Appendix D	Scenario Outline	Form ES-D-1

Facility: Turkey Point Scenario No.: 4 Op Test No.: 2010-301

Examiners: _____ Candidates: _____ US

_____ _____ RO

_____ _____ BOP

Initial Conditions: Mode 1, 75% Power, MOL because of potential grass influx problems,

Turnover: Equipment OOS: Breaker 3AB18 for 3B2 Circ water pump is racked out due to breaker failure. Shift Manager has received notification that conditions for a Grass Influx are favorable and has performed a Grass Influx evaluation.

Immediately after shift turnover perform monthly surveillance on 3A ECC using 3-OSP-055.1 section 4.2 beginning at step 4.2.1.11. IST and remote valve position verification not required. The Shift Manager has granted permission to perform the test. Operators required for this evolution have been briefed and are in the field.

Maintain 75%

Online risk – green

A train protected both units

Event No.		Event Type*	Event Description
1	TFC1DOG t	(TS) SRO	3A ECC monthly surveillance performed using 3-OSP-055.1 section 4.2.1. 3A ECC fan trips and the 3A ECC is declared OOS. The SRO enters LCO 3.6.2.2 action a.
2		C(BOP)	3A TPCW Trip
3	TFL1T8CH = T	(I) RO (I) SRO	TM-3-408C (Tavg input to rod control) fails high. The RO responds using 3-ONOP-028 and takes rods to manual to stop continuous inward rod movement.
4	TCE6DS2C & TFEG6G215	(C) RO (C) BOP (C,TS) SRO	120V vital instrument bus 3P07 main feeder breaker fails open. The RO responds using 3-ONOP-3.7 to restore Letdown and the BOP manually controls feedwater to the 3B S/G. The SRO enters LCO 3.0.3 and 3.8.1.1
5		(R) RO (N) BOP	The RO will initiate a boration and the BOP will reduce turbine load using 3-ONOP-100.
6	TAHUVBSB=22 TAHUVBMB= 6		The 3B RCP develops high vibration. The crew responds using 3-ONOP-041.1. Once vibration reaches the trip setpoint, the crew manually trips the reactor and immediate actions of 3-EOP-E-0 are performed.
7	TVHHHLB = 0.1 TFQ634AF = T	(M) ALL	When 3B RCP is tripped, 3B 4kV bus is de-energized and a large break LOCA occurs. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, then FR-Z.1 and subsequently 3-EOP-E-1. Once CSFSTs are monitored for implementation, if containment pressure is still above 20 psig, the crew will transition to 3-EOP-FR-Z.1 if no higher red or orange path exists.
7a		(C) BOP	An automatic SI occurs but train A sequencer fails due to the loss of 3P07. The BOP manually starts train 3A RHR and the 3A Containment Spray pumps.

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

2010-301 NRC Scenario #4

Event 1 - 3A ECC monthly surveillance performed using 3-OSP-055.1 section 4.2.1. 3A ECC fan trips and the 3A ECC is declared OOS. The SRO enters LCO 3.6.2.2 action a.

Event 2 - 3A TPCW Trip. The A TPCW pump bearing fails, the BOP manually starts the 3B TPCW pump and stops the 3A TPCW pump,.

Event 3 - TM-3-408C (Tavg input to rod control) fails high. The RO responds using 3-ONOP-028 and takes rods to manual to stop continuous inward rod movement.

Event 4 - 120V vital instrument bus 3P07 main feeder breaker fails open. The RO responds using 3-ONOP-3.7 to restore Letdown and the BOP manually controls feedwater to the 3B S/G. The SRO enters LCO 3.0.3 and 3.8.1.1

Event 5 - The RO will initiate a boration and the BOP will reduce turbine load using 3-ONOP-100.

Event 6 - The 3B RCP develops high vibration. The crew responds using 3-ONOP-041.1. Once vibration reaches the trip setpoint, the crew manually trips the reactor and immediate actions of 3-EOP-E-0 are performed.

Event 7 - When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07.

Event 7a - The Train A RHR **(CRITICAL TASK)** and Containment Spray **(CRITICAL TASK)** pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1 and subsequently 3-EOP-E-1.

Event 7a - Once CSFSTs are monitored for implementation, if containment pressure is still above 20 psig, the crew will transition to 3-EOP-FR-Z.1 if no higher red or orange path exists.

2010-301 NRC Scenario #4 Simulator Operating Instructions

Setup

Restore IC-16 (75% MOL)

Open and execute lesson file Gr 26 NRC Scenario 4.lsn

Place simulator in run

Manually stop the 3B2 Circulating Water pump

Trigger lesson steps:

- SETUP - 3B2 CWP OOS (actuates TAK4DP = 3)
- SETUP - 3B TPCW Fail to Auto Start (actuates TFK3B11S T)
- Place Clearance Tag on 3B2 Hand Switch

Perform of 3-OSP-055.1 section 4.2 steps 7 and 8.

Provide a copy of 3-OSP-055.1 section 4.2 & Attachment 1 filled out thru step 4.2.1.10. 3-OSP-055.1 is being performed without quarterly IST or remote position verification required.

Place stop watch on the RCO Panel.

Place simulator in freeze.

Provide shift turnover checklists

Perform Simulator Operator Checklist

Event 1 - 3A ECC OSP failure

3A ECC monthly surveillance performed using 3-OSP-055.1 section 4.2.1. 3A ECC fan trips and the 3A ECC is declared OOS. The SRO enters LCO 3.6.2.2 action a.

When the RO manually starts the 3A ECC fan ensure, lesson step **EVENT 1 - 3A ECC Fan Trip** (actuates TFC1DOG t) Auto inserts

If directed respond as TO

If directed, respond as WCC to have Electrical maintenance investigate failure of the 3A ECC fan.

If directed, respond as WCC to position 3A ECC breaker 30650 to OFF and place it under clearance. After 5 min, **trigger** lesson step **EVENT 1 - 3A ECC BKR TO OFF** (actuates TCC1DMG = F)

Event 2– 3A TPCW Pump Trip

The A TPCW pump bearing fails, the BOP manually starts the 3B TPCW pump.

When directed, trigger lesson step **Event 2 - 3A TPCW Trip** Event 7

If directed, respond as the FS/TO, report the 3A TPCW pump is not running and the pump inboard bearing is hot

If directed, respond as WCC to have Mechanical maintenance investigate failure of the 3A TPCW.

If directed, respond as WCC if directed to generate a PWO

Event 3- TM-3-408C Tavg input to rod control fails high

TM-3-408C (Tavg input to rod control) fails high. The RO responds using 3-ONOP-028 and takes rods to manual to stop continuous inward rod movement.

When directed, trigger lesson step **EVENT 3 - TM-3-408C FAILS HIGH** (actuates TFL1T8CH = T).

If directed, respond as WCC to have I&C investigate failure of rod control.

If directed, respond as WCC if directed to generate a caution tag to be hung on the rod control selector switch. Ensure a caution tag is available in the booth.

When contacted to investigate the TM-408C failure-direct the crew not to use rods until problem is resoled. Recommend that Tave be restored by reducing turbine load. When the BOP reduces load on the load limit for the second time, then enter the loss of 3P07.

Event 4 - Loss of 3P07

120V vital instrument bus 3P07 main feeder breaker fails open. The RO responds using 3-ONOP-3.7 to restore Letdown and the BOP manually controls feedwater to the 3B S/G. The SRO enters LCO 3.0.3 and 3.8.1.1

When directed, **trigger lesson step EVENT 4 - LOSS OF 3P07** (actuates TCE6DS2C & TFEG6G215)

When directed, respond as TO/FS. Report 3P07 Main Feeder and breakers 10 and 15 were found open, no apparent cause.

When directed to perform 3-ONOP-003.7 Attachment 1, respond as FS, use time compression **and trigger lesson step, EVENT 4 – OPEN 3P07 BREAKERS.** (actuates TCE6DG4C=F & TCE6215S=T)

When directed to perform 3-ONOP-003.7 Attachment 1, respond as FS, use time compression **and trigger lesson step, EVENT 4 Close 3P07 Main Breaker**

When directed to perform 3-ONOP-003.7 Attachment 1, respond as FS, use time compression **and trigger lesson step, EVENT 4 Align 3P07 to AS Inverter**

When directed to perform 3-ONOP-003.7 Attachment 1, respond as FS, use time compression **and trigger lesson step Event 4 - Close 3 P07 Breakers.**

Booth Operator— Wait until the US determines that a 3.0.3 shutdown is required.

Cue the US that the sequencer will not be restored for 24 hrs. Inform him to do a 3-ONOP-100 load reduction vice a GOP-301 Shutdown..

When directed, respond as TO/FS, use time compression notify the crew that 3P07 breakers 10 and 15 will not re-close no apparent cause Estimated time to repair is at least 10 hrs.

When directed, respond as WCC acknowledge direction to investigate the cause of the 3P07 breaker trip and to contact Electrical Maintenance and to generate PWO and clearance. **Do not restore power to P07 until the BOP has demonstrated the ability to control SG Level.**

When directed, respond as management/System if called about forced shutdown.

Event 5 –Fast load reduction

The RO will initiate a boration and the BOP will reduce turbine load using 3-ONOP-100.

If directed, respond as System when called about load reduction.

If directed, respond as SM when told to review 0-EPIP-20101 & 0-ADM-115 for notification requirements. State that the NRC Resident will be notified of the fast laod reduction.

If directed, respond as chemistry to take samples. No response back required.

If directed, respond as FS/NSO to align aux steam using attachment 1. No response back required.

Event 6 - 3B RCP high vibration / Reactor trip

The 3B RCP develops high vibration. The crew responds using 3-ONOP-041.1. Once vibration reaches either shaft or motor trip setpoint, the crew manually trips the reactor and immediate actions of 3-EOP-E-0 are performed.

When directed, trigger lesson step **EVENT 5 - 3B RCP HIGH VIBRATION** (actuates TAHUVBSB = 22.0 on 5 min ramp & TAHUVBMB = 6.0 on 5 min ramp).

When directed, respond if notified as system engineer of increasing vibration on 3B RCP motor & shaft.

Event 7 - Large break LOCA / Loss of 3B 4kv Bus

Tripping 3B RCP auto triggers lesson step EVENT 6 - LARGE BREAK LOCA (actuates TVHHHLB = 0.1) **and EVENT 6 - 3B 4KV BUS LOCKOUT** (actuates TFE2Z51S = T).

The 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1 and subsequently followed by 3-EOP-E-1.

When directed, respond as TO to locally close MOV-3-1407. After 4-6 min, **trigger** lesson step **EVENT 7 - CLOSE MOV-3-1407** (actuates TFVV07C = F). Report when complete.

When directed, respond as SNPO to locally open MOV-3-843B. After 1-3 min., **trigger** lesson step **EVENT 7 - OPEN MOV-3-843B** (actuates TFMVV02O = T). Report when complete.

When directed, respond as U4 RO to perform 3-EOP-E-0 Att 1 to align U4 HHSIPs to U3 RWST. After 1-3 min, **trigger** lesson step **EVENT 7 - ALIGN U4 HHSIP TO U3 RWST** (actuates TAMH1V41 = 1.0, TAMH1V46 = 1.0 after 1 min delay, TAMH1V37 = 0.0 after 2 min delay, TAMH4856 = 0.0 after 3 min delay). Report when complete.

When directed, respond as SNPO when directed to locally verify phase A valves MOV-3-1417, 1418, 1425 & 381 closed (all of which are in the U3 Pipe & Valve Room). After 1-3 min, **trigger** lesson step **EVENT 7 - CLOSE PHASE A ISOL VALVES** (actuates TFKV417C = T, TFKV418C = T after 1 min delay, TFBV60 = T after 2 min delay & TFSWVM5B = T after 3 min delay). Report when complete.

When directed, respond as SNPO to locally verify phase B valves MOV-3-626, 716B & 730 closed(all of which are in the U3 Pipe & Valve Room). After 1-3 min, **trigger** lesson step **EVENT 7 - CLOSE PHASE B ISOL VALVES** (actuates TFKV626C = T, TFKV16BC = T after 1 min delay & TFKV730C = T after 2 min delay). Report when complete.

When directed, respond as SNPO to place PAHMS in service on unit 3. After 8-12 minutes, **trigger** lesson step **EVENT 7 - PLACE U3 PAHMS IN SERVICE** (actuates TAC2V02A = 1.0, TAC2V02B = 1.0, TAAAV21 = 1.0, TAAAV22 = 1.0 & TACA005 = 0.0). Report when complete.

Transition is made from 3-EOP-E-0 to 3-EOP-FR-P.1 which is quickly exited due to the presence of low head SI flow in response to the LBLOCA.

When crew requests the STA (during the Major Event only), delay 10 minutes then send in the STA.

Event 7 - Respond to High Containment Pressure

Once CSFSTs are monitored for implementation, if containment pressure is still above 20 psig, the crew the crew will transition to 3-EOP-FR-Z.1 if no higher red or orange path exists.

When directed, respond as SNPO to check CSP suction & discharge valves open. After 1-3 min., report that 3A CSP suction & discharge valves are open.

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	--
1. Total malfunctions (5–8)	7
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	5
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)	2

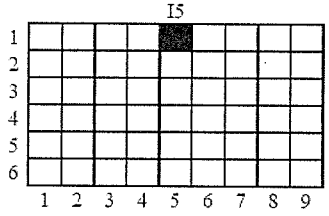
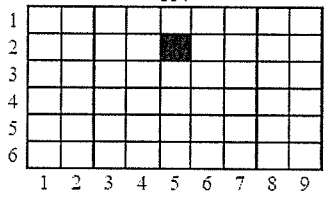
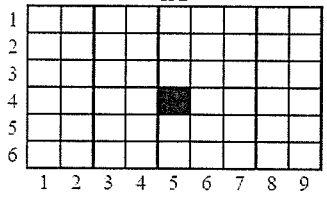
Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 1 Page 1 of 1

Event Description: 3A ECC monthly surveillance is being performed using 3-OSP-055.1 section 4.2 at step 42.1.11 when the 3A ECC fan trips and the 3A ECC is declared OOS. The SRO enters LCO 3.6.2.2 action a.

Time	Position	Applicant's Actions or Behavior
		2.1 Precautions 1. Only one Emergency Containment Cooler shall be tested at a time. 2. A 72-hour Action Statement applies to a single ECC declared inoperable. • If Inservice Testing is required in MODES 1, 2, 3, or 4, entry to a 72-hour Action Statement will occur for a single ECC declared inoperable. • If the Control switch for 3A or 3C ECC is placed in STOP, the affected ECC must be declared inoperable.
	BOP	4.2 3A Emergency Containment Cooler Test INITIAL 4.2.1 3A ECC Test Performance 11. Simultaneously **START** the following: • 3A ECC Fan _____ • The stopwatch _____
	BOP	Places the handswitch for the 3A ECC fan to START
	BOP	Observes that the 3A ECC Fan trips.
	SRO	Directs the BOP to place the handswitch to stop.
	BOP	Places the handswitch for the 3A ECC fan to STOP
		EXAMINER NOTE: The Crew may leave switch in STOP rather than return to AUTO since 3A ECC OOS.
	SRO	Determines the 3A ECC is INOPERABLE and enters LCO 3.6.2.2 action a.
		3.6.2.2 Three emergency containment cooling units shall be OPERABLE. APPLICABILITY: MODES 1, 2, 3, and 4. a. With one of the above required emergency containment cooling units inoperable restore the inoperable cooling unit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 2 Page 1 of 2

Event Description: The B TPCW bearing fails, the BOP will start the A TPCW pump using the ARP or 3-ONOP-008 to maintain plant operation

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 2– 3B TPCW Pump Bearing Fails (actuates TVKD001X 1 with a 3 min ramp).		
	RO	Observes annunciators I-5/1, 5/2 & 5/4
		I5  ATTACHMENT 9 Page 25 of 54 Panel I TPCWP A/B MOTOR OVERLOAD
		114  ATTACHMENT 9 Page 26 of 54 Panel I TPCWP A/B TRIP
		132  ATTACHMENT 9 Page 28 of 54 Panel I TPCW HI TEMP/ LO PRESS
	BOP	May start the 3A and stop the 3B TPCW pump using the ARP
	SRO	Directs response using 3-ONOP-008 or the ARP

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 2 Page 2 of 2

Event Description: The B TPCW bearing fails, the BOP will start the A TPCW pump using the ARP or 3-ONOP-008 to maintain plant operation

Time	Position	Applicant's Actions or Behavior
		CAUTIONS • *If a turbine plant cooling water pump is stopped in this procedure and the reason for stopping the pump has not been corrected, that pump is not available for starting in subsequent procedure steps.* • *Monitoring Main Generator RTDs is required if TPCW flow or temperature is changed due to the effect on Main Generator hydrogen leakage. An increase in hydrogen leakage is expected if the gas temperature to rotor temperature gradient increases. (Reference CR 2008-803)*
		NOTE *If turbine lube oil cooler outlet temperature increases to greater than 125°F, emergency cooling may be established using ATTACHMENT 1.*
	BOP	1 Check All Turbine Plant Cooling Water Pump Alarms - OFF • I 6/1, TPCWP A/B MOTOR OVERLOAD • I 6/2, TPCWP A/B TRIP • I 6/3, TPCWP A/B MOTOR BRG HI TEMP Perform the following: a. Determine affected turbine plant cooling water pump. b. Check if standby turbine plant cooling water pump auto-started. IF standby turbine plant cooling water pump did not auto-start AND offsite power is available, THEN start standby turbine plant cooling water pump. c. Stop affected turbine plant cooling water pump.
	BOP	2 Verify Turbine Plant Cooling Water Pumps - AT LEAST ONE RUNNING Perform the following: a. IF offsite power is available, THEN start one turbine plant cooling water pump. b. IF neither turbine plant cooling water pump can be started, THEN manually trip reactor AND main turbine.
		EXAMINER NOTE: When the crew starts the 3A TPCW pump, proceed to EVENT 3- TM-408C Failure

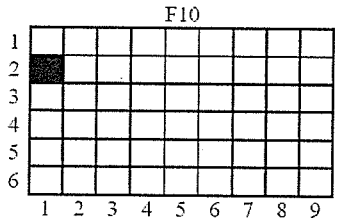
Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 3 Page 1 of 1

Event Description: TM-3-408C (Tavg input to rod control) fails high. Crew responds using 3-ONOP-028 and takes rods to manual to stop continuous inward rod movement.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 3- TM-3-408C FAILS HIGH (actuates TFL1T8CH = T)		
	RO	Observes continuous control rod auto insertion with no demand present.
	SRO	Directs response using 3-ONOP-028.
	RO	4.0 **IMMEDIATE ACTIONS** 4.3 Continuous Insertion of an RCC Control Bank 4.3.1 Place the Rod Motion Control Selector switch to the MAN position.
	RO	Places Rod Motion Control Selector to MAN
	RO	Observes continuous control rod auto insertion has stopped.
	RO	5.0 **SUBSEQUENT ACTIONS** 5.3 Continuous Insertion of an RCC Control Bank 5.3.1 Adjust rods or reduce turbine load as determined by the Shift manager to restore Tavg equal to Tref. 5.3.3 Compare rod position to control rod insertion limits using the Rod Position Bank Recorders (VPA) or using the Plant Curve Book, Section VII, Figure 3.
	BOP	Reduce Turbine Load as directed to restore RCS Temperature.
	RO	Place a caution tag on Rod control Selector Switch stating that placing rods in AUTO may result in undesired rod motion.
	BOP	Notify I&C of problem with rod control.
		Examiner Note: After the BOP reduces turbine load for the second time-with the lead examiner concurrence-Proceed to Event 4-Loss of P07. The reason the BOP has to reduce turbine load twice is to ensure the BOP must control 3B FRV in manual later.

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 4 Page 1 of 8

Event Description: 120V vital instrument bus 3P07 main feeder breaker fails open. The crew responds using 3-ONOP-3.7 to restore Letdown and control feedwater to the 3B S/G. The SRO enters LOC 3.0.3 and 3.8.1.1

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 4 - LOSS OF 3P07 (actuates TCE6DS2C & TFEG6G215)		
		 ATTACHMENT 6 Page 2 of 54 Panel F VITAL AC BUS INVERTER TROUBLE
	BOP	Observes annunciators F-1/2, B 9/2 and 9/3
	CREW	Observes the following: • RPS Status Logic Lights for Channel I & II OFF • Loss of Channel II Instrumentation (White) • Loss of Auto Control of 3B Feedwater Control Valve, FCV-3-488 • Auto VCT makeup will occur due to LT-3-115 failure
	RO	Reviews action required by the ARP.
		OPERATOR ACTIONS: 1. Verify alarm by checking the following: a. Inverter status lights below X panel. 2. Verify the following automatic actions have occured: a. Auto transfer to the CVT
		NOTE *24 hour LCO for operation on CVT, see TS 3.8.3*

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 4 Page 2 of 8

Event Description: 120V vital instrument bus 3P07 main feeder breaker fails open. The crew responds using 3-ONOP-3.7 to restore Letdown and control feedwater to the 3B S/G. The SRO enters LOC 3.0.3 and 3.8.1.1

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-ONOP-003.7
		NOTES • *Step 1 is an immediate action step.* • *All 3P07 (WHITE) channel indication/controls are affected by failure of 3P07. Enclosure 1 provides a listing of lost functions, indications, and controls.*
	CREW	Performs IOAs, Determines reactor trip not occurred nor required
	CREW	Reviews Foldout Page
		FOLDOUT PAGE FOR PROCEDURE -ONOP-003.7 1. Dispatch an operator to restore power to 3P07 using Attachment 1. 2. Due to the failure of LT-3-115, place RCS Make Up Control Switch to STOP.
	RO	Directs TO/FS perform Attachment 1 to strip and restore 3P07.
		Examiner Note: See page 6 of event 4 for Attachment 1
		Examiner Note: The crew will be unable to restore all of 3P07 due to the failure of the main feeder breaker and breakers 10 and 15.
	SRO	**2 Check Unit Operating In Modes 1 Through 3 Prior To Loss Of 3P07** Perform the following: a. IF OMS is in LOW PRESSURE OPS, THEN verify RCS pressure is less than OMS setpoint AND place PORV-3-455C control switch to CLOSE. b. Monitor #1 seal ΔP for RCP trip criteria. c. Monitor RCS pressure. d. IF RCS pressure exceeds the OMS setpoint AND PORV-3-456 does NOT AUTO open, THEN operate PORV–3–455C as necessary to reduce RCS pressure.
		NOTE *If the Pressurizer Level Control Selector Switch was NOT in Position 2 (CH 1 and CH 3), letdown isolation will have occurred.*

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 4 Page 3 of 8

Event Description: 120V vital instrument bus 3P07 main feeder breaker fails open. The crew responds using 3-ONOP-3.7 to restore Letdown and control feedwater to the 3B S/G. The SRO enters LOC 3.0.3 and 3.8.1.1

Time	Position	Applicant's Actions or Behavior
		3 **Control Pressurizer Parameters As Follows** a. Place Pressurizer Level Control Selector Switch on VPA in Position 2 (CH1 and CH3) b. Check 3A or 3C Charging Pump operating — b. Operate 3A or 3C Charging pump(s) as necessary to maintain Pressurizer Level. c. Check normal letdown in service — c. Restore Normal Letdown flow using Attachment 4. d. Maintain Pressurizer Level – IN REQUIRED CONTROL BAND e. Check Pressurizer Pressure - IN REQUIRED CONTROL BAND — e Perform the following: 1) Operate pressurizer heaters **AND** spray valves as necessary to maintain pressure in the required control band. 2) **IF** RCS is solid, **THEN** operate charging pumps and letdown flow as necessary to maintain pressure in the required control band.
	RO	Places PZR level control switch to position 2 (CH1 and CH3)
	RO	Maintains PZR press on program using heaters & spray as required

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 4 Page 4 of 8

Event Description: 120V vital instrument bus 3P07 main feeder breaker fails open. The crew responds using 3-ONOP-3.7 to restore Letdown and control feedwater to the 3B S/G. The SRO enters LOC 3.0.3 and 3.8.1.1

Time	Position	Applicant's Actions or Behavior
		ATTACHMENT 4 (Page 1 of 1) RESTORATION OF NORMAL LETDOWN FLOW 1. Throttle Low Pressure LTDN Controller, PCV-3-145, as necessary to prevent Letdown Relief Valve from lifting (approximately 50% open). 2. Manually control Low Pressure LTDN Control Valve, PCV-3-145, as necessary limit pressure spike. 3. Open High Pressure L/D Isol. Vlv., LCV-3-460. CAUTION *To prevent channeling of demineralizer resin, DO NOT exceed 120 GPM letdown flow. When placing letdown in service, DO NOT open both 60 GPM Letdown Orifices Isolation.* 4. Open the following Letdown Isolation Valves, as required, to restore pressurizer level to program level without exceeding 120 GPM letdown flow: * 45 GPM L/D Isolation Valve, CV-3-200A * 60 GPM L/D Isolation Valve, CV-3-200B * 60 GPM L/D Isolation Valve, CV-3-200C 5. Return Low Pressure Letdown Control Valve, PCV-3-145 to Automatic.
	RO	Restores normal letdown using Attachment 4
		CAUTIONS • *Reducing feed flow to less than steam flow by 655,000 lbs/hr will result in a reactor trip due to low level trip logic on Channel 2 of each Steam Generator.* • *3B Steam Generator Level Recorder is - DE-ENERGIZED.* • *Main Generator load should be maintained as stable as possible until all FW Control Valves are restored to automatic control.*
		NOTES • *3B Steam Generator level controller is in MANUAL.* • *3A and 3C Steam Generator level controller should remain in AUTOMATIC.*
	BOP	Controls 3B FRV-3-488 to maintain 3B S/G level on program US should give BOP a band to control SG level in.

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 4 Page 5 of 8

Event Description: 120V vital instrument bus 3P07 main feeder breaker fails open. The crew responds using 3-ONOP-3.7 to restore Letdown and control feedwater to the 3B S/G. The SRO enters LOC 3.0.3 and 3.8.1.1

Time	Position	Applicant's Actions or Behavior	
	CREW	**5** **Maintain The Following Plant Parameters - STABLE** • Tavg • Reactor power • Pressurizer Pressure • Pressurizer Water level • Steam generator Water level	IF any Reactor trip setpoint is approached or exceeded, THEN trip the reactor AND perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure.

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 4 Page 6 of 8

Event Description: 120V vital instrument bus 3P07 main feeder breaker fails open. The crew responds using 3-ONOP-3.7 to restore Letdown and control feedwater to the 3B S/G. The SRO enters LOC 3.0.3 and 3.8.1.1

	SRO	**6** **Check Power Restored To 3P07**	Perform the following: a. Continue efforts to restore power to 3P07. b. IF power can NOT be restored to 3P07 within 1 hour, THEN perform the actions required by Technical Specifications as directed by the NPS. c. Return to Step 1.
	SRO	**CAUTION** *Auto/Manual controllers should NOT be returned to AUTO until vital power has been completely restored.* **NOTE** *When power is restored to a Manual/Auto station, the auto light will turn on, after approximately 15 seconds the manual light will turn on. When the manual light turns on manual control of the process is available.* **7** **WHEN 3P07 Has Been Energized, THEN Restore Equipment To Automatic Controls As Follows:** a. Pressurizer pressure control using 3-OP-041.2, PRESSURIZER OPERATION b. Steam Generator level control as follows 1) Manually control feed flow to return steam generator level to required band for plant operating mode 2) Manually adjust feed flow to match steam flow 3) Place the steam generator level controls to AUTO 4) Repeat steps 7.b.1) through 7.b.3) above until all steam generator level controls are in AUTO c. Direct the operators to return all controls, listed on Enclosure 1, to AUTOMATIC using appropriate plant procedures d. Verify all annunciators indicate correctly for the current plant status	c. IF automatic control is NOT available or desired, THEN maintain controls in manual. d. Perform the actions of the appropriate Annunciator Response procedures for the affected alarms.

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Event Description: 120V vital instrument bus 3P07 main feeder breaker fails open. The crew responds using 3-ONOP-3.7 to restore Letdown and control feedwater to the 3B S/G. The SRO enters LOC 3.0.3 and 3.8.1.1

		NOTES *3A bus sequencer is out of service, due to Vital Panel 3P07 deenergized, resulting in the following Tech Spec implications:* *1) AFW actuation signals from bus stripping on 3A 4KV bus will **NOT** be generated, placing the unit in Tech Spec 3.0.3 (Tech Spec 3.3.2, Table 3.3-2, Functional Unit 6d action 23 invokes Tech Spec 3.0.3.)* *2) Loss of Power signals are lost via the 3A bus sequencer, placing the unit in Tech Spec 3.0.3 (Tech Spec 3.3.2, Table 3.3-2, Functional Unit 7a, b, and c.)* *3) Bus stripping will **NOT** automatically occur, 3A EDG will **NOT** automatically close in on the bus and is out of service (actions of Tech Spec 3.8.1.1 apply).*
	SRO	Reviews Enclosure 1 affected equipment and note regarding Tech Specs NOTE TO EXAMINER: T.S. 3.8.1.1 actions b and d apply
	SRO	Directs WCC arrange for Electrical Maint investigation of power restoration to the sequencer.

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Event Description: 120V vital instrument bus 3P07 main feeder breaker fails open. The crew responds using 3-ONOP-3.7 to restore Letdown and control feedwater to the 3B S/G. The SRO enters LOC 3.0.3 and 3.8.1.1

Examiner Note: When the SRO has addressed Tech Specs, proceed to Event 5-3-ONOP-100 Shutdown when the BOP places the feed regulating valve back in AUTO.

ATTACHMENT 1
(Page 1 of 2)

Restoration of 3P07 Vital Instrument AC Bus

1. In the Inverter Room, perform the following:
   a. Proceed to the 3A failed inverter.
   b. Open the 3A inverter System Output breaker CB6.
2. In the Cable Spreading Room, perform the following:
   a. At Vital Instrument Panel 3P07, place **ALL** breakers to OFF, including main panel breaker.
   b. At Subpanel 3P22, place all breakers to OFF.
3. Check 4P07 being powered by AS Inverter at 4P07A Vital Instrument AC Selector Switch in the Cable Spreading Room.
4. IF 4P07 is powered by the AS Inverter, THEN notify the Nuclear Plant Supervisor.

CAUTION

Do NOT proceed with this procedure if 4P07 is powered by the AS Inverter

5. IF 4P07 is NOT powered from AS Inverter, THEN place spare inverter AS in service to supply 3P07 Vital Instrument AC Bus load as follows:
   a. At Vital Instrument Panel 3P07A, in the Cable Spreading Room, place Vital Instrument AC Selector Switch 3P07A to the ALTERNATE SUPPLY STANDBY STATIC INVERTER AS (AC LINE) position.

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Event Description- Loss of the sequencer requires a 3.03 shutdown. The crew will have to perform an 3-ONOP-100, Rapid Load Reduction.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-ONOP-100.
	SRO	**1** **Brief Control Room Personnel Using Attachment 3** (See page for briefing sheet)
	CREW	Reviews 3-ONOP-100 foldout page actions (See next page)
	SRO	Determines 18 gal/% boric acid addition is required 1350-1600 gallons total.
	RO	**2** **Begin Boration** a. Set the Boric Acid Totalizer to value determined using Attachment 3 b. Set FC-3-113A, Boric Acid Flow Controller to a pot setting of 8.0 c. Place the Reactor Makeup Selector Switch to BORATE d. Place the RCS Makeup Control Switch to START IF boration is not required, THEN go to Step 3
	CREW	**3** **Notify The Following** • System Dispatcher • Plant personnel using the Page Boost
	RO BOP CREW	**4** **Reduce Unit Load** a. Check for boration effects (reducing Tavg) b. Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate c. Initiate and maintain load reduction rate to the target power level d. Monitor load reduction and auto rod control to ensure that the expected Tavg/Tref ΔT identified in Attachment 3 is maintained a. IF boration is used, THEN wait for effects before starting load reduction. d. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within t expected Tavg/Tref ΔT of Attachment 3.
	RO	**5** **Monitor Annunciator B 8/1, ROD BANK LO LIMIT – RESET** Perform the following: a. Slow load reduction until alarm is reset. b Re-evaluate boration amount and rate an make adjustments as necessary.

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 5 Page 2 of 4

Event Description- Loss of the sequencer requires a 3.03 shutdown. The crew will have to perform an 3-ONOP-100, Rapid Load Reduction.

Time	Position	Applicant's Actions or Behavior
	CREW	**FOLDOUT PAGE** **1. 3-EOP-E-0 Transition Criteria** IF any of the following limits are reached, THEN trip the Reactor and Turbine AND go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION: a. RCS Tavg - GREATER THAN 578 °F b. RCS Tavg - GREATER THAN Tref by 6 °F c. Rod Insertion Limits are exceeded as indicated by: • Rod Position Bank D Insertion Limit Recorder (VPA) • Stepcounters on console • Plant Curve Book Section 7, Figure 3 **2. Notify Chemistry Department** WHEN reactor power has changed by greater than or equal to 15 percent, THEN notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4. **3. Restore Blender to AUTO** WHEN boration is complete, THEN restore the Blender to AUTO as follows. a. Place the Reactor Makeup Selector Switch to AUTO b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired c. Place the RCS Makeup Control Switch to START

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 5 Page 3 of 4

Event Description- Loss of the sequencer requires a 3.03 shutdown. The crew will have to perform an 3-ONOP-100, Rapid Load Reduction.

Time	Position	Applicant's Actions or Behavior
	CREW	**6** **Notify The Shift Manager To Refer To The Following Procedures** • 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR • 0-ADM-115, NOTIFICATION OF PLANT EVENTS
		NOTE *Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-OP-059.9, Operation Within the Axial Flux Difference Operational Space.*
	RO	**7** **Check Plant Response** a. Check pressurizer level following program a. IF directed by the Unit Supervisor, THEN increase charging flow as follows: 1) Throttle open TCV-144, NRHX Temp Control Valve, bypass valve 3-834 to raise flow to approximately 600 gpm. 2) Start an additional charging pump. 3) Place an additional letdown orifice in service. b. Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3 b. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.
	RO	**8** **Energize Pressurizer Backup Heaters**
	BOP	**9** **Verify Turbine Load Less Than 570 MWE** WHEN turbine load is less than 570 MWe, THEN open the SGFP recirculation valves for the first feedwater pump to be stopped. Open the SGFP recirculation valves for the first feedwater pump to be stopped
		Examiner Note: The SRO may implement the following steps.
	BOP	**15** **Ensure Station Service Loads Supplied From The Startup Transformer using Attachment 2** **16** **Ensure Auxiliary Steam Supplied From Another Unit using Attachment 1**

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 5 Page 4 of 4

Event Description- Loss of the sequencer requires a 3.03 shutdown. The crew will have to perform an 3-ONOP-100, Rapid Load Reduction.

Time	Position	Applicant's Actions or Behavior
		FAST LOAD REDUCTION BRIEF 1. Reason for load reduction _____ 2. Target power level _____ % Power

Time to Shutdown from 100%	25 min	50 min	75 min	110 min
Load Reduction Rate MW/min	30 MW/min	15 MW/min	10 MW/min	7 MW/min
Load Reduction Rate %/min	4 % / min	2 % / min	1.33 % / min	1 % / min
Expected Tavg/Tref ΔT	4 °F	3 °F	2 °F	1 °F

3. Load reduction rate _____ Mw / minute

NOTES

- *Suggested boration is 9 gallons per % with control rods completely withdrawn and available, 18 gallons per % with no control rod movement (use a value between 9 and 18 if rods are not fully withdrawn when starting a load reduction from full power).*
- *The Unit Supervisor may change the boration as desired during the load reduction.*

4. Boration Rate: _____ total gallons / _____ minutes = _____ gallons/minute.
5. Plant Control Parameters and Contingency Actions
   - Tavg / Tref expected ΔT band, not to exceed ±1 °F of expected, slow ramp to restore band.
   - If Annunciator B 8/1, ROD BANK LO LIMIT alarms, the load reduction shall be slowed.
6. EOP E-0 transition criteria – Manual reactor and turbine trip:
   - Tave > 578 °F • Tave 6 °F > Tref • Rod Insertion Limits (RIL) are exceeded
7. Review required actions from other procedures currently in effect (example. stop RCP).
8. Questions or crew input?
9. End of Brief

	US	Determines that using 18ga//% a boration of 1350-1600 gallons required. Rate will be determined by the Load reduction rate.

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Event Description: The 3B RCP develops high vibration. The crew responds using 3-ONOP-041.1. Once vibration reaches either shaft or motor trip setpoint, the crew manually trips the reactor and immediate actions of 3-EOP-E-0 are performed.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 6 - 3B RCP HIGH VIBRATION (actuates TAHUVBSB = 22.0 on 5 min ramp & TAHUVBMB = 6.0 on 5 min ramp)		
		F1 RCP MOTOR/SHAFT HI VIB CAUSES: 1. RCP high vibration 2. Failed probe or spiking due to electrical transients
	RO	Observes annunciator F 1/1 Determines rising shaft & motor vibration on 3B RCP
	CREW	OPERATOR ACTIONS: 1. Verify alarm by checking the following: a. RCP Vibration recorder R-3-369. 2. Corrective actions a. Dispatch operator to check vibration indications in the cable spreading room. b. IF vibration is above the alarm setpoint, THEN go to 3-ONOP-041.1, Reactor Coolant Pump Off-Normal. c. IF vibration is below the alarm setpoint, THEN have operator reset the Bently Nevada using the Common Reset toggle switch.
		NOTES • *Foldout Page is required to be monitored throughout this procedure.* • *Off-normal RCP Conditions that require shutdown of a RCP shall be verified by cross-checking all RCP parameters.* • *If either 3B or 3C RCPs are stopped by the performance of this procedure, then the associated RCS loop pressurizer spray valve should be closed to prevent back-flow through the valve.*
	CREW	Motor frame vibration, R-369 (Points 2, 6, 10) - GREATER THAN OR EQUAL TO 5 MILS Note exception in Foldout Page Item 4. RCP shaft vibration, R-369 (Points 3, 7, 11) - GREATER THAN OR EQUAL TO 20 MILS Note exception in Foldout Page Item 4.
	SRO	Directs response using 3-ONOP-041.1 foldout page
	SRO	Directs RO to manually trip the reactor and to trip the 3B RCP

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 6 Page 2 of 2

Event Description: The 3B RCP develops high vibration. The crew responds using 3-ONOP-041.1. Once vibration reaches either shaft or motor trip setpoint, the crew manually trips the reactor and immediate actions of 3-EOP-E-0 are performed.

Time	Position	Applicant's Actions or Behavior
	RO	Manually trips the reactor, verifies the reactor tripped, then trips the 3B RCP.
		Examiner Note: Proceed to Event 7-LBLOCA

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, then FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 7 LBLOCA" (actuates TVHHCLB= 2.0 / 3:00 ramp)		
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	**1 Verify Reactor Trip** • Rod bottom lights – ON • Reactor trip and bypass breakers – OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING Manually trip reactor. IF reactor power is greater than 5% OR intermediate range power is NOT stable or decreasing, THEN perform the following: a. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b. Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.
	BOP	**2 Verify Turbine Trip** a. All turbine stop or associated control valves – CLOSED a. Manually trip turbine. IF unable to verify turbine trip, THEN close main steamline isolation and bypass valves. b. Verify Moisture Separator Reheater Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves b. Manually close valves. IF any valve can NOT be closed, THEN close main steamline isolation and bypass valves. c. Check Mid and East GCBs – OPEN (Normally 30 second delay) c. Manually open breakers. IF breakers do NOT open, THEN actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, then FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	BOP	Manually closes MSIVs to isolate the MSRs.
	BOP	**3 Verify Power To Emergency 4 KV Buses** a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED a. Perform the following: 1) Attempt to emergency start any Unit 3 available diesel generator. 2) **IF** neither 3A nor 3B 4 KV bus is energized, **THEN** go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1. b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED b. Attempt to emergency start the de-energized Unit 3 bus diesel generator. c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS c. Perform the following: 1) **IF** lockout of 3D 4 KV bus **NOT** present, **THEN** perform the following: a) Verify 3C CCW pump - BREAKER OPEN. b) Verify 3C ICW pump – BREAKER OPEN. c) Operate bus supply breakers to restore power.
	BOP	Manually aligns the 3D 4KV Bus to the 3A 4 KV Bus.by opening breakers 3AA17 and 3AD01 and then closes 3AD06 and 3AB19.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	**4 Check If SI Is Actuated** * SI Annunciators - ANY ON OR * Safeguards equipment – AUTO STARTED Perform the following: a. Check if SI is required: * Low pressurizer pressure – 1730 psig OR * High containment pressure – 4 psig OR * High steam line differential pressure – 100 psid OR * High steam flow with low S/G pressure - 614 psig OR low Tavg (543 F) b. IF SI is required, THEN manually actuate SI and containment isolation phase A AND go to Step 5. c. IF SI is NOT required, THEN perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-ES-0.1, REACTOR TRIP RESPONSE, Step 1.
	RO	Places handswitch for the 3B RCP to STOP if not already done.
	CREW	Observes RCS pressure decreasing rapidly with an automatic SI and Phase A Isolation
	CREW	Announces that adverse containment conditions exist.
	CREW	Observes loss of 3B 4kV bus.
	CREW	Monitors 3-EOP-E-0 Foldout page (see next page)
	BOP	**5 Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure**
		Examiner Note: Attachment 3 commences at page 43

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1,FR-Z.1and subsequently 3-EOP-E-1.

FOLDOUT FOR PROCEDURE E-0

1. **ADVERSE CONTAINMENT CONDITIONS**

IF either of the conditions listed below occur, THEN use adverse containment setpoints:

Containment atmosphere temperature ≥ 180°F

OR

Containment radiation levels ≥ $1.3x10^5$ R/hr

WHEN containment parameters drop below the above values, THEN normal setpoints can again be used IF the TSC determines that containment integrated dose rate has not exceeded 10^6 Rads.

2. **RCP TRIP CRITERIA**

a. IF both conditions listed below occur, THEN trip all RCPs:
   1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED.
   2) RCS subcooling - LESS THAN 25°F[65°F]

b. IF phase B actuated, THEN trip all RCPs.

3. **FAULTED S/G ISOLATION CRITERIA**

IF any S/G pressure decreasing in an uncontrolled manner OR any S/G completely depressurized, THEN the following may be performed:

a. Maintain total feedwater flow greater than 345 gpm until narrow range level in at least one S/G is greater than 6%[32%].
b. Isolate AFW flow to faulted S/G(s).
c. Stabilize RCS hot leg temperature using steam dumps when faulted S/G has blown down to less than 10% wide range.

4. **RUPTURED S/G ISOLATION CRITERIA**

IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, AND narrow range level in affected S/G(s) is greater than 6%[32%], THEN feed flow may be stopped to affected S/G(s).

5. **AFW SYSTEM OPERATION CRITERIA**

a. IF two AFW pumps are operating on a single train, THEN one of the pumps shall be shut down within one hour of the initial start signal
b. IF two AFW trains are operating and one of the AFW pumps has been operating at low flow of 60 gpm or less for one hour, THEN that AFW pump shall be shut down

6. **CST MAKEUP WATER CRITERIA**

IF CST level decreases to less than 10%, THEN add makeup to CST using 3-OP-018.1, CONDENSATE STORAGE TANK.

7. **RHR SYSTEM OPERATION CRITERIA**

IF RCS pressure is greater than 250 PSIG [650 PSIG] AND RHR flow is less than 1000 gpm, THEN the RHR pumps shall be shut down within 44 minutes of the initial start signal.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1,FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
		Examiner Note: The SRO and RO will complete the remaining steps in 3-EOP-E-0, while the BOP performs 3-EOP-E-0 prompt action verifications using attachment 3
	RO	Stops the 3A RCP when subcooling is less than 25°F (65°F) HHSI flowpath verified and HHSI pumps running or on Phase B based on foldout page requirements.
	RO	**6** **Check AFW Pumps - AT LEAST TWO RUNNING** Perform the following: a. Manually open valves to establish two AFW pumps running. b. IF an AFW pump is tripped, THEN dispatch an operator to locally reset the AFW turbine trips. c. IF both units require AFW AND only one AFW pump is available, THEN perform the following: 1) Verify all RCPs - TRIPPED 2) Establish 270 gpm AFW flow to each unit. 3) Use a setpoint of 270 gpm for required AFW flow instead of 345 gpm specified in subsequent Steps and Procedures.
	RO	**7** **Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT** Manually align valves to establish proper AFW alignment.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1,FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	8 **Verify Proper AFW Flow** a. Check narrow range level in at least one S/G - GREATER THAN 6%[32%] a. Perform the following: 1) Verify AFW flow greater than 345 gpm. 2) **IF** AFW flow less than 345 gpm, **THEN** manually start pumps **AND** align valves to establish greater than 345 gpm flow. 3) **IF** total feed flow from all sources greater than 345 gpm can **NOT** be established, **THEN** perform the following: a) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b) Go to 3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.
	RO	b. Maintain feed flow to S/G narrow range levels between 15%[32%] and 50%.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1,FR-Z,1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	**9** **Check RCP Seal Cooling** a. Check all RCP thermal barrier alarms – OFF • A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW • A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP • A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW a. IF CCW to an RCP thermal barrier is lost, THEN 1) Trip the affected RCP(s). 2) Go to Step 9c. b. Go to Step 10 c. Check all RCP seal return temperatures are less than 235 F c. Go to Step 10. d. Verify SI - RESET d. Reset SI. e. IF offsite power is NOT available, THEN check diesel capacity adequate to run one charging pump. IF adequate diesel capacity is NOT available, THEN shed nonessential loads. Refer to ATTACHMENT 2 for component KW load rating f. Start one charging pump at minimum speed for seal injection f. Go to Step 10. g. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	**10 Maintain RCS Cold Leg Temperature** * STABLE AT OR TRENDING TO 547°F IF ANY RCP RUNNING OR * LESS THAN 547°F AND STABLE IF NO RCP RUNNING Perform the following: a. IF temperature is decreasing, THEN perform the following: 1) Stop dumping steam. 2) Limit total feed flow to 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. 3) IF cooldown is due to excessive steam flow, THEN close main steamline isolation and bypass valves. b. IF temperature greater than 547°F AND increasing, THEN perform the following: * Dump steam to condenser. OR * Dump steam using S/G steam dump to atmosphere valves.
	RO	Adjusts total AFW flow to greater than 345 gpm max.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	**11 Check PRZ PORVs, Spray Valves And Excess Letdown Isolated** a. PORVs – CLOSED a. IF PRZ pressure less than 2335 psig, THEN manually close PORVs. IF any PRZ PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. b. Normal PRZ spray valves – CLOSED b. IF PRZ pressure less than 2260 psig, THEN manually close valves. IF valve(s) can NOT be closed, THEN stop RCP(s) as necessary to stop spray flow. c. Auxiliary Spray Valve, CV-3-311 – CLOSED c. Manually close auxiliary spray valve. IF auxiliary spray valve can NOT be closed, THEN close Charging Flow to Regen Heat Exchanger, HCV-3-121. d. Excess letdown isolation valves – CLOSED • CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger • HCV-3-137, Excess Letdown Flow Controller d. Manually close valve(s).

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	**12 Check If RCPs Should Be Stopped** a. Check RCPs - ANY RUNNING — a. Go to Step 13. b. Check RCS subcooling – LESS THAN 25°F[65°F] — b. Go to Step 13. c. High-Head SI Pump – AT LEAST ONE RUNNING **AND** FLOWPATH VERIFIED — c. Go to Step 13. d. Stop all RCPs
	RO	Stops RCPs when subcooling is less than 25°F (65°F) with HHSI flowpath verified and HHSI pumps running based on foldout page requirements.
	RO	**13 Check If S/Gs Are Faulted** a. Check pressures in all SGs – — a. Go to Step 14. * ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR * ANY SG COMPLETELY DEPRESSURIZED b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	**14 Check If S/G Tubes Are Ruptured** a. Check levels in all S/Gs and secondary radiation levels: * ANY SG LEVEL INCREASING IN AN UNCONTROLLED MANNER OR * Condenser air ejector radiation, R-15 – HIGHER THAN NORMAL OR * SG blowdown radiation, R-19 – HIGHER THAN NORMAL OR * ERDADS SG or secondary radiation readings – HIGHER THAN NORMAL OR * Local steamline radiation – HIGHER THAN NORMAL a. Go to Step 15. b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	**15** **Check If RCS Is Intact** a. Containment radiation - NORMAL b. Containment pressure - NORMAL c. Containment sump level - NORMAL • LI-3-6308A • LI-3-6308B Perform the following: 1. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2. Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	CREW	Diagnoses the LOCA due to Containment Pressure and sump level increasing.
	BOP	Continues performance of 3-EOP-E-0 Attachment 3 Prompt Action Verification
	STA	STA observes a RED PATH for Containment Integrity and an Orange Path for Containment Pressure, recommends entry to 3-FRP-P-1
	SRO	Transitions to 3-FRP-P.1
	SRO	Directs 3-FRP-P.1 response
		CAUTION *If CST level decreases to less than 10%, makeup water sources for the CST will be necessary to maintain secondary heatsink.*
		1 **Check RCS Pressure - GREATER THAN 250 PSIG[650 PSIG]** IF RHR Flow greater than 1000 gpm, **THEN** return to procedure **AND** step in effect.
	SRO	**Transitions out of 3-EOP-FR-P.1** (due to LBLOCA indication)
		EXAMNIER NOTE: If containment pressure is still > 20 psig, and no higher red or orange path exists, transitions to and directs response using 3-EOP-FR-Z.1
	SRO	Transitions to 3-FRP-Z.1
	SRO	

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1,FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior	
		NOTE TO EXAMINER: Actions for 3-EOP-FR-Z.1 start here.	
	SRO	**1** **Check Status Of RCPs** a. All RCPs - OFF b. All Normal Containment Coolers - OFF	 a. Stop any running RCP. b. Stop any running Normal Containment Cooler.
	SRO	**2** **Verify Containment Isolation Phase A Valve White Lights on VPB – ALL BRIGHT**	IF any containment isolation phase A valve is NOT closed AND open flow path NOT necessary, THEN close valves to isolate flow path.
	SRO	**3** **Verify Containment Isolation Phase B Valve White Lights On VPB - ALL BRIGHT**	IF any containment isolation phase B valve is NOT closed AND open flow path NOT necessary, THEN close valves to isolate flow path.
	SRO	**4** **Verify Containment AND Control Room Ventilation Isolation** a. Unit 3 Containment Purge Exhaust and Supply Fans - OFF b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT	 a. Manually stop fans. b. Manually align equipment for Control Room emergency recirculation.
	SRO	**5** **Check Cold Leg Recirculation Capability - AVAILABLE** • RHR pump suction - CAPABLE OF BEING ISOLATED FROM RWST • At least one flow path from a containment recirc sump to an RHR pump - AVAILABLE • At least one RHR pump - AVAILABLE • At least one flow path from an available RHR pump to the RCS - ESTABLISHED	IF 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, is in effect, THEN refer to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION for operation of Containment Spray Pumps AND go to Step 9.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	SRO	**6** **Verify Adequate Containment Spray Pump Suction During Injection Phase** a. RWST level - GREATER THAN 155,000 GALLONS a. IF aligned for cold leg recirc THEN go to Step 7. Otherwise go to Step 6b. b. Verify both RWST Outlet Isolation valves – OPEN • MOV-3-864A • MOV-3-864B b. Manually or locally open both RWST Outlet Valves. IF either valve can NOT be opened, THEN go to Step 9. c. Go to Step 8

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	SRO	**CAUTION** *If 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, is in effect, containment spray pumps should be operated as directed by 3-EOP-ECA-1.1, rather than Step 8 below.*

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior	
	SRO	8 **Verify Proper Containment Spray Pump Alignment**	
		a. Locally verify Containment Spray Pump suction and discharge isolation valves - OPEN • 3-844A for CSP A • 3-891A for CSP A • 3-844B for CSP B • 3-891B for CSP B	
		b. Verify Containment Spray Pumps - AT LEAST ONE RUNNING	b. Start one Containment Spray Pump.
		c. Check if second Containment Spray Pump should be running	
		1) RWST level - GREATER THAN 155,000 GALLONS	1) Verify second Containment Spray Pump in PULL-TO-LOCK, AND go to Step 8d.
		2) Containment pressure - GREATER THAN 14 PSIG	2) Verify second Containment Spray Pump in standby, AND go to Step 8d.
		3) Verify second Containment Spray Pump – RUNNING	3) Start second Containment Spray Pump.
		d. Verify Containment Spray Isolation valve on running Containment Spray Pump(s) - OPEN * MOV-3-880A for CSP A * MOV-3-880B for CSP B	d. Manually open valve(s).

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	SRO	**9** **Verify Proper CCW System Operation** a. CCW Heat Exchangers - THREE IN SERVICE a. Perform the following: 1) Stop and place in standby all EXCEPT ONE running CCW pump. 2) IF MOV-3-749A and MOV-3-749B are open, THEN stop and place in PULL-TO-LOCK all except one running CCW Pump. 3) Go to Step 10. b. CCW pumps - ONLY TWO RUNNING b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.
	SRO	**10** **Verify Containment Cooling** a. Verify emergency containment coolers - ONLY TWO RUNNING a. Perform the following: 1) Manually start or stop coolers as required to establish only two running. 2) Consult with TSC staff to determine desired cooling system alignments. b. Verify ECC Bypass valve on running ECCs - OPEN * CV-3-2814 for ECC A * CV-3-2810 for ECC B * CV-3-2812 for ECC C b. Locally open valves. c. Verify ECC Inlet valve on running ECCs - OPEN * CV-3-2905 for ECC A * CV-3-2903 for ECC B * CV-3-2904 for ECC C c. Locally open valves. d. Verify ECC Outlet valve on running ECCs - OPEN • CV-3-2908 for ECC A • CV-3-2906 for ECC B • CV-3-2907 for ECC C d. Locally open valves. e. Verify Emergency Containment Filter Fans - AT LEAST TWO RUNNING e. Manually start Emergency Containment Filter Fans to ESTABLISH AT LEAST TWO RUNNING FANS.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	SRO	**11** **Verify Main Steamline Isolation And Bypass Valves - CLOSED** — Manually close valves.
	SRO	**12** **Check If Feed Flow Should Be Isolated To Any S/G** a. Check pressure in all S/Gs - — a. Go to Step 13. * ANY S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR * ANY S/G COMPLETELY DEPRESSURIZED b. Isolate feed flow to affected S/G(s) * Isolate main feedline * Isolate AFW flow
	SRO	**13** **Return To Procedure AND Step In Effect**

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-EOP-E-1
		NOTE *Foldout page is required to be monitored throughout this procedure*
	CREW	Monitors 3-EOP-E-1 Foldout page (see next page)
		NOTE TO LEAD EXAMINER: The lead examiner may terminate the scenario when the US transitions back to E-1.
	RO	**1 Monitor Conditions To Determine If RCPs Should Be Stopped** a. RCPs - ANY RUNNING — a. Go to Step 2. b. High-head SI pumps - AT LEAST ONE RUNNING — b. Go to Step 2. c. RCS Subcooling - LESS THAN 25°F[65°F] — c. Go to Step 2. d. Controlled plant cooldown – NOT IN PROGRESS — d. Go to Step 2. e. Stop all RCPs
	RO/BOP	**2 Check If S/Gs Are NOT Faulted** a. Check pressures in all S/Gs – • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED a. IF any S/G is faulted AND that S/G has NOT previously been isolated, THEN go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1 and subsequently 3-EOP-E-1.

1. ADVERSE CONTAINMENT CONDITIONS
IF either of the conditions listed below occurs, THEN use adverse containment setpoints:
Containment atmosphere temperature ≥ 180°F
OR
Containment radiation levels ≥ $1.3x10^5$ R/hr
WHEN containment parameters drop below the above values, THEN normal setpoints can again be used
IF containment integrated dose rate has not exceeded 10^6 Rads.

2. RCP TRIP CRITERIA
a. IF all conditions listed below occur, THEN trip all RCPs:
1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED
2) RCS subcooling - LESS THAN 25°F[65°F]
3) Controlled RCS cooldown is NOT in progress
b. IF phase B actuated, THEN trip all RCPs

3. SI TERMINATION CRITERIA
IF all conditions listed below occur, THEN go to 3-EOP-ES-1.1, SI TERMINATION, Step 1:
a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[See below Table]

SI TERMINATION ADVERSE SUBCOOLING VALUE	
RCS PRESSURE (PSIG)	ADVERSE SUBCOOLING VALUE
< 2485 AND ≥ 2000	≥ 55 °F
< 2000 AND ≥ 1000	≥ 85 °F
< 1000	≥ 210°F

b. Total feed flow to intact SGs - GREATER THAN 345 GPM OR narrow range level in at least one intact SG - GREATER THAN 6%[32%]
c. RCS pressure - GREATER THAN 1600 PSIG[2000 psig] AND STABLE OR INCREASING
d. PRZ level - GREATER THAN 17%[50%]

4. SECONDARY INTEGRITY CRITERIA
IF any S/G pressure is decreasing in an uncontrolled manner OR has completely depressurized, AND that S/G has NOT been isolated, THEN go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

5. E-3 TRANSITION CRITERIA
IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, THEN manually start SI pumps as necessary and go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

6. COLD LEG RECIRCULATION SWITCHOVER CRITERIA
IF RWST level decreases to less than 155,000 gallons, THEN go to 3-EOP-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

7. RECIRCULATION SUMP BLOCKAGE
IF RHR pump flow AND amps become erratic OR abnormally low after recirculation has been established, THEN transition to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

8. CST MAKEUP WATER CRITERIA
IF CST level decreases to less than 10%, THEN add makeup to CST using 3-OP-018.1, Condensate Storage Tank.

9. LOSS OF OFFSITE POWER OR SI ON OTHER UNIT
IF SI has been reset, AND either offsite power is lost OR SI actuates on the other unit, THEN restore safeguards equipment to required configuration. Refer to ATTACHMENT 3 for essential loads.

10. RHR SYSTEM OPERATION CRITERIA
IF RCS pressure is greater than 250 PSIG [650 PSIG] AND RHR flow is less than 1000 gpm, THEN the RHR pumps shall be shut down within 44 minutes of the initial start signal.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1,FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO/BOP	**3 Maintain Intact S/G Levels** a. Narrow range level - GREATER THAN 6%[32%] a. Maintain total feed flow greater than 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. b. Control feed flow to maintain narrow range level between 15%[32%] and 50% c. Narrow range level - LESS THAN 50% c. Stop feed flow to any S/G with narrow range level greater than 50%. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
	RO/BOP	**4 Monitor Secondary Radiation** a. Direct Nuclear Chemistry to take periodic activity samples of all S/Gs b. Direct Nuclear Chemistry to check DAM1 monitor reading c. Direct Health Physics to take radiation readings on main steamlines d. Secondary radiation - NORMAL NEAR ROUTINE OPERATION VALUE d. Go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
		CAUTION *If any PRZ PORV opens because of high PRZ pressure, it is required to be verified closed or isolated after pressure decreases to less than the PORV setpoint.*
	RO	**5 Check PRZ PORVs AND Block Valves** a. Power to block valves - AVAILABLE a. Restore power to block valves b. PORVs - CLOSED b. IF PRZ pressure less than 2335 psig, THEN manually close PORVs. IF any valve can NOT be closed, THEN manually close its block valve. c. Block valves - AT LEAST ONE OPEN c. Open one block valve unless it was closed to isolate an open PORV.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior	
	RO	**6** **Verify SI - RESET**	
	RO	**7** **Reset Containment Isolation Phase A AND Phase B**	
	RO	**8** **Verify Instrument Air To Containment** a. Verify Instrument Air Containment Isolation, CV-3-2803 - OPEN b. Verify instrument air pressure, PI-3-1444 - GREATER THAN 95 PSIG	b. Restore instrument air pressure using 0-ONOP-013, LOSS OF INSTRUMENT AIR, while continuing with this procedure.
	RO	**9** **Check Power Supply To All Charging Pumps - ALIGNED TO OFFSITE POWER**	Check diesel capacity adequate to run three charging pumps. IF adequate diesel capacity is NOT available, THEN shed nonessential loads. Refer to ATTACHMENT 3 for component KW load rating.
	RO	**10** **Check Charging Flow Established** a. Charging pumps - AT LEAST ONE RUNNING b. Adjust speed controllers as necessary to establish desired charging flow to establish SI Termination conditions c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow	a. Perform Attachment 4 to establish charging.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1, and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	

ATTACHMENT 4
(Page 1 of 1)
ESTABLISH CHARGING FLOW

1. **Verify CCW Flow Alarms To All RCP Thermal Barriers - OFF**
   - A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW

   AND
   - A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP

   AND
   - A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW

   IF CCW flow to RCPs thermal barrier is lost, perform the following:
   a. Verify seal return temperature for each RCP to be less than 235 F.
   b. **IF** seal return temperature for each RCP is less than 235 F, **THEN** go to Step 2.
   c. **IF** seal return temperature is ≥ 235 F, **THEN** locally isolate seal injection to affected RCP(s) before starting charging pumps.
      * 3-297A for RCP A
      * 3-297B for RCP B
      * 3-297C for RCP C
   d. **WHEN** seal injection is isolated to each affected RCP, **THEN** go to Step 2.

2. **Check Offsite Power Available**

   IF offsite power is NOT available, **THEN** check diesel capacity adequate to run one charging pump. **IF** diesel capacity is NOT adequate, **THEN** shed non-essential loads. Refer to ATTACHMENT 3 for component KW load rating.

3. **Start One Charging Pump**

4. **Place RCS Makeup Control Switch in STOP**

5. **Establish Desired Charging Flow**

   a. Start additional charging pumps if needed and offsite power available

   a. **IF** offsite power is NOT available, **THEN** check diesel capacity adequate to run additional charging pumps.

   c. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow

   d. Verify charging pump suction auto transfers to RWST

6. **Notify The Unit Supervisor That The ESTABLISH CHARGING FLOW Attachment Is Complete**

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1, and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	RO	**11 Check if SI Should be Terminated** a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[Refer to Foldout Page Item 3 Adverse Value] — a. Go to Step 12. b. Secondary heat sink — b. IF neither condition satisfied, THEN go to Step 12. * Total feed flow to intact S/Gs - GREATER THAN 345 GPM OR * Narrow range level in at least one intact S/G - GREATER THAN 6%[32%] c. RCS pressure — c. Go to Step 12. • Pressure - GREATER THAN 1600 PSIG[2000 PSIG] • Pressure - STABLE OR INCREASING d. PRZ level - GREATER THAN 17%[50%] — d. Try to stabilize RCS pressure with normal PRZ spray. Go to Step 12. e. Go to 3-EOP-ES-1.1, SI Termination, Step 1
		EXAMINER NOTE: The scenario is terminated when the crew determines Safety Injection can not be terminated.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	BOP	ATTACHMENT 3 (Page 1 of 7) PROMPT ACTION VERIFICATIONS
	BOP	1. **Check The Load Centers Associated With The Energized 4 KV Buses – ENERGIZED** • 3A LC • 3B LC • 3C LC • 3D LC • 3H LC Close the Load Center supply breakers.
	BOP	2. **Check If Main Steamlines Should Be Isolated** a. Check main steamline isolation and bypass valves - ANY OPEN — a. Go to Step 3. b. Check if either main steam isolation signal has actuated — b. Go to Step 3. • High steam flow with either low S/G pressure 614 psig **OR** low Tavg 543 F **OR** • Hi-Hi containment pressure 20 PSIG c. Verify main steam isolation and bypass valves - CLOSED — c. Push manual Steamline Isolation push buttons on VPB **OR** manually close valves.

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	BOP	**3. Verify Feedwater Isolation** a. Place main feedwater pump switches in STOP b. Feedwater control valves – CLOSED — b. Manually close valves. c. Feedwater bypass valves – CLOSED — c. Manually close valves. d. Close feedwater isolation MOVs — d. Locally close valves. e. Verify standby feedwater pumps – OFF — e. IF standby feedwater is aligned to Unit 3, THEN stop standby feedwater pump(s).
		4. Verify Proper ICW System Operation a. Verify ICW pumps - AT LEAST TWO RUNNING — a. Start ICW pump(s) to establish at least two running. b. Verify ICW to TPCW Heat Exchanger – ISOLATED • POV-3-4882 – CLOSED • POV-3-4883 – CLOSED — b. Manually close valve(s). IF valve(s) can NOT be closed, THEN locally close the following valves: • 3-50-319 for POV-3-4882 • 3-50-339 for POV-3-4883 c. Check ICW headers - TIED TOGETHER — c. IF both ICW headers are intact, THEN direct operator to tie headers together.
	BOP	Places handswitches for the 3A and 3C ICW pumps to START

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Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z,1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
		5. Verify Proper CCW System Operation a. CCW Heat Exchangers – THREE IN SERVICE — a. Perform the following: 1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP. 2) Verify Emergency Containment Coolers - ONLY TWO RUNNING 3) Go to Step 5c. b. CCW pumps - ONLY TWO RUNNING — b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS. c. CCW headers - TIED TOGETHER — c. IF both CCW headers are intact, THEN direct a field operator to tie the headers together. d. RCP Thermal Barrier CCW Outlet, MOV-3-626 – OPEN — d. IF containment isolation phase B NOT actuated AND CCW radiation levels are normal, AND RCP number one seal leak-off temperature is less than 235°F, THEN manually open MOV-3-626. IF MOV-3-626 can NOT be manually opened, THEN direct operator to open MOV-3-626 locally.
	BOP	Places handswitch for the 3C CCW pump to START
		6. Verify Containment Cooling a. Check emergency containment coolers - ONLY TWO RUNNING — a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING. b. Verify emergency containment filter fans - AT LEAST TWO RUNNING — b. Manually start emergency containment filter fans.
	BOP	Places handswitch for the 3B and3C ECC fan to START
	BOP	Starts the 3B ECF

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 7a Page 4 of 7

Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	BOP	**7. Verify SI Pump Operation** a. At least two high head pumps running — a. Manually start high-head pump(s). b. Both RHR pumps running — b. Manually start RHR pump(s).
	BOP	Places the 3A RHR pump handswitch to START.
	BOP	**CREW CRITICAL TASK: Manually start at least one RHR pump following a large LOCA prior to completing E-0 Attachment 3 step 7.**
	BOP	**8. Verify SI Flow** a. RCS pressure - LESS THAN 1600 PSIG[2000 PSIG] — a. Go to Step 9. b. High-head SI pump flow indicator – CHECK FOR FLOW — b. Manually start pumps AND align valves to establish an injection flowpath. c. RCS pressure - LESS THAN 250 PSIG[650 PSIG] — c. Go to Step 9. d. RHR pump flow indicator - CHECK FOR FLOW — d. Manually start pumps AND align valves to establish an injection flowpath.
	BOP	**9. Realign SI System** a. Verify Unit 3 high-head SI pumps - TWO RUNNING — a. Perform the following: 1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps. 2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure. 3) Go to Step 10. b. Stop both Unit 4 high-head SI pumps AND place in standby
	BOP	Directs the Unit 4 RO to align the Unit 4 HHSI suction to the Unit 3 RWST

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 7a Page 5 of 7

Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z, 1and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	BOP	Manually stops the 4A or the 4B HHSI pumps.
	BOP	**10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT** Perform the following: a. Manually actuate Containment Isolation Phase A. b. IF any Containment Isolation Phase A valve is NOT closed, THEN manually close valve. IF valve(s) can NOT be manually closed, THEN manually or locally isolate affected containment penetration.
	BOP	Directs SNPO to locally verify phase A valves MOV-3-1417, 1418, 1425 & 381 closed
	BOP	**11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT** Manually align valves to establish proper SI alignment for an injection flowpath.
	BOP	**12. Verify SI – RESET** Reset SI
	BOP	**13. Verify Containment Phase A – RESET** Reset Phase A
	BOP	**14. Reestablish RCP Cooling** a. Check RCPs – AT LEAST ONE RUNNING a. Go to step 15. b. Open CCW to normal containment cooler valves • MOV-3-1417 • MOV-3-1418 b. Stop all RCPs c. Reset and start normal containment coolers c. Stop all RCPs

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 7 a Page 6 of 7

Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior
	BOP	**15. Monitor Containment Pressure To Verify Containment Spray NOT Required** a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG • PR-3-6306A **AND** • PR-3-6306B a. Perform the following: 1) IF containment spray NOT initiated, THEN manually initiate containment spray. 2) Verify Containment Isolation Phase B - ACTUATED. 3) Verify Containment Isolation Phase B valve white lights on VPB – ALL BRIGHT. 4) IF any Containment Isolation Phase B valve did NOT close, THEN manually or locally isolate affected containment penetration. 5) Stop all RCPs.
	BOP	Places the 3A Containment Spray pump handswitch to START.
	BOP	Verify phase B valves MOV-3-626, 716B & 730 are closed.
	BOP	**CREW CRITICAL TASK: Manually start at least one Train of Containment Spray following a large LOCA prior to completing E-0 Attachment 3 step 15.**
	BOP	**16. Verify Containment and Control Room Ventilation Isolation** a. Unit 3 containment purge exhaust and supply fans – OFF a. Manually stop fans. b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT b. Manually align equipment for Control Room emergency recirculation.
		NOTE *Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.*

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 7a Page 7 of 7

Event Description: When 3B RCP is tripped, 3B 4kV bus is lost and a large break LOCA occurs. An automatic SI occurs but train A sequencer fails due to the loss of 3P07. Train A RHR and Containment Spray pumps must be manually started. The crew completes 3-EOP-E-0 and transitions to 3-EOP-FR-P.1, FR-Z.1 and subsequently 3-EOP-E-1.

Time	Position	Applicant's Actions or Behavior	
	BOP	17. **Place Hydrogen Monitors In Service Using 3-OP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM**	
	BOP	18. **Verify All Four EDGs – RUNNING**	EMERGENCY START any available EDG **NOT** running.
	BOP	19. **Verify Power To Emergency 4 KV Buses and Load Centers** a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED	a. Perform the following: 1) Inform the Unit Supervisor that Attachment 3 is complete with the exception of the de-energized bus or buses. 2) **IF** the Unit Supervisor decides not to energize the de-energized bus or buses, **THEN** go to Step 20. 3) **IF** the Unit Supervisor decides to energize 3A, 3B, or 3D bus, **THEN** perform the following: a) **IF** 3A 4 KV bus de-energized, **THEN** restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS. b) **IF** 3B 4 KV bus de-energized, **THEN** restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS. c) **IF** 3D 4 KV bus de-energized, **THEN** restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.
	BOP	20. **Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Note Any Actions That Had To Be Taken**	

FPL

TURKEY POINT UNIT 3

OPERATIONS SURVEILLANCE PROCEDURE

SAFETY RELATED

CONTINUOUS USE

Procedure No.	Revision No.	Effective Date
3-OSP-055.1	0	03/08/10

Title:

EMERGENCY CONTAINMENT COOLER OPERABILITY TEST

Responsible Department: **OPERATIONS**

Special Considerations:

This is an Upgraded Procedure. Initial use should include increased awareness because of potential technical and/or sequential changes to the procedure. After initial use of this procedure, provide comments back to the Procedure Upgrade Project.

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED 10/25/10 INITIAL

Revision	Approved By	Approval Date
0	David Houtz	03/04/10

UNIT #	UNIT 3
DATE	
DOCT	PROCEDURE
DOCN	3-OSP-055.1
SYS	
STATUS	COMPLETED
REV	0
# OF PGS	

REVISION SUMMARY	
Rev. No.	**Description**
0	**PCR 08-5322, 03/04/10, William Leonard** Upgraded procedure format per AD-AA-100-1003, FPL Procedure Writer's guide. Upgraded 3-OSP-055.1 revision dated 01/23/2009. Added Scope statement. Deleted P&L NOT meeting Writer's Guide definition of P&L. Placed Acceptance Criteria logic instructions for first and second valve stroking tests into appropriate instruction sections. Separated Acceptance Criteria into Acceptance Criteria and Functional Criteria. Deleted QA Record pages and revised Records instructions. Added steps to check valve remote position before as well as after stroking. Removed acceptance criteria for CCW flow and restoration check step to be consistent with 3-NOP-055 steps for Standby alignment. Relocated Pilot Operated Lockup Valve tests from attachments to body of procedure. Incorporated CR 2009-14595 and PCRs 09-1438 and 09-2526 adding Precaution regarding failure of any Emergency Containment Cooler Outlet valve that does not meet required 20 minute delay before failing open. Also added a Note before the Acceptance Criteria for the test stating that the failure does not make the valve inoperable.

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE

1.1 Purpose

1. This procedure provides instructions and Acceptance Criteria for performance of the monthly test of Emergency Containment Cooler Fans 3A, 3B, and 3C to satisfy Technical Specifications Surveillance Requirement 4.6.2.2.a, Emergency Containment Cooling System.

2. This procedure provides instructions and Functional Criteria for performance of the following CCW valve exercise tests specified by 0-ADM-502 to satisfy ASME OM code, Subsection ISTC and Technical Specifications Surveillance Requirement 4.0.5:

   - CV-3-2903, 3B EMERG CNTMT COOLER INLET
   - CV-3-2906, 3B EMERG CNTMT COOLER OUTLET
   - CV-3-2904, 3C EMERG CNTMT COOLER INLET
   - CV-3-2907, 3C EMERG CNTMT COOLER OUTLET
   - CV-3-2905, 3A EMERG CNTMT COOLER INLET
   - CV-3-2908, 3A EMERG CNTMT COOLER OUTLET

3. This procedure provides instructions and Functional Criteria for testing Pilot Operated Lockup Valves for CCW valves CV-3-2908, CV-3-2907, and CV-3-2906.

1.2 Scope

1.2.1 Frequency

1. Section 4.1 Step 2, Section 4.3, and Section 4.4 are performed:

   - Prior to entering MODE 4
   - Once per 31 days while in MODE 1, 2, 3, or 4
   - Quarterly for IST
   - Every 2 years for Remote Position indication

2. Section 4.5, Section 4.6, and Section 4.7 are performed when requested by System Engineer.

1.2.2 Applicability

Emergency Containment Cooling (ECC) Units, including CCW system components that supply cooling water to ECC Units, are required to be OPERABLE in MODE 1, 2, 3, and 4.

1.2.3 MODE Restrictions

All sections of this procedure may be performed in any MODE.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

1. Only one Emergency Containment Cooler shall be tested at a time.
2. A 72-hour Action Statement applies to a single ECC declared inoperable.
   - If Inservice Testing is required in MODES 1, 2, 3, or 4, entry to a 72-hour Action Statement will occur for a single ECC declared inoperable.
   - If the Control switch for 3A or 3C ECC is placed in STOP, the affected ECC must be declared inoperable.
   - 3B ECC is the Swing ECC and has **NO** automatic start function. It is required to be OPERABLE to support manual starting only. Placing 3B ECC control switch to STOP does **NOT** render 3B ECC inoperable.
3. If any Emergency Containment Cooler Outlet, CV-3-2906, CV-3-2907, or CV-3-2908, from Emergency Containment Coolers does **NOT** remain closed for greater than or equal to 20 minutes, it is **NOT** considered an IST failure. This failure of the valve function is neither a Safety Relater or Quality Related function, hence it does **NOT** affect the valve's operability. Furthermore, it does **NOT** prevent 3B ECC from performing it's Maintenance Rule function or degrade the ability of the CCW System or Heat Exchangers.

2.2 Limitations

1. Flow limitations for each ECC are:
   - 2000 gpm for continuous operation
   - 3200 gpm for 1 month (Post - LOCA recirculation limit)
   - 3600 gpm for 1 week
   - 5000 gpm for 24 hours (initial safety injection limit)
   - 5500 gpm for 1 hour

3.0 PREREQUISITES

None

4.0 INSTRUCTIONS

INITIAL

4.1 General Requirements

1. **OBTAIN** Shift Manager permission to perform this test. _____

2. Immediately **NOTIFY** US/SM of any Acceptance Criteria determined UNSAT. _____

3. **DOCUMENT** UNSAT criteria and test discrepancies in Section 5.2. _____

4.2 3A Emergency Containment Cooler Test

INITIAL

4.2.1 3A ECC Test Performance

NOTE

- Inservice Testing (IST) of CCW valves is performed during quarterly ECC Fan testing.
- H 9/5 – RCP MOTOR BEARING COOLING WATER LOW FLOW and other Component Cooling Water annunciators may alarm while performing this procedure.

CAUTION

Three CCW Heat Exchangers shall be in service to prevent exceeding 6840 gpm individual CCW Heat Exchanger flow rate, above which could cause heat exchanger damage. During performance of this test, CCW flow rates will change.

1. **ENSURE** Component Cooling Water System operating with all three CCW Heat Exchangers in service. ____

2. **MONITOR** CCW Heat Exchanger flow rates to ensure limits are **NOT** exceeded. ____

3. **INDICATE** the reason(s) for performing this test. ____

   ☒ Monthly Fan Start ☐ Quarterly Valve IST

   ☐ 18 Month Valve Remote Position indication

   ☐ Increased Surveillance frequency for _____

   ☐ Other (Specify) _____

4. **OBTAIN** a portable ammeter. ____

5. **RECORD** portable ammeter M&TE number and calibration due date. ____

   Ammeter M&TE #: XXXX Calibration Due Date: XX/XX/XX

4.2.1 3A ECC Test Performance (continued) INITIAL

6. IF CV-3-2908, 3A EMERG CNTMT COOLER OUTLET, IST is required, THEN:
   - A. **OBTAIN** stopwatches for valve opening time and valve fail-safe time. N/A
   - B. **RECORD** stopwatch M&TE numbers and calibration due dates. N/A

   Stopwatch M&TE #: N/A Calibration Due Date: N/A

   Stopwatch M&TE #: N/A Calibration Due Date: N/A

7. **PLACE** Control Switch 3V30A, 3A EMERG CNTMT COOLER FAN MOTOR, to STOP. N/A

8. **ENSURE** the following are CLOSED:
   - CV-3-2905, 3A EMERG CNTMT COOLER INLET N/A
   - CV-3-2814, 3A EMERG CNTMT COOLER BYPASS N/A
   - CV-3-2908, 3A EMERG CNTMT COOLER OUTLET N/A

CAUTION

ECC coils may be damaged if operated with flow rates exceeding 5500 gpm for time periods greater than 1 hour.

9. IF CV-3-2908 IST is required, THEN **PERFORM** fail-safe test of CV-3-2908, 3A EMERG CNTMT COOLER OUTLET, as follows:
   - A. **CLOSE** 40-1168, INST. AIR ISOLATION VALVE FOR CV-3-2908. N/A
   - B. **OPEN** 3-40-5331, 3A ECC SUPPLY AIR DRAIN VALVE. N/A
   - C. WHEN air has bled off, THEN **START** the stopwatch. N/A

4.2.1 3A ECC Test Performance (continued) INITIAL

9. (continued)

D. WHEN CV-3-2908 CLOSED indication is lost OR 20 minutes have elapsed, THEN:

(1) **STOP** the stopwatch. N/A

(2) **RECORD** elapsed time. N/A

Elapsed time: N/A minutes

E. **COMPARE** CV-3-2908 CLOSED time to Functional Criteria below: N/A

Functional Criteria	Results
CV-3-2908 remains CLOSED for ≥ 20 minutes after Instrument Air supply is lost, then fails OPEN	☐ SAT ☐ UNSAT

F. IF elapsed time is less than 20 minutes, THEN **INITIATE** corrective action. N/A

G. IF greater than 20 minutes AND CV-3-2908 is still CLOSED, THEN:

(1) **OPEN** 3-40-5337, 3A ECC SUPPLY AIR ACCUMULATOR DRAIN VALVE, at bottom of air accumulator. N/A

(2) IF CV-3-2908 does **NOT** fully OPEN, THEN **INITIATE** corrective action. N/A

H. **ENSURE** 3-40-5337, 3A ECC SUPPLY AIR ACCUMULATOR DRAIN VALVE, is CLOSED. N/A

N/A
IV

I. **CLOSE** 3-40-5331, 3A ECC SUPPLY AIR DRAIN VALVE. N/A

N/A
IV

4.2.1 3A ECC Test Performance (continued) INITIAL

9. (continued)

J. **OPEN** 40-1168, INST. AIR ISOLATION VALVE FOR CV-3-2908. _____

_____ IV

K. **CHECK** CV-3-2908, 3A EMERG CNTMT COOLER OUTLET, is CLOSED. _____

10. IF remote position indication verification is required, THEN **STATION** an observer at CV-3-2908, 3A EMERG CNTMT COOLER OUTLET, in communication with the RCO. N/A

NOTE

If IST is required, Section 4.2.1 Step 11 through Section 4.2.1 Step 14 are performed simultaneously.

11. Simultaneously **START** the following:

- 3A ECC Fan _____
- The stopwatch _____

12. **RECORD** 3A ECC Fan start time in Section 4.2.1 Step 17.B. _____

13. IF CV-3-2908 IST is required, THEN:

A. **MEASURE** CV-3-2908, 3A EMERG CNTMT COOLER OUTLET, opening stroke time. _____

B. **RECORD** CV-3-2908 opening stroke time. _____

CV-3-2908 Stroke Time:_____seconds

4.2.1 3A ECC Test Performance (continued) INITIAL

13. (continued)

C. COMPARE CV-3-2908 opening stroke time to Functional Criteria below: _____

Functional Criteria	Results
Open stroke time within Acceptable Range of 2.21 to 6.63 seconds	☐ SAT ☐ UNSAT
Open stroke time ≤ Required Action Time of 8.84 seconds	☐ SAT ☐ UNSAT

D. IF stroke time is greater than Required Action time of 8.84 seconds, THEN **INITIATE** corrective action. _____

E. IF stroke time **NOT** within Acceptable Range of 2.21 to 6.63 seconds AND less than or equal to Required Action Time, THEN **NOTIFY**:

- Unit Supervisor _____
- IST Engineer. _____

14. IF IST is required AND either of the following valves remote position indication does **NOT** agree with locally observed position:

- CV-3-2908, 3A EMERG CNTMT COOLER OUTLET
- CV-3-2905, 3A EMERG CNTMT COOLER INLET

THEN **INITIATE** corrective action. _____

15. COMPARE remote and local position to Functional Criteria below: _____

Functional Criteria	Results
CV-3-2908 remote position indication agrees with locally observed position	☐ SAT ☐ UNSAT
CV-3-2905 remote position indication agrees with locally observed position	☐ SAT ☐ UNSAT

4.2.1 3A ECC Test Performance (continued) INITIAL

16. At MCC 3A, **PERFORM** the following:

A. **MEASURE** 3A ECC Fan running current using the portable ammeter connected to MCC Breaker 30650 test plug. _____

B. **RECORD** 3A ECC Fan running current . _____

Running current: _____ amps

C. **COMPARE** 3A ECC Fan running current to Acceptance Criteria below: _____

Acceptance Criteria	Results
3A ECC Fan running current between 17 and 28 amps	☐ SAT ☐ UNSAT

D. IF 3A ECC Fan running current is **NOT** between 17 and 28 amps, THEN **INITIATE** corrective action. _____

17. WHEN 3A ECC Fan has run for at least 15 minutes, THEN:

A. **STOP** 3A ECC Fan. _____

B. **RECORD** time 3A ECC Fan stopped. _____

Start Time: _____ Stop Time: _____

C. **CALCULATE** 3A ECC Fan run time by subtracting Start from Stop time. _____

D. **RECORD** 3A ECC Fan run time. _____

3A ECC Fan run time: _____ minutes

E. **COMPARE** 3A ECC Fan run time to Acceptance Criteria below: _____

Acceptance Criteria	Results
When started from Control Room, fan runs for at least 15 minutes	☐ SAT ☐ UNSAT

4.2.1 3A ECC Test Performance (continued) **INITIAL**

18. IF all of the following conditions are met:

- CV-3-2908 opening stroke time is **NOT** within Acceptable Range
- CV-3-2908 opening stroke time is **NOT** greater than Required Action Time:
- First test performance
- Directed by Unit Supervisor and IST Engineer

THEN **PERFORM** 2nd stroke of valve as follows:

A. Simultaneously **START** the following: _____

- 3A ECC Fan
- The stopwatch

B. **MEASURE** CV-3-2908, 3A EMERG CNTMT COOLER OUTLET, opening stroke time. _____

C. **RECORD** CV-3-2908 opening stroke time. _____

CV-3-2908 Stroke Time:_____seconds

D. **COMPARE** open stroke time to Functional Criteria below: _____

Functional Criteria	Results
Open stroke time within Acceptable Range of 2.21 to 6.63 seconds	☐ SAT ☐ UNSAT

E. IF 2nd stroke time **NOT** within Acceptable Range of 2.21 to 6.63 seconds, THEN **INITIATE** corrective action. _____

4.2.2 3A ECC Test Restoration

INITIAL

1. **PLACE** Control Switch 3V30A, 3A EMERG CNTMT COOLER FAN MOTOR, in AUTO. _____

   _____ IV

2. **ENSURE** CV-3-2905, 3A EMERG CNTMT COOLER INLET, is OPEN. _____

   _____ IV

3. **ENSURE** CV-3-2814, 3A EMERG CNTMT COOLER BYPASS, is OPEN. _____

   _____ IV

4. **ENSURE** CV-3-2908, 3A EMERG CNTMT COOLER OUTLET, is CLOSED. _____

   _____ IV

5. **CHECK** flow on FI-3-1470, A ECC CCW FLOW, greater than 0 but less than 1000 gpm after stabilizing. _____

6. **NOTIFY** Unit Supervisor that testing of 3A Emergency Containment Cooler is complete. _____

7. **COMPLETE** Section 5.2 entries for Section 4.1 Step 2. _____

5.0 RESTORATION AND DOCUMENTATION

5.1 Restoration

None

5.2 Documentation

1. Acceptance Criteria

   ☐ SAT ☐ UNSAT _____

2. Functional Criteria

   ☐ SAT ☐ UNSAT _____

3. Performance and Review Signatures

Remarks: _____

Performed By:

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
(Signature)	(Print)	(Init)	(Date)

Reviewed By:

_____	_____	_____
(Shift Manager or SRO Designee)	(Print)	(Date)

Approved By:

_____	_____	_____
(Shift Manager or SRO Designee)	(Print)	(Date)

5.2 Documentation (continued) INITIAL

4. IF IST was performed, THEN:

   A. **FORWARD** completed test to IST Engineer for review. _____

   B. IST Engineer **REVIEW** test results and **RECORD** conclusions. _____ IST Eng

IST Engineer Remarks: _____

Reviewed By: _____

IST Engineer (Print) Date

5. **FORWARD** to Records. _____

6.0 ACCEPTANCE AND FUNCTIONAL CRITERIA

6.1 Acceptance Criteria

6.1.1 Monthly Test

1. The Emergency Containment Cooler Fan being tested, when started from the Control Room:
   - Runs for a minimum of 15 minutes
   - Measured electrical current for the fan between 17 amps and 28 amps.

6.2 Functional Criteria

6.2.1 Quarterly IST

1. A valve's measured opening stroke time is within Acceptable Range.
2. A valve's measured opening stroke time is less than Required Action Time:

> **NOTE**
>
> Failure of any ECC Outlet Control Valve to remain closed for the required 20 minutes does **NOT** render the valve inoperable.

3. On loss of air, the ECC Outlet Control Valve remains CLOSED ≥20 minutes after Instrument Air supply is lost; and fails OPEN when supply air accumulator is depressurized.

6.2.2 Remote Position Indication Verification IST

1. Remote (Control Room) position indication agrees with the valve's locally observed position for the following valves:

6.2.3 POLV Testing

1. Air venting from the smaller (gray) accumulator through the open vent valve indicates the POLV successfully stroked.

7.0 RECORDS

1. The date, time and section completed shall be logged in the Unit Narrative Log.

2. Any problems encountered while performing the procedure should be logged (i.e., malfunctioning equipment, delays due to changes in plant conditions, etc.).

3. Completed copies of the below listed item(s) document the compliance with Technical Specifications surveillance requirements and shall be transmitted to QA Records for retention in accordance with Quality Assurance Records Program requirements:

   - Section 4.1 Step 2
   - Section 4.3
   - Section 4.4
   - Section 5.2

4. Completed copies of the below listed items shall be transmitted to QA Records for retention in accordance with Quality Assurance Records Program requirements:

   - Section 4.5
   - Section 4.6
   - Section 4.7
   - Section 5.2

8.0 REFERENCES AND COMMITMENTS

8.1 References

8.1.1 Implementing

None

8.1.2 Developmental

1. Technical Specifications
   - A. TS 3/4 6.2.2, Emergency Containment Cooling System
   - B. TS Surveillance Requirement 4.0.5
2. FSAR
   - A. Section 6.3.5, Testing of Containment Pressure Reducing Systems Components
3. Operating Diagrams
   - A. 5613-M-3030, Sheet 2, Component Cooling Water System
   - B. 5613-M-3030, Sheet 4, Component Cooling Water System
   - C. 5613-M-3057, Sheet 1, Containment Normal and Emergency Cooler Systems
4. Plant Procedures
   - A. 0-ADM-502, In-Service Testing (IST) Program
   - B. 0-ADM-215, Plant Surveillance Tracking Program
   - C. 3-NOP-030, Component Cooling Water System
   - D. 3-OP-055, Emergency Containment Cooling and Filtering System
   - E. 0-OSP-200.1, Schedule of Plant Checks and Surveillances

8.1.2 Developmental (continued)

5. Miscellaneous Documents

   A. Fourth Ten Year In-service Inspection Internal In-service Testing Program For Pumps and Valves

   B. JPN-PTN-SENP-95-026, CCW Flow Balance and Post Accident Alignment Requirements to Support Current and Uprated Conditions

   C. PTN-JPES-89-4643, High Flow Through Emergency Containment Coolers

   D. JPNS-PTN-90-3769, Component Cooling Flow Through the Emergency Containment Coolers

   E. JPNS-PTN-90-5175, Evaluation of Emergency Containment Coolers

   F. NCR N-91-0793, 3V30A ECC High Current

   G. JPN-PTN-SEMS-93-044, 10CFR 50.59 Evaluation for Emergency Containment Cooler Bypass CCW Flow

   H. PC/M 95-133, Add Accumulator to ECC Outlet Isolation Valves

   I. PC/M 95-147, Emergency Containment Cooler Start Logic Design Change

   J. PC/M 96-039, Spring/Setpoint Change for the Pilot Operated Lockup Vlvs for the ECC CCW Supply/Return Isolation Valves

   K. CR 96-0535, Failure of the Pilot Operated Lockup Valve (POLV) Utilized in the Actuator Controls of CV-3-2908

   L. CR 96-1415, 4A ECC Had a Measured Voltage Less than 460 Volts

   M. PC/M 96-055, Relocation of Various Instrument Air Valves for ECC Outlet Valves

   N. ASME OM Code 1998 Edition through 2000 Addenda, Subsection ISTC, Inservice Testing of Valves in Light Water Reactor Nuclear Power Plants

8.1.2 Developmental (continued)

5. (continued)

O. CR 2009-14595, Technical Review of CV-3-2906 failure to remain closed for greater than or equal to 20 minutes during testing.

8.1.3 Management Directives

None

8.2 Commitments

None

OPERATIONS SHIFT TURNOVER REPORT

ONCOMING CREW ASSIGNMENTS

Shift Mgr:		Inside SNPO:	
Field Supv.:		Outside SNPO:	
Admin RCO:		ANPO:	

Unit 3		Unit 4	
Unit Supv.:		Unit Supv.:	
RCO:		RCO:	
NPO:		NPO:	

Plant Status

Unit 3		Unit 4	
Mode:	1	Mode:	1
Power:	75	Power:	100
MWe:	548	MWe:	756
Gross Leakrate:	.02	Gross Leakrate:	.02
RCS Boron Conc:	755	RCS Boron Conc:	286

Operational Concerns:

Equipment OOS: Breaker 3AB18 for 3B2 Circ water pump is racked out due to breaker failure. The Shift Manager has received notification that conditions for a Grass Influx are favorable and has performed a Grass Influx evaluation.

Maintain this power level until 3B2 Circ Water Pump is restored to service.

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

none

Unit 3 Status

Reactor Operator

Mode:	1
Power:	75
MWe:	548
Tavg:	566
RCS Pressure:	2249
RCS Boron Conc:	755

RCS Leakrate	
Gross:	.02
Unidentified	.01
Charging Pps:	.01

Accumulator Ref Levels	
A	6614
B	6631
C	6621

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

Unit 3 Status

Changes to Risk Significant Equipment:

A train protected both units
Online risk is green

Upcoming Reactivity Management Activities:

Increase power to 100% after 3B2 Circ Water Pump is returned to service. Reactor Engineering will provide Maneuvering Guidelines before power increase.

Upcoming Major POD Activities:

Immediately after shift turnover perform monthly surveillance on 3A ECC per 3-OSP-055.1 section 7.1. IST and remote valve position verification not required. Operators to support the evolution have been briefed and are on station.

Upcoming ECOs to Hang and /or Release:

Evolutions or Compensatory Actions in Progress:

General Information, Remarks, and Operator Work Around Status:

Aux. steam supply aligned from unit 4.
Condenser inleakage 0 scfm.

Appendix D	Scenario Outline	Form ES D-1

Facility:	Turkey Point	Scenario No.:	6	Op Test No.:	2010-301
Examiners:	_____	Candidates:	_____		US
	_____		_____		RO
	_____		_____		BOP

Initial Conditions: Mode 2, 2-3% power, MOL. Ready to raise power to 5-6% to roll the turbine and sync to the grid

Turnover: Shift Manager has received notification that conditions for a Grass Influx are favorable and has performed a Grass Influx evaluation.

Immediately after shift turnover raise Reactor Power to between 5-6%. The shift manager has granted permission to perform the evolution.

Event No.		Event Type*	Event Description
1		(R) RO (N) BOP	The RO will raise Reactor Power to 5% and the BOP will manually control Steam Generator levels using 3-GOP-301.
2	TVS1SALO 1	(TS)	LT-3-474 will fail low, the crew will respond using the ARP and 3-ONOP-049.1 to address the failed channel. The SRO will enter LCO 3.3.1 Action 6
3	TFK2B17T T	(C) BOP (C,TS) SRO	3B ICW Pump shaft seizes, crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.
4	TVBVLK40=1.0	(C) RO (C) SRO	CVCS relief valve, RV-3-203, fails open, the RO isolates Letdown using the ARP and will re-seat the relief valve. The RO will establish Letdown once the relief valve is re-seated
5	TVS1SR3O 1	(C) BOP (C) SRO	PT-3-1608 fails high which causes CV-3-1608 to fail open and increases steam flow 3-4%. The BOP will place the controller for CV-3-1608 to manual and reduce output to close the valve.
6	TFL2XASE = T TFL2XBSE = T TFL4AF = T	(M)ALL	A Steam Line Break inside containment on the 3A SG. A SI occurs with a failure of the Reactor Protection System to actuate. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-FR-S-1 to initiate a local reactor trip. The crew will then transition back to E-0 and isolate feed to the faulted SG.
6a	TFBVS63 T TABM356 1)	(C) RO	The RO will align charging pump suction to the manual emergency boration path to initiate boration.

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

Turkey Point 2010-301 Scenario #6

Event 1 - The RO will raise Reactor Power and the BOP will manually control Steam Generator levels using 3-GOP-301.

Event 2 – LT-3-474 will fail low, the crew will respond using the ARP and 3-ONOP-049.1 to address the failed channel. The SRO will enter LCO 3.3.1 Action 6

Event 3 - The 3B ICW Pump shaft seizes, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.

Event 4 - CVCS relief valve, RV-3-203, fails open, the RO isolates Letdown using the ARP and will re-seat the relief valve. The RO will establish Letdown once the relief valve is re-seated

Event 5 - PT-3-1608 fails high which causes CV-3-1608 to fail open and increases steam flow 3-4%. The BOP will place the controller for CV-3-1608 to manual and reduce output to close the valve.

Event 6 – A Steam Line Break inside containment on the 3A SG. A SI occurs with a failure of the Reactor Protection System to actuate. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-FR-S-1 to initiate a local reactor trip. The crew will then transition back to E-0 and isolate feed to the faulted SG.

Event 6a – The RO will align charging pump suction to the manual emergency boration path to initiate boration.

CREW CRITICAL TASK: Insert negative reactivity into the core by establishing emergency boration flow to the RCS prior to completing step 4 of 3-EOP-FR-S.1.

CREW CRITICAL TASK: STOP AFW flow to the SGs to minimize energy released to containment.

Gr 26 NRC Scenario # 6 Simulator Operating Instructions Setup

Restore IC- 20

Place simulator in run

Open and execute lesson file Gr 26 NRC Scenario 6 lsn

Trigger lesson steps:

- SETUP - MOV-3-350 Fails Closed (actuates TFBVS63 T)
- SETUP – ATWS (actuates TFL2XASE = T, TFL2XBSE = T TFL4AF=T)

Provide a copy of 3-GOP-301 complete to step 5.44

Provide power ascension guidelines

Place simulator in freeze.

Provide shift turnover checklists

Perform Simulator Operator Checklist

Event 1 – Raise Reactor Power

Initiated by crew based on shift turnover.

The RO will raise Reactor Power to 5% power and the BOP will manually control Steam Generator levels using 3-GOP-301.

Event 2 – LT-3-474 fails low

LT-3-474 will fail low, the crew will respond using the ARP and 3-ONOP-049.1 to address the failed channel. The SRO will enter LCO 3.3.1 Action 6

When directed, trigger lesson step EVENT 2 - LT-3-474 Fails Low (actuates TVS1SALO 1on 3 min ramp).

If directed as FS/TO to reset AMSAC **trigger lesson step EVENT 2 RESET AMSAC TROUBLE** (actuates TCL4RST T, TCL4P1BA T, TCL4P1BB T)

Event 3 - 3B ICW Shaft Seizes

When directed, trigger lesson step EVENT 3 - B ICW Pump Trip (actuates TFK2B17T T).

If directed, respond as WCC to initiate a PWO and contact I&C. Also respond as WCC if directed to generate an ECO.

Event 4. CVCS Relief Valve, RV-3-203, Fails Open

When directed, trigger lesson step EVENT 4 CVCS Relief Valve, RV-3-203, Fails Open (actuates TVBVLK40 1)

If directed, respond as WCC to generate a work order and contact maintenance.

Event 5 - PT-3-1608 fails high

When directed, trigger lesson step EVENT 5 - PT-3-1608 FAILS HIGH (actuates TVS1SR3O 1).

PT-3-1608 fails high which causes CV-3-1608 to fail open and increases steam flow 3-4%. The BOP will place the controller for CV-3-1608 to manual and reduce output to close the valve.

Event 6 –Steam line break / ATWS

A Steam Line Break inside containment on the 3A SG. A SI occurs with a failure of the Reactor Protection System to actuate. The crew responds using 3-EOP-E-0 and transitions to 3-EOP-FR-S-1 to initiate a local reactor trip. The RO will align charging pump suction to the manual emergency boration path to initiate boration. The BOP will lower AFW flow to all Steam Generators.

When directed by the lead examiner, **trigger lesson step EVENT 6 – Inadvertent Train A Safety Injection.** (actuates TFL2XASE = T TFL2XBSE = T TFL4AF = T)

If directed to locally open Manual Emergency Boration Valve, 3-356 respond as SNPO **trigger lesson step EVENT 6 – LOCALLY Open 3-356** (actuates TABM356 1) Report when complete.

If directed to locally trip the reactor, respond as TO/FS. When directed by the lead evaluator, **trigger lesson step EVENT 6 - LOCALLY OPEN RX TRIP BKRS** (actuates TFL2XASE=F then TFL2XBSE=F 15 sec later). Report when complete.

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	--
1. Total malfunctions (5–8)	6
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	2
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	2
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	2

Op-Test No.: 2010-301 Scenario No.: 6 Event No.: 1 Page 1 of 1

Event Description: The crew performs 3-GOP-301 beginning at step 5.52.3 to synchronize generator to grid, increase power and swap S/G level control to main feed reg valves controlling in automatic.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs the evolution
	RCO	5.44 In preparation for rolling the main turbine, increase Reactor Power to 3 to 5 percent by withdrawing control rods. RCO should be given guidance to withdraw rods in 2 step increments.
	BOP	Adjust feedwater flow on the bypasses as reactor power is raised to 5%.
	BOP	c. Adjust the setpoints for SDTA controllers in automatic for staggered operation. d. Adjust the setpoint for SDTA controller in manual to 1005 psig. e. Use the SDTA controller in manual to make minor adjustments to Tavg, as necessary.
		NOTE *The following step may be performed as SDTA controllers are adjusted and steam generator levels are stabilized.*
		Once Plant is stable at 5%, Proceed to event 2-LT-3-474 failing low.

Op-Test No.: 2010-301 Scenario No.: 6 Event No.: 2 Page 1 of 2

LT-3-474 will fail low, the crew will respond using the ARP and 3-ONOP-049.1 to address the failed channel. The SRO will enter LCO 3.3.1, Action 6 and TS 3.3.2, Action 15.

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Observes C-1/1, D 7/6
		C1 — SG A NARROW RANGE LO/LO-LO LEVEL CAUSES: 1. Steam Generator Level Control Malfunction 2. Instrument Failure
		D52 — AMSAC TROUBLE/ ACTUATED CAUSES: 1. AMSAC actuated demand for reactor trip 2. Processor trouble, loss of voltage, or bypass switch NOT in normal 3. Instrument failures
	SRO	Enters 3-ONOP-049.1,Deviation or failure of safety related or Reactor Protection Channels
	BOP	5.1 Verify instrument loop failure by comparison to adjacent loops and known plan parameters and conditions.
	BOP	5.2 Verify no off-normal conditions exist on the adjacent channels which are to remain in service.
	BOP	5.3 Verify applicable control transfer switches are in the position which eliminates the failed loop.
	BOP	5.4 IF a control function was placed in manual control due to the failure, THEN verify the control function is returned to automatic.
	SRO	5.5 Refer to Technical Specifications 3/4.3, Instrumentation, AND verify the minimum channels operable. 5.5.1 Take appropriate actions as specified in Technical Specifications.
	SRO	Enters LCO 3.3.1, T.S. 3.3-1 Function 11, 12 action 6 T.S. 3.3-2 Functions 5c & 6b action 15

Op-Test No.: 2010-301 Scenario No.: 6 Event No.: 2 Page 2 of 2

LT-3-474 will fail low, the crew will respond using the ARP and 3-ONOP-049.1 to address the failed channel. The SRO will enter LCO 3.3.1, Action 6 and TS 3.3.2, Action 15.

Time	Position	Applicant's Actions or Behavior
----------	BOP	5.6 IF a 4KV bus/480V load center undervoltage channel has failed, THEN perform Attachment 1.
	BOP	5.7 IF a turbine stop valve closure channel has failed, THEN perform Attachment 2.
	BOP	5.8 IF a turbine auto stop oil channel has failed, THEN perform Attachment 3.
	SRO	5.9 IF I&C determines a Test Sequence Processor on an Eagle-21 Channel has failed AND no off-normal bistables are lit, THEN perform Attachment 6 once per 4 hours until the associated Eagle-21 Channel is removed from service for repair.
	BOP	5.12 IF any of the following channels are failed, THEN place the Bypass Switch(es) for the failed channel to Bypass position at the AMSAC panel using Attachment 5: 5.12.1 Any Steam Generator Level Channel I (LI-3-474, LI-3-484, or LI-3-494) OR 5.12.2 Any Steam Generator Level Channel II (LI-3-475, LI-3-485, or LI-3-495) OR 5.12.3 PT-3-446 OR 5.12.4 PT-3-447
	BOP	May Bypass AMSAC using ARP D7/6

ATTACHMENT 4
(Page 25 of 53)

FAILED CHANNEL BISTABLE LIST

L-3-474	Steam Generator A Narrow Range Level				Ref Dwgs 5610-T-D-17; 5610-T-L1, Sh 3 and 19	
Max Deviation As Compared to other Channels			10% LEVEL DEVIATION			
RACK No.	BISTABLE No.	BISTABLE FUNCTION	STATUS LIGHT	ANNUNCIATOR	FUNC-TION	LOGIC AFFECTED
3	BS-3-474-1	HI Level Logic	S/G A HI LEVEL LC474-1		P	2/3 channels on 1/3 S/G, high S/G level (N/R 80%) for turbine trip, with P-7 satisfied causing reactor trip signal
3	BS-3-474-2	HI Level Alarm		C 2/1 SG A NARROW RANGE HI LEVEL	C	
3	BS-3-474A-1	Lo Lo Level Logic	S/G A LO LO LEVEL LC474A1		P	2/3 channels on 1/3 S/G, low low level (10%)
3	BS-3-474A-2	Lo Lo Level Alarm		C 1/1 SG A NARROW RANGE LO/LO-LO LEVEL	C	
3	BS-3-474B-1	Lo Level Logic	S/G A LO LEVEL LC474B1		P	1/2 channels on 1/3 S/G, low level (10%), with 1/2 low feedwater flow (665,000 lb/hr<steam flow) on same S/G
3	BS-3-474B-2	Lo Level Alarm		C 1/1 SG A NARROW RANGE LO/LO-LO LEVEL	C	

C - CONTROL RELATED
P - RX PROTECTION RELATED
S - SAFETY INJECTION RELATED

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Steam Generator Water Level--Low-Low	3/stm. gen.	2/stm. gen.	2/stm. gen.	1, 2	6
12. Steam Generator Water Level--Low Coincident With Steam/ Feedwater Flow Mismatch	2 stm. gen. level and 2 stm./feed-water flow mismatch in each stm. gen.	1 stm. gen. level coin-cident with 1 stm./feed-water flow mismatch in same stm. gen.	1 stm. gen. level and 2 stm./feed-water flow mismatch in same stm. gen. or 2 stm. gen. level and 1 stm./feedwater flow mismatch in same stm. gen.	1, 2	6
13. Undervoltage--4.16 KV Busses A and B (Above P-7)	2/bus	1/bus on both busses	2/bus	1	12
14. Underfrequency-Trip of Reactor Coolant Pump Breaker(s) Open (Above P-7)	2/bus	1 to trip RCPs***	2/bus	1	11
15. Turbine Trip (Above P-7)					
a. Autostop Oil Pressure	3	2	2	1	12
b. Turbine Stop Valve Closure	2	2	2	1	12

TABLE 3.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. Steam Line Isolation (Continued)					
d. Steam Line Flow--High Coincident with: Steam Generator Pressure--Low	2/steam line	1/steam line in any two steam lines	1/steam line in any two steam lines	1, 2, 3	16
	1/steam generator	1/steam generator in any two steam lines	1/steam generator in any two steam lines	1, 2, 3	16
or T_{avg}--Low	1/Loop	1/loop in any two loops	1/loop in any two loops	1, 2, 3	25
5. Feedwater Isolation					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2	22
b. Safety-Injection	See item 1. above for all Safety Injection initiating functions and requirements.				
c. Steam Generator Water Level -- High-High# # # #	3/steam generator	2/steam generator in any operating steam generator	2/steam generator in any operating steam generator	1, 2	16
6. Auxiliary Feedwater# # #					
a. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	20

TABLE 3.3-2 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. Auxiliary Feedwater### (Continued)					
b. Stm. Gen. Water Level--Low-Low	3/steam generator	2/steam generator in any steam generator	2/steam generator	1, 2, 3	15
c. Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
d. Bus Stripping	1/bus	1/bus	1/bus	1, 2, 3	23
e. Trip of all Main Feedwater Pumps Breakers	1/breaker	(1/breaker) /operating pump	(1/breaker) /operating pump	1, 2	23
7. Loss of Power					
a. 4.16 kV Busses A and B (Loss of Voltage)	2/bus	2/bus	2/bus	1, 2, 3, 4	18
b. 480 V Load Centers 3A, 3B, 3C, 3D and 4A, 4B, 4C, 4D Undervoltage	2 per load center	2 on any load center	2 per load center	1, 2, 3, 4	18
Coincident with: Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				

TABLE 3.3-2 (Continued)

TABLE NOTATION

\# Trip function may be blocked in this MODE below the Pressurizer Pressure Interlock Setpoint of 2000 psig.

\#\# Channels are for particulate radioactivity and for gaseous radioactivity.

\#\#\# Auxiliary feedwater manual initiation is included in Specification 3.7.1.2.

\#\#\#\# Steam Generator overfill protection is not part of the Engineered Safety Features Actuation System (ESFAS), and is added to the Technical Specifications only in accordance with NRC Generic Letter 89-19.

* Trip function may be blocked in this MODE below the T_{avg}–Low Interlock Setpoint.

** Only during CORE ALTERATIONS or movement of irradiated fuel within the containment.

ACTION STATEMENTS

ACTION 14 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 12 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 8 hours for surveillance testing per Specification 4.3.2.1, provided the other channel is OPERABLE.

ACTION 15 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required ANALOG CHANNEL OPERATIONAL TEST or TRIP ACTUATING DEVICE OPERATIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.

ACTION 16 - With less than the Minimum Channels OPERABLE requirement, comply with the ACTION statement requirements of Specification 3.3.3.1 Item 1a of Table 3.3-4.

ACTION 17 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Op-Test No.: 2010-301 Scenario No.: 6 Event No.: 3 Page 1 of 4

Event Description: The 3B ICW Pump shaft seizes, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19. SRO enters LCO 3.7.3a,actions a and b.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 3 – B ICW PUMP TRIP (actuates TFK2B17T=T = T).		
	BOP	Observes 3B ICWP amps increasing. & annunciator I-4/4
	BOP	Refers to ARP for annunciator I-4/4
	SRO	Directs response using 3-ONOP-019. May direct response from the ARP.
	BOP	ARP Actions 2. Corrective actions: a. Start the standby ICW pump using 3-NOP-019, Intake Cooling Water System.
	BOP	3-NOP-019 Actions 4. IF starting 3A ICW PUMP, THEN: A. **ENSURE** 3-50-312, 3A ICW PP DISCH ISOL is OPEN. B. **START** 3A ICW PUMP from VPA. C. **CHECK** 3A ICW PUMP Motor Amps at VPA stabilizes to less than 49 amps. D. **CHECK** PI-3-1450, PRESS IND FOR INTAKE COOLING WTR PUMP A indicates between 11 and 35 psig.
	BOP	7. **PLACE** offgoing ICW PUMP to STOP at VPA.
	BOP	Manually starts 3A ICW Pump, stops the 3B ICW pump.
		Examiner Note: If 3-ONOP-19 is NOT entered, observe 3A ICW pump is started and go to page 4 for TS LCO entry.

Op-Test No.: 2010-301 Scenario No.: 6 Event No.: 3 Page 2 of 4

Event Description: The 3B ICW Pump shaft seizes, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.

Time	Position	Applicant's Actions or Behavior
	CREW	Reviews 3-ONOP-19 foldout page actions (See next page)
		CAUTIONS • *If the cause of the Intake Cooling Water Malfunction is determined to be due to high differential pressure on the traveling screens, then 3-ONOP-011, SCREEN WASH SYSTEM/INTAKE MALFUNCTION, should be used.* • *If an Intake Cooling Water Pump is stopped in this procedure and the reason for stopping the pump has not been corrected, that pump is not available for starting in subsequent procedure steps.* • *Monitoring Main Generator RTDs is required if TPCW flow or temperature is changed due to the effect on Main Generator hydrogen leakage. An increase in hydrogen leakage is expected if the gas temperature to rotor temperature gradient increases. (Reference CR 2008-803)*
	RO	1 **Verify All Intake Cooling Water Pump Alarms - OFF** • I 4/1, ICWP A/B/C MOTOR OVERLOAD • I 4/2, ICWP A/B/C TRIP • I 4/3, ICWP A/B/C MOTOR BRG HI TEMP Perform the following: 1. Have operator check pump(s) locally 2. Determine affected intake cooling water pump. 3. Start standby intake cooling water pump. 4. Stop affected intake cooling water pump.
		FOLDOUT PAGE FOR 3-ONOP-019 1. TRIP CRITERIA • Component Cooling Water temperature as read on TI-3-607A and TI-3-607B cannot be maintained less than 120°F. • Turbine or Generator bearing temperatures cannot be maintained less than 180°F. 2. MINIMUM FLOW REQUIREMENTS FOR CCW HXs While isolating a CCW/ICW strainer, ICW flow less than minimum required through the CCW HXs can be tolerated without entry into Technical Specification Action 3.0.3, provided flow is restored to the minimum allowable, as determined by 3-NOP-019, Intake Cooling Water System, in less than 5 minutes by reopening the strainer isolation valves. If flow is below the minimum allowable value for greater than 5 minutes, then entry into Technical Specification Action 3.0.3 is started at the point where flow first fell below the minimum value. [Reference 3.1.4]

Op-Test No.: 2010-301 Scenario No.: 4 Event No.: 3 Page 3 of 4

Event Description: The 3B ICW Pump shaft seizes, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.

Time	Position	Applicant's Actions or Behavior
	BOP	**2** **Check Traveling Screens - CLEAN** — Go to 3-ONOP-011, SCREEN WASH SYSTEM/INTAKE MALFUNCTION • Alarm I 3/3, Traveling Screen HI ΔP - OFF • Traveling Screen DP - LESS THAN 7.5 INCHES OF WATER
	BOP	**3** **Verify Intake Cooling Water Pumps - AT LEAST ONE RUNNING**
	BOP	**4** **Verify Intake Cooling Water Pumps - TWO RUNNING** — Perform the following: a) Manually start any available Intake Cooling Water Pump to establish TWO RUNNING.
	BOP	Manually starts 3A ICW Pump, stops the 3B ICW pump.
	SRO	Implements LCO 3.7.3.a actions a & b (72 hr until 3B ICW pump bkr racked out then 14 day with 3A & 3C ICWP on independent power supplies)
	CREW	Notifies WCC to initiate PWO & repair

Op-Test No.: 2010-302 Scenario No.: 6 Event No.: 3 Page 4 of 4

Event Description: The 3B ICW Pump shaft seizes, the crew manually starts the 3A ICW pump using the ARP or 3-ONOP-19.

Time	Position	Applicant's Actions or Behavior
	SRO	EXAMINER NOTE: LCO 3.7.3 a The Intake Cooling Water System (ICW) shall be OPERABLE with Three ICW pumps Action b With only one ICW pump OPERABLE or with two ICW pumps OPERABLE but not from independent power supplies, restore two pumps from independent power supplies to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Then to: Action a With only two ICW pumps with independent power supplies OPERABLE, restore the inoperable ICW pump to OPERABLE status within 14 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable. (Once the 3B ICW pump breaker is racked out.)
		EXAMINER NOTE: When the crew has started the 3A ICW pump, proceed to EVENT 4

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CVCS relief valve, RV-3-203, fails open, the RO isolates Letdown using the ARP and will re-seat the relief valve. The RO will establish Letdown once the relief valve is re-seated

Time	Position	Applicant's Action or behavior
		A50 CVCS LP LTDN LINE RELIEF HI TEMP CAUSES: 1. Hi letdown flow rate 2. PCV-3-145 failure 3. RV-3-203 setpoint drift low 4. CV-3-204 fail closed
		ALARM CONFIRMATION
	RO	1. CHECK TI-3-141, LTDN RELIEF TO PRT TEMP greater than 150°F on VPA.
	RO	2. CHECK PRT in leakage has increased.
	RO	3. CHECK for an increase in charging flow.
	RO	4. CHECK increased calculated RCS leakage using 3-OSP-041.1, Reactor Coolant System Leak Rate Calculation.
	RO	5. CHECK for a decrease of indicated letdown flow.
	SRO	NOTE The decision to isolate letdown should be based on unacceptable RV-3-203 leakage and Shift Manager discretion.
		OPERATOR ACTIONS
	RO	1. ENSURE CV-3-204, L/D FROM RHX ISOL VALVE is OPEN.

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CVCS relief valve, RV-3-203, fails open, the RO isolates Letdown using the ARP and will re-seat the relief valve. The RO will establish Letdown once the relief valve is re-seated

Time	Position	Applicant's Action or behavior
		2. RESEAT RV-3-203 as follows: A. CLOSE all letdown orifices. B. IF PCV-3-145 LOW PRESSURE LTDN CONTROLLER does NOT operate properly, THEN USE 3-309C, BYPASS VALVE. C. CHECK TI-3-141 NOT increasing. D. OPEN the required number of orifices while controlling PCV-3-145 or 3-309C.
	RO	Expected to isolate charging flow when letdown is isolated. Will reduce charging to minimum for seal injection; one charging pump at minimum speed with HCV-3-121 throttled to maintain seal injection.
		3. CHECK RV-3-203 is CLOSED as follows: A. CHECK TI-3-141 indication decreasing. B. CHECK FI-3-150, LOW PRESS LTDN FLOW stable.
		Examiner Note: When the letdown relief valve is reseated, proceed to event 5.

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Event Description PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%.

Time	Position	Applicant's Actions or Behavior
	BOP	Observes PT-3-1608 failed high & CV-3-1608 failed open as evident by: • PT-3-1608 indication • CV-3-1608 position indication on ERDADS • Steam noise present • 3C SG steam flow indication • Primary plant responses, Tavg indication, reactor power increase
	RO	Observes 3-4% reactor power increase Observes Tavg < Tref
	SRO	Determines CV-3-1608 failure open caused Tavg-Tref deviation Directs taking manual control of CV-3-1608.
	BOP	Takes manual control of CV-3-1608 and attempts to close the valve. valve. Reports that the valve has failed open.
	SRO	When informed of CV-3-1608 failure, directs local isolation of CV-3-1608

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Event Description PT-3-1608 fails high. CV-3-1608 fails open and increases steam flow 3-4%.

Time	Position	Applicant's Actions or Behavior
	BOP	Attempts manual closure of CV-3-1608 & determines CV-3-1608 closed.
	SRO	Determines CV-3-1608 isolation valve isolated. Directs WCC have Mechanical maintenance investigate CV-3-1608 Directs caution tag generated for CV-3-1608 in manual
When the crew has stabilized power, direct the facility operator to trigger EVENT 6 – Steam Line break		

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Event Description: A steamline break occurs inside containment. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step EVENT 6 – Steam Line Break inside containment		
	RO/BOP	Observes SI components operate without any first out annunciators.
	SRO	Directs manual reactor trip when SI Actuates.
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	1 **Verify Reactor Trip** • Rod bottom lights – ON • Reactor trip and bypass breakers – OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING Manually trip reactor. **IF** reactor power is greater than 5% **OR** intermediate range power is **NOT** stable or decreasing, **THEN** perform the following: a. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b. Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.
	RO	Attempts to manually trip the reactor by placing the Reactor Trip switch to TRIP.

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Event Description: A steam line break occurs inside containment.. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration.

Time	Position	Applicant's Actions or Behavior
	SRO	Transition to 3-EOP-FR-S.1.
	SRO	Directs response using 3-EOP-FR-S.1
		CAUTION *RCPs should not be tripped with reactor power GREATER THAN 5%.*
		NOTE *Steps 1 and 2 are IMMEDIATE ACTION steps.*
	RO	**1 Verify Reactor Trip** • Rod bottom lights - ON • Reactor trip and bypass breakers - OPEN • Rod position indicators – AT ZERO • Neutron flux - DECREASING Perform the following: a. Manually trip reactor. b. IF reactor will NOT trip, THEN ensure control rod insertion in Auto or Manual.
	RO	Rods fail to insert in manual or automatic
	BOP	**2 Verify Turbine Trip** a. All turbine stop valves - CLOSED a. Perform the following: 1) Manually trip the turbine. 2) IF turbine will NOT trip, THEN close main steamline isolation and bypass valves. 3) Go to Step 3. b. Verify Moisture Separator Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves b. Perform the following: 1) Manually close valves. 2) IF any MSR valve can NOT be closed, THEN close main steamline isolation and bypass valves.
	BOP	Turbine is not Latch

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Event Description: A steam line break occurs inside containment.. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration.

Time	Position	Applicant's Actions or Behavior
	BOP	**3** **Check AFW Pumps - ALL RUNNING** — Manually open steam supply valves.
	RO	**4** **Initiate Emergency Boration Of RCS** a. Verify charging pumps – AT LEAST ONE RUNNING IN MANUAL b. Stop makeup system c. Manually start Boric Acid Pump 3A or 3B — c. Align charging pump suction to the RWST as follows: 1) Hold closed LCV-3-115C control switch. 2) Direct an operator to open Breaker 30669 for LCV-3-115C. 3) **WHEN** 30669 is open, **THEN** release LCV-3-115C control switch. 4) Go to Step 4e. d. Open Emergency Boration Valve, MOV-3-350 — d. Perform the following: 1) Open Boric Acid To Blender, FCV-3-113A. 2) Open Blender Flow To Charging Pump, FCV-3-113B. 3) Locally open Manual Emergency Boration Valve, 3-356. 4) **WHEN** Manual Emergency Boration Valve, 3-356, is open, **THEN** close Blender To Charging Pump, FCV-3-113B. 5) Continue with Step 4e. e. Open Charging Flow To Regen Heat Exchanger, HCV-3-121 f. Verify Loop A Charging Isolation, CV-3-310A – OPEN — f. Open Loop C Charging Isolation, CV-3-310B g. Establish emergency boration flow • FI-3-110 – GREATER THAN 60 GPM • FI-3-122A – GREATER THAN 45 GPM — g. Start additional charging pumps **AND** align valves as necessary to establish emergency boration flow.
	RO	Places Rx Makeup Control switch to STOP Manually starts Boric Acid Pump 3B Manually attempts to open Emergency Boration Valve, MOV-3-350 Opens FCV-3-133A and FCV-3-113B Locally opens 3-356 Closes Blender to Charging Pump FCV-3-133B

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Event Description: A steam line break occurs inside containment.. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration.

Time	Position	Applicant's Actions or Behavior
	RO	SI has actuated, then manually resets SI SI has actuated, then manually starts one Charging pump at maximum speed.
		CREW CRITICAL TASK: Insert negative reactivity into the core establishing emergency boration flow to the RCS prior to completing step 4 of 3-EOP-FR-S.1.
	RO	**5** **Check PRZ Pressure - LESS THAN 2335 PSIG** Perform the following: a. Verify PRZ PORVs and block valves open. b. IF PRZ PORVs and block valves are NOT open, THEN open PRZ PORVs and block valves until PRZ pressure less than 2135 psig.
	RO	**6** **Verify Containment Ventilation – ISOLATED** a. Verify Unit 3 containment purge exhaust and supply fans – OFF b. Verify Containment Purge Supply and Exhaust Isolation valves – CLOSED • POV-3-2600 • POV-3-2601 • POV-3-2602 • POV-3-2603 b. IF any purge valve can NOT be closed, THEN pull fuse(s) for any open purge valve(s) from behind VPB: • XEP for POV-3-2600 • XLAG for POV-3-2601 • XEQ for POV-3-2602 • XLAH for POV-3-2603 c. Verify Containment Instrument Air Bleed Isolation valves - CLOSED • CV-3-2819 • CV-3-2826 c. IF neither valve can be closed, THEN locally close Containment Air Bleed to Purge Air Return Line Isolation, MPAS-3-005.
	RO	Verifies Containment Instrument Air Bleed valves CV-3-2819 and CV-3-2826 are closed.
		CAUTION *If an SI signal exists or occurs and the reactor is subcritical, proper safeguards equipment alignment is required to be verified using Attachment 3 of 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure.*

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Event Description: A steam line break occurs inside containment.. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration.

Time	Position	Applicant's Actions or Behavior
	BOP	If SI has actuated performs 3-EOP-E-0 Attachment 3, see page 37 for details.
	RO BOP BOP	**7 Check If The Following Trips Have Occurred** a. Reactor trip a. In 3B MCC room, locally trip reactor as follows: • Open 3A and 3B Reactor Trip Breakers. • Open 3A and 3B Reactor Trip Bypass Breakers. • Open A/B MG set generator output breakers. • Open A/B MG set motor input breakers. b. Turbine trip b. Locally trip turbine at turbine front standard. c. Mid and East GCBs – OPEN (Normally 30 seconds delay) c. Perform the following: 1) Manually open breakers. 2) IF breakers do NOT open THEN actuate Emergency Gen Bkr Trip Switch for the affected breaker(s). 3) IF breaker position indication is NOT available AND turbine speed is NOT decreasing, THEN direct Field Operator to perform the following: a) Obtain key 17 from the Shift Manager key locker. b) Locally trip Mid and East GCBs from the switchyard. • 8W33 • 8W68
	CREW	Directs the FS/TO locally trip the Reactor Trip Breakers & MG set input & output breakers
		Examiner note: When the crew directs AND when the emergency boration has been established, direct the facility operator to **trigger lesson step EVENT 5 - LOCALLY OPEN RX TRIP BKRS** (actuates TFL2XASE=F then TFL2XBSE=F 15 sec later).
		NOTE *When adverse containment conditions exist, Gamma-Metrics indication needs to be used.*

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Event Description: A steam line break occurs inside containment.. The reactor fails to automatically trip due to an ATWS. Crew enters 3-FRP-S1 to initiate a manual boration.

Time	Position	Applicant's Actions or Behavior
	RO	**8 Monitor Reactor Subcritical** a. Power range channels – LESS THAN 5% — a. Observe Caution prior to Step 9 and go to Step 9. b. Intermediate range channels – NEGATIVE STARTUP RATE — b. Observe Caution prior to Step 9 and go to Step 9. c. Observe Caution prior to Step 17 and go to Step 17
	SRO	Observes Caution prior to Step 17 and goes to Step 17
		CAUTION *Boration should continue during subsequent actions until adequate shutdown margin is obtained.*
		17 Return To Procedure And Step In Effect
	SRO	Transitions to 3-EOP-E-0 step 1

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2 then to ES-1.1 to terminate SI.

Time	Position	Applicant's Actions or Behavior
	SRO	Transitions to 3-EOP-E-0 step 1
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	**1 Verify Reactor Trip** • Rod bottom lights – ON • Reactor trip and bypass breakers – OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING Manually trip reactor. **IF** reactor power is greater than 5% **OR** intermediate range power is **NOT** stable or decreasing, **THEN** perform the following: a. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b. Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.
	BOP	**2 Verify Turbine Trip** a. All turbine stop or associated control valves – CLOSED b. Verify Moisture Separator Reheater Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves c. Check Mid and East GCBs – OPEN (Normally 30 second delay) a. Manually trip turbine. **IF** unable to verify turbine trip, **THEN** close main steamline isolation and bypass valves. b. Manually close valves. **IF** any valve can **NOT** be closed, **THEN** close main steamline isolation and bypass valves. c. Manually open breakers. **IF** breakers do **NOT** open, **THEN** actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2, then to ES-1.1 to terminate SI.

Time	Position	Applicant's Actions or Behavior
	BOP	**3 Verify Power To Emergency 4 KV Buses** a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED a. Perform the following: 1) Attempt to emergency start any Unit 3 available diesel generator. 2) IF neither 3A nor 3B 4 KV bus is energized, THEN go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1. b. Check the 3A and 3B 4 KV buses - MAINTAIN BOTH ENERGIZED b. Attempt to emergency start the de-energized Unit 3 bus diesel generator. c. Maintain the 3D 4 KV bus energized - ALIGNED TO AN ENERGIZED 4 KV BUS c. Perform the following: 1) IF lockout of 3D 4 KV bus NOT present, THEN perform the following: a) Verify 3C CCW pump - BREAKER OPEN. b) Verify 3C ICW pump – BREAKER OPEN. c) Operate bus supply breakers to restore power.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped.

Time	Position	Applicant's Actions or Behavior
	RO	**4 Check If SI Is Actuated** * SI Annunciators - ANY ON OR * Safeguards equipment – AUTO STARTED Perform the following: a. Check if SI is required: * Low pressurizer pressure – 1730 psig OR * High containment pressure – 4 psig OR * High steam line differential pressure – 100 psid OR * High steam flow with low S/G pressure - 614 psig OR low Tavg (543 F) b. IF SI is required, THEN manually actuate SI and containment isolation phase A AND go to Step 5. c. IF SI is NOT required, THEN perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-ES-0.1, REACTOR TRIP RESPONSE, Step 1.
		NOTE *FOLDOUT Page shall be monitored for the remainder of this procedure.*
	CREW	Monitors 3-EOP-E-0 Foldout page (see next page)
	BOP	**5 Continue With Attachment 3 To Complete The Prompt Action Verifications While Performing This Procedure**
		Examiner Note: 3-EOP-E-0 Attachment 3 commences at page 37 EXAMINER NOTE: The scenario may be terminated after AFW flow is isolated to 3A SG.k

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped.

FOLDOUT FOR PROCEDURE E-0

1. **ADVERSE CONTAINMENT CONDITIONS**

   IF either of the conditions listed below occur, THEN use adverse containment setpoints:

   Containment atmosphere temperature ≥ 180°F

   OR

   Containment radiation levels ≥ 1.3×10^5 R/hr

   WHEN containment parameters drop below the above values, THEN normal setpoints can again be used IF the TSC determines that containment integrated dose rate has not exceeded 10^6 Rads.

2. **RCP TRIP CRITERIA**

   a. IF both conditions listed below occur, THEN trip all RCPs:
      1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED.
      2) RCS subcooling - LESS THAN 25°F[65°F]

   b. IF phase B actuated, THEN trip all RCPs.

3. **FAULTED S/G ISOLATION CRITERIA**

   IF any S/G pressure decreasing in an uncontrolled manner OR any S/G completely depressurized, THEN the following may be performed:

   a. Maintain total feedwater flow greater than 345 gpm until narrow range level in at least one S/G is greater than 6%[32%].
   b. Isolate AFW flow to faulted S/G(s).
   c. Stabilize RCS hot leg temperature using steam dumps when faulted S/G has blown down to less than 10% wide range.

4. **RUPTURED S/G ISOLATION CRITERIA**

   IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, AND narrow range level in affected S/G(s) is greater than 6%[32%], THEN feed flow may be stopped to affected S/G(s).

5. **AFW SYSTEM OPERATION CRITERIA**

   a. IF two AFW pumps are operating on a single train, THEN one of the pumps shall be shut down within one hour of the initial start signal
   b. IF two AFW trains are operating and one of the AFW pumps has been operating at low flow of 60 gpm or less for one hour, THEN that AFW pump shall be shut down

6. **CST MAKEUP WATER CRITERIA**

   IF CST level decreases to less than 10%, THEN add makeup to CST using 3-OP-018.1, CONDENSATE STORAGE TANK.

7. **RHR SYSTEM OPERATION CRITERIA**

   IF RCS pressure is greater than 250 PSIG [650 PSIG] AND RHR flow is less than 1000 gpm, THEN the RHR pumps shall be shut down within 44 minutes of the initial start signal.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2, then ES-1.1 to terminate SI.

Time	Position	Applicant's Actions or Behavior		
	RO	Stops RCPs if subcooling is less than 25°F(65°F) wiith HHSI flowpath verified and HHSI pumps running based on foldout page requirements.		
	RO	**6**	**Check AFW Pumps - AT LEAST TWO RUNNING**	Perform the following: a. Manually open valves to establish two AFW pumps running. b. **IF** an AFW pump is tripped, **THEN** dispatch an operator to locally reset the AFW turbine trips. c. **IF** both units require AFW **AND** only one AFW pump is available, **THEN** perform the following: 1) Verify all RCPs - TRIPPED 2) Establish 270 gpm AFW flow to each unit. 3) Use a setpoint of 270 gpm for required AFW flow instead of 345 gpm specified in subsequent Steps and Procedures.
	RO	**7**	**Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT**	Manually align valves to establish proper AFW alignment.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2, then to ES-1.1 to terminate SI.

Time	Position	Applicant's Actions or Behavior
	RO	8 **Verify Proper AFW Flow** a. Check narrow range level in at least one S/G - GREATER THAN 6%[32%] a. Perform the following: 1) Verify AFW flow greater than 345 gpm. 2) IF AFW flow less than 345 gpm, THEN manually start pumps AND align valves to establish greater than 345 gpm flow. 3) IF total feed flow from all sources greater than 345 gpm can NOT be established, THEN perform the following: a) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b) Go to 3-EOP-FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.
	RO	b. Maintain feed flow to S/G narrow range levels between 15%[32%] and 50%.
	CREW	**CREW CRITICAL TASK: STOP AFW flow to the 3A SGs**

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2.

Time	Position	Applicant's Actions or Behavior
	RO	**9 Check RCP Seal Cooling** a. Check all RCP thermal barrier alarms – OFF • A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW • A 1/2, RCP THERMAL BARR COOLING WATER HI TEMP • A 1/3, RCP THERMAL BARR COOLING WATER LO FLOW a. **IF** CCW to an RCP thermal barrier is lost, **THEN**: 1) Trip the affected RCP(s). 2) Go to Step 9c. b. Go to Step 10 c. Check all RCP seal return temperatures are less than 235 F c. Go to Step 10. d. Verify SI - RESET d. Reset SI. e. **IF** offsite power is **NOT** available, **THEN** check diesel capacity adequate to run one charging pump. **IF** adequate diesel capacity is **NOT** available, **THEN** shed nonessential loads. Refer to ATTACHMENT 2 for component KW load rating f. Start one charging pump at minimum speed for seal injection f. Go to Step 10. g. Adjust Charging Flow To Regen Heat Exchanger, HCV-3-121, to maintain proper seal injection flow

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0, then transition to E-2.

Time	Position	Applicant's Actions or Behavior
	RO	**10 Maintain RCS Cold Leg Temperature** * STABLE AT OR TRENDING TO 547°F IF ANY RCP RUNNING OR * LESS THAN 547°F AND STABLE IF NO RCP RUNNING Perform the following: a. IF temperature is decreasing, THEN perform the following: 1) Stop dumping steam. 2) Limit total feed flow to 345 gpm until narrow range level greater than 6%[32%] in at least one S/G. 3) IF cooldown is due to excessive steam flow, THEN close main steamline isolation and bypass valves. b. IF temperature greater than 547°F AND increasing, THEN perform the following: * Dump steam to condenser. OR * Dump steam using S/G steam dump to atmosphere valves.
	RO	Reduces total AFW flow to greater than 345 gpm max for all S/G's.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0, then transition to E-2..

Time	Position	Applicant's Actions or Behavior
	RO	**11** **Check PRZ PORVs, Spray Valves And Excess Letdown Isolated** a. PORVs – CLOSED a. IF PRZ pressure less than 2335 psig, THEN manually close PORVs. IF any PRZ PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. 2) Go to 3-EOP-E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. b. Normal PRZ spray valves – CLOSED b. IF PRZ pressure less than 2260 psig, THEN manually close valves. IF valve(s) can NOT be closed, THEN stop RCP(s) as necessary to stop spray flow. c. Auxiliary Spray Valve, CV-3-311 – CLOSED c. Manually close auxiliary spray valve. IF auxiliary spray valve can NOT be closed, THEN close Charging Flow to Regen Heat Exchanger, HCV-3-121. d. Excess letdown isolation valves – CLOSED • CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger • HCV-3-137, Excess Letdown Flow Controller d. Manually close valve(s).
	RO	**12** **Check If RCPs Should Be Stopped** a. Check RCPs - ANY RUNNING a. Go to Step 13. b Check RCS subcooling – LESS THAN 25°F[65°F] b. Go to Step 13. c. High-Head SI Pump – AT LEAST ONE RUNNING AND FLOWPATH VERIFIED c. Go to Step 13. d. Stop all RCPs
	RO	Stops RCPs if subcooling is less than 25° with HHSI flowpath verified and HHSI pumps running.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2.

Time	Position	Applicant's Actions or Behavior
	RO	**13 Check If S/Gs Are Faulted** a. Check pressures in all SGs – a. Go to Step 14. * ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR * ANY SG COMPLETELY DEPRESSURIZED b. Perform the following: 1) Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES 2) Go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1
	STA	**17 Monitor Critical Safety Functions Using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES**
	US	Transition to E-2
		Examiner Note: The scenario may be terminated after AFW flow is isolated to 3A SG off the EOP FOP.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to ES-1.1 to terminate SI.

Time	Position	Applicant's Actions or Behavior
	BOP	ATTACHMENT 3 (Page 1 of 7) PROMPT ACTION VERIFICATIONS
	BOP	**1. Check The Load Centers Associated With The Energized 4 KV Buses – ENERGIZED** • 3A LC • 3B LC • 3C LC • 3D LC • 3H LC Close the Load Center supply breakers.
	BOP	**2. Check If Main Steamlines Should Be Isolated** a. Check main steamline isolation and bypass valves - ANY OPEN — a. Go to Step 3. b. Check if either main steam isolation signal has actuated — b. Go to Step 3. • High steam flow with either low S/G pressure 614 psig <u>OR</u> low Tavg 543 F <u>OR</u> • Hi-Hi containment pressure 20 PSIG c. Verify main steam isolation and bypass valves - CLOSED — c. Push manual Steamline Isolation push buttons on VPB <u>OR</u> manually close valves.
	BOP	**3. Verify Feedwater Isolation** a. Place main feedwater pump switches in STOP b. Feedwater control valves – CLOSED — b. Manually close valves. c. Feedwater bypass valves – CLOSED — c. Manually close valves. d. Close feedwater isolation MOVs — d. Locally close valves. e. Verify standby feedwater pumps – OFF — e. <u>IF</u> standby feedwater is aligned to Unit 3, <u>THEN</u> stop standby feedwater pump(s).

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2.

Time	Position	Applicant's Actions or Behavior
	BOP	**4. Verify Proper ICW System Operation** a. Verify ICW pumps - AT LEAST TWO RUNNING a. Start ICW pump(s) to establish at least two running. b. Verify ICW to TPCW Heat Exchanger – ISOLATED • POV-3-4882 – CLOSED • POV-3-4883 – CLOSED b. Manually close valve(s). IF valve(s) can NOT be closed, THEN locally close the following valves: • 3-50-319 for POV-3-4882 • 3-50-339 for POV-3-4883 c. Check ICW headers - TIED TOGETHER c. IF both ICW headers are intact, THEN direct operator to tie headers together.
	BOP	Directs FS/TO to locally close 3-50-319
	BOP	**5. Verify Proper CCW System Operation** a. CCW Heat Exchangers – THREE IN SERVICE a. Perform the following: 1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP. 2) Verify Emergency Containment Coolers - ONLY TWO RUNNING 3) Go to Step 5c. b. CCW pumps - ONLY TWO RUNNING b. Start or stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS. c. CCW headers - TIED TOGETHER c. IF both CCW headers are intact, THEN direct a field operator to tie the headers together. d. RCP Thermal Barrier CCW Outlet, MOV-3-626 – OPEN d. IF containment isolation phase B NOT actuated AND CCW radiation levels are normal, AND RCP number one seal leak-off temperature is less than 235°F, THEN manually open MOV-3-626. IF MOV-3-626 can NOT be manually opened, THEN direct operator to open MOV-3-626 locally.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2.

Time	Position	Applicant's Actions or Behavior
	BOP	**6. Verify Containment Cooling** a. Check emergency containment coolers - ONLY TWO RUNNING a. Manually start or stop emergency containment coolers to establish - ONLY TWO RUNNING. b. Verify emergency containment filter fans - AT LEAST TWO RUNNING b. Manually start emergency containment filter fans.
	BOP	**7. Verify SI Pump Operation** a. At least two high head pumps running a. Manually start high-head pump(s). b. Both RHR pumps running b. Manually start RHR pump(s).
	BOP	**8. Verify SI Flow** a. RCS pressure - LESS THAN 1600 PSIG[2000 PSIG] a. Go to Step 9. b. High-head SI pump flow indicator – CHECK FOR FLOW b. Manually start pumps **AND** align valves to establish an injection flowpath. c. RCS pressure - LESS THAN 250 PSIG[650 PSIG] c. Go to Step 9. d. RHR pump flow indicator - CHECK FOR FLOW d. Manually start pumps **AND** align valves to establish an injection flowpath.
	BOP	**9. Realign SI System** a. Verify Unit 3 high-head SI pumps - TWO RUNNING a. Perform the following: 1) Operate Unit 3 and Unit 4 high-head SI pumps to establish injection to Unit 3 from two high-head SI pumps. 2) Direct Unit 4 Reactor Operator to align Unit 4 high-head SI pump suction to Unit 3 RWST using ATTACHMENT 1 of this procedure. 3) Go to Step 10. b. Stop both Unit 4 high-head SI pumps **AND** place in standby
	BOP	Places the handswitches for the 4A and 4B HHSI pumps to STOP.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2.

Time	Position	Applicant's Actions or Behavior	
	BOP	**10. Verify Containment Isolation Phase A Valve White Lights On VPB – ALL BRIGHT**	Perform the following: a. Manually actuate Containment Isolation Phase A. b. **IF** any Containment Isolation Phase A valve is **NOT** closed, **THEN** manually close valve. **IF** valve(s) can **NOT** be manually closed, **THEN** manually or locally isolate affected containment penetration.
	BOP	**11. Verify SI Valve Amber Lights On VPB - ALL BRIGHT**	Manually align valves to establish proper SI alignment for an injection flowpath.
	BOP	**12. Verify SI – RESET**	Reset SI
	BOP	**13. Verify Containment Phase A – RESET**	Reset Phase A
	BOP	**14. Reestablish RCP Cooling**	
		a. Check RCPs – AT LEAST ONE RUNNING	a. Go to step 15.
		b. Open CCW to normal containment cooler valves • MOV-3-1417 • MOV-3-1418	b. Stop all RCPs
		c. Reset and start normal containment coolers	c. Stop all RCPs

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2.

Time	Position	Applicant's Actions or Behavior	
	BOP	**15. Monitor Containment Pressure To Verify Containment Spray NOT Required** a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG • PR-3-6306A **AND** • PR-3-6306B	a. Perform the following: 1) IF containment spray NOT initiated, THEN manually initiate containment spray. 2) Verify Containment Isolation Phase B - ACTUATED. 3) Verify Containment Isolation Phase B valve white lights on VPB – ALL BRIGHT. 4) IF any Containment Isolation Phase B valve did NOT close, THEN manually or locally isolate affected containment penetration. 5) Stop all RCPs.
	BOP	**16. Verify Containment and Control Room Ventilation Isolation** a. Unit 3 containment purge exhaust and supply fans – OFF b. Verify Control Room ventilation status panel - PROPER EMERGENCY RECIRCULATION ALIGNMENT	a. Manually stop fans. b. Manually align equipment for Control Room emergency recirculation.
		NOTE *Hydrogen Monitors should be in service within 30 minutes of a valid SI signal. They should be available in a timely manner to support decision-making related to hydrogen generation in containment.*	
	BOP	**17. Place Hydrogen Monitors In Service Using 3-OP-094, CONTAINMENT POST ACCIDENT MONITORING SYSTEM**	
	BOP	**18. Verify All Four EDGs – RUNNING**	EMERGENCY START any available EDG NOT running.

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and will terminated feed flow to the 3A SG.

Time	Position	Applicant's Actions or Behavior
	BOP	**19. Verify Power To Emergency 4 KV Buses and Load Centers** a. Check the 3A, 3B and 3D 4 KV buses - ALL ENERGIZED a. Perform the following: 1) Inform the Unit Supervisor that Attachment 3 is complete with the exception of the de-energized bus or buses. 2) IF the Unit Supervisor decides not to energize the de-energized bus or buses, THEN go to Step 20. 3) IF the Unit Supervisor decides to energize 3A, 3B, or 3D bus, THEN perform the following: a) IF 3A 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS. b) IF 3B 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS. c) IF 3D 4 KV bus de-energized, THEN restore power to bus using 3-ONOP-004.5, LOSS OF 3D 4KV BUS.
	BOP	**20. Notify The Unit Supervisor That The PROMPT ACTION VERIFICATIONS Attachment Is Complete And Note Any Actions That Had To Be Taken**

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Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2.

Time	Position	Applicant's Actions or Behavior
	SRO	Transition to E-2.
	SRO	
		NOTE: Lead Examiner may terminate the scenario after AFW flow is isolated to the 3A SG off the foldout page,

Op-Test No.: 2010-301 Scenario No.: 6 Event No.: 6 Page 24 of 24

Event Description: The crew transitions to 3-EOP-E-0 once the reactor is tripped. The crew will complete E-0 and transition to E-2.

1. ADVERSE CONTAINMENT CONDITIONS
IF either of the conditions listed below occurs, THEN use adverse containment setpoints:
Containment atmosphere temperature ≥ 180°F
OR
Containment radiation levels ≥ $1.3x10^5$ R/hr
WHEN containment parameters drop below the above values, THEN normal setpoints can again be used
IF containment integrated dose rate has not exceeded 10^6 Rads.

2. RCP TRIP CRITERIA
a. IF all conditions listed below occur, THEN trip all RCPs:
1) High-head SI pumps - AT LEAST ONE RUNNING AND SI FLOWPATH VERIFIED
2) RCS subcooling - LESS THAN 25°F[65°F]
3) Controlled RCS cooldown is NOT in progress
b. IF phase B actuated, THEN trip all RCPs

3. SI TERMINATION CRITERIA
IF all conditions listed below occur, THEN go to 3-EOP-ES-1.1, SI TERMINATION, Step 1:
a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[See below Table]

SI TERMINATION ADVERSE SUBCOOLING VALUE	
RCS PRESSURE (PSIG)	ADVERSE SUBCOOLING VALUE
< 2485 AND ≥ 2000	≥ 55 °F
< 2000 AND ≥ 1000	≥ 85 °F
< 1000	≥ 210°F

b. Total feed flow to intact SGs - GREATER THAN 345 GPM OR narrow range level in at least one intact SG - GREATER THAN 6%[32%]
c. RCS pressure - GREATER THAN 1600 PSIG[2000 psig] AND STABLE OR INCREASING
d. PRZ level - GREATER THAN 17%[50%]

4. SECONDARY INTEGRITY CRITERIA
IF any S/G pressure is decreasing in an uncontrolled manner OR has completely depressurized, AND that S/G has NOT been isolated, THEN go to 3-EOP-E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

5. E-3 TRANSITION CRITERIA
IF any S/G level increases in an uncontrolled manner OR any S/G has abnormal radiation, THEN manually start SI pumps as necessary and go to 3-EOP-E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

6. COLD LEG RECIRCULATION SWITCHOVER CRITERIA
IF RWST level decreases to less than 155,000 gallons, THEN go to 3-EOP-ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

7. RECIRCULATION SUMP BLOCKAGE
IF RHR pump flow AND amps become erratic OR abnormally low after recirculation has been established, THEN transition to 3-EOP-ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

8. CST MAKEUP WATER CRITERIA
IF CST level decreases to less than 10%, THEN add makeup to CST using 3-OP-018.1, Condensate Storage Tank.

9. LOSS OF OFFSITE POWER OR SI ON OTHER UNIT
IF SI has been reset, AND either offsite power is lost OR SI actuates on the other unit, THEN restore safeguards equipment to required configuration. Refer to ATTACHMENT 3 for essential loads.

CREW CRITICAL TASK: Insert negative reactivity into the core by establishing emergency boration flow to the RCS prior to completing step 4 of 3-EOP-FR-S.1.

CREW CRITICAL TASK: STOP AFW flow to the SGs to minimize energy released to containment.

TURKEY POINT

Reactivity Manipulation Table
(USE ONLY AS GUIDELINE)

SIMULATOR ENGINEERING

UNIT 3 POWER ASCENSION: HSB to 100% POWER @ MOL (IC's 3, 5, 19, 20)

DATE/TIME	POWER (%)	CBD (Steps)	AFD (%)	RAOC (Limit)	BORON (ppm)	CHANGE (ppm)	DILUTE (gal)	BORATE (gal)
0:00	5.0	116	0.7	N/A	1140	0	*	*
0:30	20.0	120	2.0	N/A	1120	-20	899	*
1:00	25.0	123	2.4	N/A	1110	-10	456	*
1:30	30.0	125	2.8	N/A	1100	-10	460	*
2:00	35.0	128	2.8	N/A	1095	-5	231	*
2:30	40.0	130	2.8	N/A	1090	-5	232	*
3:00	45.0	133	2.7	N/A	1083	-8	351	*
3:30	50.0	135	2.5	25.00	1075	-8	353	*
4:00	55.0	138	2.1	23.20	1065	-10	475	*
4:30	60.0	140	1.6	21.40	1055	-10	479	*
5:00	65.0	146	1.6	19.60	1048	-7.5	362	*
5:30	70.0	152	1.5	17.80	1040	-7.5	365	*
6:00	75.0	161	1.8	16.00	1033	-7.5	368	*
6:30	80.0	170	2.0	14.20	1025	-7.5	370	*
7:00	85.0	180	2.1	12.40	1015	-10	498	*
7:30	90.0	190	2.2	10.60	1005	-10	503	*
8:00	95.0	195	1.4	8.80	995	-10	508	*
8:30	100.0	200	0.5	7.00	985	-10	513	*

OPERATIONS SHIFT TURNOVER REPORT

ONCOMING CREW ASSIGNMENTS

Shift Mgr:		Inside SNPO:	
Field Supv.:		Outside SNPO:	
Admin RCO:		ANPO:	

Unit 3		Unit 4	
Unit Supv.:		Unit Supv.:	
RCO:		RCO:	
NPO:		NPO:	

Plant Status

Unit 3		Unit 4	
Mode:	2	Mode:	1
Power:	3	Power:	100
MWe:	0	MWe:	756
Gross Leakrate:	.02	Gross Leakrate:	.02
RCS Boron Conc:	1140	RCS Boron Conc:	286

Operational Concerns:

The Shift Manager has received notification that conditions for a Grass Influx are favorable and has performed Grass Influx evaluation.

A third RO will be available to support rolling the main Turbine.

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

Raise power to above 5% power and commence starting the Main Turbine. 3-GOP-301 is in progress at step 5.44.

The Shift Manager has authorized raising Reactor Power greater than 5% and has authorized entry into MODE 1.

Unit 3 Status

Reactor Operator

Mode:	2
Power:	3
MWe:	0
Tavg:	549.5
RCS Pressure:	2250
RCS Boron Conc:	1140

RCS Leakrate	
Gross:	.02
Unidentified	.01
Charging Pps:	.01

Accumulator Ref Levels	
A	6614
B	6631
C	6621

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

Unit 3 Status

Changes to Risk Significant Equipment:

B train protected both units
Online risk is green

Upcoming Reactivity Management Activities:

Raise power to above 5% power and commence starting the Main Turbine. 3-GOP-301 is in progress at step 5.44.
The Shift Manager has authorized raising Reactor Power greater than 5% and has authorized entry into MODE 1.

Upcoming Major POD Activities:

Upcoming ECOs to Hang and /or Release:

Evolutions or Compensatory Actions in Progress:

General Information, Remarks, and Operator Work Around Status:

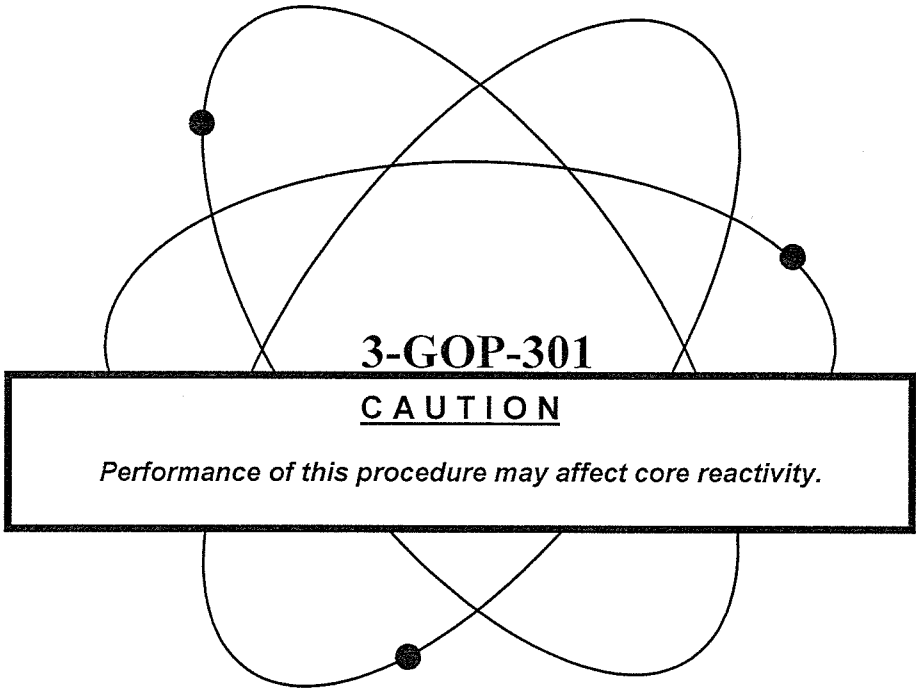
Aux. steam supply aligned from unit 4.
Condenser inleakage 0 scfm.

This procedure may be affected by a T.C. (Temporary Change) Verify information prior to use.
Date verified 8/24/10 Initials [signature]

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3



3-GOP-301

CAUTION

Performance of this procedure may affect core reactivity.

Title:

Hot Standby to Power Operation

(Continuous Use)

Safety Related Procedure

Responsible Department:	Operations
Revision Number:	1
Issue Date:	XX/XX/XX
Revision Approval Date:	8/20/10

ARs *574481*
PCRs *08-1439, 08-4134, 08-4078, 08-5327, 08-3671, 08-3795, 08-4230, 08-4090, 09-0644, 09-0982, 08-4392, 09-1114, 09-1350, 09-1288, 09-2944, 09-3802, 09-3880*
PC/Ms *83-199, 86-06, 86-200, 87-258, 87-263, 87-264, 87-265, 88-178, 88-486, 89-168, 90-440, 92-040, 92-018, 92-178, 93-032, 93-053, 95-027, 95-047, 95-057, 96-022, 96-086, 99-016, 99-045, 02-031, 02-085, 04-026, 04-112, 04-163, 06-002, 07-019, 08-025, 09-052*

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1.0 PURPOSE

1.1 This procedure provides instructional guidance for the startup of the unit from a hot standby condition to power operations.

2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References

2.1.1 Technical Specifications

1. 1.7, Containment Integrity Definition
2. 2.1, Safety Limits
3. 3.1.1, Boron Control
4. 3.1.3, Movable Control Assemblies
5. 3/4.2.4, Quadrant Power Tilt Ratio
6. 3.3.1, Reactor Trip System Instrumentation
7. 3.3.2, Engineered Safety Features Actuation System Instrumentation
8. 3.4, Reactor Coolant System
9. 3.4.1, Reactor Coolant Loops and Coolant Circulation System
10. 3.4.9, Pressure/Temperature Limits
11. 3.5, Emergency Core Cooling Systems
12. 3.6, Containment System
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2.1.2 FSAR

1. Section 4.2, Reactor Coolant System Design and Operation

2.1.3 Plant Drawings

1. 5613-M-3050, Residual Heat Removal System
2. 5613-M-3062, Safety Injection System
3. 5613-M-3064, Safety Injection Accumulators
4. 5613-M-3068, Containment Spray System
5. 5613-M-3041, Reactor Coolant System
6. 5613-M-3030, Component Cooling Water System
7. 5613-M-3047, CVCS-Charging and Letdown System
8. 5613-M-3075, Auxiliary Feedwater System

2.1.4 Plant Procedures

1. 0-ADM-009, Containment Entries when Containment Integrity is Established
2. 0-ADM-031, Independent Verification
3. 0-ADM-100, Preparation, Revision, Review, Approval and Use of Procedures
4. 0-ADM-101, Procedure Writer's Guide
5. 0-ADM-200, Conduct of Operations
6. 0-ADM-201, Operations Procedure Usage
7. 0-ADM-205, Administrative Control of Valves, Locks and Switches
8. 0-ADM-215, Plant Surveillance Tracking Program
9. 0-ADM-230, Duties and Responsibilities of the Shift Technical Advisor (STA)
10. 0-ADM-503, Temporary System Alterations
11. 0-ADM-511, Post Trip Review (PTR)
12. 0-ADM-529, Unit Restart Readiness
13. 0-ADM-651, Nuclear Chemistry Parameters Manual

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14. 3-GOP-103, Power Operation to Hot Standby
15. 0-NCOP-002, Secondary Chemistry Startup and Shutdown Guidelines
16. 3-NOP-003.11, DCS Uninterruptible Power Supply System
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18. 3-NOP-024.01A, 3A Emergency Bus Load Sequencer
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27. 3-NOP-053, Containment Purge System
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29. 3-NOP-061.03, Reactor Coolant Drain Tank
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32. 3-NOP-068, Containment Spray System
33. 3-NOP-073.01, Steam Jet Air Ejector Operation
34. 3-NOP-081, Heater Drain Pumps
35. 3-NOP-087.01, Turbine Generator Seal Oil System
36. 3-NOP-089.01, Turbine Gland Seals and High Pressure Cylinder Heating
37. 3-NOP-090, Gas Evolutions in the Main Generator
38. 3-NOP-090.01, Iso-Phase Bus Cooling System Operation

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40. 3-ONOP-046.1, Emergency Boration
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45. 0-OP-003.3, 120V Vital Instrument AC System
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61. 0-NOP-018, Demineralized Water System
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63. 3-OP-020, Primary Water System

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66. 0-NOP-025, Control Room Ventilation System
67. 3-OP-028, Control Rod Drive M-G Set Operation
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69. 3-OP-041.7, Draining the Reactor Coolant System
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75. 3-OP-050, Residual Heat Removal System
76. 0-NOP-051.02, Post Accident Containment Vent System
77. 3-NOP-057, Containment Normal Ventilation and Cooling System
78. 0-OP-059.9, Operation Within the Axial Flux Difference Operational Space
79. 0-OP-061.15, Waste Gas System
80. 3-OP-064, Safety Injection Accumulators
81. 0-NOP-065.01, Hydrogen Gas Supply System
82. 0-NOP-065.03, Nitrogen Gas System
83. 0-NOP-065.04, Steam Dump to Atmosphere, Controller Backup Nitrogen Gas Supply System
84. 3-OP-071, Steam Generator Blowdown Recovery System
85. 3-OP-072, Main Steam System
86. 3-OP-072.1, Moisture Separator Reheaters
87. 3-OP-073, Condensate System

2.1.4 (Cont'd)

88. 3-OP-074, Steam Generator Feedwater Pump
89. 0-NOP-074.01, Standby Steam Generator Feedwater System
90. 3-OP-075, Auxiliary Feedwater System
91. 3-NOP-075.02, AFW Backup Nitrogen System Alignment and Bottle Changeout
92. 3-OP-077, Condensate Polishing System
93. 3-NOP-079, Steam Generator Wet Lay-up System
94. 3-NOP-081.01, Feedwater Heater Extraction Steam Vents and Drains Valve Alignment
95. 3-OP-082, Secondary Wet Lay Up System
96. 0-OP-084, Auxiliary Steam System
97. 3-NOP-087, Turbine Lube Oil System
98. 3-NOP-087.03, Turbine Turning Gear Operation
99. 3-OP-089, Main Turbine
100. 3-OP-094, Containment Post Accident Monitoring Systems
101. 3-OP-099, Metal Impact Monitoring System
102. 3-OSP-030.4, CCW Heat Exchanger Performance Test
103. 3-OSP-040.2, Power Defect Measurement
104. 0-OSP-040.4, Estimated Critical Conditions
105. 0-OSP-040.9, Full Power Critical Boron Concentration
106. 0-OSP-040.10, Implementation of Augmented Surveillance
107. 3-OSP-040.12, At Power Measurement of Moderator Temperature Coefficient
108. 0-OSP-040.16, Initial Criticality After Refueling and Nuclear Design Verification
109. 3-OSP-041.16, Minimum Temperature for Criticality Verification
110. 0-OSP-046.1, Boric Acid Transfer Inservice Test
111. 3-OSP-047.1, Charging Pumps/Valves Inservice Test
112. 3-OSP-059.1, Source Range Nuclear Instrumentation Analog Channel Operational Test

2.1.4 (Cont'd)

113. 3-OSP-059.2, Intermediate Range Nuclear Instrumentation Analog Channel Operational Test

114. 3-OSP-059.4, Power Range Nuclear Instrumentation Analog Channel Operational Test

115. 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio

116. 0-OSP-059.13, Core Map Analysis and Peaking Factors Verification

117. 0-OSP-059.15, Nuclear Instrumentation Channel Check and Calibration

118. 3-OSP-075.1, Auxiliary Feedwater Train 1 Operability Verification

119. 3-OSP-075.2, Auxiliary Feedwater Train 2 Operability Verification

120. 3-OSP-075.6, Auxiliary Feedwater Train 1 Backup Nitrogen Test

121. 3-OSP-075.7, Auxiliary Feedwater Train 2 Backup Nitrogen Test

122. 3-OSP-089, Main Turbine Valves Operability Test

123. 3-OSP-089.2, Auto Stop Oil Pressure and Turbine Stop Valve Closure Trip Actuation Device Operational Test

124. 0-OSP-200.1, Schedule of Plant Checks and Surveillances

125. 3-OSP-200.3, Secondary Plant Periodic Tests

126. 0-OSP-200.5, Miscellaneous Tests, Checks, and Operating Evolutions

127. 0-OSP-205, Verification of Administratively Controlled Valves, Locks, and Switches

128. 3-PMI-059.2, Gamma Metric Wide Range Percent of Power Range Meter Calibration

129. 0-PMI-066.2, Area Radiation Monitoring System Channel Calibration

130. 0-SMM-051.3, Containment Closeout Inspection

2.1.5 Miscellaneous Documents (i.e., PC/Ms, Correspondence)

1. Plant Curve Book

2. QAO-PTN-87-807, Corrective Action Request CAR-87-051.

3. PTN-RE-88-059, Limiting Power Escalation Rate for Turkey Point Unit-3, Cycle XI

4. PTN-RE-88-090, Power Ascension Ramp Rate for Cycle XI of Turkey Point Units 3 and 4

2.1.5 (Cont'd)

5. Westinghouse Letter, 88-FP*-G-0026, Fuel Operating Ramp Rates After Official Startup, dated May 5, 1988
6. FRN-89-522, Safety Evaluation, Turbine By-Pass Valve Stroke Time, dated June 12, 1989
7. SER 22-89, Miscalibration of Nuclear Detectors by Repositioning
8. JPN-PTN-SEMS-91-011, Reduction in the RCS Minimum Hydrogen Concentration for Mode 2 Operations
9. JPNS-PTN-93-0848, Letter, Main Turbine Overspeed Protection, dated July 20, 1993
10. PC/M No. 83-199, CR#4, Installation of Reactor Ex-Core Neutron Flux Monitoring
11. PC/M 86-06 and PC/M 86-07, Removal of Load Frequency Control - Unit 4
12. PC/M 86-200, High Initial Response (HIR) Excitation System
13. PC/M 87-258, Load Center 3H and Repowering of MCC D (3D)
14. PC/M 87-263, New EDGs Installation
15. PC/M 87-264, EDG 3B/4B, EDG 3A/4A and New EDG Building Tie-ins
16. PC/M 87-265, Swing Switchgear 3D and Transfer of ICW and CCW 3C Pumps
17. PC/M 88-178, Switchyard Breaker Replacement Protection and Control
18. PC/M 89-168, Anticipated Transient without SCRAM (ATWS) Modification, Turkey Point Unit 3
19. PC/M 90-440, Boron Concentration Reduction
20. PC/M 92-040, Addition of Reverse Power Relays
21. JPNS-PTN-96-0194, Heater Drain Pump Modifications
22. PC/M 96-022, Thermal Power Uprate Implementation
23. PC/M 96-086, AFW System Various Drain Piping Mods to Trough
24. INPO SER 185, Recurring Event, Inappropriate Continuous Control Rod Withdrawal from Subcritical Conditions
25. PC/M 97-003, Thermal Overpressurization of Isolated Piping
26. PC/M 88-486, Unit 3 Removal of Low Power Auto Rod Withdrawal Stop Status Lite

2.1.5 (Cont'd)

27. PC/M 92-018, Unit 3/4 Change 3/4-90-045 and 90-046 to Closed Position
28. PC/M 93-032, Unit 3 Main Generator Protection Mods
29. PC/M 93-053, Turbine Gantry Crane Drum Cover Replacement
30. PC/M 92-178, Installation of Secondary Sample Lines to Cold Chem Lab
31. PC/M 95-027, Unit 3 Replacement of Containment Monitoring Equipment
32. PC/M 95-057, Unit 3 In-Containment Primary Water Supply
33. PC/M 99-045, Atmospheric Steam Dump Valve Air/Nitrogen Supply Enhancements
34. PTN-ENG-SEFJ-99-002, Rev. 0, Implementation of the Single Point Incore/Excore Calibration
35. PC/M 99-016, Main Generator Synchronizing Enhancements
36. Westinghouse Letter NF-FP-02-20, Dated February 8, 2002, Revised Limits and Condition for Ramp Rate Limits
37. PC/M 02-031, Abandonment of H_2 Recombiner Exhaust Line to Containment and Replacement of 3-40-205
38. PC/M (MSP) 02-085, Replace Recorder NR-45
39. PC/M 04-026, Appendix R Safe Shutdown Changes and De-energize MOV-3-716A
40. PC/M 04-163, Feedwater Recirculation Valve Low Flow Seal-In Modification
41. CR 2004-16253, Long Term Rejection of Heater Drains to Condenser Results in Condenser Tube Damage
42. Just-In-Time OE, Low Power Operational Events, Rev.0, July 2006
43. CR 2005-16653, Power Bands While Performing Low Power Operations in Mode 2
44. PC/M 04-112, Emergency Response Data Acquisition and Display System (ERDADS) Replacement
45. CR 2007-13566, UFSAR Commitment with Respect to ANS/ANSI - 19.6.1-1985, Reload Startup Physics Test for PWRs
46. Westinghouse Letter NF-FP-08-155, dated September 12, 2008, 08-IC-20-Fall 2008 Ramp Rate Guidance
47. PC/M 08-025, Steam Dump to Atmosphere Control Upgrade.
48. NEI Position Statement, Guidance to Licensees on Complying with the Licensed Power Limit, dated 6/12/08

2.2 Records Required

2.2.1 The date, time, section, and attachment completed shall be entered in the Unit Narrative Log. Any problems encountered while performing the procedure should be entered; i.e., malfunctioning equipment, delays due to changes in plant conditions, etc.

2.2.2 Completed copies of the below listed items constitute Quality Assurance records and shall be transmitted to QA Records for retention in accordance with Quality Assurance Records Program requirements:

1. Section 3.0
2. Section 5.0
3. Attachments 1 through 4

2.2.3 Entry in the Unit Startup/Shutdown/Trip Log

2.3 Commitment Documents

2.3.1 JNS-PS-87-069, Generator Bus Breaker Failure During Synchronization (from J.W. Dickey) Dated 4/3/87

2.3.2 JNS-PS-87-080, Electrical Generator Disconnects (from J.W. Dickey) Dated 4/14/87

2.3.3 PTN-PMN-87-475, Corrective Action in Response to QAO-PTN-87807 (CAR-87-051), October 15, 1987

2.3.4 CTRAC 88-2243, Revise GOP-301 for SOER 88-02 Recommendations

2.3.5 LER-250-90-010, Technical Specification Violation Due to Entry Into Mode 3 Without Both QSPDS Channels in Service

2.3.6 Licensing Amendment 148 and Supporting NRC Safety Evaluation

2.3.7 Licensing Amendment 172 and Supporting Documentation

2.3.8 CR-97-1821, Valves Out of Position - Condensate Vents and Drains

2.3.9 CR-98-0770, Manatee Plant U1 Water Induced Event

2.3.10 CR 2007-37078, Organizational Effectiveness Evaluation Following Mismatch of Calorimetric Power and MWe After ERDADS Replacement, Action 6 - CAPR

2.3.11 CR 2008-7157, Perform Post Trip Review for Manual Trip of Unit 4 Reactor, Action 2 - CAPR

2.3.12 CR 09-10996, Unit 3 entry into Mode 3 delayed by Steam Flow Protection Channel FT-3-494 and 4A EDG/4A HHSI pump inoperability

3.0 PREREQUISITES

INIT

Date/Time Started: 10/25/10 1000

3.1 Complete the following steps prior to entry into Mode 2.

NOTE

If entering this procedure with the unit already in Mode 1 or 2, non-applicable steps shall be marked N/A and the procedure entered at the appropriate step as directed by the Shift Manager.

N 3.1.1 Verify that all three (3) Reactor Coolant Loops are in operation.

N 3.1.2 **IF** unit is being returned to service from a refueling outage, **THEN** commence 0-OSP-040.16, Initial Criticality after Refueling and Nuclear Design Verification.

N 3.1.3 Notify the Nuclear Chemistry Department of pending startup **AND**, if possible, provide approximate times for reaching 2 percent and 30 percent power.

N 3.1.4 Verify that the Condensate and Feedwater Systems are in operation and capable of maintaining the steam generator levels between 45 and 55 percent narrow range. (This step may be marked N/A at the discretion of the Assistant Operations Manager.)

3.1.5 Verify that the Steam Generator Main Steam Valves are aligned as follows: (N/A if in a Reactor Trip recovery and/or MSIVs are open)

N 1. Main Steam Isolation, POV-3-2604, CLOSED

N 2. Main Steam Isolation, POV-3-2605, CLOSED

N 3. Main Steam Isolation, POV-3-2606, CLOSED

N 4. Main Steam Isol Bypass, MOV-3-1400, closed **AND** Breaker 30525, OFF (N/A if being used for Main Steam Line Warmup)

N 5. Main Steam Isol Bypass, MOV-3-1401, closed **AND** Breaker 30748, OFF (N/A if being used for Main Steam Line Warmup)

N 6. Main Steam Isol Bypass, MOV-3-1402, closed **AND** Breaker 30618, OFF (N/A if being used for Main Steam Line Warmup)

N 3.1.6 Verify that the Condenser Circulating Water System is in service using 3-OP-010, Circulating Water System. (This step may be marked N/A at the discretion of the Assistant Operations Manager)

N/A 3.1.7 **IF** recovering from a Reactor Trip, **THEN** verify that the requirements of 0-ADM-511, Post Trip Review, have been completed.

INIT

3.1.8 **IF** no further containment entries are required **AND** containment purge is in operation, **THEN** terminate containment purge using 3-NOP-053, Containment Purge System.

3.1.9 Verify that all required surveillances for entry into Mode 2, Startup, are completed or current using 0-ADM-215, Plant Surveillance Tracking Program, Mode Change Reports. (If the surveillance computer is out of service, the manual log for 0-ADM-215, Plant Surveillance Tracking Program, may be utilized.) (N/A if already in Mode 2)

N/A 1. **IF** Mode 3 was entered with 3-OSP-063.1, Safeguards System Actuation Test, NOT current, **THEN** verify that it has been completed within 96 hours of entering Mode 3 AND prior to Mode 2. (CR 2004-15705)

3.1.10 Verify that each of the three CCW Heat Exchangers has been tested using 3-OSP-030.4, CCW Heat Exchanger Performance Test, within the 31-day period prior to entry into Mode 2 **AND** enter the dates:

3A 10/8/10 3B 10/15/10 3C 10/20/10

OR

N/A Verify that each of the three CCW Heat Exchangers has been tested using 3-OSP-030.4, CCW Heat Exchanger Performance Test, within 72 hours after reaching Tavg of 547°F but prior to entry into Mode 2 **AND** enter dates and times:

3A N/A 3B N/A 3C N/A

3.1.11 **IF** Area Radiation Monitor Channels RD-3-1401, RD-3-1402, and RD-3-1403 are set to alarm at their Shutdown High Alarm setpoint, **THEN** have I&C reset these channels to the Operating High Alarm and Warning setpoints using 0-PMI-066.2, Area Radiation Monitoring System Channel Calibration. Reference FYP 066004.

3.1.12 Perform Attachment 2 prior to entering Mode 2. (This check shall be done just prior to entering Mode 2.)

3.1.13 Perform Annunciator review using 0-OSP-200.5, Miscellaneous Tests, Checks and Operating Evolutions, Subsection 7.11, prior to entering Mode 2.

3.1.14 Contact Radiation Protection and verify that all mode restricted temporary shielding has been removed.

3.1.15 **IF** evolutions were performed during shutdown affecting CCW flows to RCPs, **THEN** verify the following CCW flows to RCPs are within their specified range per 3–NOP-030, Component Cooling Water System.

N/A 1. FI-3-626, RCP Thermal Barrier Flow N/A
Range 75 – 90 gpm

N/A 2. FI-3-677, RCP Bearing CCW Flow ~
Range 465 – 510 gpm

INIT

___ 3.1.16 **IF** Containment Entry was made, **THEN** verify the following 0-ADM-009, Containment Entry When Integrity is Established, attachments are complete:

- Attachment 2, Equipment/Material Log for Containment Entries when Containment Integrity is Established
- Attachment 3, Record Log of Attachment 2 Sheets Opened
- Attachment 4, Record of Daily Inspection Surveillance
- Attachment 5, Unit RO Monitoring of Personnel Hatch Inner and Outer Door Indication on VPB
- Attachment 6, Entry and Exit Requirements Data Sheet
- Attachment 7, Final Containment Closeout Inspection

3.1.17 Verify the following documents have been reviewed to ensure no Technical Specification related equipment required for Mode 2 is inoperable:

___ 1. EOOS records [Commitment – Step 2.3.5]

___ 2. Equipment Clearance Orders [Commitment – Step 2.3.5]

___ 3. Locked Valve Deviation Log

___ 4. Caution Tag Indexes

___ 5. Operator Log Readings

___ 6. 3-OSP-201.1, Attachment 2, commenced 24 hours prior to proposed mode change **AND** has been completed every 8 hours. [Commitment Step 2.3.12]

N/A 3.1.18 Verify 3-OP-038.9, Refueling Activities Checkoff List, Subsection 5.1 has been completed. (N/A if not returning from refueling.)

3.1.19 Notify the following personnel to review the requirements of 0-ADM-529, Unit Restart Readiness, prior to entry into Mode 2:

___ 1. Site Vice President

___ 2. Plant General Manager

___ 3. Operations Shift Manager

INIT

3.2 Verify that the following steps have been completed prior synchronizing the generator:

NOTE

The following system alignment is required to be completed when returning from a refueling outage. For cold SNOs, the Operations Manager or designee may waive any or all of the alignment requirements by initialing next to the item to be waived, and putting N/A in the completed by column.

___ 3.2.1 Perform the following system alignment unless waived by the Operations Manager or designee:

___ 1. 3-NOP-093.01, ATWs Mitigating System Actuation Circuitry (AMSAC)

NOTE

Prior to rolling the main turbine, lube oil discharge temperature may be as low as 80°F. Main turbine lube oil discharge temperature should be between 95° and 100° F immediately prior to synchronizing the generator.

___ 3.2.2 Verify that the Turbine Plant Cooling Water System is maintaining main turbine lube oil discharge temperature between 80°F to 100°F with two TPCW heat exchangers in service.

___ 3.2.3 Verify that the Generator Liquid Detectors have been drained AND valved in service.

___ 3.2.4 Verify that the Generator Seal Oil System is in service using 3-NOP-087.01, Turbine Generator Seal Oil System.

___ 3.2.5 Verify the Generator has been charged with H_2 using 3-NOP-090, Gas Evolutions in Main Generator, **AND** is pressurized in accordance with the Plant Curve Book, Section IV, Figure 2, Generator Capability Curve.

___ 3.2.6 Verify that the Main Turbine Lube Oil System is in service using 3-NOP-087, Turbine Lube Oil System, by verifying completion of the following subsections:

___ 1. Subsection 5.1, Lube Oil Conditioner (Turbotoc)

___ 2. Subsection 5.2, Lube Oil Reservoir Cooler

___ 3. Subsection 5.3, Lube Oil Filters (Cuno)

INIT

___ 3.2.7 In the generator voltage regulator housing, verify the local LED alarms at Module No. 1, Generator Field Forcing or Regulator Limiting, and Module No. 2 Voltage Regulator Trouble have with no locked in alarms.

1. **IF** any alarms are locked in, **THEN** reset the alarms as follows:

NA a. Momentarily depress the A button located at the bottom of the applicable module to acknowledge the alarm.

NA b. Momentarily depress the R button located at the bottom of the applicable module AND verify all LED alarms clear.

NA c. **IF** the LED alarms fail to clear, **THEN** contact Electrical Maintenance.

3.2.8 Perform a ground detection test on the generator-exciter rotor by performing the following steps:

___ 1. At voltage regulator, open the front right top door.

___ 2. Momentarily depress the SIMULATE button on the ground detection system board **AND** verify the white GROUND light illuminates.

___ 3. Momentarily depress the RESET button.

NOTE

The following test takes approximately 60 seconds to complete.

___ 4. Momentarily depress the TEST button.

___ 5. Verify the amber TESTING light **AND** the red BRUSHES DOWN light illuminate during the test.

___ 6. **IF** the white GROUND light illuminates, **THEN** contact Electrical Maintenance.

___ 7. Close the door.

NOTE

Generator-exciter should be meggered if the unit has been off-line for more than thirty (30) days or if maintenance was performed on the Generator-exciter or Iso-Phase Bus System.

___ 3.2.9 Contact Electrical Maintenance Supervisor or designee to determine if generator-exciter needs to be meggered.

___ 3.2.10 **IF** desired, **THEN** place the Amertap System in service using 3-NOP-015.01, Amertap Condenser Tube Cleaning Operation.

INIT

3.2.11 Verify that the Iso-Phase Bus Cooling System is in service using 3-NOP-090.01, Isophase Bus Cooling System Operation.

3.2.12 Verify that the Condensate and Feedwater Systems are in operation **AND** capable of maintaining steam generator levels between 45 and 55 percent narrow range.

3.2.13 Verify that the Condenser Circulating Water System is in service using 3-OP-010, Circulating Water System, for both sets of waterboxes.

3.2.14 Perform 3-NOP-087.03, Turbine Turning Gear Operation, as applicable to verify all turning gear equipment is properly aligned.

3.2.15 Perform Attachment 3 prior to entry into Mode 1. (This check shall be completed just prior to entry into Mode 1.)

3.2.16 Perform Annunciator review using 0-OSP-200.5, Miscellaneous Tests, Checks and Operating Evolutions, Subsection 7.11, prior to entering Mode 1.

3.2.17 Verify the following documents have been reviewed to ensure no Technical Specification related equipment required for Mode 1 is inoperable:

1. EOOS records [Commitment – Step 2.3.5]
2. Equipment Clearance Orders [Commitment – Step 2.3.5]
3. Locked Valve Deviation Log
4. Caution Tag Indexes
5. Operator Log Readings
6. 3-OSP-201.1, Attachment 1, commenced 24 hours prior to proposed mode change **AND** has been completed every 8 hours. [Commitment Step 2.3.12]

3.2.18 Notify the following personnel to review the requirements of 0-ADM-529, Unit Restart Readiness, prior to entry into Mode 1:

1. Site Vice President
2. Plant General Manager
3. Operations Shift Manager

3.2.19 Verify that all surveillances required to enter Mode 1 are completed using the 0-ADM-215, Plant Surveillance Tracking Program, Mode Change Report for entry into Mode 1, Power Operation, or if not available, using the manual log.

1. **IF** 3-OSP-089.2, Subsection 7.2, (turbine not capable of being latched) was performed to allow entry into Mode 2, **THEN** perform 3-OSP-089.2, Subsection 7.1, (turbine capable of being latched) prior to entering Mode 1.

INIT

NOTES

- *The Operations Manager or designee shall initial next to all steps to be waived, and N/A the completed by column prior to beginning Subsection 3.3. All required steps shall be initialed by the operator when completed.*
- *This is a work list of alignments that, in addition to the minimum required alignments for refueling outages listed in Subsection 3.2, may be required to be completed prior to placing the system in service or entry into Mode 1, as designated by Operations Manager or designee.*
- *Any step not completed shall be listed in the Remarks Section of this step. The exceptions shall list the specifics of each exception as shown in the documentation example prior to the Remarks Section.*

3.3 Verify the following systems have the applicable alignments completed as indicated by the Operations Manager or designee:

___	3.3.1	3-NOP-003.11, DCS Uninterruptible Power Supply System
___	3.3.2	3-NOP-019, Intake Cooling Water
___	3.3.3	3-NOP-032, Secondary Sampling System
___	3.3.4	3-NOP-041.01A, 3A Reactor Coolant Pump Operations
___	3.3.5	3-NOP-041.01B, 3B Reactor Coolant Pump Operations
___	3.3.6	3-NOP-041.01C, 3C Reactor Coolant Pump Operations
___	3.3.7	3-NOP-041.03, Pressurizer Relief Tank
___	3.3.8	3-NOP-041.04, Overpressure Mitigating System
___	3.3.9	3-NOP-053, Containment Purge System
___	3.3.10	3-NOP-055, Emergency Containment Cooling and Filtering System
___	3.3.11	3-NOP-061.03, Reactor Coolant Drain Tank
___	3.3.12	3-NOP-062, Safety Injection
___	3.3.13	3-NOP-067, Process Radiation Monitoring System
___	3.3.14	3-NOP-068, Containment Spray System
___	3.3.15	3-NOP-073.01, Steam Jet Air Ejector Operation
___	3.3.16	3-NOP-073.02, Draining of Condenser/Condensate and Heater Drain System (Restoration Section) [Commitment - Step 2.3.8]
___	3.3.17	3-NOP-081, Heater Drain Pumps

INIT		
V	3.3.18	3-NOP-087.01, Turbine Generator Seal Oil System
V	3.3.19	3-NOP-089.01, Turbine Gland Seals and High Pressure Cylinder Heating
V	3.3.20	3-NOP-093.01, ATWS Mitigating System Actuation Circuitry (AMSAC)
V	3.3.21	0-OP-001.1, Plant Page System
V	3.3.22	0-NOP-003.01, 125V Vital DC System
V	3.3.23	0-NOP-003.02, 125V Auxiliary DC System
V	3.3.24	0-OP-003.3, 120V Vital Instrument AC System
V	3.3.25	0-NOP-003.04, Auxiliary 120V AC System
V	3.3.26	3-OP-005, 4160 Volt Buses A, B, and D
V	3.3.27	3-OP-005.1, 4160 Volt Bus C
V	3.3.28	3-OP-006, 480 Volt Switchgear System
V	3.3.29	3-OP-007, 480 Volt Motor Control Centers
V	3.3.30	3-NOP-008, Turbine Plant Cooling Water
V	3.3.31	3-OP-010, Circulating Water System
V	3.3.32	3-NOP-010.01, Cathodic Protection System
V	3.3.33	0-NOP-011, Screen Wash System
V	3.3.34	0-NOP-012, Service Water System
V	3.3.35	3-NOP-013.03, Instrument Air System Valve and Breaker Alignments
V	3.3.36	0-OP-016.1, Fire Protection Water System
V	3.3.37	0-OP-016.2, Fire and Smoke Detector System
V	3.3.38	0-NOP-016.05, Halon Suppression System
V	3.3.39	0-NOP-018, Demineralized Water System
V	3.3.40	3-NOP-018.01, Condensate Storage Tank (CST)
V	3.3.41	3-OP-020, Primary Water System
V	3.3.42	3-OP-022, Emergency Diesel Generator Fuel Oil System
V	3.3.43	3-OP-023, Emergency Diesel Generator
V	3.3.44	0-NOP-025, Control Room Ventilation System

INIT		
	3.3.45	3-OP-028, Control Rod Drive M-G Set Operation
	3.3.46	3-NOP-030, Component Cooling Water System
	3.3.47	3-OP-038.9, Refueling Activities Checkoff List
	3.3.48	3-OP-041.2, Pressurizer Operation
	3.3.49	3-OP-041.8, Filling and Venting the Reactor Coolant System
	3.3.50	0-OP-046, CVCS - Boron Concentration Control
	3.3.51	3-OP-047, CVCS - Charging and Letdown
	3.3.52	3-OP-050, Residual Heat Removal System
	3.3.53	0-NOP-051.02, Post Accident Containment Vent System
	3.3.54	3-NOP-057, Containment Normal Ventilation and Cooling System
	3.3.55	3-OP-064, Safety Injection Accumulators
	3.3.56	0-NOP-065.01, Hydrogen Gas Supply System
	3.3.57	0-NOP-065.03, Nitrogen Gas System
	3.3.58	0-NOP-065.04, Steam Dump to Atmosphere, Controller Backup Nitrogen Gas Supply System
	3.3.59	3-OP-071, Steam Generator Blowdown Recovery System
	3.3.60	3-OP-072, Main Steam System
	3.3.61	3-OP-072.1, Moisture Separator Reheaters
	3.3.62	3-OP-073, Condensate System
	3.3.63	3-NOP-074, Steam Generator Feedwater Pump
	3.3.64	0-NOP-074.01, Standby Steam Generator Feedwater System
	3.3.65	3-NOP-075, Auxiliary Feedwater System
	3.3.66	3-NOP-075.02, AFW Backup Nitrogen System Alignment and Bottle Changeout
	3.3.67	3-OP-077, Condensate Polishing System
	3.3.68	3-NOP-079, Steam Generator Wet Lay-up System
	3.3.69	3-NOP-081.01, Feedwater Heater Vents, Drains and Extraction Steam Valve Alignment
	3.3.70	0-OP-084, Auxiliary Steam System
	3.3.71	3-NOP-087, Turbine Lube Oil System
	3.3.72	3-OP-089, Main Turbine
	3.3.73	3-OP-094, Containment Post Accident Monitoring Systems

Walkdown Exceptions:

NOTE

Exception Documentation Requirement Example:

Step 37 - CVCS - Charging and Letdown

1. B Charging Pp OOS on Clearance 3-96-04-003 for repack.

Step 23 - Primary Water

1. 3B Primary Water Pump OOS on Clearance 3-96-03-002 Breaker PM.

4.0 PRECAUTIONS/LIMITATIONS

4.1 Criticality should be anticipated anytime when shutdown or control rod banks are being withdrawn or boron dilution is in progress.

4.2 All shutdown rods shall be fully withdrawn before the reactor is made critical.

4.3 Do not make the reactor critical with a moderator temperature coefficient of reactivity more positive than +5 pcm/°F (except as permitted for low power physics tests).

4.4 The approach to criticality shall be guided by plotting inverse count rate ratio versus control rod position. Observe the 1/m plot to assure criticality will not occur below the insertion limit for zero power.

4.5 Before withdrawing any rod bank from the fully inserted position, the group step counters and the rod position indicators for that bank shall meet the control rod position acceptance criteria in 3-OSP-201.1, RO Daily Logs.

4.6 When moving shutdown or control rod banks; the group step counters, RPIs, and all Nuclear Instrumentation Channels shall be closely monitored to verify proper bank movement and bank overlap for control rods.

4.7 The Reactor Coolant System lowest operating loop temperature (Tavg) shall be greater than or equal to 541°F with Keff greater than or equal to 1.0.

4.8 All Reactor coolant loops shall be in operation prior to making the reactor critical, Mode 2. With less than 3 Loops in operation, restore all Loops to operable status or be in hot standby within six (6) hours.

4.9 Before transferring the Rod Control selector from manual to AUTO mode, the control rod banks shall be positioned as required to adjust Tavg within 1.0°F of Tref.

4.10 At power, all rod position indicators and Power Range Nuclear channels shall be periodically monitored for control rod misalignment and abnormal power distribution.

4.11 Every attempt should be made to maintain the Axial Flux Difference within the Operational Space to avoid otherwise unnecessary power reductions; reference 0–OP–059.9, Operation within the Axial Flux Difference Operational Space.

4.12 Control banks shall be maintained above the respective Rod Bank A-B-C or D Low Limit Alarm by maintaining the required RCS boron concentration.

4.13 When any control rod bank is below the Rod Bank A-B-C or D Extra Low Limit Alarm for greater than one hour, emergency boration shall be initiated using 3-ONOP-046.1, Emergency Boration.

4.14 SUR should not be permitted to exceed a steady state value of 1.0 dpm below the POAH and 0.5 dpm above the POAH.

4.15 If the Steam Dump System is automatically armed by a load rejection and equilibrium conditions are re-established, the Steam Dump Control shall be reset by placing the steam dump to condenser Mode Selector switch to RESET .

4.16 The Steam Pressure Control Dump to Condenser Auto/Manual station shall have a zero output signal prior to placing the Steam Dump to Condenser Mode Selector in MANUAL.

4.17 When the steam dump is in the Manual Mode of operation, then reactor power, Tavg, S/G pressure, and indicated valve position shall be closely monitored.

4.18 When adjusting the Steam Dump Control, adjustments shall be made in small increments, allowing sufficient time between adjustments for valve response.

4.18.1 The valves require approximately 18 seconds to travel full stroke, 0 to 100 percent, when given a modulation signal, and are required to travel 0 to 100 percent open in less than 7 seconds when given a quick-open signal.

4.18.2 All changes should result in an equivalent change in steam demand and reactor power.

4.18.3 Any control adjustment that does not change the demand should be investigated and use of the dump valves discontinued until the problem is resolved.

4.19 When any instrumentation channel is removed from service, the channel shall be removed from control, if required, by use of the appropriate selector switch. Associated bistables shall be tripped as necessary to satisfy the requirements of Technical Specification Table 3.3-1; reference 3-ONOP-049.1, Deviation or Failure of Safety Related or Reactor Protection Channels.

4.20 During secondary plant warmup, steam should be drawn from the steam generator slowly and feedwater additions should be carefully regulated to avoid uncontrolled cooldown of the Reactor Coolant System.

4.21 Main Turbine speed should not be increased above 600 RPM until the RCS temperature is between 544°F and 550°F.

4.22 The operability of Main Feedwater Control Valves, FCV-3-478, 488, and 498, should be checked by stroking through one complete cycle prior to placing the Turbine/Generator on line.

4.23 Serious damage to the Main Generator windings can result from operation of the generator at a terminal voltage greater than 23,100 volts.

4.24 Safety Injection Signals shall not be in a blocked status for any reason other than for intentional, controlled depressurization and cooldown of the Reactor Coolant System as per approved plant procedures.

4.25 During a Post Trip Recovery at EOL, Reactor Engineering Department shall be contacted for startup guidelines when startup is within 4 hours of criticality.

4.26 The following guidelines shall be used after the third (3rd) doubling (i.e., 1/m approximately 0.125) while approaching criticality using the 1/m plot.

4.26.1 If the projected critical rod position is below the insertion limit (105 steps on Bank C), then the control banks should be inserted and the RCS borated as necessary.

4.26.2 If the projected critical rod position deviates from the ECC rod position by more than 300 PCM but less than or equal to 400 PCM, then permission to pull the Reactor critical shall be obtained from the Shift Manager or designee after a review of the ECC calculations.

4.26.3 If the projected critical rod position deviates from the ECC rod position by greater than 400 PCM, but less than or equal to 500 PCM, then permission to pull to criticality shall be obtained from the Reactor Engineering Supervisor or designee.

4.26.4 If the projected critical rod position deviates from the ECC rod position by greater than 500 PCM, then the control banks shall be reinserted and the ECC reevaluated.

1. If the error cannot be determined, permission of the Operations Manager and Reactor Supervisor (or designee) shall be obtained prior to making the reactor critical under the guidance of the 1/m plot.

2. The Reactor shall not be made critical with a difference of greater than or equal to 1000 PCM between the projected critical height and the ECC rod position.

4.27 If all of the following conditions exist, power increases performed under the direction of this procedure should be limited to 3 percent/hour for fuel conditioning:

4.27.1 The plant has not operated with the existing core at or above the intended power level in the last 27 days. Time spent with the unit at zero power does not count towards the 27-day time limit.

4.27.2 Reactor power is between 40 percent and 100 percent of full power.

4.27.3 The plant has not operated at or above the intended power level for at least 72 cumulative hours in any 7-day period.

4.28 Rod withdrawals performed above 50 percent power after a reload and during the fuel conditioning period (Precaution/Limitation 4.27) should be limited to three rod steps/hour. This withdrawal rate is based upon a Westinghouse recommendation and may be relaxed specifically to control axial offset or to perform an incore/excore calibration.

4.29 All work in the Radiation Controlled Area shall be performed in accordance with the requirements of the Radiation Work Permit and ALARA program.

4.30 The Reactor Coolant System hydrogen concentration shall be greater than 15 cc/kg prior to entering Mode 2. If RCS hydrogen is not between 25 and 50 cc/kg within 24 hours after entering Mode 2, then Action Level 1 of 0-ONOP-041.10, Primary Chemistry Deviation from Limits, applies.

4.31 With reactor power below the POAH, reactivity shall not be changed by rod withdrawal and boron dilution at the same time.

4.32 Per Reference Substep 2.1.5.36, Limitation and Conditions for Westinghouse Fuel Operation, the following apply to load increases:

4.32.1 During the <u>initial</u> return to power following a refueling shutdown or following a cold shutdown where fuel assemblies have been handled (e.g., inspection), the following apply:

1. The rate of reactor power increase **between 40 percent and 100 percent** of full power should be less than or equal 3 percent full power/hour, but shall not exceed an increase of:

   a. 4 percent over any 1-hour period

   b. 7 percent over any 2-hour period

   c. 10 percent over any 3-hour period

2. No single step increase in power shall exceed 3 percent full reactor power.

   This ramp rate requirement applies during the initial startup of a reload cycle for that period of time until full power is achieved for 72 cumulative hours out of any seven-day operating period at power. It may also apply for any other power increases during that time period, depending on the maximum power level achieved and length of operation at that power level.

   Specifically this requirement may be removed for reactor power levels at or below a given P (40 percent $<P\leq100$ percent) provided the plant has operated at or above level P for at least 72 cumulative hours out of any seven-day (168 hour) operating period at power (fuel is preconditioned).

   Down time or time at zero power is not considered as operating time.

4.32.2 Once the plant has attained some steady state power level for 72 hours, then load follow operation may be conducted in that cycle up to that power level **without fuel related limitations on ramp rate**. In other words, there are no fuel-related limitations on ramp rates on preconditioned fuel.

4.32.3 Other administrative limitations on ramp rate may be imposed at the discretion of Operations or Reactor Engineering depending on other factors (i.e., possible leaking fuel, time in core life, etc.).

4.33 The following guidelines shall be employed for reduced power operation.

4.33.1 Operation at reduced power levels for greater than 27 days establishes a reduced power threshold.

1. The reduced power threshold is the highest power level at which the reactor has experienced 72 hours of operation in the preceding 30 days.
2. Power increases above the reduced power threshold are limited to 3 percent per hour.
3. Down time or time at zero power is not considered as operating time.

4.34 During Mode 2 operation and at reduced power levels (less than 30 percent) in Mode 1, caution shall be exercised when making Secondary System adjustments which would affect power/reactivity levels.

4.35 Reactor power changes shall be monitored as follows:

4.35.1 Attachment 4, Power Data Sheet, shall be completed during all power changes.

4.35.2 If Reactor Power changes by greater than or equal to 15 percent in a 1-hour period, Chemistry shall be notified to begin sampling the RCS per Technical Specification 4.4.8, Table 4.4-4, Item 6.

4.36 Prior to closing the Reactor Trip Breakers, the DCS Reactor Protection SOE Group shall be checked for abnormalities in the system that may not be indicated on status lights. However, if the DCS Reactor Protection SOE Group is out of service and cannot readily be restored, then I&C shall perform a visual check of reactor trip relays in the reactor protection racks to verify none of the reactor trip relays are in the tripped mode.

4.37 The RCS and pressurizer boron concentration may be equalized at any time using Pressurizer spray and heaters.

4.38 Prior to admitting steam to the turbine, all feedwater heater alarms are required to be cleared or the feedwater heater isolated if the System Engineer suspects tube leakage. This does not apply to the #1 and #2 Heaters up to 50 percent power because high level is expected due to the plant design. [Commitment Step 2.3.9]

4.39 Heater drain pump and condensate pump operation should be optimized to maximize unit efficiency and minimize rejection of heater drains to the condenser, thus minimizing the potential for damage to condenser tubes as a result of impingement. For example, it is desirable to operate as many heater drain pumps as possible and to minimize the number of condensate pumps being run.

4.40 The SGFPs are equipped with recirculation valves that are designed to protect the pump under low demand conditions. The SGFPs are started with respective control switch in OPEN and the recirculation valves open. The recirculation valves operate as follows:

4.40.1 The SGFP recirculation valves will automatically open when flow rate on an operating SGFP reaches the low flow setpoint.

4.40.2 If the SGFP recirculation valves open automatically, the respective control switch must be placed in OPEN/RESET (resets seal-in circuit) and then returned to the CLOSE/AUTO position in order to close the valves.

4.40.3 Opening of a SGFP breaker will close the associated recirculation valves provided their control switch is in the CLOSE/AUTO position.

4.41 The Shift Manager may designate operating bands as necessary based on current plant mode and equipment conditions as needed to allow the operating crew more flexibility. This guidance on operating bands does not allow the violation of Tech Specs or allow the operation near automatic trip setpoints. One example is S/G levels while not in Mode 1 or in unit startup. The program level is 50 percent, so the operating band is set at 45 to 55 percent. This allows the deviation alarm to remain clear, yet still alert the operator when a 5 percent deviation from program occurs, which is the system design.

4.42 For power ascension above 75% during the fuel preconditioning period as defined in Precaution/Limitation 4.27, Axial Flux Difference shall be limited to within ±3% of the target value provided by Reactor Engineering.

4.43 If Turbine Power is greater than or equal to 150 MW and the Power System Stabilizer (PSS) is not in service or becomes disabled, then the Transmission System Operator (TSO) shall be notified within 30 minutes.

4.44 All communications with the Transmission System Operation (TSO) are required to be logged in the Unit Narrative Log. In addition, the log entry for any request from the TSO to adjust Main Generator VARS must either indicate that the request was complied with or give an explanation of why the schedule could not be met.

5.0 PROCEDURE

NOTES

- *Steps in this procedure may be performed out of sequence provided:*
  1. *All applicable conditions necessary to perform the step are satisfied and,*
  2. *The performance of the out of sequence steps do not change an operational mode and,*
  3. *The performance of the out of sequence steps do not bypass a Shift Manager Verification Point which prohibits procedural continuance and,*
  4. *Notifications to NRC Resident Inspector are made for load changes.*
- *If DCS is available, then Enclosure 1 is a list of points suggested for use by the Operator as an aid during Reactor Startup.*

INIT

5.1 **WHEN** RCS temperature reaches 547°F, **THEN** perform the following to maintain HOT STANDBY conditions of 546°F to 549°F at 1005 psig in the steam generators.

5.1.1 Place the Steam Generator Blowdown System in service using 3-OP-071, Steam Generator Blowdown Recovery System.

AND/OR

5.1.2 Operate the Steam Generator Atmospheric Relief Valves, CV-1606, CV-1607 and CV-1608 in a rotating manner in order to maintain steam generator chemistry constant. These can be operated in automatic or manual control.

NOTE

Although it is not a startup requirement, performance of 3-OSP-089, Main Turbine Valves Operability Test, Subsection 7.2, is recommended in order to begin a new surveillance period.

5.2 **IF** desired, **THEN** perform Subsection 7.2 of 3-OSP-089, Main Turbine Valves Operability Test, prior to opening the MSIVs.

INIT

5.3 **IF** they have not been performed, **THEN** check if the following tests are required to be completed prior to proceeding:

N/A 5.3.1 3-OSP-089.2, Auto Stop Oil Pressure and Turbine Stop Valve Closure Trip Actuating Device Operational Test (N/A if performed within last 31 days.)

N/A 5.3.2 3-OSP-059.1, Source Range Nuclear Instrumentation Analog Channel Operational Test (N/A if performed within last 31 days.)

N/A 5.3.3 3-OSP-059.2, Intermediate Range Nuclear Instrumentation Analog Channel Operational Test (N/A if performed within last 31 days.)

N/A 5.3.4 3-OSP-059.4, Power Range Nuclear Instrumentation Analog Channel Operational Test (N/A if performed within last 31 days **OR** if 3-PMI-059.12 through 3-PMI-059.15 and 3-PMI-028.2 were all performed within last 31 days.)

NOTE

Reactor power is limited to approximately 2 to 3 percent until MSIVs are opened.

N/A 5.4 Begin warming the main steam header using 3-OP-072, Main Steam System. (N/A if not warming main steam header at this time.)

N/A 5.4.1 **IF** desired by the Shift Manager, **THEN** place the turbine gland seal system in service using 3-NOP-089.01, Turbine Gland Seals and High Pressure Cylinder Heating.

N/A 5.4.2 **IF** gland seals were placed in service in the previous step, **THEN** establish condenser vacuum using 3-NOP-073.01, Steam Jet Air Ejector Operation.

5.5 **IF** desired by the Shift Manager **AND** the reactor trip breakers are closed, **THEN** test the Main Feedwater Control Valves as follows:

5.5.1 Verify all three Feedwater Isolation valves are closed:

N/A 1. MOV-3-1407

N/A 2. MOV-3-1408

N/A 3. MOV-3-1409

INIT

5.5.2 Perform test of Main Feedwater Control Valve, FCV-3-478:

___ 1. Open Main Feedwater Control Valve, FCV-3-478.

___ 2. **WHEN** the controller output for FCV-3-478 is 100 percent, **THEN** locally verify valve is fully open.

___ 3. Close Main Feedwater Control Valve, FCV-3-478.

5.5.3 Perform test of Main Feedwater Control Valve, FCV-3-488:

___ 1. Open Main Feedwater Control Valve, FCV-3-488.

___ 2. **WHEN** the controller output for FCV-3-488 is 100 percent, **THEN** locally verify valve is fully open.

___ 3. Close Main Feedwater Control Valve, FCV-3-488.

5.5.4 Perform test of Main Feedwater Control Valve, FCV-3-498:

___ 1. Open Main Feedwater Control Valve, FCV-3-498.

___ 2. **WHEN** the controller output for FCV-3-498 is 100 percent, **THEN** locally verify valve is fully open.

___ 3. Close Main Feedwater Control Valve, FCV-3-498.

___ 5.6 Verify that all applicable prerequisites in Subsection 3.1 have been signed off.

5.6.1 **RADIATION PROTECTION VERIFICATION POINT**

1. ***IF*** *containment entry has been completed,* ***THEN*** *verify the Containment Personnel* ***AND*** *Escape Hatches are properly locked with Operations, Radiation Protection, and Security Locking Devices,*

AND

Verify the RP Postings are properly posted on both doors. (N/A if no containment entry has been made.) [Commitment - Step 2.3.3]

Radiation Protection: R. Protection R Protection 10/4/10
Signature *Print* *Date*

5.6.2 MAINTENANCE DEPARTMENT VERIFICATION POINT

1. *Verify that all required post maintenance testing is complete on equipment listed in the EOOS log for entry into Mode 2.*

Mechanical Supv: _____ (Signature) _____ (Print) / 1/24/10 (Date)

Electrical Supv: _____ (Signature) _____ (Print) / 1/24/10 (Date)

I&C Supv: _____ (Signature) _____ (Print) / 1/24/10 (Date)

2. *Verify 0-SMM-051.3, Containment Closeout Inspection, is complete. (N/A if no containment entry has been made, or if 0–ADM–009, Containment Entry When Integrity is Established, is controlling material in containment.)*

Mechanical Supv: _____ (Signature) _____ (Print) / 1/24/10 (Date)

5.6.3 CHEMISTRY DEPARTMENT VERIFICATION POINT

1. *RCS Chemistry meets the requirements for Mode 2 and Mode 1 entry.*

2. *Verify the capability to sample ALL required sample points in containment.*

Chemistry Supv/Designee: _____ (Signature) _____ (Print) / 1/24/10 (Date)

5.6.4 IST COORDINATOR/SHIFT ENGINEER VERIFICATION POINT

1. *Verify that all required IST testing for entry into Mode 2 is complete.*

IST Coordinator/ Shift Engineer: _____ (Signature) _____ (Print) / 1/24/10 (Date)

5.6.5 CORRECTIVE ACTION VERIFICATION POINT

1. *Verify that all mode restricting Condition Reports/Actions for entry into Mode 2 are satisfactorily addressed. (This Verification Point may be satisfied via a telephone call to the CAG Supervisor)*

CAG Supv: _____ (Signature) _____ (Print) / 1/24/10 (Date)

2. ***WHEN*** *telephone call is used,* ***THEN*** *record time and date of call.*

Time N/A *Date* N/A *Initials* N/A

5.6.6 **QUALITY ASSURANCE DEPARTMENT VERIFICATION POINT**

1. *The Nuclear Assurance Department has no open items that require closure prior to entering Mode 2. (This verification point may be satisfied by telephone call to the Quality Assurance Manager.)*

Quality Assurance Mgr Or Designee _____ (Signature) _____ (Print) 1/5/10 (Date)

2. ***WHEN*** *telephone call is used,* ***THEN*** *record time and date of call.*

Time N/A *Date* N/A *Initials* _____

5.6.7 **WORK CONTROL MANAGER VERIFICATION POINT**

1. *Verify that all mode restricting work orders (including work orders for PC/Ms) for entry into Mode 2 have been satisfactorily addressed.*

2. *Verify that all identified boric acid leakage inside containment is properly addressed per the boric acid corrosion control program (0-ADM-537) including Site Vice President approval for unit startup with known leakage.*

Work Control Manager Or Designee: _____ (Signature) _____ (Print) 1/5/10 (Date)

5.6.8 **SHIFT MANAGER VERIFICATION POINT**

1. *The Plant General Manager has authorized Reactor Startup* ***AND*** *has notified the NRC.*

2. *All items related to 0-ADM-529, Unit Restart Readiness, applicable to entering Mode 2 have been completed.*

- *Keff* ***SHALL NOT*** *be raised above 0.99 (Mode 2) until all Section 5.0 steps prior to this verification are completed and the conditions of this verification point are satisfied.* ***Only*** *those subsequent administrative and action steps designated by (♦) may be performed prior to the Shift Manager Verification Point being satisfied. All other steps must wait until the Mode 2 Shift Manager Verification Point is complete.*

Shift Manager: _____ (Signature) _____ (Print) 1/5/10 (Date)

INIT

5.7 If the reactor has not been made critical since the last refueling, then perform the following:

N/A (♦) 5.7.1 Commence 0-OSP-040.16, Initial Criticality after Refueling, and Nuclear Design Verification.

5.7.2 Perform the following surveillance tests within 12 hours of initiation Physics Tests (Tech. Spec. 4.10.3.2):

NA (♦) 1. 3-OSP-059.2, Intermediate Range Nuclear Instrumentation Analog Channel Operational Test

N/A (♦) 2. 3-OSP-059.4, Power Range Nuclear Instrumentation Analog Channel Operational Test

N/A 5.7.3 Commence approach to criticality and PHYSICS TESTS as directed by 0–OSP–040.16, Initial Criticality After Refueling, and Nuclear Design Verification, Attachment 2, Reactivity Parameters and Initial Criticality.

N/A (♦) 5.7.4 Mark Steps 5.8 through 5.20.1 N/A.

___ (♦) 5.8 Verify that the NIS Recorders are selected to the highest reading Source Range **AND** Intermediate Range channels.

___ (♦) 5.9 Estimate the control rod bank positions and RCS boron concentration for critical conditions, 0-OSP-040.4, Estimated Critical Conditions (ECC).

___ (♦) 5.10 Perform the following to prepare for criticality:

___ (♦) 5.10.1 Adjust the RCS boron concentration to the value determined in the Estimated Critical Conditions, using 0-OP-046, CVCS - Boron Concentration Control.

___ (♦) 5.10.2 Wait approximately 20 minutes after any RCS boron adjustments **AND** then request the Nuclear Chemistry Department to:

___ (♦) 1. Purge the RCS sample lines for a minimum of 10 minutes **AND** obtain 3 separate RCS samples.

___ (♦) 2. Verify boron concentration **AND** report results to the Unit RO.

___ (♦) 5.11 Verify that all three Reactor Coolant Pumps are running.

5.12 Perform the following to prepare for the Reactor Startup:

___ (♦) 5.12.1 Conduct Reactor Startup Pre-job Briefing for personnel to be involved in the reactor startup.

___ (♦) 5.12.2 Assign an individual (Unit Supervisor or Reactor Engineer) the responsibility of monitoring reactivity (i.e., Count Rate, Startup Rate, Rx Power, NI Channel overlaps, and NI Interlocks).

___ (♦) 5.12.3 Verify running at least one Rod Drive MG set using 3-OP-028, Control Rod Drive M-G Set Operation.

INIT

5.12.4 Prior to closing the Reactor Trip Breakers, perform the following to determine if any abnormalities exist that may cause a reactor trip:

(♦) 1. Check the DCS Reactor Protection SOE Group displays for any abnormalities that may cause a reactor trip.

(♦) 2. **IF** any abnormalities exist that may cause a reactor trip, **THEN** ensure the abnormalities are corrected.

(♦) 3. **IF** the DCS Reactor Protection SOE Group is out of service, **THEN** have I&C perform a visual check of Reactor Trip Relays in the Reactor Protection Racks to verify none of the Reactor Trip Relays are in the tripped mode.

(♦) 5.12.5 Reset the Reactor Trip Breakers.

(♦) 5.12.6 Depress Rod Control Startup Reset pushbutton.

(♦) 5.12.7 Reset Rod Control System Urgent Failure alarm.

(♦) 5.12.8 Verify all Dropped Rod/Rod Stop bistables are reset on Power Range Channels.

NOTES

- *If during rod withdrawal prior to criticality, a rod control condition requires opening the Reactor Trip Breakers, entry into 3-EOP-E-0 is not required. Step 5.12.9 and its substeps are continuous action steps that apply during rod withdrawal prior to criticality.*
- *Proceeding beyond Step 5.12.9 is permissible to perform subsequent steps prior to criticality.*

CAUTION

When withdrawing Shutdown or Control Rods, group step counters, RPIs and all Nuclear Instrumentation shall be closely monitored to verify proper bank movement and bank overlap for control rods.

(♦) 5.12.9 Monitor Rod Control System operation while continuing with this procedure.

1. **IF** during rod withdrawal prior to criticality, a rod control condition requires opening the reactor trip breakers, **THEN** perform the following:

   a. Momentarily place the Reactor Trip Control Switch in the TRIP position to open Reactor Trip Bkrs A and B.

   b. Verify all Rod Bottom Lights are ON.

INIT

5.12.10 Withdraw Shutdown Banks as follows:

(♦) 1. **IF** final ECC boron concentration not yet established, **THEN** consult with Reactor Engineering to verify adequate Shutdown Margin to withdraw Shutdown Banks.

(♦) 2. Place the Rod Control Selector Switch to SBA.

(♦) 3. Verify the GRP SELECT lights on the power cabinets in 3B MCC are as follows:

Power Cabinet		GRP SELECT
1AC	✓	C
2AC	✓	C
1BD	✓	C
2BD	✓	C

(♦) 4. Fully withdraw Shutdown Bank A to the ARO position as identified in the Core Operating Limits Report. (COLR)

(♦) 5. Place the Rod Control Selector Switch to SBB.

(♦) 6. Verify the GRP SELECT lights on the power cabinets in 3B MCC are as follows:

Power Cabinet		GRP SELECT
1AC	✓	C
2AC	✓	C
1BD	✓	C
2BD	✓	C

(♦) 7. Fully withdraw Shutdown Bank B to the ARO position as identified in the Core Operating Limits Report. (COLR)

(♦) 5.13 Enter 3-OSP-041.16, Minimum Temperature for Criticality Verification, to record RCS temperature.

5.14 Block the High Flux at Shutdown Alarms as follows:

5.14.1 Place HIGH FLUX AT SHUTDOWN switch (NIS Panel N-31) to BLOCK.

5.14.2 Place HIGH FLUX AT SHUTDOWN switch (NIS Panel N-32) to BLOCK.

5.14.3 Place HS-3-6649A, Hi-Flux at Shutdown Block Channel A (Console) to BLOCK.

5.14.4 Place HS-3-6649B, Hi-Flux at Shutdown Block Channel B (Console) to BLOCK.

INIT

5.15 Perform the following to commence Unit 3 reactor startup.

5.15.1 Verify each shutdown rod to be fully withdrawn within 15 minutes prior to withdrawal of any control rods during an approach to reactor criticality.

Indicated Steps	RPI								Step Counters	
SBA	G3	C9	J13	N7	J3	C7	G13	N9	GP1	GP2
SBB	E5	L11	L5	E11	H6	H10	F8	K8	GP1	GP2

5.15.2 Verify the predicted critical rod position is above the rod insertion limits for zero power (Bank C above 105 steps) within 4 hours of going critical.

CAUTIONS

- ***During Mode 2 operation and at reduced power levels (less than 30 percent) in Mode 1, caution must be exercised when making Secondary System adjustments which would affect power/reactivity levels. The Unit RO shall be aware of adjustments to S/G steam, feed, or blowdown flow.***
- ***Nuclear Instrumentation including startup rate meters are required to be monitored during reactivity changes.***
- ***Excessive boration/dilution rates and rod motion shall be avoided.***

5.15.3 Announce on paging system, **Unit 3 Reactor Startup has commenced.**

5.15.4 **SHIFT MANAGER VERIFICATION POINT**

1. *Verify that NO evolutions are ongoing (Surveillance Testing, Turnover, etc.) which will distract the at-controls operator during approach to criticality.*

Shift Manager: _____ _____ 5/24/10
Signature Print Date

INIT

NOTES

- *A Reactor Engineer should perform the inverse count rate calculation and the projected critical rod height.*
- *Analog Rod Position Indicators in any rod bank may deviate from Demand Position Indicators by greater than 18 steps during startup. Operation may proceed provided that the condition does not exist for more than 1 hour following motion of any rod bank. Technical Specifications for moveable control assemblies should be referred to prior to commencing reactor startup.*
- *The following steps for verification of the power cabinet group select lights do not preclude any necessary operator action to control reactivity.*

5.15.3 Withdraw Control Banks as follows:

1. Place the Rod Control Selector Switch to the MANUAL position.

2. Verify the GRP Select lights on the power cabinets in 3B MCC are as follows:

Power Cabinet		GRP Select
1AC		A
2AC		A
1BD		C
2BD		C

3. Withdraw the control banks, as guided by the Inverse Count Rate Data and Plot sheet (Attachment 1) **AND** stop when **Control Bank A** group counter is at 128 steps.

INIT

5.15.5 (Cont'd)

U 4. Verify the GRP Select lights on power cabinets in 3B MCC are as follows:

Power Cabinet		GRP Select
1AC		A
2AC		A
1BD		A
2BD		A

N 5. Withdraw the Control banks, as guided by the Inverse Count Rate Data and Plot sheet (Attachment 1) **AND** stop when **Control Bank B** group counter is at 128 steps.

U 6. Verify the GRP Select lights on power cabinets in 3B MCC are as follows:

Power Cabinet		GRP Select
1AC		B
2AC		B
1BD		A
2BD		A

U 7. Withdraw the Control banks, as guided by the Inverse Count Rate Data and Plot sheet (Attachment 1) **AND** stop when **Control Bank C** group counter is at 128 steps.

U 8. Verify the GRP Select lights on power cabinets in 3B MCC are as follows:

Power Cabinet		GRP Select
1AC		B
2AC		B
1BD		B
2BD		B

U 9. Withdraw the Control banks, as guided by the Inverse Count Rate Data and Plot sheet (Attachment 1).

U 10. **WHEN** audible count rate becomes too rapid, **THEN** adjust the Audio Multiplier switch on the Audio Count Rate Channel drawer as required to provide an appropriate indication of power level.

U 11. Record the estimated Mode 2 Rod Position:

Bank C at 105 steps.

U 12. Record the time the Unit enters Mode 2:

Time: 2200

U 13. Announce on paging system, Unit 3 is in Mode 2.

INIT

CAUTIONS

- ***Blocking of the Source Range Channels is required prior to increasing reactor power greater than 1 x 10^5CPS.***
- ***Source Range to Intermediate Range overlap is required prior to de-energizing Source Range Channels.***

5.16 **WHEN** Reactor Power is above 10^{-10} amps on the Intermediate Range, **THEN** complete the following:

___ 5.16.1 Verify receipt of POWER ABOVE P-6 status light on VPA.

___ 5.16.2 Verify operable Intermediate Range channels indicate above 10^{-10} amps.

___ 5.16.3 Depress Train A Source Range Trip Push to Block pushbutton.

___ 5.16.4 Depress Train B Source Range Trip Push to Block pushbutton.

___ 5.16.5 Verify receipt of 10^5 CPS TRIP BLOCKED status light on VPA.

___ 5.16.6 Verify high voltage to Source Range detectors is deenergized.

___ 5.16.7 Select two Power Range channels to replace the deenergized Source Range channels on the NIS recorders.

___ 5.16.8 Verify on DCS that Source Range NIS is blocked (N/A if DCS is inoperable)

___ 5.16.9 **IF** DCS is inoperable, **THEN** reverify receipt of 10^5 CPS TRIP BLOCKED status lights on VPA **AND** high voltage to source range detector is de-energized.

___ 5.16.10 Select highest reading Intermediate Range channel to display Startup Rate.

___ 5.17 Record the time that the reactor is made critical:

Time: 2300

___ 5.18 Announce on paging system, **Unit 3 Reactor is critical**.

___ 5.19 Monitor Intermediate Range Nuclear instrumentation for proper operation.

INIT

___ 5.20 Establish a steady state startup rate of one (1.0) dpm or less to 10^{-8} amps **AND** stabilize Reactor Power at 10^{-8} amps on the Intermediate Range Monitors.

___ 5.20.1 **WHEN** Reactor Power stabilized at 10^{-8} amps on the IRMs, **THEN** record the following:

Time	2315
Tavg	547 °F
RCS boron	1250 ppm
Rod Position Bank A	229
Rod Position Bank B	229
Rod Position Bank C	229
Rod Position Bank D	105
Highest reading IRM	10^{-8} amps
Pressurizer Pressure	2235 psig

___ 5.21 Sign off satisfactory completion of 3-OSP-028.6, RCCA Periodic Exercise, in the Surveillance Tracking Program (Record No. 411).

___ 5.22 Enter the Startup Number in the Startup/Shutdown/Trip Log **AND** here:

Startup Number XXX

CAUTION

Startup rate shall be limited to 0.5 dpm when above the POAH.

___ 5.23 **IF** testing of the Auxiliary Feedwater pumps is required, **THEN** increase Reactor Power as necessary (approximately 2 to 3 percent) to allow testing of the Auxiliary Feedwater pumps **AND** to maintain Tavg at approximately 547°F to 549°F.

INIT

5.24 **IF** required, **THEN** test the Auxiliary Feedwater pumps using the following: (N/A if tests are current **AND** not returning from a cold shutdown of greater than 30 days, **AND** no maintenance was performed)

or 5.24.1 3-OSP-075.1, Auxiliary Feedwater Train 1 Operability Verification, **OR** 3-OSP-075.6, Auxiliary Feedwater Train 1 Backup Nitrogen Test, as determined by the Shift Manager.

or 5.24.2 3-OSP-075.2, Auxiliary Feedwater Train 2 Operability Verification, **OR** 3-OSP-075.7, Auxiliary Feedwater Train 2 Backup Nitrogen Test, as determined by the Shift Manager.

CAUTIONS

- ***Diverse instrumentation shall be used to verify reactor power during operations low in the power range (i.e. Power Range, Intermediate Range, Startup Rate, Gammametrics).***
- ***Adjustments for Feed, Steam, and Blowdown will affect both Tave and Reactor Power. Cooldown will cause power increases that could result in an unplanned Mode change. Heatup could drive the reactor subcritical. Compensation for these changes should not include excessive rod motion in either direction.***
- ***If the reactor becomes subcritical, it shall be shutdown using the applicable procedure/sections. Withdrawing rods to re-establish criticality without procedural guidance could result in a short reactor period and an uncontrolled Startup Rate that results in a Reactor Trip at 10 percent in the Power Range.***

N/A 5.25 **IF** testing of the Auxiliary Feedwater pumps has been completed **OR** is not required, **THEN** adjust Reactor Power to approximately 1-2 percent to maintain Tavg at approximately 547°F. (This is approximately 3 x 10^{-6} to 8 x 10^{-6} amps.)

N/A 5.26 Notify Chemistry Lab when Steam Generator blowdown is initiated using 3-OP-071, Steam Generator Blowdown Recovery System. (N/A if already in service.)

NOTE

Limit reactor power to approximately 2–3 percent until MSIVs are opened. Steam Generator chemistry parameters are expected to be within the limits of Attachment 1 of 0-NCOP-002, Secondary Chemistry Startup and Shutdown Guidelines, prior to exceeding 7 percent reactor power.

N/A 5.27 Warm the Main Steam lines using 3-OP-072, Main Steam System. (N/A if Main Steam lines are already aligned for service.)

N/A 5.28 Verify that all prerequisites in Subsection 3.2 are signed off.

N/A 5.29 Verify that any remaining system line-ups in Subsection 3.3 are signed off.

INIT

5.30 MAINTENANCE DEPARTMENT VERIFICATION POINT

5.30.1 *Verify that all required post maintenance testing on equipment listed in the EOOS log for entry into Mode 1 is complete.*

Mechanical Supervisor _____ (Signature) _____ (Print) / 1/25/10 (Date)

Electrical Supervisor _____ (Signature) _____ (Print) / 1/25/10 (Date)

I&C Supervisor _____ (Signature) _____ (Print) / 1/25/10 (Date)

5.31 IST COORDINATOR/SHIFT ENGINEER VERIFICATION POINT

5.31.1 *Verify that all required IST testing for entry into Mode 1 is complete.*

IST Coordinator/ Shift Engineer: _____ (Signature) _____ (Print) / 1/25/10 (Date)

5.32 CORRECTIVE ACTION VERIFICATION POINT

5.32.1 *Verify that all mode restricting Condition Reports/Actions for entry into Mode 1 are satisfactorily addressed. (This Verification Point may be satisfied via a telephone call to the CAG Supervisor.)*

CAG Supv.: _____ (Signature) _____ (Print) / 1/25/10 (Date)

5.32.2 ***WHEN*** *telephone call is used,* ***THEN*** *record time and date of call.*

Time NA *Date* NA *Initial* NA

5.33 WORK CONTROL MANAGER VERIFICATION POINT

5.33.1 *Verify that all mode restricting work orders (including work orders for PC/Ms) for entry into Mode 1 have been satisfactorily addressed.*

Work Controls Manager Or Designee: _____ (Signature) _____ (Print) / 1/25/10 (Date)

5.34 **SHIFT MANAGER VERIFICATION POINTS**

5.34.1 *NRC Resident notified of commencing load increase.*

5.34.2 *All items related to 0-ADM-529, Unit Restart Readiness, that apply to entering Mode 1 have been completed.*

- *Reactor power **SHALL NOT** be raised above 5 percent (Mode 1) until all Section 5.0 steps prior to this verification are completed and the conditions of this verification point are satisfied. **Only** those subsequent administrative and action steps designated by (♦) may be performed prior to the Shift Manager Verification Point being satisfied. All other steps must wait until the Mode 1 Shift Manager Verification Point is complete.*

Shift Manager: _____ (Signature) _____ (Print) 4/25/10 (Date)

INIT

5.35 **IF** the Main Feedwater Control Valves have not been tested, **THEN** test as follows:

5.35.1 Verify all three Feedwater Isolation valves are closed:

NA (♦) 1. MOV-3-1407

NA (♦) 2. MOV-3-1408

NA (♦) 3. MOV-3-1409

5.35.2 Perform test of Main Feedwater Control Valve, FCV-3-478:

NA (♦) 1. Open Main Feedwater Control Valve, FCV-3-478.

NA (♦) 2. **WHEN** the controller output for FCV-3-478 is 100 percent, **THEN** locally verify valve is fully open.

NA (♦) 3. Close Main Feedwater Control Valve, FCV-3-478.

5.35.3 Perform test of Main Feedwater Control Valve, FCV-3-488:

NA (♦) 1. Open Main Feedwater Control Valve, FCV-3-488.

NA (♦) 2. **WHEN** the controller output for FCV-3-488 is 100 percent, **THEN** locally verify valve is fully open.

NA (♦) 3. Close Main Feedwater Control Valve, FCV-3-488.

INIT

5.35.4 Perform test of Main Feedwater Control Valve, FCV-3-498:

(♦) 1. Open Main Feedwater Control Valve, FCV-3-498.

(♦) 2. **WHEN** the controller output for FCV-3-498 is 100 percent, **THEN** locally verify valve is fully open.

(♦) 3. Close Main Feedwater Control Valve, FCV-3-498.

(♦) 5.36 Place the Turbine Gland Seal System in service using 3-NOP-089.01, Turbine Gland Seals and High Pressure Cylinder Heating. (Mark N/A if system is in service)

(♦) 5.37 Establish condenser vacuum using 3-NOP-073.01, Steam Jet Air Ejector Operation. (Mark N/A if vacuum has been established.)

(♦) 5.38 Obtain an air in-leakage reading after placing the Steam Jet Air Ejectors in service **AND** report the reading to Chemistry Department.

(♦) 5.39 Conduct Turbine Startup Pre-job Briefing for all personnel to be involved in turbine roll **AND** placing the generator on-line.

(♦) 5.40 Prior to exceeding 7 percent power, ensure the Steam Generators are within limits by completion of Attachment 1 of 0-NCOP-002, Secondary Chemistry Startup and Shutdown Guidelines.

CAUTION

The probability of an uncontrolled cooldown is increased if the Reactor trips with the Steam Dump Mode Selector switch not in AUTO.

5.41 Align the Steam Dumps to Condenser as follows:

(♦) 5.41.1 Place the Steam Dump to Condenser Control switch to OFF.

(♦) 5.41.2 Verify Steam Header Pressure Controller setpoint is at 7.18 (controlling at 1005 psig).

(♦) 5.41.3 Place the Steam Header Pressure Controller to AUTO.

5.42 **IF** the Steam Dumps to Condenser are to be used for startup, **THEN** verify the following:

N/A 5.42.1 Place the Mode Selector switch to MANUAL.

N/A 5.42.2 Verify Steam Header Pressure Controller output signal is less than 10 percent.

N/A 5.42.3 Place the Steam Dump to Condenser Control switch to ON.

N/A 5.42.4 Verify receipt of Annunciator C 8/3, STEAM DUMP ARMED/ACTUATED.

N/A 5.42.5 Verify steam dump valves controlling steam header pressure at 1005 psig.

INIT

CAUTION

Precautions/Limitations 4.27, 4.28, 4.32, and 4.33 should be referenced for power increase ramp rates.

NA (♦) 5.43 **IF** the reactor has not been made critical since the last refueling, **THEN** perform the following:

REACTOR ENGINEERING VERIFICATION POINTS

Reactor Engineering shall:

NA (♦) 1. *Verify that the total rod worth is within 10 percent of design value.*

NA (♦) 2. *Verify or update shutdown boron curves in the Plant Curve Book (Hot and Cold Shutdown).*

NA (♦) 3. *Verify that the moderator temperature coefficient is proven less than or equal to plus 5 pcm/°F.*

NA (♦) 4. *Verify that the HZP unrodded measured temperature coefficient ensures that the 100 percent power, xenon free MTC is less than or equal to Zero **OR** Figure 13, Section 2 of the Plant Curve Book has been updated to reflect the measured data.*

NA (♦) 5. ***IF** an HZP flux map was not performed, **THEN** notify the Shift Manager that a flux map will be required at less than or equal to 30 percent power.*

NA (♦) 6. *Verify that all Reactor Engineering surveillance tests required by 0-OSP-200.1, Schedule of Plant Checks and Surveillances, and 0-ADM-215, Plant Surveillance Tracking Program, have been completed.*

NA (♦) 7. *Verify that 3-OSP-059.7, NIS Setpoint and Calibration Predictions for a New Cycle Startup, has been completed for applicable unit.*

NA (♦) 8. *Verify new intermediate range alarm setpoints have been installed as necessary. (**IF** setpoints did NOT change, **THEN** mark this step N/A.)*

Reactor Engineering Supervisor or Designee: _____ (Signature) GA Laughlin (Print) 10/22/10 (Date)

INIT

NOTES

- *If reactor power changes by more than 15 percent in a 1-hour period, Chemistry is required to sample the RCS per Technical Specification 4.4.8, Table 4.4-4, Item 6b.*
- *If reactor power is stabilized for any reason and performance of Attachment 4 is terminated, power data recording shall be recommenced when power changes are recommenced.*
- *All available indication should be monitored when changing power, including OSI/PI and DCS. During power ascension, a rolling average power increase should be accessed every 15 minutes to ensure that the recommended ramp rate is not exceeded in any 1 hour time period.*
- *As power is increased, the SDTA valves will open as steam flow increases. [Commitment Step 2.3.11 - CAPR]*

____ 5.44 In preparation for rolling the main turbine, increase Reactor Power to 3 to 5 percent by dilution using 0-OP-046, CVCS - Boron Concentration Control, **OR** by withdrawing control rods. [Commitment Step 2.3.11 - CAPR]

____ 5.44.1 Monitor the rolling average power increase every 15 minutes to ensure the hourly limit is not exceeded. (N/A if limit is not applicable.)

____ (♦) 5.44.2 Verify all Steam Generator Safety Valves are operable or comply with the action requirements of Technical Specification 3.7.1.1 prior to increasing reactor power above 14 percent.

____ (♦) 5.44.3 Prior to exceeding 7 percent power, ensure Attachment 1 of 0-NCOP-002, Secondary Chemistry Startup and Shutdown Guidelines, has been completed.

____ (♦) 5.44.4 Commence performance of Attachment 4, Power Data Sheet.

5.45 Perform the following prior to admitting steam to the turbine:

____ (♦) 5.45.1 Determine turbine first stage metal temperature, and refer to the Plant Curve Book, Section 4, Figure 4 to determine minimum turbine roll time and loading time.

____ (♦) 5.45.2 Check generator RTD monitor for normal conditions prior to turbine roll.

5.45.3 Ensure installed the Turbine Trip Solenoid fuses listed below:

____ (♦) 1. Fuse XJAZ, under North end of Unit 4 console

____ (♦) 2. Fuse XIB, under North end of Unit 3 console

____ (♦) 5.45.4 Verify all feedwater heater high level alarms are clear. (This does not apply to the #1 and #2 Feedwater Heaters.) [Commitment Step 2.3.9]

____ (♦) 1. **IF** all feedwater heater high level alarms are **NOT** clear, **THEN** contact the System Engineer to determine if tube leakage is suspected and heater isolation is required prior to admitting steam to the turbine.

INIT

____ (♦) 5.46 Verify generator lockout relay reset by steady blue indicating light on VPA.

____ (♦) 5.47 Verify the Fault Monitor System Recorder in the Cable Spreading Room is ON **AND** the Elect Fault Monitor switch on VPB is in NORMAL.

____ (♦) 5.48 Place AMSAC in service using 3-NOP-093.01, ATWS Mitigating System Actuation Circuitry.

CAUTION

Operation at Low or No Load conditions on the turbine can cause turbine exhaust hood temperatures to increase. The turbine exhaust hood sprays need to be verified to be operating properly by monitoring the exhaust hood temperatures frequently. If exhaust hood temperatures exceed 175°F, the Unit Supervisor needs to be informed.

(♦) 5.49 Perform the following to roll the turbine.

NOTE

The Generator Leads Backup Distance relay is susceptible to vibration with the Generator Field Circuit Breaker open and may cause a generator lockout and subsequent turbine trip. To prevent this occurrence, the paddle is removed from this relay during the Main Turbine Startup.

____ (♦) 5.49.1 Direct SAO to pull the relay paddle to defeat the Generator Leads Backup Distance (LDT) SAM timer relay in relay cabinet 3C106 in the Cable Spreading Room.

____ (♦) 5.49.2 Enter 3-OP-089, Main Turbine, Subsection 5.1, Main Turbine Startup, **AND** perform steps up to, but not including, rolling turbine.

____ 5.49.3 **WHEN** SAO has removed the relay paddle above, **THEN** roll the main turbine using 3-OP-089, Main Turbine, Subsection 5.1, Main Turbine Startup.

____ (♦) 5.50 **IF** the generator disconnects are open, **THEN** obtain a Switching Order **AND** close the generator disconnects. [Commitment - Step 2.3.2]

5.51 Maintain steam generator levels by manual control of the Feedwater Bypass valves as required.

____ (♦) 5.51.1 FW Bypass Valve Stm Generator 3A; FCV-3-479

____ (♦) 5.51.2 FW Bypass Valve Stm Generator 3B; FCV-3-489

____ (♦) 5.51.3 FW Bypass Valve Stm Generator 3C; FCV-3-499

INIT

CAUTION

The non-controlling oil pressure should be maintained 7 to 10 psig above the control device oil pressure.

5.52 **WHEN** Turbine speed reaches 1800 rpm. **THEN** maintain noncontrolling oil pressure 7 to 10 psig above control device oil pressure **AND** perform the following:

5.52.1 Perform the following Main Turbine tests:

____ 1. **IF** returning from a refueling outage **OR** if maintenance was performed on the Turbine Control Oil System OR on the Turbine Front Standard, **THEN** perform 3-OSP-200.3, Secondary Plant Period Tests, Subsection 7.2, Main Turbine Trips Tests and Condenser Low Vacuum Alarm, Low Vacuum Trip Functional Tests.

____ 2. **IF** returning from a refueling outage **OR** if maintenance was performed on the Turbine Front Standard, **THEN** perform Overspeed Trip Test using 3-OSP-089.1, Turbine Generator Overspeed Trip Test.

5.52.2 **WHEN** Main Turbine Trip Testing is complete, **THEN** perform the following to raise power in preparation for synchronizing and loading the main generator: [Commitment Step 2.3.11 - CAPR]

NOTES

- *When reactor power is greater than 5 percent, Mode 1, Power Operation, is entered.*
- *Communication between the Reactor Operators on the control board is critical during plant startup. ROs must inform each other of important parameter changes such as reactor and turbine power, S/G levels, changes in blowdown flow and SDTA valve position.*
- *Tavg should be controlled between 547°F and 551°F.*
- *Annunciator B 4/4, TAVG/ TAVG-TREF DEVIATION, may alarm while waiting to load the main generator. The alarm should clear as the main generator is loaded.*

____ 1. Commence a reactor power increase to between 5 and 7 percent by dilution using 0-OP-046, CVCS – Boron Concentration Control, **OR** by withdrawing control rods.

INIT 5.52.2 (Cont'd)

NOTE

Changes to blowdown flow should be minimized during main generator loading to 40 MWe. If blowdown flow is needed to control SG level or RCS temperature, then blowdown flow may be adjusted accordingly.

____ 2. **IF** blowdown flow is established, **THEN** maintain stable.

3. Align the SDTA controllers as follows: (Reference Attachment 5 for operation of the SDTA controllers.)

____ a. Ensure two SDTA controllers are in automatic.

____ b. Ensure one SDTA controller is in manual and maintaining Tavg two to four degrees higher than Tref.

NOTES

- *The intent is to have all three SDTA valves throttled open to maintain Tavg greater than Tref and reactor power below P7 (Target is 5 to 7 percent).*
- *The SDTA controllers should be adjusted so that the valves do not close at the same time, but operate on a staggered basis and throttle closed as the main generator is loaded.*
- *A difference of approximately 20 psi should be used as the initial staggered setting.*
- *The SDTA controller settings may be adjusted in small increments as necessary to maintain steam flow from all three steam generators.*
- *The steam generator with the lower setpoint will require additional feed flow.*

____ c. Adjust the setpoints for SDTA controllers in automatic for staggered operation.

d. Adjust the setpoint for SDTA controller in manual to 1005 psig.

____ e. Use the SDTA controller in manual to make minor adjustments to Tavg, as necessary.

INIT

NOTE

The following step may be performed as SDTA controllers are adjusted and steam generator levels are stabilized.

5.52.3 Perform the following in preparation for synchronizing the main generator:

____ 1. Verify that the Main Exciter DC Regulator Control is in the full lower position (approximately 10 percent on DC Regulator Control Indicator).

NOTE

The generator leads backup distance relay is susceptible to vibration with the generator field circuit breaker open and may cause a generator lockout and subsequent turbine trip. To prevent this occurrence, the paddle is removed from this relay during the Main Turbine Startup and is installed prior to closing the generator field circuit breaker.

____ 2. Direct SOA to install the relay paddle to restore the generator leads backup distance (LTD) SAM timer relay in Cabinet 3C106 in the Cable Spreading Room.

NOTES

- *Annunciator E 8/2, GEN FIELD FORCING/VOLT REG LIMITING, may come in and clear.*
- *When the exciter field breaker is closed, the exciter amps and generator voltage may vary based on generator conditions, i.e. cold from a refueling outage or relatively hot from a SNO. If exciter amps or generator voltage are not within the specified band, System Engineering shall be contacted for further guidance.*

____ 3. Close the exciter field breaker and verify response on Control Room or local exciter field ammeter between greater than 0 and 90 amps.

____ 4. Verify three generator voltmeter readings are indicating between greater than 0 and 17 KV.

____ 5. Slowly increase generator voltage by raising the DC regulator control in small step changes.

____ a. Verify exciter field ammeter responds with each adjustment.

____ b. Verify all three generator voltmeters are indicating equal values.

INIT 5.52.3 (Cont'd)

CAUTION

Generator operation greater than 23,100 volts may damage the generator windings. Exciter field current is limited to 135 amps at no-load to ensure acceptable generator voltage.

____ 6. Raise generator voltage until voltage is between 21.5 KV and 22.5 KV on all three phases with exciter field amps between 100 amps and 130 amps on the generator voltmeters and exciter field ammeter. (The Control Room or local exciter field ammeter may be used.)

____ 7. Place the Voltage Regulator Control Switch in the TEST position.

NOTE

The regulator mismatch meter may oscillate about the zero point due to minor speed changes.

____ 8. Slowly adjust the AC regulator control to null the AC-DC regulator mismatch meter.

____ 9. Place the Voltage Regulator Control Switch in the ON position.

____ 10. Place the Generator Synchronizing East Bus Control in the MANUAL position.

____ 11. Adjust the turbine speed using the Generator Governor Speed Changer Control until the synchroscope Indicator is rotating slowly in the FAST direction.

____ 12. Adjust the AC regulator control to set the incoming voltage equal to the running voltage.

____ 5.52.4 **WHEN** reactor power is between 5 and 7 percent, **THEN** verify the following parameters are stable or indicate a very slow rate of change:
[Commitment Step 2.3.11 - CAPR]

- Tavg (549° to 551°F)
- PRZ level (on program for Tavg)
- Steam Generator levels (46 to 54 percent)

INIT

NOTES

- *If auto synchronizing is inoperable or undesirable, the Shift Manager may authorize the use of Manual Synchronizing Mode.*
- *In Auto Mode, the turbine speed and generator voltage are automatically adjusted, which may require several minutes to satisfy the system logic.*
- *If the auto synchronizing pushbutton is held for greater than 10 seconds, the auto-synchronizing logic will be disabled before a second auto-synchronizing attempt at breaker closure is initiated.*

5.53 Perform auto synchronization as follows: (N/A if manual mode is used.)

____ 5.53.1 Place the Gen Synchronizing East Bus Control to the AUTO position.

____ 5.53.2 Verify East Bus Breaker white light above synchroscope flashes at 12 o'clock position, indicating synchronized conditions.

____ 5.53.3 Verify the Inadvertent Protection Scheme Armed amber light above the synchroscope is LIT.

NOTES

- *If East Bus Breaker fails to close, the Power Coordinator in Systems Operations needs to be notified prior to attempting to synchronize with the Mid Bus Breaker, since realignment of the switchyard may be required. (The Systems Operator/Power Coordinator evaluates system conditions to determine if the high line should be isolated before closing the Mid Bus Breaker, and will work with the plant to expedite any necessary switching.) [Commitment - Step 2.3.1]*
- *If the generator is motored at 2 MW or more incoming for 30 seconds, the reverse power relay will initiate generator lockout.*

____ 5.53.4 Before the synchroscope reaches the 11 o'clock position, depress and hold the AUTO Synchronizing Button.

INIT

5.53.5 **WHEN** the GCB closes, **THEN** perform the following:

____ 1. Observe the East Bus Breaker indicating lights to verify breaker closure (red on; green off).

2. **IF** main generator load is less then 10 MWe, **THEN** increase load to approximately 10 MWe using the Generator Governor Speed Changer Control.

____ 3. Place synchroscope in the OFF position.

4. Match the flag on the East Bus Generator GCB Control Switch by taking the switch to CLOSE.

____ 5. Verify the Inadvertent Protection Scheme Armed amber light above the synchroscope is OFF.

____ 6. Verify Generator Amps are within 2 percent on all three phases.

NOTE

The Manual Mode is only to be used by authorization of the Shift Manager.

5.54 Manually synchronize the generator as follows (N/A if Auto Synchronization was used):

____ 5.54.1 Place the Gen Synchronizing East Bus Control in the MAN position.

____ 5.54.2 Verify the Inadvertent Protection Scheme Armed amber light above the synchroscope is LIT.

____ 5.54.3 Ensure synchroscope is rotating slowly in the FAST direction.

CAUTION

DO NOT hold GCB control switch in CLOSED position beyond the 12 o'clock position.

____ 5.54.4 **WHEN** the synchroscope is approximately 11 o'clock, **THEN** manually hold closed the GCB Control Switch until either the GCB is closed or the 12 o'clock position is reached.

INIT

NOTES

- *If East bus breaker fails to close, the Power Coordinator in Systems Operations needs to be notified prior to attempting to synchronize with the Mid Bus Breaker, since realignment of the switchyard may be required. (The Systems Operator/Power Coordinator evaluates system conditions to determine if the high line should be isolated before closing the Mid Bus Breaker, and will work with the plant to expedite any necessary switching). [Commitment - Step 2.3.1]*
- *If the generator is motored at 2 MW or more for 30 seconds, the reverse power relay will initiate generator lockout.*

5.54.5 **WHEN** the GCB closes, **THEN** perform the following:

____ 1. Observe the East Bus Breaker indicating lights to verify breaker is closed (red on, green off).

____ 2. **IF** main generator load is less than 10 MWe, **THEN** increase load to approximately 10 MWe using the Generator Governor Speed Changer Control.

____ 3. Place synchroscope in the OFF position.

____ 4. Verify the Inadvertent Protection Scheme Armed amber light above the synchroscope is OFF.

____ 5. Verify Generator Amps are within 2 percent on all three phases.

NOTES

- *To prevent excessive changes in S/G pressure and level, the SDTA valves should be checked to verify that they are responding prior to each additional load step.*
- *Increasing main generator load shall be coordinated with the operator controlling steam generator levels.*

5.55 Perform the following to increase turbine load: [Commitment Step 2.3.11 - CAPR]

____ 5.55.1 Monitor automatic control program values using the Plant Curve Book Section IV, Figure 5, **AND** notify the Shift Manager of any unexpected deviations.

INIT

NOTE

The following step is performed by the operator controlling steam generator levels and pressures.

5.55.2 **IF** the Steam Dump to Atmosphere (SDTA) valves are being used, **THEN** perform the following steps until all SDTA valves are closed and the Tavg - Tref deltaT is within the band provided by the US. (Reference Attachment 5 for operation of the SDTA controllers.)

____ 1. Verify the SDTA controllers in automatic are closing the SDTA valves as steam is drawn off to the turbine.

____ 2. Slowly close the SDTA valve in manual to balance steam flow with the SDTA valves in automatic and make minor adjustments to Tavg, as necessary.

NOTES

- *When the SDTA valves are operating properly, there should be a balance between the SDTA valves closing and main turbine steam usage, with little perturbation in main steam header pressure as load is increased.*
- *The SDTA valves can be verified to be closing by observing main steam header pressure recover as the main generator is loaded.*
- *The SDTA controller settings may be adjusted in small increments as necessary to maintain steam generator levels.*
- *It should not be necessary to close the SDTA valve in manual as a pre-emptive action when the main generator output breaker is closed.*

____ 3. Observe main steam header pressure while loading the main generator to maintain a balance between the SDTA valves closing and the steam being used to increase load.

____ 4. **WHEN** steam generator levels and pressures stabilize following a load increase, **THEN** notify the operator controlling the main generator to increase load by 5 to 10 MWe.

____ 5. Continue monitoring and controlling in the steps above until Step 6 below is completed.

NOTE

The SDTA valves should be closed by approximately 40 MWe.

____ 6. **WHEN** the SDTA valves in automatic are closed, **THEN** ensure the SDTA valve in manual is closed and Tavg/Tref are within the band provided by US.

INIT

5.55.2 (Cont'd)

7. Align the SDTA controllers for automatic operation as follows:

____ a. Verify Steam Dump to Atmosphere Valve, CV-3-1606, is CLOSED.

____ (1) Adjust the controller setpoint to 1005 psig.

____ (2) Ensure the controller is in AUTO.

____ b. Verify Steam Dump to Atmosphere Valve, CV-3-1607, is CLOSED.

____ (1) Adjust the controller setpoint to 1005 psig.

____ (2) Ensure the controller is in AUTO.

____ c. Verify Steam Dump to Atmosphere Valve, CV-3-1608, is CLOSED.

____ (1) Adjust the controller setpoint to 1005 psig.

____ (2) Ensure the controller is in AUTO.

8. Perform the following to align the steam dump to condenser for AUTO:

____ a. Place the Steam Dump to Condenser Control switch in the ON position.

____ b. Momentarily place the Mode Selector switch to RESET.

____ c. Place the Mode Selector Switch to AUTO.

5.56 **IF** the steam dump to condenser (SDTC) valves are being used, **THEN** perform the following:

____ 5.56.1 Verify the SDTC valves are closing as steam is drawn off to the turbine.

____ 5.56.2 **WHEN** load has increased sufficiently to cause the SDTC valves to fully close, **THEN** place the Mode Selector Switch to RESET, then to AUTO.

____ 5.56.3 Verify Annunciator C 8/3, STEAM DUMP ARMED/ACTUATED, clears.

INIT

CAUTIONS

- *Communication between the Reactor Operators on the control board is critical during plant startup. ROs must inform each other of important parameter changes such as reactor and turbine power, S/G levels, and changes in blowdown flow.*
- *Intermediate Range to Power Range overlap is required prior to blocking the Intermediate Range Trip and the Power Range LO Range Trip.*
- *Block of the Intermediate Range Trip and the Power Range LO Range Trip is required prior to increasing power greater than 20 percent.*

5.57 Perform the following to slowly increase reactor power:

____ 5.57.1 **WHEN** S/G levels are stable, **THEN** continue to increase reactor power by dilution using 0-OP-046, CVCS – Boron Concentration Control, **OR** by withdrawing control rods.

____ 5.57.2 Monitor and adjust S/G levels in response to rising reactor power and turbine load.

5.58 **WHEN** Reactor Power level is greater than 10 percent, **THEN** perform the following:

____ 5.58.1 Verify POWER ABOVE P-10 status light on VPA is ON.

____ 5.58.2 Verify AT POWER TRIPS BLOCKED status light on VPA goes OFF.

____ 5.58.3 Press **AND** hold for 2 to 4 seconds Train A and Train B Intermediate Range Trip Push to Block pushbuttons on the Reactor Console.

____ 5.58.4 Verify 25% INTER RNG TRIP BLOCKED status light on VPA is ON.

____ 5.58.5 Press **AND** hold for 2 to 4 seconds Train A and Train B Power Lo Range Trip Push to Block pushbuttons on the Reactor Console.

____ 5.58.6 Verify 25% PWR RNG TRIP BLOCKED status light on VPA is ON.

5.58.7 Verify the following on DCS:

____ 1. Intermediate Range NIS Trip blocked

____ 2. NIS LO Power Range Trip blocked

INIT

____ 5.59 Notify Chemistry Lab that RCS sampling is required by Technical Specification 3.4.8.

5.60 Perform the following as load is increased:

____ 5.60.1 Complete Section 5.0 of 3-OP-072, Main Steam System.

____ 5.60.2 Verify the Feedwater Pump Turbine Runback switch on 3C01 is in DEFEAT.

____ 5.60.3 Commence purging the MSR tube bundles using 3-OP-072.1, Moisture Separator Reheaters.

CAUTION

Prior to opening the feedwater isolation MOVs, evaluate for leak-by.

5.61 **WHEN** power is between 10 and 20%, **THEN** stop the power increase and perform the following to place the FRVs in automatic:

5.61.1 Ensure open the Feedwater Isolation valves:

____ • FW Isol Stm Gen 3A, MOV-3-1407

____ • FW Isol Stm Gen 3B, MOV-3-1408

____ • FW Isol Stm Gen 3C, MOV-3-1409

NOTES

- *FRVs in the following steps can be placed in service in any order*
- *The controlling channels of feed flow and steam flow can be changed at the discretion of the US*

5.61.2 Transfer the 3A steam generator level controls to automatic as follows:

1. **WHEN** steam flow and feed flow are indicated on the 3A steam generator, **THEN** perform the following:

____ a. Slowly open Main Feedwater Control Valve, FCV-3-478, in the manual mode.

____ b. Slowly close FW Bypass Valve, FCV-3-479.

INIT

5.61.2 (Cont'd)

____ 2. Verify that 3A steam generator level and feed flow respond to Main Feedwater Control Valve, FCV-3-478.

____ 3. **WHEN** 3A steam generator level is approximately 50 percent **AND** feed flow and steam flow are matched, **THEN** place the controller for 3A Main Feedwater Control Valve, FCV-3-478, in AUTO.

____ 4. Verify 3A Main Feedwater Control Valve, FCV-3-478, maintains program level.

5.61.3 Transfer the 3B steam generator level controls to automatic as follows:

1. **WHEN** steam flow and feed flow are indicated on the 3B steam generator, **THEN** perform the following:

   a. Slowly open Main Feedwater Control Valve, FCV-3-488, in the manual mode.

____ b. Slowly close FW Bypass Valve, FCV-3-489.

____ 2. Verify that 3B steam generator level and feed flow respond to Main Feedwater Control Valve, FCV-3-488.

____ 3. **WHEN** 3B steam generator level is approximately 50 percent **AND** feed flow and steam flow are matched, **THEN** place the controller for 3B Main Feedwater Control Valve, FCV-3-488, in AUTO.

____ 4. Verify 3B Main Feedwater Control Valve, FCV-3-488, maintains program level.

5.61.4 Transfer the 3C steam generator level controls to automatic as follows:

1. **WHEN** steam flow and feed flow are indicated on the 3C steam generator, **THEN** perform the following:

____ a. Slowly open Main Feedwater Control Valve, FCV-3-498, in the manual mode.

____ b. Slowly close FW Bypass Valve, FCV-3-499.

____ 2. Verify that 3C steam generator level and feed flow respond to Main Feedwater Control Valve, FCV-3-498.

____ 3. **WHEN** 3C steam generator level is approximately 50 percent **AND** feed flow and steam flow are matched, **THEN** place the controller for 3C Main Feedwater Control Valve, FCV-3-498, in AUTO.

____ 4. Verify 3C Main Feedwater Control Valve, FCV-3-498, maintains program level.

INIT

____ 5.61.5 Verify that each S/G level is being automatically controlled.

5.61.6 Verify the main feedwater control valves are in AUTO:

____ • FCV-3-478

____ • FCV-3-488

____ • FCV-3-498

5.61.7 Verify the FW Bypass Valves are CLOSED:

____ • FCV-3-479

____ • FCV-3-489

____ • FCV-3-499

5.62 Perform the following to continue a slow increase in reactor power:

____ 5.62.1 **WHEN** S/G levels are stable, **THEN** slowly increase reactor power in 2 to 3 percent increments by dilution using 0-OP-046, CVCS – Boron Concentration Control, **OR** by withdrawing control rods.

____ 5.62.2 As reactor power rises, increase turbine load to maintain Tref within 3°F of Tavg.

____ 5.62.3 Monitor S/G levels to ensure proper automatic S/G level control.

5.63 Perform the following to close the Mid Bus Breaker:

____ 5.63.1 Place the Generator Synch Mid Bus Breaker control in the MANUAL position.

____ 5.63.2 Verify incoming and running voltages are matched with the synchroscope locked at 12 o'clock.

____ 5.63.3 **WHEN** both synchronizing lights are out, **THEN** close the Generator GCB Mid Bus Breaker.

____ 5.63.4 Observe the Generator GCB Mid Bus Breaker indicating lights to verify breaker closure (red on, green off).

NOTE

A failure of the Mid Bus Breaker should NOT hinder the Unit from synchronizing, but is reported to Systems Operations to facilitate repairs. [Commitment - Step 2.3.1]

____ 5.63.5 Place the Generator Synch Mid Bus Breaker control to the OFF position.

____ 5.63.6 Adjust the Generator VARS as required for system conditions.

INIT

5.64 Place the generator core monitor in service as follows:

____ 5.64.1 Verify generator H_2 pressure is 65 to 75 psig.

____ 5.64.2 Verify system filter (Local) is free of oil.

____ 5.64.3 Set H_2 gas flow at 16 (Local flow meter).

____ 5.64.4 Verify power ON light (VPA).

____ 5.64.5 Depress the ALARM RESET pushbutton.

____ 5.64.6 **IF** MANUAL START ONLY yellow light is ON, **THEN** press MANUAL START ONLY pushbutton.

____ 1. Verify AUTO SAMPLER READY light is ON (VPA).

____ 5.64.7 Verify printer is stamping between 0.75 and 1.0 (No units); mark date and time.

5.65 **WHEN** at approximately 130 MWe, **THEN** perform the following to transfer auxiliary loads from the Startup Transformer to the Auxiliary Transformer:

____ 5.65.1 Place the Aux Transf Synch switch for 4 KV Bus 3A in the ON position.

5.65.2 Verify conditions met for transferring as follows:

____ 1. Verify incoming voltage and running voltage are matched within 10 percent (approximately 24 KV indicated).

____ 2. Verify synchroscope is indicating 12 o'clock +/– approximately 20° and stationary.

5.65.3 Close the AUX Transf ACB for 4 KV Bus 3A **AND** hold the control switch in the closed position while performing the following:

____ 1. Verify Aux Transf ACB for 4 KV Bus 3A red indicating light is ON.

____ 2. Verify that current flow from Startup Transformer to the 3A Bus decreases.

____ 3. Verify that current flow from Auxiliary Transformer to the 3A Bus increases.

5.65.4 Release the Aux Transf ACB control switch **AND** verify the following:

____ 1. Startup Transf ACB for 4 KV Bus 3A trips.

____ 2. Current flow from Startup Transformer to 3A Bus decreases to zero.

____ 3. Current flow from Auxiliary Transformer to 3A Bus increases

INIT

____ 5.65.5 Turn the Startup Transf ACB 4 KV Bus 3A Control Switch to the TRIP position and release.

____ 5.65.6 Turn the Aux Transf Synch 4 KV Bus 3A Switch to the OFF position **AND** remove handle.

____ 5.65.7 Place the Aux Transf Synch Switch for 4 KV Bus 3B in the ON position.

5.65.8 Verify conditions met for transferring as follows:

____ 1. Verify incoming voltage and running voltage are matched within 10 percent (approximately 24 KV indicated).

____ 2. Verify synchroscope is indicating 12 o'clock +/– approximately 20° and stationary.

5.65.9 Close the AUX Transf ACB for 4 KV Bus 3B **AND** hold the control switch in the closed position while performing the following:

____ 1. Verify Aux Transf ACB for 4 KV Bus 3B red indicating light is ON.

____ 2. Verify that current flow from Startup Transformer to the 3B Bus decreases.

____ 3. Verify that current flow from Auxiliary Transformer to the 3B Bus increases.

5.65.10 Release the Aux Transf ACB control switch **AND** verify the following:

____ 1. Startup Transf ACB for 4 KV Bus 3B trips.

____ 2. Current flow from Startup Transformer to 3B Bus decreases to zero.

____ 3. Current flow from Auxiliary Transformer to 3B Bus increases.

____ 5.65.11 Turn the Startup Transf ACB 4 KV Bus 3B control switch to the TRIP position and release.

____ 5.65.12 Turn the Aux Transf Synch 4 KV Bus 3B switch to the OFF position and remove handle.

____ 5.65.13 Notify Electrical Maintenance to monitor and adjust Unit 3 and Unit 4 Vital Battery Charger currents, as required, until 70 percent Reactor Power.

INIT

____ 5.66 Verify that the control rods are in the desired position to maintain delta flux using 0-OP-059.9, Operation Within the Axial Flux Difference Operational Space.

____ 5.67 Verify the receipt of the Intermediate Range HIGH LEVEL ROD STOP bistable at approximately 20 percent power.

____ 5.68 Verify the receipt of the Intermediate Range HIGH LEVEL TRIP bistable at approximately 25 percent power.

5.69 **WHEN** at approximately 150 MWe, **THEN** perform the following:

5.69.1 Place the Turbine Drain Selector Switch to CLOSE **AND** verify that the following valves closed:

____ 1. No. 1 Control Vlv Drain, CV-3-3717

____ 2. No. 2 Control Vlv Drain, CV-3-3718

____ 3. No. 3 Control Vlv Drain, CV-3-3719

____ 4. No. 4 Control Vlv Drain, CV-3-3720

____ 5. Cold Reheat Piping Drain, CV-3-3721

____ 6. Cold Reheat Piping Drain, CV-3-3722

____ 7. Turbine First Stage Drain, CV-3-3723

5.69.2 Locally close the following valves:

____ 1. Right Stop Vlv Drn to Cndsr Isol Vlv, 3-90-045

____ 2. Left Stop Vlv Drn to Cndsr Isol Vlv, 3-90-046

____ 5.69.3 Verify or align Steam Generator Blowdown for at power operation using 3-OP-071, Steam Generator Blowdown Recovery System.

NOTE

To minimize secondary plant swings induced by grid frequency perturbation, the main turbine load should be transferred from the governor to the load limit.

____ 5.69.4 With Shift Manager concurrence, transfer main turbine load from the governor to the load limit using 3-OP-089, Main Turbine. (N/A if turbine load is to remain on the governor)

INIT

5.69.5 Turn on the Power System Stabilizer as follows:

CAUTION

If MVARS or voltage swings occur upon energization of PSS, immediately turn off PSS, and notify the System Engineer.

NOTE

PSS voltmeter is located inside the Exciter house, inside left side panel, lower left bottom.

____ 1. At exciter housing inside voltage regulator cabinet on the lower left side, check if PSS voltmeter is reading 0 +/– 1 volts.

____ a. **IF** PSS voltmeter is NOT reading 0 +/– 1 volts, **THEN** do not energize PSS **AND** contact System Engineer.

____ 2. At 3C02, verify exciter voltage **AND** bus voltage stable.

____ 3. Place PSS Control Switch to ON **AND** verify Red light ON and Green light OFF.

NOTE

All communications with the Transmission System Operator (TSO) are required to be logged in the Unit Narrative Log.

4. **IF** the Power System Stabilizer (PSS) is disabled or will not turn ON, **THEN** perform the following:

____ a. Notify Transmission System Operator (TSO) that the PSS is not in service, and obtain permission to continue with startup.

____ b. Request TSO to notify the Manager of Power Supply Operations Engineering that the PSS is out of service.

____ c. Keep TSO updated on PSS status during startup and expected time for PSS return to service.

5.70 Perform the following prior to exceeding 30 percent power:

____ 5.70.1 Ensure the Steam Generators are within limits by completion of Attachment 2 of 0-NCOP-002, Secondary Chemistry Startup and Shutdown Guidelines. Power ascension to 50% power may proceed provided necessary action is being taken to correct out of spec Steam Generator parameters.

INIT

5.70.2 **IF** the reactor has not operated at 30 percent power since the last refueling, **THEN** perform the following:

1. Initiate two thermal calorimetrics:

____ a. Adjust the power range NIS to be within 2 percent of the calorimetric power using 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations.

____ b. Record NIS intermediate range currents in the Remarks Section of the calorimetric procedure.

____ 2. **IF** a Zero Power flux map was not performed **OR** a 30 percent flux map is desired, **THEN** perform the map using 0-OSP-059.13, Core Map Analysis and Peaking Factors Verification.

3. **IF** the Max Power from the most recent flux map is greater than 50 percent, **THEN** mark the remainder of this step N/A.

____ a. Increase Reactor Power to Max Power allowed by the flux map at a rate of approximately 3 percent per hour.

b. Initiate two thermal calorimetrics.

____ (1) Adjust the power range NIS to be within two percent of the calorimetric power using 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations.

____ (2) Record NIS currents in the Remarks Section of the calorimetric procedure.

____ c. Perform a power distribution map using 0-OSP-059.13, Core Map Analysis and Peaking Factors Verification.

____ d. **IF** the allowed power as determined by this flux map is less than 50 percent, **THEN** repeat Substeps 5.70.2.3.a through 5.70.2.3.c.

____ 4. **IF** the power range high flux trip setpoint is less than or equal to 55 percent **AND** the peaking power flux map indicates maximum power is less than 80 percent, **THEN** reset the power range high flux trip setpoint to 85 percent.

____ 5.70.3 **WHEN** power is approximately 30 percent, **THEN** place the control switch for the associated feedwater pump recirculation valves on the operating feedwater pump to CLOSE/AUTO and verify the recirculation valve green closed lights are ON.

____ 5.70.4 **IF** reactor has been operating at reduced power (less than 90 percent) for greater than 14 days, **THEN** consult with Reactor Engineering before further increases are made.

INIT

5.71 Perform the following to continue a slow increase in reactor power:

____ 5.71.1 **WHEN** an increase in Reactor Power above 30 percent is authorized, **THEN** slowly increase reactor power as directed by Reactor Engineering by dilution using 0-OP-046, CVCS – Boron Concentration Control, **OR** by withdrawing control rods.

____ 5.71.2 As reactor power rises, increase turbine load to maintain Tref within 3°F of Tavg.

____ 5.71.3 Monitor S/G levels to ensure proper automatic S/G level control.

____ 5.72 Verify 3-OSP-089, Main Turbine Valves Operability Test, Step 7.1.2 was satisfactorily completed during turbine startup **AND** sign off completion of the test in the Surveillance Tracking Program (Record 1679).

____ 5.73 Verify the hydrogen gas dryer in service using 3-NOP-090, Gas Evolutions in the Main Generator.

CAUTION

After MSRs have been placed in service, deviations from the normal lineup could result in undesirable thermal effects on the main turbine. In particular, isolation of MSR reheater sections will cause LP turbine shell temperature to decrease, resulting in differential turbine expansion.

____ 5.74 **WHEN** at approximately 200 MWe, **THEN** place the MSRs in service using 3-OP-072.1, Moisture Separator Reheaters.

NOTE

The Heater Drain Pumps should not be started until chemistry samples verify that feedwater and steam generator chemistry will remain within specifications per 0-NCOP-002, Secondary Chemistry Startup and Shutdown Guidelines.

5.75 **IF** Heater Drain System water quality is acceptable, **THEN** perform the following:

____ 5.75.1 Place the first Heater Drain pump in service using 3-NOP-081, Heater Drain Pumps, at approximately 250 MWe. (N/A if not desired at this time, as directed by the Shift Manager.)

____ 5.75.2 Start the second condensate pump using 3-OP-073, Condensate System, at approximately 275 MWe.

____ 5.75.3 Verify heater drain flow (FI-3-1404 local) is approximately 2000 gpm. (N/A if Heater Drain pump start was not desired at this time.)

____ 5.75.4 Place the second Heater Drain pump in service using 3-NOP-081, Heater Drain Pumps, at approximately 300 MWe.

INIT

5.76 **IF** Heater Drain pump start is delayed due to water quality, or as directed by the Shift Manager, **THEN** perform the following: (N/A if the Heater Drain pump was started in Subsection 5.75.)

____ 5.76.1 Start the second condensate pump using 3-OP-073, Condensate System, at approximately 275 MWe.

____ 5.76.2 Start the third condensate pump using 3-OP-073, Condensate System, at approximately 360 MWe.

____ 5.76.3 **WHEN** Heater Drain System water quality is acceptable and as directed by the Shift Manager, **THEN** place both Heater Drain pumps in service using 3-NOP-081, Heater Drain Pumps.

____ 5.77 Verify ATWS Mitigating System Actuation Circuitry (AMSAC) automatically arms when turbine power (first stage) is greater than or equal to 40 percent.

NOTE

If the second feedwater pump is not going to be placed in service, then reactor power can be raised to 55 percent with a single feedwater pump in service. Power must be reduced to 45 to 50 percent when it is desired to place the second feedwater pump in service.

CAUTION

Due to recent design changes to the FRVs and the ongoing fine tuning of the control circuits, the FRVs may not respond as expected after the second feed pump is started. Manual feed control may be necessary if the control system does not respond as expected after starting the second feedwater pump.

____ 5.78 **IF** desired and steam generator level is on program, **THEN** place the second S/G Feedwater Pump in service using 3-NOP-074, Steam Generator Feedwater System.

____ 5.78.1 Record MWe SGFP placed in service: _____

____ 5.78.2 Verify both running pumps have approximately equal running amps.

____ 5.78.3 Place the S/G FD Pump Turbine Runback switch to the NORMAL position.

INIT

5.79 **WHEN** Reactor Power is greater than 45 percent, **THEN** perform the following:

____ 5.79.1 Verify that the POWER BELOW P-8 status light on VPA is OFF.

____ 5.79.2 Verify Turbine Overspeed Protection amber 20 percent load light is out.

NOTE

Reactor Protection System design precludes testing of the RCP Breaker Loss of Flow (1/3) logic function in accordance with 3-OSP-049.1 (STP 2384 and 2386) prior to entering the applicable Mode and plant condition (Mode 1, above P-8).

_____ 5.79.3 **IF** the RCP Breaker Loss of Flow (1/3) logic function surveillance (STP 2384 and/or 2386) is expired, **THEN** log the surveillance as a missed surveillance and comply with Technical Specification. 4.0.3. (Reference CR 2008-20641)

5.80 Perform the following prior to exceeding 50 percent power:

____ 5.80.1 Verify Steam Generator chemistry parameters are within limits by completion of Attachment 2 of 0-NCOP-002, Secondary Chemistry Startup and Shutdown Guidelines.

____ 5.80.2 Verify the Axial Flux Difference is within the RAOC Operational Space, Plant Curve Book Section VII, Figure 1.

____ 1. **IF** QPTR determination has not been performed within 7 days, **THEN** perform 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio, as required by Technical Specification 4.2.4.1.

5.80.3 **IF** the reactor has not operated at 50 percent power since the last refueling, **THEN** perform the following:

____ 1. Perform two thermal calorimetrics using 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations

____ 2. Adjust the Power Range NIS to be within 2 percent of the calorimetric power using 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations.

____ 3. Record NIS currents in the Remarks Section of 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations.

5.80.4 **IF** a Power Range NIS Detector has been replaced with a detector of a different kind or model **OR** the reactor has not operated at 50 percent power since the last refueling, **THEN** perform the following:

____ 1. Perform a power distribution map using 0-OSP-059.13, Core Map Analysis and Peaking Factors Verification.

INIT 5.80.4 (Cont'd)

NOTES

- *The new detector currents are required to be entered into the Plant Curve Book, Section V, Figure 5, prior to increasing power.*
- *The voltages and currents need to be installed at this time.*

____ 2. Perform an NIS detector calibration using 0-OSP-059.15, Nuclear Instrumentation Channel Check and Calibration.

3. **IF** the power range high flux trip setpoint is less than or equal to 85 percent, **THEN** reset the power range high flux trip setpoint to one of the following as determined by the Reactor Engineering Supervisor:

____ a. The limiting power as determined by the most recent fluxmap

OR

____ b. 108 percent

____ 5.80.5 **IF** a second feedwater pump is to be placed in service, **THEN** ensure the pump is placed in service prior to exceeding 50 percent reactor power.

____ 5.80.6 Ensure flow through the Turbine Lube Oil Conditioner (Turbotoc) is returned to normal while continuing with this procedure.

NOTES

- *Power increase may continue at this time.*
- *Excessive drifting may occur with either #1 or #3 Turbine Control Valve servos when operating at 60 percent power for a long duration. Drifting may be stabilized by operating at a power level from 56 to 58 percent if possible when required for a long duration.*
- *TCV #3 has a travel stop set at approximately 65 percent of full stroke.*
- *TCV #2 has a travel stop set at 100 percent power.*

5.80.7 **IF** the reactor has not operated at 65 percent power since the last refueling **AND** Annunciator B 2/2 or B 2/3 alarms before 65 percent power, **THEN** stop the power increase and perform the following:

____ 1. Perform 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio.

____ 2. Perform a power distribution map using 0-OSP-059.13, Core Map Analysis and Peaking Factors Verification.

INIT 5.80.7 (Cont'd)

NOTES

- *The new detector currents are required to be entered into the Plant Curve Book, Section V, Figure 5, prior to increasing power.*
- *Only the voltages and currents need to be installed in the NIS at this time.*

____ 3. Perform an NIS detector calibration using 0-OSP-059.15, Power Range Nuclear Instrumentation Channel Check and Calibration.

4. **IF** the power range high flux trip setpoint is less than or equal to 85 percent, **THEN** reset the power range high flux trip setpoint to one of the following as determined by the Reactor Engineering Supervisor:

____ a. The limiting power as determined by the most recent flux map

OR

____ b. 108 percent

CAUTIONS

- ***If Annunciator B 2/2 or B 2/3 alarms between 65 and 75 percent power during the first power ascension following refueling, stop the power increase and perform Subsection 5.85.***
- ***After MSRs have been placed in service, deviations from the normal lineup could result in undesirable thermal effects on the main turbine. In particular, isolation of MSR reheater sections will cause LP turbine shell temperature to decrease, resulting in differential turbine expansion.***

SHIFT MANAGER VERIFICATION POINT

5.81 Verify the following prior to exceeding 450 MWe:

5.81.1 The MSRs have been placed in service using 3-OP-072.1, Subsection 5.2 (i.e., MSR timing has completed, and MSR steam supply MOVs are open).

NOTE: *This hold point does NOT prevent the performance of subsequent procedure steps which will NOT increase load above 450 MWe.*

Shift Manager: _____ _____ / _____

Signature *Print* *Date*

INIT

____ 5.82 Perform the following at 450 MWe, following any Chemistry holds: (N/A at Operations Management discretion.)

INIT

____ 5.82.1 Ensure both Heater Drain Pumps are operating using 3-NOP-081, Heater Drain Pumps.

____ 5.82.2 Verify Heater Drain flow (FI-3-1404 local) is approximately 3000 gpm.

____ 5.83 Prior to exceeding 70 percent power, verify that the MTC limits of Technical Specification 3.1.1.3 are met by confirming that STP #199 was completed this cycle.

____ 5.84 **WHEN** between 540 and 570 MWe, **THEN** place the control switch for the associated Feedwater Pump Recirculation valves for the second feedwater pump started to CLOSE/AUTO.

____ 5.84.1 Verify the green closed lights for the recirculation valves for both feedwater pumps are ON.

NOTE

Vibration alarms may be encountered during power ascension on the #1 turbine bearing. This is due to steam flow conditions and occurs mostly between 70 and 80 percent unit power level. Vibration amplitudes have been recorded up to 5 mils and may cause alarming in the Control Room. This does not represent an equipment problem and will disappear with increasing power level beyond 80 percent.

5.85 **IF** the reactor has **NOT** operated at 80 percent power since the last refueling outage, **THEN** perform the following prior to exceeding 80 percent power:

NOTE

If equipment limitations or MTC Control required sustained reduced power or operation, the 80 percent flux map and calorimetric may be performed at a lower power.

____ 5.85.1 Initiate two thermal calorimetrics.

____ 1. Adjust the Power Range NIS to be within 2 percent of the calorimetric power using 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations. (N/A if adjustments not required)

____ 2. Record NIS intermediate range currents in the Remarks Section of 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations.

____ 5.85.2 Request Reactor Engineering determine the 100 percent reactor power Loop deltaT using the calorimetric **AND** NIS current data in current Data Sheet, Full Power deltaT Extrapolation and Measurement.

____ 5.85.3 Transmit the 100 percent Loop deltaT values to I&C.

INIT

5.85.4 **IF** Annunciator B 2/2 or B 2/3 has alarmed above 65 percent power, **THEN** perform the following:

____ 1. Perform 3-OSP-059.10, Determination of Quadrant Power Tilt Ratio.

____ 2. Perform a power distribution map using 0-OSP-059.13, Core Map Analysis and Peaking Factors Verification.

NOTES

- *The new detector currents are required to be entered into the Plant Curve Book, Section V, Figure 5, prior to increasing power.*
- *Only the voltages and currents need to be installed in the NIS at this time.*

____ 3. Perform an NIS detector calibration using 0-OSP-059.15, Nuclear Instrumentation Channel Check and Calibration.

____ 5.85.5 **IF** the power range high flux trip setpoint is less than 108 percent, **THEN** reset power range high flux trip setpoint to 108 percent after I&C has updated the Eagle-21 parameters.

____ 5.86 Stop the third condensate pump using 3-OP-073, Condensate System. (N/A if not running or not desired at this time.)

____ 5.87 **IF** required by special instruction letter, **THEN** initiate augmented surveillance using 0-OSP-040.10, Implementation of Augmented Surveillance, prior to exceeding Threshold Power.

5.88 Prior to exceeding 90 percent power, perform the following:

5.88.1 Perform one of the following:

____ 1. Verify ALL Control and Shutdown Rods are aligned within 12 steps from the Group Step Demand position.

OR

____ 2. Verify less than 1 hour since last rod motion **AND** that continuing to maneuver the plant will require further rod motion.

OR

____ 3. Hold reactor power less than 90 percent until ALL Control and Shutdown Rods are aligned within 12 steps from the Group Step Demand position.

____ 5.88.2 **IF** a Travel Stop is installed on TCV #2, **THEN** Station an observer at TCV #2 to verify proper Stop engagement with valve arms as power is raised to 100 percent.

____ 1. **IF** proper engagement is NOT observed, **THEN** refer to 3-OP-089, Main Turbine, Section 7.6, Adjustment of Travel Stop on the 3-10-035 Valve, to adjust the TCV #2 Travel Stop.

INIT

NOTES

- *Steady state full power operation should be 100 percent (99.8 percent to 100.0 percent) as read on daily calorimetric, DCS hourly heat rate report, or NIS Power Ranges. However, routine monitoring of these indications should be utilized to maintain the indicated power less than or equal to 100 percent/2300 MWth without reliance on the specified tolerance.*
- *Enclosure 3 provides instructions for reactivity manipulation using control rods or turbine control valves when at or near full power.*
- *Enclosure 4 provides instructions for maintaining reactor power below 100 percent to prevent exceeding the Tech Spec power limit.*

____ 5.89 **IF** the reactor has not operated at full power since the last outage **AND** plant changes/modifications were made during the outage that could affect previously understood indication of reactor power (from Engineering input in accordance with 0-ADM-542, Plant Start-up Equipment Monitoring Plan), **THEN** prior to exceeding 98 percent power, ensure the section titled Start-up Monitoring at 98 % Power within 0-ADM-542 is completed satisfactorily. [Commitment Step 2.3.10 - CAPR]

____ 5.90 **WHEN** steady state power conditions have been established, **AND** Tavg - Tref deviation is within 1°F, **THEN** the Rod Control Selector Switch should be placed in AUTO. (N/A if rods are to be left in manual)

5.91 **IF** the reactor has not operated at full power since the last refueling outage, **THEN** perform the following:

____ 5.91.1 Initiate two thermal calorimetrics.

____ 5.91.2 Adjust the Power Range NIS to be within plus or minus 1 percent of the calorimetric power using 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations.

____ 5.91.3 Record NIS Intermediate Range currents in the Remarks Section of 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibrations.

5.92 **IF** the Reactor has **NOT** operated at full power since the last refueling outage, **THEN** notify Reactor Engineering that the following items will be needed:

____ 5.92.1 Perform an NIS calibration using 0-OSP-059.15, Nuclear Instrumentation Channel Check and Calibration.

____ 5.92.2 Perform 0-OSP-040.9, Full Power Critical Boron Concentration Test, **AND** the following as determined by the Reactor Engineering Supervisor:

____ 1. 3-OSP-040.12, At Power Measurement of Moderator Temperature Coefficient (mark N/A if not performed)

____ 2. 3-OSP-040.2, Power Defect Measurement (mark N/A if not performed)

INIT

____ 5.92.3 Perform 3-OSP-040.15, Calorimetric Verification of Reactor Coolant System flow.

____ 5.92.4 Perform 3-OSP-059.5, Power Range Nuclear Instrumentation Shift Checks and Daily Calibration, at greater than 99 percent power and equilibrium reactor conditions **AND** verify the extrapolated full power DeltaT values on Data Sheet, Full Power deltaT Extrapolation and Measurement, are still acceptable.

____ 5.92.5 Complete Intermediate Range Setpoint Check and Calibration using 0-OSP-059.15, Nuclear Instrumentation Channel Check and Calibration.

____ 5.93 Request Reactor Engineering to align MIMS for Mode 1, Steady State Operations, using 3–OP-099, Metal Impact Monitoring System.

5.93.1 **IF** Reactor Engineering is not available, **THEN** place MIMS in service using 3-OP-099, Metal Impact Monitoring System.

____ 5.94 Verify that the Gamma Metric Wide Range percent power meter reads within 1.5 percent of the Westinghouse Power Range Instrumentation when reactor power is at 98.5 to 100 percent.

5.94.1 **IF** a Gamma Metrics channel is **NOT** reading within 1.5 percent of the Westinghouse Power Range Instrumentation, **THEN** have I&C perform 3-PMI-059.2, Gamma Metrics Wide Range Percent of Power Meter Calibration.

5.95 **WHEN** the steam jet air ejector is in service **AND** the hogging ejector is secured, **THEN** perform the following:

____ 5.95.1 Ensure closed, SJAE Main Stm Sply CV-3700 Byp Angle Vlv, 3-30-026.

____ 5.95.2 Ensure closed, SJAE Main Stm Sply CV-3700 Byp Throt, 3-30-027.

____ 5.95.3 Ensure closed, SJAE Main Stm Sply RO-1454 Inlet Isol, 3-30-029.

____ 5.95.4 Ensure closed, SJAE Main Stm Sply RO-1455 Inlet Isol, 3-30-031.

____ 5.96 **IF** the unit is being returned to service following a Cold Shutdown, **THEN** perform a Pressurizer Steam Space Vent using 3-OP-041.2, Pressurizer Operation, for a duration of 96 hours.

____ 5.97 **IF** the unit is being returned to service from Mode 3, **THEN** start up the Reactor Vessel Head Leakage Detection System using 3-NOP-067.01, Reactor Vessel Head Leakage Detection System, and run for approximately 7 days, or as directed by the Shift Manager.

____ 5.98 Verify that MIMS has been returned to service using 3-OP-099, Metal Impact Monitoring System, Attachment 2, Normal MIMS Operating Alignment.

____ 5.99 Verify all log entries specified in Subsection 2.2 have been recorded.

REMARKS: _____

Date/Time Completed: _____ / _____

PERFORMED BY (Print)	INITIALS
K. White	

REVIEWED BY: _____
Shift Manager or SRO Designee

END OF TEXT

ENCLOSURE 1
(Page 1 of 2)

DCS POINTS FOR USE DURING REACTOR STARTUP

If DCS is available, the following list of points is suggested for use by the Operator as an aid during reactor startup. The operator may also choose other available parameters from DCS during reactor startup.

DCS ANALOG CHANNELS	
DCS POINT	**SIGNAL NAME**
TALPACON_A	Tave LP A Control
TALPBCON_A	Tave LP B Control
TALPCCON_A	Tave LP C Control
L462_A	PZR Level Wide Range (LT462)
P444_A	PZR Press Loop (PT444)
P445_A	PZR Press Loop (PT445)
P446_A	Turb First STG PR CHNL 3 (PT446)
P447_A	Turb First STG PR CHNL 4 (PT447)
T453_A	PZR Liquid Temp (TE453)
T454_A	PZR Steam Temp (TE454)
T450_A	PZR Surge Line Temp (TE450)
T452_A	PZR Spray Temp LP B (TE452)
T451_A	PZR Spray Temp LP C (TE451)
P402_A	RCS Narrow Range Press PT402
AUCT_TAV_A	Auctioneered Tave
AUCT_DT_A	Auctioneered Delta T
T_REF_A	T Ref
F6277A_A	SG A Blowdown Flow (FT6277A)
F6277B_A	SG B Blowdown Flow (FT6277B)
F6277C_A	SC C Blowdown Flow (FT6277C)
SGBLDNTL_V	Steam Gen Blowdown Flow Total
SGA_AVL_V	Steam Generator Level A
SGB_AVL_V	Steam Generator Level B
SGC_AVL_V	Steam Generator Level C
P1612X_A	ABS Condenser PSR PT1612X
L1546_A	Containment Sump Level LT1546

ENCLOSURE 1
(Page 2 of 2)

DCS POINTS FOR USE DURING REACTOR STARTUP

DCS ANALOG CHANNELS (Cont'd)	
DCS POINT	**SIGNAL NAME**
N31_A	Source Range NIS CHNL I
N35_A	Intermediate Range NIS CHNL I
N32_A	Source Range NIX CHNL II
N36_A	Intermediate Range NIS CHNL II
N41_PWR_A	N41 % Power
N42_PWR_A	N42 % Power
N43_PWR_A	N43 % Power
N44_PWR_A	N44 % Power
F476X_A	FT476X Diff Pressure
P1616X_A	Feedwater Pressure (PT1616X)
P1606X_A	Steam Pressure Loop A PT1606X
P1607X_A	Steam Pressure Loop B PT1607X
P1608X_A	Steam Pressure Loop C PT1608X
P3414X_A	Turb Control Oil Press PT3414X
TLPWRN_V	Total Power - Nuclear
GENMW_RE_A	Gen Megawatt Rec
GENMW_IN_A	Gen Megawatt IND
T412CD_A	T Cold LP A (TE412C/D)
T411D123_A	T Hot LP A (TE411D1/2/3)
T422CD_A	T Cold LP B (TE422C/D)
T421D123_A	T Hot LP B (TE421D1/2/3)
T432CD_A	T Cold LP C (TE432C/D)
T431D123_A	T Hot LP C (TE431D1/2/3)
GENMVARI_A	Gen MEGAVAR IND

ENCLOSURE 2
(Page 1 of 1)

MANUAL CONTROL OF FEED WATER FLOW CONTROL VALVES IN CONJUNCTION WITH THE FEED WATER BYPASS VALVES

NOTE

The enclosure is intended for use on ONLY one Feed Regulating Valve at any one time.

1. The Shift Manager has authorized controlling a Steam Generator feed regulating valve in accordance with this enclosure.

2. Slowly throttle open on the feed water bypass valve for the applicable feedwater control valve that is to be placed in MANUAL.

3. **WHEN** the applicable feed water flow control valve has started to throttle close in AUTO **AND** the feedwater bypass valve is demanded approximately 50 percent open, **THEN** stop throttling open on the feedwater bypass valve and allow the feedwater flow control valve to stabilize in AUTO.

4. **WHEN** steam flow and feed flow are matched and Steam Generator water level is stable, **THEN** place the applicable feed water flow control valve in MANUAL.

5. Control feed flow as required using the feed water bypass valve for fine control adjustments and manual control of the feed water flow control valve as required.

6. **WHEN** conditions that require manual control are no longer present, **THEN** verify that steam flow and feed flow are matched and place the applicable feed water flow control valve in AUTO.

7. Slowly throttle closed on the applicable feedwater bypass valve and observe that the applicable feed water flow control valve opens in AUTO to maintain steam generator water level.

8. When the applicable feedwater bypass valve is full closed, inform the Shift Manager that the Feed Water System has been restored to normal operation.

ENCLOSURE 3
(Page 1 of 2)

REACTIVITY MANAGEMENT AT OR CLOSE TO FULL POWER

NOTE

This enclosure section is intended for use during manipulations involving Rod Control operations. It is not intended to supplant other procedural requirements.

Rod Motion

CAUTIONS

- ***Inserting or withdrawing control rods must be done in a deliberate, carefully controlled manner, while closely monitoring the reactor response. Even small changes in control rod position represent significant reactivity effects.***
- ***Efforts must be made to predict the results of rod motion in advance if possible. The Plant Curve Book, Section 2, may be used to predict results.***
- ***Whenever control rods have automatically inserted, full understanding of the reason for the insertion must be evaluated prior to restoring the rods to the previous position.***

1. Verify control rod position change is needed.
2. Determine direction and magnitude to adjust control rods.
3. Withdrawal of control rods should be limited to 5 steps maximum at any given time.
4. The Unit Supervisor will authorize control rod position changes and concurrent reactivity manipulation.

CAUTION

The following plant indications shall be closely monitored during and after the manipulation, until steady state operation is achieved.

- *Reactor power*
- *SUR*
- *Tavg*
- *Axial Flux*
- *Rod Position (RPI and Bank Demand)*

5. Adjust control rod position as determined in Step 2.
6. Monitor plant indications to verify proper expected plant response to control rod adjustment.
7. Additional control rod motion should continue only after plant parameters have been evaluated and the need for further control rod withdrawal or insertion is established.

ENCLOSURE 3
(Page 2 of 2)

REACTIVITY MANAGEMENT AT OR CLOSE TO FULL POWER

NOTE

This enclosure section is intended for use during manipulations involving Turbine Control Valve operations. It is not intended to supplant other procedural requirements.

Turbine Control Valve Motion

CAUTIONS

- ***Increasing or decreasing turbine load using turbine throttle valve motion, when close to full power, must be closely monitored to ensure the expected response is obtained. Very small changes in turbine valve position result in significant changes in RCS temperature, reactor power and reactivity.***
- ***Whenever turbine control valve motion has occurred, without operator input, the valves may be restored to the previous position based on calorimetric or NIS power indications with Unit Supervisor authorization.***

1. Verify a turbine control valve change is needed.
2. Determine direction and magnitude to adjust turbine control valves.
3. The Unit Supervisor will authorize turbine control valve position change and concurrent reactivity manipulation.

CAUTION

The following plant indications shall be closely monitored during and after the manipulation, until steady state operation is achieved.

- *Reactor Power*
- *Tavg*
- *Control Oil Pressure*
- *Turbine Control Valve position*
- *MWe Load changes*
- *Turbine first stage pressure*
- *Condenser Vacuum*

4. Adjust turbine control valve position as determined in Step 2.
5. Monitor plant indications to verify proper expected plant response to turbine control valve adjustment.
6. Additional turbine control valve adjustments should continue only after plant parameters have been evaluated and the need for further turbine control valve adjustment is established.

ENCLOSURE 4
(Page 1 of 1)

MAINTAINING REACTOR POWER BELOW 100 PERCENT TECH SPEC LIMIT

During full power operation, reactor power should be maintained below 100 percent using the following instructions based on 0-ADM-200, Conduct of Operations:

1. Reactor Power shall be maintained as follows:

   a. Prompt corrective action is required to reduce thermal power whenever discovered to be above 2300 MWth. The 8-hour average power level shall not exceed 2299.9 MWth.

   b. For steady state full power operation, ensure the hourly indicated Reactor Power is between 2296.6 and 2299.9 MWth (99.85 to 99.99%) on the DCS Hourly Heat Rate Report. Routine monitoring of alternate power indications shall be used as a tool to ensure the hourly indicated Reactor Power remains less than or equal to 99.99% and 2299.9 MWth on the DCS Hourly Heat Rate Report. Alternate power indications to be monitored include, but are not limited to, RCS Delta T, Tave-Tref, MWe, first stage pressure, turbine valve position, circulating water temperature, feed flow, condenser vacuum, and Calorimetric power. [Commitment Step 2.3.10 - CAPR]

   c. **IF** the DCS hourly heat rate report exceeds 100%, **THEN** perform the following:

      1. Ensure the 8-hour average Reactor Power will remain below 2299.9 MWth.

      2. Notify the AOM.

      3. Generate a Condition Report to document the event.

   d. If a planned evolution (blowdown flow change, AFW pump run, etc.) is expected to cause a transient increase in reactor power that could exceed the licensed power limit (100%), then action should be taken to reduce power prior to the evolution.

2. Increasing Reactor Power caused by plant secondary transients which would cause either the DCS hourly heat rate report to exceed 100.00 percent or the instantaneous power level to exceed 102 percent (i.e., CV-2011 opening, large steam leak, turbine control problem, AFW actuation, etc.) shall be turned and reduced below 100 percent by a reduction in steam demand/turbine load.

3. Increasing Reactor Power caused by a reduction in boron concentration which would cause either the DCS hourly heat rate report to exceed 100.00 percent or the instantaneous power level to exceed 102 percent shall be turned and reduced below 100 percent by control rod insertion.

ATTACHMENT 5
(Page 1 of 1)

OPERATION OF THE STEAM DUMP TO ATMOSPHERE CONTROLLERS

A. **To Go to MANUAL from AUTO Mode of Operation**

1. To place the controller in MANUAL, press the M key (Yellow LED) until the key illuminates indicating MANUAL mode of operation.

2. Note: When the controller is in AUTO, the MANUAL setpoint follows automatically so no adjustments are necessary prior to placing the controller in MANUAL.

B. **Adjusting Output in MANUAL Mode**

1. To raise output on a controller in MANUAL, press the MV Increase key on bottom right of controller (arrow points to the right).

2. To reduce output on a controller in MANUAL, press the MV Decrease key on bottom left of controller (arrow points to the left).

C. **To Go to AUTO from MANUAL Mode of Operation**

1. Match controller setpoint (SV1) with Steam Pressure (PV1) indication using the SV Decrease key on the right side of the controller (arrow points down) OR the SV Increase key on the right side of the controller (arrow points up), as appropriate.

2. Depress the A key (Green LED) on the controller until the key illuminates.

3. Observe the valve demand indication (MV1) on controller. If necessary to prevent oscillating valve demand, return controller to MANUAL Mode.

D. **Adjusting Output in Auto Mode**

1. To raise the setpoint at which a controller is controlling in AUTO, press the SV Increase key on the right side of the controller (arrow points up).

2. To lower the setpoint at which a controller is controlling in AUTO, press the SV Decrease key on the right side of the controller (arrow points down).

FINAL PAGE

Appendix D	Scenario Outline	Form ES-D-1

Facility: Turkey Point Scenario No.: 1 Op Test No.: 2010-301

Examiners: _____ Candidates: _____ US

_____ _____ RO

_____ _____ BOP

Initial Conditions: Mode 1, 100% Power, MOL.

Turnover: Equipment OOS: Breaker 3AB18 for 3B2 Circ water pump is racked out due to breaker failure. Shift Manager has received notification that conditions for a Grass Influx are favorable and has performed a Grass Influx evaluation.

Immediately after turnover perform TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3 starting at step 7.3.9. All previous steps have been complete. The Shift Manager has granted permission to perform the test. Operators required for this evolution have been briefed and are in the field.

Maintain 100%

Online risk – green

B train protected both units

Event No.		Event Type*	Event Description
1	TFKC882A=T	(TS) SRO	TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3. During the test, the valve will fail to close and will be declared inoperable. The SRO enters LCO 3.7.3.b Action c.
2	TFBVSHRL=T	(C) RO (C) SRO	Charging pump 3C breaker trips, the RO will respond using the ARP and 3-ONOP-47.1 and start another Charging Pump.
3	TFE2D22T=T	(C) BOP (C) SRO (TS) SRO	Breaker 3AD06 opens resulting in a loss of power to the 3D 4kv bus. The BOP will respond using 3-ONOP-4.5 or 3-OP-005 to energize 3D 4kv bus from the 3A 4kv bus. The SRO will enter LCO 3.7.3.a Action a
4	TFUZ10BO T	(N) BOP	The B Heater Drain Tank High Level Control Valve, CV-3-1510B Fails Open, the BOP will reduce turbine load to maintain power less than100% power. Crew should reduce power less than100% before they attempt to restore Tave using rod withdrawal. Crew may attempt to start the 3C Condensate pump to restore Feed Pump suction pressure to normal using the ARP.
5	TFL10201 T	(C) RO (C) SRO	The control rods continuously insert after the downpower, the crew will enter 3-ONOP-28 and the RO will place rod control in MANUAL.
6	TVHNL1B = 8.7 e-04 3 min ramp	(R) RO	3A RCP #1 seal failure gradually develops, the crew responds using 3-ONOP 41.1. The RO will initiate a boration and the BOP will reduce turbine load using 3-ONOP-100.
7	TFP8SWYD = T TFQ5GAFS = T TFQ5B20A = T TTFG1B86S = T	(M)ALL (C) BOP	A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip, the BOP will manually trip the Main Turbine or close the MSIVs. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker. After power is restored the crew will transition back to E-0.

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

2010-301 Scenario #1

Event 1 – TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3. During the test, the valve will fail to close and will be declared inoperable. The SRO enters LCO 3.7.3.b Action c.

Event 2 – Charging pump 3C breaker trips, the RO will respond using the ARP and 3-ONOP-47.1 and start another Charging Pump.

Event 3 – Breaker 3AD06 opens resulting in a loss of power to the 3D 4kv bus. The BOP will respond using 3-ONOP-4.5 or 3-OP-005 to energize 3D 4kv bus from the 3A 4kv bus. The SRO will enter LCO 3.7.3.a Action a.

Event 4 – The B Heater Drain Tank High Level Control Valve, CV-3-1510B Fails Open, the BOP will reduce power and start the 3C Condensate pump and to restore Feed Pump suction pressure to normal using the ARP.

Event 5 – The control rods continuously insert during the downpower, the crew will enter 3-ONOP-28 and the RO will place rod control in MANUAL.

Event 6 – 3A RCP #1 seal failure gradually develops, the crew responds using 3-ONOP 41.1. The RO will initiate a boration and the BOP will reduce turbine load using 3-ONOP-100.

Event 7 –A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the BOP will manually trip the Main Turbine or close the MSIVs. **Critical Task** The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker. **Critical Task**

2010-301 Scenario 1 Simulator Operating Instructions

Setup

IC-1 (100% MOL)

Place simulator in run

Open and execute lesson Gr 26 NRC Scenario 1.lsn

Manually stop the 3B2 Circulating Water pump

Trigger lesson steps:

- SETUP - 3B2 CWP OOS (actuates TAK4DP = 3)
- SETUP –3A EDG Fails To Start (actuates TAQ5GAFS=T)
- SETUP –3B EDG Output Breaker Fails To Close (actuates TFQ5B20A=T)
- SETUP - Main Turbine Fails to Trip (actuates TFU10005=T)
- SETUP - 3C Cond Pump Fail to Start (actuates TFUZ10BO =T)
- SETUP-Fail Main Turbine Control Valve to close
- Place a stopwatch on the Unit Supervisor desk.
- Hang a Clearance Tag on 3B2 CW Hand Switch

Provide an in progress procedure 3-OSP-206.2 step 7.3.9

Place simulator in freeze.

Provide shift turnover checklists

Perform Simulator Operator Checklist

Event 1 POV-3-4882 & 4883 Stroke Time Test

Initiated immediately after shift turnover.

TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3. During the test, the valve will fail to close and will be declared inoperable. The SRO enters LCO 3.7.3.b Action c.

When the BOP has placed the HS for POV-3-4882 to close, **ensure lesson step EVENT 1 - POV-3-4882 FAIL TO CLOSE is inserted after 60 seconds.** (actuates TFKC882A with a 60 second delay.)

If directed, respond as FS and report local valve position indication section of the test is not required.

If directed, respond as FS/TO and report POV-3-4882 is in mid position and has stopped moving. There is no apparent cause for the failure of the valve.

If directed, respond as SM and acknowledge the failure of POV-3-4882.

If directed, respond as FS/TO and manually close POV-3-4882 isolation valve, 3-50-319, **trigger lesson step EVENT 1 Locally Close 3-50-319, report when complete.**

If directed, respond as WCC if requested to prepare a PWO/Clearance and notify maintenance.

Event 2 Charging pump 3C breaker Trip

Charging pump 3C breaker trips, the RO will respond using the ARP and 3-ONOP-47.1 and start another Charging Pump.

When directed, **trigger lesson step EVENT 2 - 3C Charging Pump Trip** (actuates TVBMBFN 1)

If directed, respond as SNPO and report 3C charging pump motor stopped. If directed to check out breaker 35008, report that it is tripped open, but nothing else appears abnormal.

If directed as SNPO, report an after start inspection of the Charging Pump.that was started by the RCO.

If directed, respond as WCC/TO/FS to rack out breaker 35008, **trigger** lesson step **EVENT 1 - RACK OUT 3C CHG PP BKR** (actuates TAB1POSN = 3).

If directed, respond as WCC if asked to generate PWO, troubleshoot & repair the 3C charging pump.

Event 3 – Loss of 3D 4kV bus

Breaker 3AD06 opens resulting in a loss of power to the 3D 4kv bus. The BOP will respond using 3-ONOP-4.5 to energize 3D 4kv bus from the 3A 4kv bus. The SRO will enter LCO 3.7.3.a Action a.

When directed, trigger lesson step **EVENT 3 - 3AD06 OPENS** (actuates TFE2D22T = T).

If directed, respond as ANPO to locally investigate 3C ICWP. Report back normal conditions for a recently idled pump.

If directed, respond as ANPO to perform post-start checks for 3A ICWP. Report back that pump is operating normally.

If directed, respond as ANPO to locally investigate breaker 3AD05 and/or 3AD06. Report breaker 3AD06 tripped open. 3D 4kV bus is deenergized.

If directed, respond as ANPO/FS to walk down the ICW system to look for leaks. After 4-6 min, report no ICW system leaks are visible.

If directed, respond as TO and report TPCW HXs ICW flow. Click on SCHEMA → COMMON SERVICES → INTAKE COOLING → report TPCW HX ICW total flow as indicated on ICW system mimic (or use default value of 5800 gpm).

If directed, respond as SNPO to report CCW HXs ICW flow. From ICW system mimic, report indicated CCW HX ICW total flow (or use default value of 13600 gpm).

If directed, respond as IST coordinator regarding evaluation of 3C ICWP for flow > 19000 gpm.

If directed, respond as TO and check TPCW supply temperature (TI-3-1432) < 105°F. From ICW system mimic, touch TPCW ♦ & report system temp TE-1472/TI-1432 at top left of TPCW mimic (approx 99°F and stable).

If directed, respond as WCC to troubleshoot & repair breaker 3AD06.

If directed, respond as WCC/FS about 3D 4kV bus, report that the bus is fine for re-energization, but breaker 3AD06 is OOS and needs to be racked out for repair.

If directed, respond as TO/FS to rack out breaker 3AD06, **trigger** lesson step **EVENT 3 - RACK OUT 3AD06** (actuates TAE2D22P = 3).

Report no targets on 3D 4kV bus after reenergization.

EVENT 4 - CV-3-1510B Fails Open

The B Heater Drain Tank High Level Control Valve, CV-3-1510B Fails open due to a air leak on the valve actuator. The BOP may attempt to start the 3C Condensate pump and reduce power to restore Feed Pump suction pressure to normal using the ARP.

If ask to investigate the Heater Drain Tank Valves-report back an air leak on the valve actuator,

When directed, **trigger lesson step EVENT 4 CV-3-1510B Fails Open** (actuates TFL10201 =T)

Event 5 – Continuous Rod Insertion

The control rods continuously insert during the downpower, the crew will enter 3-ONOP-28 and the RO will place rod control in MANUAL.

When an insertion demand is present, **ensure lesson step EVENT 5 Control Rods Continuous Insertion** (actuates TFL10201 T)

US should request a caution tag be placed on the rod control in/out control switch

Event 6 – 3A RCP #1 SEAL FAILURE

3A RCP #1 seal failure gradually develops, the crew responds using 3-ONOP 41.1. The RO will initiate a boration and the BOP will reduce turbine load using 3-ONOP-100.

When directed by the lead examiner, **trigger lesson step EVENT 6 – 3A RCP #1 seal failure.** (actuates TVHNL1B = 8.7 e-04 3 min ramp)

If directed, wait 3 to 5 minutes and respond as SNPO, "Seal Injection flow to all RCPs is 8 gpm."

If directed, respond as System when called about load reduction.

If directed, respond as SM when told to review 0-EPIP-20101 & 0-ADM-115 for notification requirements. State that the NRC Resident will be notified of the fast load reduction.

If directed, respond as chemistry to take samples. No response back required.

If directed, respond as FS/TO to align aux steam using attachment 1. No response back required.

3-ONOP-100

If called, respond as system dispatcher; acknowledge Unit 3 load reduction.

If directed, respond as SM when told to review 0-EPIP-20101 & 0-ADM-115 for notification requirements. State that the NRC Resident will be notified of the fast load reduction.

If directed, respond as chemistry to take samples. No response back required.

If directed, respond as FS/NSO to align aux steam using attachment 1. No response back required.

If the crew decides to use rods during the power reduction remove the **Control Rods Continuous Insertion** (actuates TFL10201 Tfailure.

Event 7 –Loss of All AC)

Event 7- A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the BOP will manually trip the Main Turbine or close the MSIVs. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

When directed by the lead examiner, **trigger lesson step EVENT 6 LOSS OF ALL AC** **(actuates TFP8SWYD = T, TFQ5GAFS = T, TFQ5B20A = T, TFG1B86S = T, TCE2E01T=-1, TCE2E07T=T, & TCE6DR5C=F)**

If directed, respond as FS/SNPO; acknowledge direction to locally open 3-MOV-843A&B. After 3 minutes **TRIGGER lesson step EVENT 7 - LOCALLY OPEN 3-MOV-843 A and B** **(actuates TFMVV01O & TFMVV02O=T)**

If directed, respond SNPO, **trigger lesson step EVENT 7 Locally Isolate RCP Seals** **(actuates TAHN97A, B & C=0)** Report when complete.

If directed, respond as FS/ANPO, acknowledge direction to locally reset 3A EDG lockout relay. After 2 minutes **TRIGGER lesson step EVENT 7 - ATTEMPT LOCAL RESET OF 3A EDG** (actuates TCQ586AR). Report back lockout will not reset.

If directed, respond as FS/ANPO to take 3A EDG MCSS to OFF & rack out 3AA20, **trigger lesson step EVENT 7 – 3A EDG MCSS OFF & RO 3AA20** (actuates TAQ5LRSA=0 & TAQ5A20P=3). Report when complete.

If directed, respond as FS/ANPO after 1 to 2 minutes report the 3"B" EDG is running but the output breaker 3AB20 is open.

If directed, respond as WCC, after 10 minutes report Electrical Maintenance has performed a visual inspection of output breaker 3AB20 and can find no visible problem

When an operator places the control switch for the B EDG Breaker to CLOSE, ensure lesson step **Event 7 - 3B EDG Output Breaker Closes auto inserts**

If directed, respond as FS/TO, acknowledge direction to reduce DC bus loading as necessary using ATTACHMENT 3.

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	--
1. Total malfunctions (5–8)	7
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	5
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	2

Appendix D	Required Operator Actions	Form ES-D-2

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 1 Page 1 of 2

Event Description: The crew will perform TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3. During the test, the valve will fail to close and will be declared inoperable.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs 3-OSP-206.2 section 7.3 actions.
	BOP	Places 3A TPCW Hx Isolation Valve POV-3-4882 handswitch to CLOSE.
After the BOP places POV-3-4882 HS to close, direct facility operator to trigger lesson step EVENT 1 - POV-3-4882 FAIL TO CLOSE is inserted after 60 seconds. (actuates TFKC882A with a 30 second delay.)		
		NOTE *The tested Intake Cooling Water Valves are operable if all test values are within the specified ranges.*
		Examiner Note: TPCW Hx Isolation Valve POV-3-4882 and 4883 will have a significant delay from the time of switch actuation until the time the valve begins to stroke. Acceptable stroke time is approximately 150 seconds, (126-210 seconds)
	BOP	Observes POV-3-4882 does not fully close
	SRO	Declares A ICW INOPERABLE and enters LCO 3.7.3.b action c 1. May attempt to manually/ locally re-open POV-3-4882. 2. May have the ANPO locally close 3-50-319. 3. May have the fuses pulled for POV-3-4882. If uses option 1 will remain in the LCO. Options 2 and 3 will allow him to exit the LCO.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 1 Page 2 of 2

Event Description: The crew will perform TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3. During the test, the valve will fail to close and will be declared inoperable.

Time	Position	Applicant's Actions or Behavior
		Examiner Note: **3.7.3 The Intake Cooling Water System (ICW) shall be OPERABLE with:** **b. Two ICW headers.** **c. With only one ICW header OPERABLE, restore two headers to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.**
When the SRO has addressed Tech Specs for ICW, direct facility operator to trigger lesson step EVENT 2 – 3C Charging Pump Trip.		

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 2 Page 1 of 2

Event Description: Charging pump 3C breaker trips, the crew will respond using the ARP or 3-ONOP-47.1 and start another Charging Pump.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 2 - 3C Charging Pump Trip" (actuates TVBMBFN 1).		
		A23 CHARGING PUMP C TRIP CAUSES: 1. Mechanical failure of pump 2. Loss of suction source to pump 3. Electrical failure
	RO	Observes the trip of the 3C charging pump. Observes annunciator A 6/3, A 6/5, A 5/3
	RO	OPERATOR ACTIONS: 1. Verify alarm by checking the following: a. 3C charging pump red indicator light off. b. Reduced or no charging flow.
		2. Corrective actions: a. Verify adequate suction source by checking: (1) VCT level, LT-3-115, greater than 4% **AND** LCV-3-115C open, **OR** (2) **IF** VCT level less than 4%, **THEN** LCV-3-115B open.
		2. Corrective actions: b. Start any available charging pump to re-establish charging flow **AND** seal injection.
	RO	Manually starts the 3A or 3B Charging Pump.
		2. Corrective actions: c. Place C pump switch to STOP **AND** DO NOT restart.
	RO	Places 3C Charging Pump handswitch to STOP.
	SRO	2. Corrective actions: d. Refer to Tech Spec 3.1.2.1; 3.1.2.2; and 3.1.2.3 e. Refer to 3-ONOP-047.1, Loss of Charging Flow in Modes 1 through 4.
	SRO	Refers to 3-ONOP-047.1, Loss of Charging Flow in Modes 1 through 4.
		Examiner note: With the chief examiner's concurrence when the crew has started a Charging Pump, proceed to Event 3-3AD06 Opens

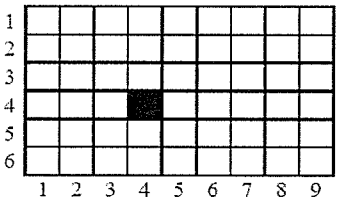
Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 2 Page 2 of 2

Event Description: Charging pump 3C breaker trips, the crew will respond using the ARP or 3-ONOP-47.1 and start another Charging Pump.

Time	Position	Applicant's Actions or Behavior
		NOTE *A plant shutdown using either 3-ONOP-100 or 3-GOP-103 is not desired with a loss of charging because of the high potential of being in an at-power RIL Lo-Lo rod insertion unanalyzed condition.*
		1 Check Any Charging Pumps Running Perform the following to start a charging pump: a. Verify VCT level, LT-3-115, greater than 4% AND LCV-3-115C open. 1) IF unable to open LCV-3-115C, THEN open LCV-3-115B. 2) IF unable to open LCV-3-115B, THEN locally open 3-358, RWST Emer Makeup to Chrg Pumps LCV-3-115B Bypass. 3) IF there is a problem with the VCT level control system, THEN refer to 3-ONOP-046.4, Malfunction of Boron Concentration Control System. b. Verify open Charging Flow to Regen Hx, HCV-3-121. c. Verify open Loop A Charging Isolation, CV-3-310A. d. Start functional charging pumps as necessary to restore pressurizer level. e. Adjust charging pump speed controllers to restore pressurizer level to program. f. Go to Step 3.
	RO	Manually starts the 3A or 3B Charging Pump.
		3 Check Charging Flow Established a. Verify normal expected flow on FI-3-122A, Charging Line Flow
		Examiner note: With the chief examiner's concurrence when the crew has started a Charging Pump, proceed to Event 3—3AD06 Opens

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 3 Page 1 of 4

Event Description: Breaker 3AD06 opens resulting in a loss of power to the 3D 4kv bus. The crew will respond using 3-ONOP-4.5 to energize 3D 4kv bus from the 3A 4kv bus. The SRO will enter LCO 3.7.3.a Action a.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 3 - 3AD06 OPENS" (actuates TFE2D22T T).		
		 Page 22 of 54 Panel I ICW HEADER A/B LO PRESS
	BOP	Observes 3C ICW pump not running Observes breaker 3AD06 OPEN
	RO	Observes annunciator I-4/4
	BOP	OPERATOR ACTIONS: 1. Verify alarm by checking the following: a. Check ICW header pressure indicators, PI-3-1619 and/or -1620 less than or equal to 10 PSIG. (VPA) b. IF operating a single ICW Pump, THEN verify total ICW flow is less than 19,000 gpm.
	BOP	2. Corrective actions: a. Start the standby ICW pump using 3-NOP-019, Intake Cooling Water System. Manually starts the 3A ICW pump.
	BOP	2. Corrective actions: b. Locally check ICW piping **AND** heat exchangers for leaks.
	SRO	2. Corrective actions: c. Refer to 3-ONOP-019, Intake Cooling Water Malfunction.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 3 Page 2 of 4

Event Description: Breaker 3AD06 opens resulting in a loss of power to the 3D 4kv bus. The crew will respond using 3-ONOP-4.5 or 3-OP-005 to energize 3D 4kv bus from the 3A 4kv bus. The SRO will enter LCO 3.7.3.a Action a

Time	Position	Applicant's Actions or Behavior
	BOP	**1** **Check 3D 4KV Bus Lockout Relay - RESET** Perform the following: a. Direct Electrical Maintenance to determine and correct cause of lockout relay actuation. b. **WHEN** cause of 3D 4KV bus lockout relay actuation has been determined and corrected, **THEN** reset lockout relay. c. **WHEN** 3D 4KV bus lockout relay has been reset, **THEN** OBSERVE NOTE PRIOR TO STEP 2 and go to Step 2.
		NOTE *Efforts to re-energize 3A and 3B 4KV buses may restore power to 3D 4KV bus. If the 3D 4KV bus will be used to re-energize 3A or 3B 4KV bus using station blackout tie line, the remainder of this procedure shall not be used.*
	BOP	**2** **Check 3A And 3B 4KV Buses – AT LEAST ONE ENERGIZED** Perform the following: a. Try to re-energize 3A 4KV bus using 3-ONOP-004.2, LOSS OF 3A 4KV BUS. b. Try to re-energize 3B 4KV bus using 3-ONOP-004.3, LOSS OF 3B 4KV BUS. c. Continue with procedure and step in effect.
	BOP	**3** **Disconnect Loads From 3D 4KV Bus** a. Verify 3C Intake Cooling Water Pump breaker, 3AD05 - OPEN b. Verify 3C Component Cooling Water Pump breaker, 3AD04 – OPEN

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 3 Page 3 of 4

Event Description: Breaker 3AD06 opens resulting in a loss of power to the 3D 4kv bus. The crew will respond using 3-ONOP-4.5 to energize 3D 4kv bus from the 3A 4kv bus. The SRO will enter LCO 3.7.3.a Action a

Time	Position	Applicant's Actions or Behavior
	BOP	**4** **Determine Source Of Power For 3D 4KV Bus** a. Check 3A and 3B 4KV buses - BOTH ENERGIZED — a. Perform the following: 1) **IF** 3A 4KV bus is energized, **THEN** go to Step 5. 2) **IF** 3B 4KV bus is energized, **THEN** go to Step 7. b. Consult with Nuclear Plant Supervisor to determine desired source of power for 3D 4KV bus: * 3A 4KV bus **OR** * 3B 4KV bus c. Check desired source of power for 3D 4KV bus - 3A 4KV bus — c. Go to Step 7.
	BOP	**5** **Re-energize 3D 4KV Bus From 3A 4KV Bus** — Go to Step 7. a. Open Feeder To 4KV Bus 3D, 3AB19 b. Open Supply From 4KV Bus 3B, 3AD06 c. Close Supply From 4KV Bus 3A, 3AD01 d. Close Feeder To 4KV Bus 3D, 3AA17
	BOP	Performs actions to energize the 3D 4kv Bus from the 3 A 4kv Bus May match flags for feeder breakers for D Bus.
	SRO	**6** **Go To Step 8**
	SRO	**8** **Verify 3D 4KV Bus - ALIGNED TO AN ENERGIZED BUS** * 3A 4KV bus **OR** * 3B 4KV bus — Perform the following: a. Notify Nuclear Plant Supervisor that 3D 4KV bus cannot be re-energized. b. Continue efforts to re-energize 3D 4KV bus from one of the following: * 3A 4KV bus using Step 5 * 3B 4KV bus using Step 7 c. **WHEN** 3D 4KV bus has been re-energized, **THEN** do Steps 9 and 10. d. Continue with procedure and step in effect.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 3 Page 4 of 4

Event Description: Breaker 3AD06 opens resulting in a loss of power to the 3D 4kv bus. The crew will respond using 3-ONOP-4.5 to energize 3D 4kv bus from the 3A 4kv bus. The SRO will enter LCO 3.7.3.a Action a

Time	Position	Applicant's Actions or Behavior
	SRO	Refers to Tech Specs and determines entry into LCO 3.7.2.a Action a and LCO 3.7.3.a Action a are required.
		Examiner Note: TS LCO and Action for the loss of 3D 4kv Bus
		3.7.2 The Component Cooling Water System (CCW) shall be OPERABLE with: a. Three CCW pumps, and APPLICABILITY: MODES 1, 2, 3, and 4. ACTION: a. With only two CCW pumps with independent power supplies OPERABLE, restore the inoperable CCW pump to OPERABLE status within 30 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable.
		3.7.3 The Intake Cooling Water System (ICW) shall be OPERABLE with: a. Three ICW pumps, and APPLICABILITY: MODES 1, 2, 3, and 4. ACTION: a. With only two ICW pumps with independent power supplies OPERABLE, restore the inoperable ICW pump to OPERABLE status within 14 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable.
		EXAMINER NOTE: Proceed to EVENT 4-B HDT LCV CV-3-1510B fails open.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 4 Page 1 of 2

Event Description: The B Heater Drain Tank High Level Control Valve, CV-3-1510B Fails Open, the crew will reduce power to restore Feed Pump suction pressure to normal using 3-ONOP-100

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step "EVENT 4 - CV-3-1510B Fails Open" (actuates TFL10201 =T)		
		D23 SGFP A SUCTION LO PRESS CAUSES: 1. High strainer ΔP on feed train components 2. Heater drain pump(s) tripped 3. Condensate pump tripped
	BOP	Observes annunciator D 5/3, 6/3, 9/6, and 7/4
	BOP	OPERATOR ACTIONS: 1. Verify alarm by checking feed pump suction pressure PI-3-1627 on console. 2. Verify automatic actions have occurred: a. IF SGFP suction pressure is less than 220 psig, THEN verify Low Pressure Heater Bypass CV-3-2011 - OPEN.
	BOP	3. Corrective actions: a. Start a standby condensate pump.
	BOP	May attempt to start the 3C Condensate pump if feed pump suction pressure is less than 260 psig.
	BOP	b. IF feed pump suction pressure is less than 260 psig, THEN reduce power to reset alarm using 3-ONOP-100, FAST LOAD REDUCTION.
		D34 LP HEATER BYPASS OPEN CAUSES: 1. Low feed pump suction pressure 2. Fast load reduction 3. CV-3-2011 malfunction 4. PT-3-1604 failed low
		CAUTIONS • *Reactor power may increase due to the positive reactivity addition of colder feedwater into the Steam Generators.* • *Reactor power indication may be lower than actual power due to lower Tavg.*

	BOP	OPERATOR ACTIONS: 1. Verify alarm by checking LP Heaters Bypass CV-3-2011 indication. 2. Verify automatic actions have occurred - None.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 4 Page 2 of 2

Event Description: The B Heater Drain Tank High Level Control Valve, CV-3-1510B Fails Open, the crew will reduce power to restore Feed Pump suction pressure to normal using 3-ONOP-100

Time	Position	Applicant's Actions or Behavior
	BOP	3. Corrective actions: a. Maintain reactor power less than 100 percent.
	BOP	Lowers Main Turbine load to maintain reactor power less than 100% using the load limit control switch. Power should be reduced less than 100% before the crew attempts to withdraw rods.
	BOP	3. Corrective actions: b. IF feed pump suction pressure is less than 260 psig, THEN perform the following: (1) Start a standby condensate pump. (2) IF feed pump suction pressure remains less than 260 psig, THEN reduce power to restore suction pressure using 3-ONOP-100. FAST LOAD REDUCTION.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 5 Page 1 of 2

Event Description: The control rods continuously insert during the downpower, the crew will enter 3-ONOP-28 and place rod control in MANUAL.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to ensure lesson step "EVENT 5 - Control Rods Continuous Insertion (actuates TFL10201 T)**, actuates**		
	RO	Observes continuous control rod auto insertion with no demand present. May take rods to manual before below annuciator comes in.
	BOP	Might receive annunciator B 8/1
		B8 ROD BANK A/B/C/D LO LIMIT CAUSES: 1. Control bank A or B below 223 steps 2. Control bank C inserted to within 10 steps of its respective extra low limit 3. Control bank D inserted to within 20 steps of its respective extra low limit
		OPERATOR ACTIONS: NOTE *Normal alarm during reactor startup or shutdown when rods are below the lo insertion limit.* 1. Verify alarm by checking the following: a. Control Rod Position - Insertion Limit recorders (VPA) b. RPI and stepcounters on console. 2. Corrective Actions: a. Stop driving control rods in and perform normal boration restore the rods back above the low limit.
	RO	Places Rod Motion Control Selector to MAN
		EXAMINER NOTE: Auto Makeup to the VCT may occur to RCS Cooldown due to uncontrolled rod insertion.
	RO	Restore the rods back above the low limit if required. May withdraw rods in manual in 2 steps increments to restore temperature or may reduce turbine load to restore temperature.
	RO	2. Corrective Actions: c. Check for possible inadvertent dilution due to valve misalignment in CVCS system d. IF control rod malfunction, THEN refer to 3-ONOP-028, Reactor Control System Malfunction, 3-ONOP-028.1, RCC Misalignment, 3-ONOP-028.2, RCC Position Indication Malfunction, OR 3-ONOP-028.3, Dropped RCC, as appropriate.

	SRO	Directs response using 3-ONOP-028.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 5 Page 2 of 2

Event Description: The control rods continuously insert during the downpower, the crew will enter 3-ONOP-28 and place rod control in MANUAL.

Time	Position	Applicant's Actions or Behavior
	RO	4.0 IMMEDIATE ACTIONS 4.3 Continuous Insertion of an RCC Control Bank 4.3.1 Place the Rod Motion Control Selector switch to the MAN position.
	RO	Places Rod Motion Control Selector to MAN
	RO	Observes continuous control rod auto insertion has stopped.
	RO	5.0 SUBSEQUENT ACTIONS 5.3 Continuous Insertion of an RCC Control Bank 5.3.1 Adjust rods or reduce turbine load as determined by the Shift manager to restore Tavg equal to Tref. 5.3.3 Compare rod position to control rod insertion limits using the Rod Position Bank Recorders (VPA) or using the Plant Curve Book, Section VII, Figure 3.
	RO	Positions Control Rods as directed to restore RCS Temperature. Should withdraw rods in 2 step increments.
	SRO	Requests a caution tag be placed on the Rod Control Switch.
		EXAMINER NOTE: With chief examiner's concurrence proceed to Event 6-3A RCP #1 Seal Failure

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 6 Page 1 of 10

Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior
Direct facility operator to trigger lesson step, EVENT 6 – 3A RCP #1 seal failure. (actuates TVHNL1B = 8.7 e-04 3 min ramp)		
	RO	Notes increasing trend on FR-3-154A
	BOP	Verifies alarm A 1/5 and 6/5
		CAUTION *Containment entries shall NOT be performed when there are indications of an RCP seal package failure until the reactor is shutdown and RCS pressure/temperature is reduced to minimize leakage.*
		NOTES • *Foldout Page is required to be monitored throughout this procedure.* • *Off-normal RCP Conditions that require shutdown of a RCP shall be verified by cross-checking all RCP parameters.* • *If either 3B or 3C RCPs are stopped by the performance of this procedure, then the associated RCS loop pressurizer spray valve should be closed to prevent back-flow through the valve.*
	SRO	Directs response using 3-ONOP-041.1, RCP Off-Normal.
	CREW	Reviews 3-ONOP-041.1 foldout page actions (see next page)
	RO	1 **Check For Proper Seal Injection Flow** Go to Step 14 • RCP 3A Thermal Barrier ΔP, PI-3-131A - GREATER THAN ZERO INCHES • RCP 3B Thermal Barrier ΔP, PI-3-128A - GREATER THAN ZERO INCHES • RCP 3C Thermal Barrier ΔP, PI-3-125A - GREATER THAN ZERO INCHES • Local Seal Injection Flow Indication - GREATER THAN OR EQUAL TO 6 GPM ON ALL RCPs • ERDADS Seal Injection Flow Indication - GREATER THAN OR EQUAL TO 6 GPM ON ALL RCPs

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 6 Page 2 of 10

Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior

FOLDOUT PAGE FOR PROCEDURE 3-ONOP-041.1

1. **RCP Vibration Assessment Criteria**

   IF motor frame vibration, R-369 (Points 2, 6, 10) is greater than or equal to 3 mils but less than 5 mils, **THEN** contact Engineering to evaluate the condition.

2. **RCP STOPPING CRITERIA**

   IF any of the following RCP limits are reached, **THEN** manually trip the reactor, verify reactor trip using the EOP network **AND** stop the affected RCP.

   - RCP number one seal ΔP - LESS THAN 200 psid.
   - RCP number one seal leakoff temperatures on ERDADS - GREATER THAN OR EQUAL TO 235°F.
   - RCP pump bearing temperature on ERDADS - GREATER THAN OR EQUAL TO 225°F.
   - RCP motor bearing temperature on ERDADS - GREATER THAN OR EQUAL TO 195°F.
   - RCP stator winding temperature on ERDADS - GREATER THAN OR EQUAL TO 248°F Note exception in Foldout Page Item 4.
   - Motor frame vibration, R-369 (Points 2, 6, 10) - GREATER THAN OR EQUAL TO 5 MILS Note exception in Foldout Page Item 4.
   - RCP shaft vibration, R-369 (Points 3, 7, 11) - GREATER THAN OR EQUAL TO 20 MILS Note exception in Foldout Page Item 4.

3. **RCP SEAL CRITERIA FOR STOPPING RCP**

   WHEN the RCP number one seal leakoff flow exceeds 6 gpm, **THEN** perform the following:

   a. Trip the reactor **AND** verify the reactor tripped using the EOP network.

   b. Stop the affected RCP.

   c. Close the applicable RCP Seal Leakoff Isolation Valve 303A, 303B, or 303C.

4. **EXCEEDING VIBRATION OR STATOR TEMPERATURE LIMITS**

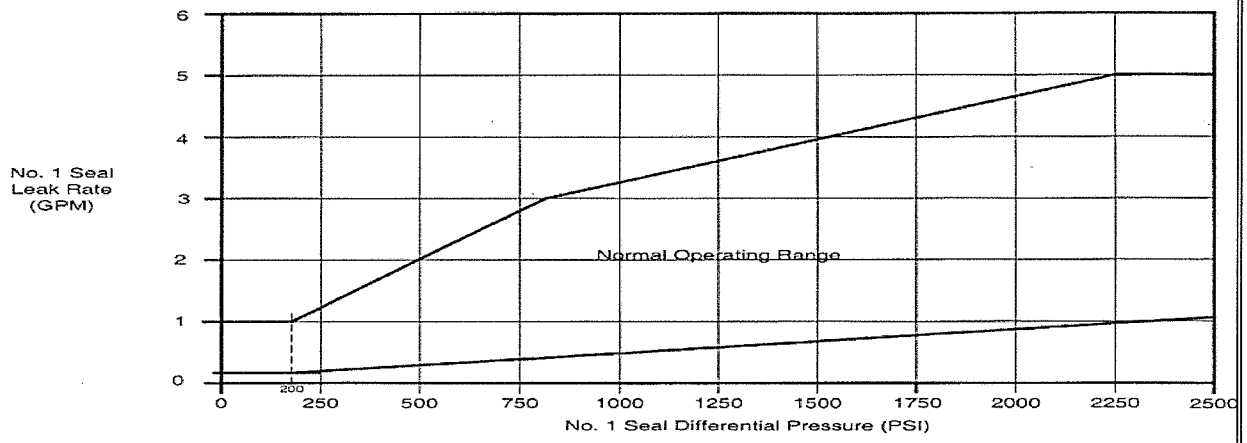
   For the basis of obtaining data for startup, for balancing an RCP, or for shutdown operations; the Electrical Maintenance Supervisor or Component Engineering Supervisor may authorize continued RCP operations with vibration level or stator winding temperature above stopping criteria noted in Foldout Page Item 2. This authorization is required to be obtained prior to starting the RCP.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 6 Page 3 of 10

Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior
	RO	2 **Check Number One Seal Leakoff Flow Within Limits Of Enclosure 1** Observe NOTE prior to Step 16 **AND** go to Step 16.

ENCLOSURE 1
(Page 1 of 1)
NUMBER ONE SEAL LEAKOFF



	RO	Verifies 3A #1 seal leakoff is NOT within the upper limit of enclosure 1.
	SRO	Goes to step 16
		NOTE *An RCP STANDPIPE HI LEVEL alarm is indication of 0.5 gpm flow past the number two seal.*
	RO	16 **Check If Any RCP Number One Seal Leak-off Flow(s), FR-3-154A - GREATER THAN UPPER LIMIT OF ENCLOSURE 1** Go to Step 21
	SRO	Determines 3A RCP #1 Seal Leakoff flow is greater than 5.5

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 6 Page 4 of 10

Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior		
	RO	17	Check RCP Seal Bypass Valve CV-3-307 - CLOSED	Perform the following: a. Manually close CV-3-307 b. Check for corresponding decrease in thermal barrier ΔP c. Perform cross check of all RCP parameters to determine cause of high leakoff flow d. Request diagnostic assistance from the System Engineer **AND** Operations Supervision
	RO	18	Check All RCP Number One Seal Leak-Off Flows On FR-3-154A – LESS THAN 6 GPM	Perform the following: a. Manually trip the reactor **AND** perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure. b. **WHEN** the reactor verified tripped, **THEN** stop the affected RCP(s) c. Close affected RCP Seal Leakoff valve(s) after the pump has stopped: * CV-3-303A for RCP A * CV-3-303B for RCP B * CV-3-303C for RCP C d. Monitor RCDT level for indication of number two seal failure. e. DO **NOT** restart the affected RCP until the cause of the seal malfunction has been determined **AND** corrected. f. Return to Step 3.
	SRO	Determines 3A RCP #1 Seal Leakoff flow is less than 6 gpm.		

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 6 Page 5 of 10

Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior
		19 Check All RCP Number One Seal Leak-Off Flows On FR-3-154A a. RCP number one seal leak-off flow - LESS THAN OR EQUAL TO 5.5 GPM a. Perform the following: 1) Commence unit shutdown using 3-ONOP-100, FAST LOAD REDUCTION. 2) WHEN turbine tripped, THEN trip the reactor. 3) WHEN the reactor is tripped, THEN stop affected RCP(s). 4) Go to Step 19c.
	SRO	Determines 3A RCP #1 Seal Leakoff flow is less than 6 gpm and greater than 5.5 gpm.
	SRO	Transitions to 3-ONOP-100

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 6 Page 6 of 10

Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior
	SRO	Conducts a crew brief to conduct a power reduction, to trip the reactor and trip 3A RCP.
	SRO	Directs response using 3-ONOP-100.
	SRO	**1** **Brief Control Room Personnel Using Attachment 3** (See page 10 for briefing sheet)
	CREW	Reviews 3-ONOP-100 foldout page actions (see next page)
	SRO	Determines 18 gal/% boric acid addition is required approximately 1800 gallons total. Boration rate is approximately 36 gpm. If crew decides to use manual rods, then borate 9 gal/% or approximately 900 gallons. Boration rate should be approximately 18 gpm.
	RO	**2** **Begin Boration** — IF boration is not required, THEN go to Step 3. a. Set the Boric Acid Totalizer to value determined using Attachment 3 b. Set FC-3-113A, Boric Acid Flow Controller to a pot setting of 8.0 c. Place the Reactor Makeup Selector Switch to BORATE d. Place the RCS Makeup Control Switch to START
	CREW	**3** **Notify The Following** • System Dispatcher • Plant personnel using the Page Boost
	RO BOP CREW	**4** **Reduce Unit Load** a. Check for boration effects (reducing Tavg) — a. IF boration is used, THEN wait for effects before starting load reduction. b. Adjust FC-3-113A, Boric Acid Flow Controller to obtain the Attachment 3 desired flow rate c. Initiate and maintain load reduction rate to the target power level d. Monitor load reduction and auto rod control to ensure that the expected Tavg/Tref ΔT identified in Attachment 3 is maintained — d. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.

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Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

1. **3-EOP-E-0 Transition Criteria**

   IF any of the following limits are reached, **THEN** trip the Reactor and Turbine **AND** go to 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION:

   a. RCS Tavg - GREATER THAN 578 °F

   b. RCS Tavg - GREATER THAN Tref by 6 °F

   c. Rod Insertion Limits are exceeded as indicated by:
      - Rod Position Bank D Insertion Limit Recorder (VPA)
      - Stepcounters on console
      - Plant Curve Book Section 7, Figure 3

2. **Notify Chemistry Department**

   WHEN reactor power has changed by greater than or equal to 15 percent, **THEN** notify the Chemistry Department that RCS sampling is required according to Tech Spec Table 4.4-4.

3. **Restore Blender to AUTO**

   WHEN boration is complete, **THEN** restore the Blender to AUTO as follows.

   a. Place the Reactor Makeup Selector Switch to AUTO

   b. Set FC-3-113A, Boric Acid Flow Controller pot setting as desired

   c. Place the RCS Makeup Control Switch to START

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 6 Page 8 of 10

Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior
	RO	**5** **Monitor Annunciator B 8/1, ROD BANK LO LIMIT – RESET** Perform the following: a. Slow load reduction until alarm is reset. b. Re-evaluate boration amount and rate and make adjustments as necessary.
	CREW	**6** **Notify The Shift Manager To Refer To The Following Procedures** • 0-EPIP-20101, DUTIES OF EMERGENCY COORDINATOR • 0-ADM-115, NOTIFICATION OF PLANT EVENTS
		NOTE *Axial flux difference is allowed to exceed the Target Band during the load reduction without entering 0-OP-059.9, Operation Within the Axial Flux Difference Operational Space.*
	RO	**7** **Check Plant Response** a. Check pressurizer level following program a IF directed by the Unit Supervisor, THEN increase charging flow as follows: 1) Throttle open TCV-144, NRHX Temp Control Valve, bypass valve 3-834 to raise flow to approximately 600 gpm. 2) Start an additional charging pump. 3) Place an additional letdown orifice in service. b. Verify load reduction rate and auto rod control is maintaining the expected Tavg/Tref ΔT identified in Attachment 3 b. Stop or slow power reduction to control temperature. If necessary, place control rods in manual and maintain Tavg within the expected Tavg/Tref ΔT of Attachment 3.
	RO	**8** **Energize Pressurizer Backup Heaters**
	BOP	**9** **Verify Turbine Load Less Than 570 MWE** WHEN turbine load is less than 570 MWe, THEN open the SGFP recirculation valves for the first feedwater pump to be stopped. Open the SGFP recirculation valves for the first feedwater pump to be stopped
		Examiner Note: The SRO may implement the following steps.

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Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

Time	Position	Applicant's Actions or Behavior
	BOP	15 Ensure Station Service Loads Supplied From The Startup Transformer using Attachment 2 16 Ensure Auxiliary Steam Supplied From Another Unit using Attachment 1
		EXAMINER NOTE: The chief examiner evaluates the power reduction When power has been sufficiently reduced, with the lead examiner's concurrence then proceed to EVENT 7-Loss of All AC-ECA-0.0

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 1 Page 10 of 10

Event Description: 3A RCP #1 seal failure gradually develops, the crew enters 3-ONOP 41.1 and subsequently to 3-ONOP-100 which will initiate a boration and reduce turbine load.

ATTACHMENT 3
(Page 1 of 1)

FAST LOAD REDUCTION BRIEF

1. Reason for load reduction _____

2. Target power level _____ % Power

Time to Shutdown from 100%	25 min	50 min	75 min	110 min
Load Reduction Rate MW/min	30 MW/min	15 MW/min	10 MW/min	7 MW/min
Load Reduction Rate %/min	4 % / min	2 % / min	1.33 % / min	1 % / min
Expected Tavg/Tref ΔT	4 °F	3 °F	2 °F	1 °F

3. Load reduction rate _____ Mw / minute

NOTES

- *Suggested boration is 9 gallons per % with control rods completely withdrawn and available, 18 gallons per % with no control rod movement (use a value between 9 and 18 if rods are not fully withdrawn when starting a load reduction from full power).*
- *The Unit Supervisor may change the boration as desired during the load reduction.*

4. Boration Rate: _____ total gallons / _____ minutes = _____ gallons/minute.

5. Plant Control Parameters and Contingency Actions
   - Tavg / Tref expected ΔT band, not to exceed ±1 °F of expected, slow ramp to restore band.
   - If Annunciator B 8/1, ROD BANK LO LIMIT alarms, the load reduction shall be slowed.

6. EOP E-0 transition criteria – Manual reactor and turbine trip:

   - Tave > 578 °F
   - Tave 6 °F > Tref
   - Rod Insertion Limits (RIL) are exceeded

7. Review required actions from other procedures currently in effect (example, stop RCP).

8. Questions or crew input?

9. End of Brief

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 7 Page 1 of 11

Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip, the crew will manually close the MSIVs.. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
		Direct facility operator to trigger lesson step EVENT 7 LOSS OF ALL AC (actuates TFP8SWYD = T TFQ5GAFS = T TFQ5B20A = TTFG1B86S = T)
	SRO	Directs response using 3-EOP-E-0
		NOTE *Steps 1 through 4 are IMMEDIATE ACTION steps.*
	RO	**1 Verify Reactor Trip** • Rod bottom lights – ON • Reactor trip and bypass breakers – OPEN • Rod position indicators - AT ZERO • Neutron flux – DECREASING Manually trip reactor IF reactor power is greater than 5% OR intermediate range power is NOT stable or decreasing, THEN perform the following: a. Monitor Critical Safety Functions using 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES. b. Go to 3-EOP-FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ ATWS, Step 1.
	BOP	**2 Verify Turbine Trip** a. All turbine stop or associated control valves – CLOSED a. Manually trip turbine. IF unable to verify turbine trip, THEN close main steamline isolation and bypass valves. b. Verify Moisture Separator Reheater Steam Valves – CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves b. Manually close valves. IF any valve can NOT be closed, THEN close main steamline isolation and bypass valves. c. Check Mid and East GCBs – OPEN (Normally 30 second delay) c. Manually open breakers. IF breakers do NOT open, THEN actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s).
	BOP	Manually Trips the Main Turbine or closes MSIV's
		CREW CRITICAL TASK: Closes all MSIV's (due to no positive indications on the MSR steam supply MOVs) before SI occurs.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the crew will manually close the MSIVs. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	BOP	Manually closes MSR steam supply stop MOVs-3-1431 through MOV-3-1434.
	BOP	If offsite power is lost before verification of MSR steam supply stop MOVs is complete, places 3A, 3B and 3C MSIVs PV-3-2604, PV-3-2605, and PV-3-2606 to CLOSE
	BOP	**3 Verify Power To Emergency 4 KV Buses** a. Check the 3A and 3B 4 KV buses - MAINTAIN AT LEAST ONE ENERGIZED a. Perform the following: 1) Attempt to emergency start any Unit 3 available diesel generator. 2) **IF** neither 3A nor 3B 4 KV bus is energized, **THEN** go to 3-EOP-ECA-0.0, LOSS ALL AC POWER, Step 1.
	BOP	Determines the 3B EDG is running with the output breaker open
	BOP	Reports 3A and 3B 4kv busses are DE-ENERGIZED
	SRO	Transitions to 3-EOP-ECA-0.0

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip, the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	SRO	Directs response using 3-EOP-ECA-0.0
		NOTE • *Steps 1 and 2 are IMMEDIATE ACTION steps.* • *CSF Status Trees are required to be monitored for information only. FRPs shall NOT be implemented.*
	RO	1 **Verify Reactor Trip** Manually trip reactor. • Rod bottom lights – ON • Reactor trip and bypass breakers – OPEN • Rod position indicators – AT ZERO • Neutron flux - DECREASING

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip, the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	BOP	**2 Verify Turbine Trip** a. All turbine stop valves - CLOSED a. Manually trip turbine. IF turbine will NOT trip, THEN close main steamline isolation and bypass valves. b. Verify Moisture Separator Reheater Steam Valves - CLOSED • MSR Main Steam Supply Stop MOVs • Reheater Timing Valves • MSR Purge Steam Valves b. Manually close valves. IF any valve can NOT be closed, THEN close main steam isolation and bypass valves. c. Mid and East GCBs - OPEN (Normally 30 seconds delay) c. WHEN approximately one minute has elapsed, THEN verify Mid and East GCBs – OPEN. 1) IF breakers do NOT open, THEN actuate EMERGENCY GEN. BKR. TRIP SWITCH for the affected breaker(s). 2) IF breaker position indication is NOT available AND turbine speed is NOT decreasing, THEN direct Turbine Operator to perform the following: a) Obtain key 17 from Shift Manager key locker. b) Locally trip Mid and East GCBs from the switchyard. • 8W33 • 8W68
	RO	**3 Check If RCS Is Isolated** a. PRZ PORVs – CLOSED a. IF PRZ pressure less than 2335 psig, THEN manually close PORVs. b. Letdown isolation valves - CLOSED b. Manually close valves. c. Excess letdown isolation valves – CLOSED • CV-3-387, Excess Letdown Isolation Valve From Cold Leg To Excess Letdown Heat Exchanger • HCV-3-137, Excess Letdown Flow Controller c. Manually close valves.
	RO	Places Letdown Orifice Stop valve handswitches CV-3-200A, CV-3-200B and CV-3-200C to CLOSE.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	RO	**4 Verify Proper AFW Flow** a. Check AFW pumps - AT LEAST TWO RUNNING a. IF both units require AFW, THEN perform the following: 1) Establish 270 gpm flow to each unit. 2) Use a setpoint of 270 gpm for required AFW flow instead of the 345 gpm specified in subsequent steps AND procedures. b. Verify total AFW flow – GREATER THAN 345 GPM b. Perform the following: 1) Verify AFW pump running. IF AFW pump NOT running, THEN manually open steam supply valves. 2) Verify proper alignment of AFW valves. IF alignment NOT proper, THEN manually align valves as necessary to establish proper lineup. 3) IF AFW can NOT be established, THEN restore AFW using 3-ONOP-075, AUXILIARY FEEDWATER SYSTEM MALFUNCTION, while continuing with Step 5.
		CAUTIONS • *If SI has been reset or SI actuation occurs on the other unit, safeguards equipment needs to be restored to the required configuration.* • *If an SI signal exists or is actuated during this procedure, it must be reset to ensure restoration of a power source and to ensure controlled loading of equipment on the 4KV Bus.*
		NOTES • *Attachment 5 provides a reference for Emergency Diesel Generator loads.* • *If a Sequencer failure has occurred and SI has actuated, the associated EDG output breaker may not close unless SI is reset.*

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	BOP RO BOP RO	**5** **Verify 4KV Bus Stripping** a. Verify 4KV bus stripping using ATTACHMENTS 1 and 2 b. Verify SI - RESET c. Check the A and B 4KV buses - AT LEAST ONE ENERGIZED — c. Go to Step 6. d. Verify required safeguards equipment - OPERATING — d. Manually start equipment as required. e. Check if 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES being monitored FOR INFORMATION ONLY prior to entering 3-EOP-ECA-0.0, LOSS OF ALL AC POWER — e. Implement FRPs as required, unless this procedure was directly entered from outside the EOP network. f. Return to procedure AND step in effect
		EXAMINER NOTE: The SRO will probably choose to implement Attachment 2 for expediency since the 3B EDG is running. Either attachment is acceptable. See the following two pages for ATTACHMENTS 1 and 2

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	BOP	Attachment 1 3A 4KV BUS STRIPPING 1. IF 3A 4KV Bus is de-energized AND 3D 4KV Bus is aligned to 3A 4KV Bus, THEN verify the Station Blackout Tie Permissive Blue light is ON AND 4AD07 OPEN. 2. IF 3A 4KV Bus is de-energized AND 3D 4KV Bus is NOT aligned to 3A 4KV Bus OR Station Blackout Tie Permissive Blue Light is OFF, THEN verify the following breakers open: • 3AA22, 3A 4KV Bus Emergency Tie To Unit 4 Startup Transformer • 3AA09, 3A 4KV Bus Tie To 3B Or 3C 4KV Bus • 3AA05, Startup Transformer 3A 4KV Bus Supply • 3AA02, Auxiliary Transformer 3A Bus Supply • 3AA03, Steam Generator Feed Pump 3A • 3AA07, Heater Drain Pump 3A • 3AA21, Condensate Pump 3A • 3AA13, Safety Injection Pump 3A • 3AA15, Residual Heat Removal Pump 3A • 3AA12, Component Cooling Water Pump 3A • 3AA01, Reactor Coolant Pump 3A • 3AA19, Intake Cooling Water Pump 3A • 3AA11, Turbine Plant Cooling Water Pump 3A • 3AA16, Circulating Water Pump 3A1 • 3AA18, Circulating Water Pump 3A2 • 3AA08, 3A Load Center • 3AA14, 3C Load Center 3. IF Supply From 4KV Bus 3A, 3AD01, is open, THEN verify Feeder To 4KV Bus 3D, 3AA17, is open. 4. IF Supply From 4KV Bus 3A, 3AD01, is closed, THEN perform the following: a. IF Station Blackout Breaker, 3AD07, is closed, THEN perform the following: 1) Open Station Blackout Breaker, 3AD07. 2) Direct Unit 4 Reactor Operator to open Station Blackout Breaker, 4AD07. b. Verify breaker for Intake Cooling Water Pump 3C, 3AD05, is open. c. Verify breaker for Component Cooling Water Pump 3C, 3AD04, is open. d. IF breaker for Intake Cooling Water Pump 3C, 3AD05, OR breaker for Component Cooling Water Pump 3C, 3AD04, can NOT be opened, THEN open Feeder To 4KV Bus 3D, 3AA17, AND Supply From 4KV-Bus 3A, 3AD01. 5. Notify Unit 3 Reactor Operator that 3A 4KV bus stripping is complete.
	BOP	Verifies SBO tie Blue permissive light is ON
	BOP	Verifies 3C ICW and 3C CCW pump breakers are OPEN, as required.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	BOP	Attachment 2 **3B 4KV BUS STRIPPING** 1. IF 3B 4KV Bus is de-energized AND 3D 4KV Bus is aligned to 3B 4KV Bus, THEN verify the Station Blackout Tie Permissive Blue light is ON AND 4AD07 OPEN. 2. IF 3B 4KV Bus is de-energized AND 3D 4KV Bus is NOT aligned to 3B 4KV Bus OR Station Blackout Tie Permissive Blue Light is OFF, THEN verify the following breakers open: • 3AB22, 3B 4KV Bus Tie To 3A Or 3C 4KV Bus • 3AB05, Startup Transformer 3B 4KV Bus Supply • 3AB02, Auxiliary Transformer 3B Bus Supply • 3AB10, Heater Drain Pump 3B • 3AB21, Condensate Pump 3B • 3AB12, Safety Injection Pump 3B • 3AB15, Residual Heat Removal Pump 3B • 3AB13, Component Cooling Water Pump 3B • 3AB01, Reactor Coolant Pump 3B • 3AB06, Reactor Coolant Pump 3C • 3AB17, Intake Cooling Water Pump 3B • 3AB11, Turbine Plant Cooling Water Pump 3B • 3AB16, Circulating Water Pump 3B1 • 3AB18, Circulating Water Pump 3B2 • 3AB09, 3B Load Center • 3AB14, 3D Load Center 3. IF Supply From 4KV Bus 3B, 3AD06, is open, THEN verify Feeder To 4KV Bus 3D, 3AB19, is open. 4. IF Supply From 4KV Bus 3B, 3AD06, is closed, THEN perform the following: a. IF Station Blackout Breaker, 3AD07, is closed, THEN perform the following: 1) Open Station Blackout Breaker, 3AD07. 2) Direct Unit 4 Reactor Operator to open Station Blackout Breaker, 4AD07. b. Verify breaker for Intake Cooling Water Pump 3C, 3AD05, is open. c. Verify breaker for Component Cooling Water Pump 3C, 3AD04, is open. d. IF breaker for Intake Cooling Water Pump 3C, 3AD05, OR breaker for Component Cooling Water Pump 3C, 3AD05, can NOT be opened, THEN open Feeder To 4KV Bus 3D, 3AB19, AND Supply From 4KV-Bus 3B, 3AD06. 5. Notify Unit 3 Reactor Operator that 3B 4KV bus stripping is complete.

Op-Test No.: 2010-301 Scenario No.: 1 Event No.: 7 Page 9 of 11

Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior	
	RO/BOP	**6** **Verify The A And B 4KV Bus Lockout Relays – RESET**	Perform the following: a. Reset lockout relay(s). b. IF neither lockout relay can be reset, THEN go to Step 10.
	RO/BOP	**7** **Verify 3A And 3B Emergency Diesel Generator Lockout Relays - RESET**	Perform the following: a. Locally reset affected emergency diesel start failure relay by depressing the alarm reset pushbutton. b. Reset affected emergency diesel lockout relay. c. IF neither lockout relay can be reset, THEN go to Step 10.
	RO/BOP	Attempts to manually reset the 3A EDG LOCKOUT relay.	
	RO/BOP	**8** **Try To Reenergize The A 4KV Bus From 3A Emergency Diesel Generator** a. Manually start 3A emergency diesel generator from Control Room * Emergency start OR * Rapid start OR * Normal start b. Verify 3A 4KV bus stripping from ATTACHMENT 1 - COMPLETED c. Verify SI – RESET d. Manually synchronize 3A emergency diesel generator to 3A 4KV bus	a. Go to Step 9. b. IF any load can NOT be disconnected from 3A 4KV bus, THEN go to Step 9. d. Locally synchronize 3A emergency diesel generator to 3A 4KV bus using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE, while continuing with Step 9

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	RO/BOP	**9** **Try To Reenergize The B 4KV Bus From 3B Emergency Diesel Generator** a. Manually start 3B emergency diesel generator from Control Room * Emergency start OR * Rapid start OR * Normal start a. Go to Step 10. b. Verify 3B 4KV bus stripping from ATTACHMENT 2 - COMPLETED b. IF any load can NOT be disconnected from 3B 4KV bus, THEN go to Step 10. c. Verify SI - RESET d. Manually synchronize 3B emergency diesel generator to 3B 4KV bus d. Locally synchronize 3B emergency diesel generator to 3B 4KV bus using 3-ONOP-023.2, EMERGENCY DIESEL GENERATOR FAILURE, while continuing with Step 10.
	RO/BOP	Manually synchronizes the 3B EDG to the 3B 4kv bus.
		CREW CRITICAL TASK: Energize the 3B 4KV bus from the 3B EDG before completing step 9 of 3-EOP-ECA-0.0.

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Event Description: A grid disturbance causes a loss of power to the switchyard. The crew responds using 3-EOP-E-0, the 3A EDG will fail to start, 3B EDG starts but the output breaker fails to close. The Main Turbine fails to trip; the crew will manually trip the Main Turbine. The crew transitions to 3-EOP-ECA-0.0 to recover electrical power by closing the B EDG output breaker.

Time	Position	Applicant's Actions or Behavior
	BOP	**10** **Check If AC Power Has Been Restored** a. Check the 3A and 3B 4KV buses - AT LEAST ONE ENERGIZED a. Perform the following: 1) Restore AC power using the following procedures: • 3-ONOP-004.2, LOSS OF 3A 4KV BUS • 3-ONOP-004.3, LOSS OF 3B 4KV BUS 2) **WHEN** power is restored to the 3A or 3B 4KV bus, **THEN** observe the CAUTIONS prior to Step 32 and go to Step 32 to perform recovery actions. 3) Observe CAUTION prior to Step 11 **AND** continue with Step 11.
	RO	b. Verify required safeguards equipment – OPERATING b. Manually start equipment as required. c. Check if 3-EOP-F-0, CRITICAL SAFETY FUNCTION STATUS TREES being monitored FOR INFORMATION ONLY prior to entering 3-EOP-ECA-0.0, LOSS OF ALL AC POWER c. Implement FRPs as required, unless this procedure was directly entered from outside the EOP network. d. Return to procedure **AND** step in effect
		EXAMINER NOTE: The scenario is terminated when power is restored to the 3B 4kv bus.

CREW CRITICAL TASK: CREW CRITICAL TASK: Closes all MSIV's (due to no positive indications on the MSR steam supply MOVs) before SI occurs.

CREW CRITICAL TASK: Energize the 3B 4KV bus from the 3B EDG before completing step 9 of 3-EOP-ECA-0.0.

OPERATIONS SHIFT TURNOVER REPORT

ONCOMING CREW ASSIGNMENTS

Shift Mgr:		Inside SNPO:	
Field Supv.:		Outside SNPO:	
Admin RCO:		ANPO:	
Unit 3		**Unit 4**	
Unit Supv.:		Unit Supv.:	
RCO:		RCO:	
NPO:		NPO:	

Plant Status

Unit 3		Unit 4	
Mode:	1	Mode:	1
Power:	100	Power:	100
MWe:	763	MWe:	756
Gross Leakrate:	.02	Gross Leakrate:	.02
RCS Boron Conc:	680	RCS Boron Conc:	286

Operational Concerns:

Equipment OOS: Breaker 3AB18 for 3B2 Circ water pump is racked out due to breaker failure. The Shift Manager has received notification that conditions for a Grass Influx are favorable and has performed a Grass Influx evaluation.

U3 Anticipated LCO Actions:

none

U4 Anticipated LCO Actions:

none

Results of Offgoing Focus Area:

none

Unit 3 Status

Reactor Operator

Mode:	1
Power:	100
MWe:	763
Tavg:	574
RCS Pressure:	2249
RCS Boron Conc:	680

RCS Leakrate	
Gross:	.02
Unidentified	.01
Charging Pps:	.01

Accumulator Ref Levels	
A	6614
B	6631
C	6621

Abnormal Annunciators:

Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	
Annunciator: Comp Actions:	

Current Tech Spec Action Statements: (Does Not Include "For Tracking Only Items"

T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	
T.S.A.S / Component: Reason: Entry Date:	

Unit 3 Status

Changes to Risk Significant Equipment:

B train protected both units
Online risk is green

Upcoming Reactivity Management Activities:

Rx Engineering Monthly Reactivity Plan for 100% Operation
Dilute 700 Gal for 0.1% power & 0.1 F Tave Rise
Borate 740 Gal w/ CB D Rods to 100 Steps to lower Power to 19.9%
Control Oil Band 44.4 – 44.9 psig

Current Plant Conditions
Dilute to maintain power @ 99.8 - 100.0 %

Upcoming Major POD Activities:

Immediately after turnover perform TPCW HX ICW Isolation Valves POV-3-4882 stroke time test using 3-OSP-206.2 section 7.3 starting at step 7.3.9.. All previous steps have been complete. The Shift Manager has granted permission to perform the test. Operators required for this evolution have been briefed and are in the field.

Upcoming ECOs to Hang and /or Release:

Evolutions or Compensatory Actions in Progress:

General Information, Remarks, and Operator Work Around Status:

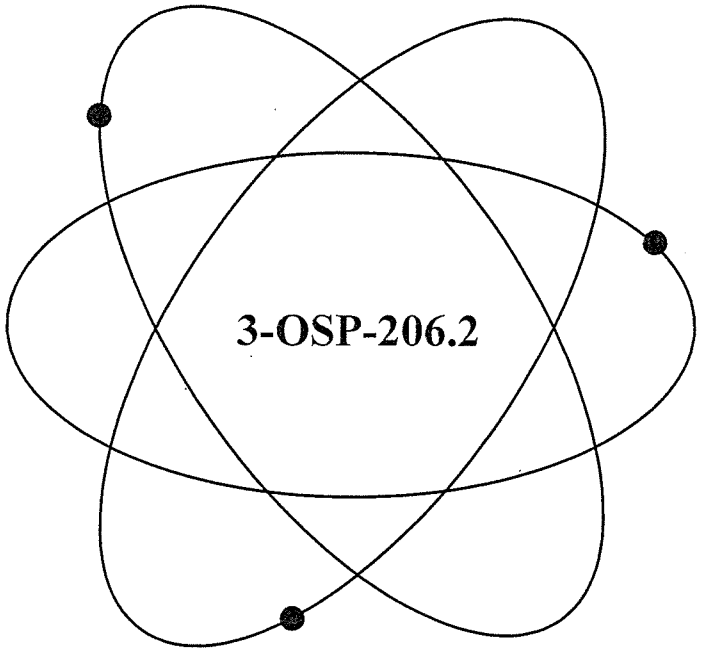
Aux. steam supply aligned from unit 4.
Condenser inleakage 0 scfm.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

This procedure may be affected by a T.C. (Temporary Change) Verify information prior to use.
Date verified 10/27/12 *Initials* MR



Title:

Quarterly Inservice Valve Testing

(Continuous Use)

Safety Related Procedure

Responsible Department:	Engineering
Revision Approval Date:	5/26/10

PCRs *08-3184, 08-3688, 08-4783, 08-4329, 08-5119, 08-5340, 08-5892, 08-5569, 09-0666, 09-1125, 09-1335, 09-1746, 09-1866, 09-2063, 09-2842, 09-4069, 10-0109, 10-0590, 10-1413, 10-1821*
RTSs *90-2265, 91-2450, 92-1397P, 93-1125, 94-0317P, 94-1599, 95-0734, 96-0079P, 98-1024P, 99-0453P, 00-0436P, 00-0666P, 01-0304P, 01-0396P, 02-0453P, 02-0583P, 03-0199, 03-0344, 03-0648P, 04-0653, 04-0483P, 05-0074P, 05-0670, 05-0582P, 05-0931P, 06-0555P, 07-0225P, 07-0267P, 07-0859P, 07-0917P, 07-1145, 07-1117*
OTSCs *9417, 0381-96, 0552-96, 0648-96, 0371-98, 0021-99, 0488-00, 0226-01, 0432-01, 0367-03, 0489-03, 0073-05, 0006-08*
PC/Ms *95-168, 02-048, 04-112*

W97:JM/mr/cls/cls

LIST OF EFFECTIVE PAGES

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14	05/26/10	44	10/14/08	74	04/29/09	104	10/14/08
15	05/26/10	45	10/14/08	75	04/29/09	105	10/14/08
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17	05/26/10	47	10/14/08	77	05/13/09	107	10/14/08
18	10/14/08	48	10/14/08	78	12/18/08	108	10/14/08
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20	05/10/10	50	10/14/08	80	10/14/08		
21	10/14/08	51	10/14/08	81	01/20/10		
22	10/14/08	52	10/14/08	82	10/14/08		
23	10/14/08	53	10/14/08	83	10/14/08		
24	10/14/08	54	10/14/08	84	10/14/08		
25	10/14/08	55	10/14/08	85	10/14/08		
26	10/14/08	56	10/14/08	86	10/14/08		
27	11/06/08	57	10/14/08	87	10/14/08		
28	11/06/08	58	10/14/08	88	10/14/08		
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30	10/14/08	60	10/14/08	90	10/14/08		

TABLE OF CONTENTS

1.0 PURPOSE

1.1 This procedure provides the prerequisites, precautions, limitations, and instructional guidance to perform testing and exercising of valves as required by Reference Steps 2.1.1 and 2.1.3.

1.2 This test shall be performed in all modes when the respective valves are required to be operable. During periods when a valve is not required to be operable, testing may be deferred providing that it is exercised within 30 days prior its return to operable status.

1.3 This procedure performs the required valve exercise tests in accordance with the ASME OM Code, Subsection ISTC.

2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References

2.1.1 Technical Specifications

1. Section 4.0.5
2. Section 3.3.3.3, Table 3.3-5, Item 22
3. Section 4.3.3.3, Table 4.3-4, Item 22

2.1.2 FSAR

1. Section 6.2, Safety Injection System
2. Section 6.6, Containment Isolation
3. Section 9.2, Chemical and Volume Control System
4. Section 9.4, Sampling System
5. Section 9.13, Post Accident Sampling System
6. Section 10.2.4.3, Steam Generator Blowdown Recovery System

2.1.3 Miscellaneous Documents (i.e., PC/M, Correspondence)

1. Condition Report 94-753, dated 7/26/94
2. PC/M 95-168, Time Delay Removal for Blowdown Isolation Valves CV-3-6275A, B, C
3. CR-98-0160, dated 2/27/98, Valve was stuck and could not isolate flow. Body of valve has a washed out area
4. Condition Report 00-1095, Supplement 1 and 00-1482
5. Condition Report 03-0459
6. Condition Report 03-1058, Stroke Time Change

2.1.3 (Cont'd)

7. Condition Report 2008-18474, Add Fail Safe Testing of CV-3-6275 A, B, and C to Section 7.2 of *-OSP-206.2
8. PC/M 02-048 U-3 TPCW Hx Replacement
9. Fourth Ten-Year Testing Program for Pumps and Valves – Turkey Point Nuclear Plant Unit 3 or 4
10. PC/M 04-112, Emergency Response Data Acquisition and Display System (ERDADS) Replacement

2.1.4 Operating Procedures

1. 0-ADM-502, In-Service Testing (IST) Program

2.1.5 Operating Diagrams

1. 5613-M-3072, Sh 1, Main Steam System
2. 5613-M-3032, Sh 1, Sample System-Secondary-Steam Generator Blowdown
3. 5613-M-3074, Sh 4, Feedwater System-Steam Generator Blowdown Recovery
4. 5613-M-3036, Sh 1, Sample System-NSSS
5. 5613-M-3061, Sh 1, Waste Disposal System-Solid Chemical Addition
6. 5613-M-3041, Sh 2, Reactor Coolant System
7. 5613-M-3047, Sh 2, Chemical and Volume Control System - Charging and Letdown
8. 5613-M-3050, Sh 1, Residual Heat Removal System
9. 5613-M-3062, Sh 1, Safety Injection System
10. 5613-M-3064, Sh 1, Safety Injection System
11. 5610-M-3065, Sh 1, Nitrogen and Hydrogen System - Nitrogen Supply
12. 5610-M-3061, Sh 14, Waste Disposal System - Gas Waste Analyzers
13. 5613-M-3041, Sh 3, Reactor Coolant System
14. 5613-M-3094, Sh 1, Containment Post Accident Evaluation System
15. 5613-M-3053, Sh 1, Containment Purge System and Penetration Cooling System

2.1.5 (Cont'd)

16. 5613-M-3030, Sh 5, Component Cooling Water System
17. 5610-M-3076, Sh 1, Chemical Addition System
18. 5613-M-3074, Sh 3, Feedwater System

2.1.6 Regulatory Guidelines

1. ASME OM Code 1998 Edition through 2000 Addenda, Subsection ISTC, Inservice Testing of Valves in Light-Water Reactor Nuclear Power Plants

2.2 Records Required

2.2.1 The date, time, and section completed shall be entered in the Unit Narrative Log. Also, problems encountered while performing the procedure should be entered; i.e., malfunctioning equipment, delays due to changes in plant conditions, etc.

2.2.2 Prior to routing to QA Records, the completed Attachment 1 shall be routed to the IST Coordinator for analysis and evaluation.

2.2.3 Completed copies of the below listed item document compliance with Technical Specification surveillance requirements and shall be transmitted to QA Records for retention in accordance with Quality Assurance Records Program requirements:

1. Attachment 1

3.0 PREREQUISITES

3.1 The required prerequisites for each subsection are provided in the associated text of Section 7.0.

4.0 PRECAUTIONS/LIMITATIONS

4.1 Observe all applicable Radiation Protection requirements as set forth in plant instructions and related Radiation Work Permits (obtain RWPs as required).

4.2 Personnel performing this procedure should be aware of plant conditions or evolutions which could be affected by or could affect valve exercising.

4.3 As required, ensure proper communications (walkie-talkie, sound- powered phones, page, etc.) are established.

4.4 All valve manipulations shall be performed by Operations Department personnel.

4.5 When valve exercising is prevented by a clearance, the following actions shall be taken:

4.5.1 The applicable procedural steps shall be indicated as N/A.

4.5.2 A note shall be included in the **Remarks** area of the respective subsection stating the test variance and the reason for deferment.

4.5.3 The IST Coordinator or designee shall be notified.

4.6 When exercising an air-operated valve, the valve shall be in the pretest position for a minimum of 3 minutes prior to exercising it to its test position.

4.7 Except where specifically identified in the procedure, only one valve should be tested at a time.

4.8 The subsections of this procedure are independent and can be performed individually or in any sequence. Also, valves within each subsection may be tested individually or in any sequence with the concurrence of the Shift Manager.

4.9 When a valve measured stroke time exceeds the **Required Action Range** the valve shall immediately be declared inoperable, appropriate corrective action initiated, and a condition report generated.

4.10 Valves with remote position indication are required to be observed at least once every 2 years to verify that valve operation is accurately indicated. When this is required, an observer will be positioned at the valve in communication with a second observer located at the remote position indicator. As the valve is operated, actual valve position will be compared to that indicated at the remote location. If a valve fails the remote position indication verification test, the value shall immediately be declared inoperable and appropriate corrective action initiated.

4.11 Containment isolation **White Light** indication verification steps in procedure Subsections 7.4, 7.6, 7.7, 7.8, 7.9 and 7.11 are not required to be performed each quarter. This verification is scheduled by 0-ADM-215, Plant Surveillance Tracking Program, every 18 months.

4.12 Technical Specification Table 4.3-4, Item 22 requires Containment Isolation Valve accident monitoring channels indication to be calibrated every 18 months. Reg Guide 1.97 requires this indication to distinguish between valve Closed and Not Closed conditions. FSAR Table 6.6-3 lists the containment isolation valves. When performing this procedure to satisfy that Technical Specification; the status panel indication shall be compared to actual valve position and Control Room indication to verify accurate indication of Phase A status, including indication during valve travel (intermediate position), if possible. For those valves that travel too fast for intermediate position to be observed, an alternate testing method is provided that manually exercises a limit switch at the valve. These tests apply mainly to AOVs and MOVs. Because of limit switch configuration, SVs do not have an intermediate position as indicated in Subsection 6.3. Containment ventilation valves are calibrated under another procedure. If the Containment Isolation indicator (white) light is found to be outside the acceptance criteria given in Subsection 6.3, refer to Technical Specification Table 3.3-5, Item 22 for appropriate actions.

4.13 The System Engineer (SE) or Valve Component Engineer should evaluate whether leakage from the S/G blowdown flow control valve (FCV-3-6278A, B or C) requires corrective action considering that periods greater than 3 years between overhauls may place the valve body at risk for damage.

4.14 A S/G blowdown flow control valve (FCV-3-6278A, B or C) leakage flow (as indicated by ERDADS) greater than or equal to 47,300 lb_m/hr should be evaluated for potential functional failure and operability concern.

4.15 Prior to testing CV-3-2822 and CV-3-2821, verify that a high containment sump level condition does not exist. Exercising the open limit switch of either of these valves concurrent with a high sump level will start the containment sump pump.

4.16 The valve stroke time test also satisfies the fail safe test unless specified otherwise.

4.17 When performing Subsection 7.2 in Modes 1-3, a minimum of two AFW pumps are required to be operable during surveillance testing of Steam Generator Blowdown Isolation Valves (CV-3-6275A, B, or C) to ensure AFW system operability in the event that one of these valves is discovered inoperable.

5.0 SPECIAL TOOLS/EQUIPMENT

5.1 Calibrated stopwatches (2)

6.0 ACCEPTANCE CRITERIA

6.1 The IST Coordinator or designee shall provide appropriate valve stroke time acceptance criteria.

6.2 Actual valve position shall be compared to remote position indication a minimum of once every 2 years. This is to verify valve operation is accurately indicated.

6.3 Containment Isolation valve position indication acceptance criteria is tabulated below:

NOTES

- *Containment isolation **White Light** indication verification steps in Subsections 7.4, 7.6, 7.7, 7.8, 7.9 and 7.11 are not required to be performed each quarter. This verification is scheduled by 0-ADM-215, Plant Surveillance Tracking Program, every 18 months.*
- *Valve position indication verification for intermediate position may be made during either valve opening or valve closing strokes. Intermediate position may be used to determine indication Closed/Not Closed status, which is required every 18 months.*
- *ERDADS position indication is NOT acceptance criterion for value operability determination. If ERDADS acceptance criterion is NOT met, initiate a work request to correct the indication discrepancy on ERDADS.*

CV516, CV739, CV855, CV956 A/B/D, CV2819, CV2821, CV2822, CV2826, CV4658A/B, CV4659A/B, CV4668A/B Position Indication Logic

	White	Red	Green	ERDADS
Open	Dim	On	Off	NOT CLOSED
Intermediate	Dim	On	On	NOT CLOSED
Closed	Bright	Off	On	CLOSED

CV519, CV522 A/B/C Position Indication Logic

	White	Red	Green	ERDADS
Open	Dim	On	Off	100
Intermediate	Dim	On	On	Between 0 and 100
Closed	Bright	Off	On	0

SV2911, SV2912, SV2913, SV6428 Position Indication Logic

	White	Red	Green	ERDADS
Open	Dim	On	Off	OPEN
Intermediate	N/A	N/A	N/A	OPEN
Closed	Bright	Off	On	CLOSED

SV6385 Position Indication Logic

	White	Red	Green	ERDADS
Open	Dim	On	Off	100
Intermediate	N/A	N/A	N/A	Between 0 and 100
Closed	Bright	Off	On	0

6.4 The Steam Generator Chemical Injection Line Check Valve (Subsection 7.12) seat leakage less than or equal to 1 gpm. CR-94-0753.

6.5 The required actions as a function of the measured stroke time are as follows:

Measured Stroke Time	Required Actions	
	1st Stroke	**2nd Stroke**
Within Acceptable Range	• Test is SAT • Mark 2nd Stroke N/A	• If 1st stroke time deviation is analyzed or determined NOT to be due to a degraded valve condition, then record deviation under Remarks.*
NOT within Acceptable Range but less than Required Action Time	• Immediately retest valve **OR** • Declare valve Inoperable	• Generate a 3-day operability CR to analyze data to determine if valve is showing acceptable operation and if a new reference stroke time may be established from this test.
Exceeds Required Action Time	• Declare valve inoperable. • Generate WR to correct deficiency. • Generate CR to determine maintenance rule implications.	

* This allows not removing a valve from service for initial 1st stroke deviations caused by such things as failure to terminate the timing when the light goes out, burned-out light indication, power interruption, test equipment failure, etc.

6.6 Fail safe testing of valves with fail safe actuators is performed in conjunction with stroke time testing for the valve. Acceptable stroke times indicate satisfactory fail safe function of the valve. Except for valves CV-3-6275A, B, and C, for valves CV-3-6275A, B, and C follow the instructions in the procedure to test the loss of air fail safe test. If a fail safe test is unsatisfactory, then declare the valve out of service. Generate a work request to correct the deficiency, and generate a Condition Report to determine maintenance rule implications.

7.3 Intake Cooling Water

SHIFT MANAGER/UNIT SUPERVISOR HOLD POINT

Ensure briefing as to possible effects on Main Generator H_2 leakage has been conducted with the Control Room and NSO prior to continuing with this section. (Reference CR 2008-803). Inform Operations Manager and PGM of the evolution.

Shift Manager K W. Lee (Signature) K White (Print) 10/27/10 0700 (Date/Time)

INITIALS CK'D VERIF

Date/Time Started 10/27/10 / 0700

CK'D	VERIF		
KL		7.3.1	Obtain permission from the Shift Manager to perform this test.
KL		7.3.2	Notify the Reactor Operator of the intent to exercise the Intake Cooling Water Valves (Subsection 7.3).
KL		7.3.3	Record the reason for performing this test on Attachment 1.
KL		7.3.4	Record Test Equipment number and calibration due date for the stopwatch used on Attachment 1.
KL		7.3.5	Verify stopwatch calibration is current.

NOTE

Valves with remote position indication are required to be observed at least once every 2 years to verify that valve operation is accurately indicated. When this is required and no other steps are provided for verifying position indication, an observer will be positioned at the valve in communication with a second observer located at the remote position indicator. As the valve is operated, actual valve position will be compared to that indicated at the remote location. Remote position indication for valves inside containment should be performed when the plant is shut down.

KL		7.3.6	**IF** valve remote position indication verification is required, **THEN** station an observer in the vicinity of the valves **AND** establish appropriate communication with the Reactor Operator (RO). (N/A if not required)

INITIALS
CK'D VERIF

NOTE

When exercising air-operated valves, the valve shall be in the pretest position for a minimum of 3 minutes prior to exercising it to its test position (the direction in which the stroke time is measured).

___ ___ 7.3.7 Open or verify open 3A TPCW Hx Isolation Valve to POV-3-4882.

___ ___ 7.3.8 Open or verify open 3B TPCW Hx Isolation Valve to POV 3-4883.

___ 7.3.9 Close 3A TPCW Hx Isolation Valve POV-3-4882, **AND** record closing stroke time on Attachment 1.

NOTE

The ICW System Engineer shall be notified if ICW/TPCW Isolation Valve to 3A HX, POV-3-4882, stroke time is less than 150 sec.

___ 1. Verify valve remote position indication **AND** locally observed position agree, **AND** record on Attachment 1. (N/A if not required.)

___ ___ 7.3.10 Open 3A TPCW Hx Isolation Valve POV-3-4882.

___ 7.3.11 Close 3B TPCW Hx Isolation Valve POV-3-4883, **AND** record closing stroke time on Attachment 1.

NOTE

The ICW System Engineer shall be notified if ICW\TPCW Isolation Valve to 3B HX, POV-3-4883, stroke time is less than 150 sec.

___ 1. Verify valve remote position indication **AND** locally observed position agree, **AND** record on Attachment 1. (N/A if not required.)

INITIALS
CK'D VERIF

____ ____ 7.3.12 Open 3B TPCW Hx Isolation Valve POV-3-4883.

____ 7.3.13 Notify the Reactor Operator the test of the Intake Cooling Water Valves (Subsection 7.3) is complete.

NOTE

The tested Intake Cooling Water Valves are operable if all test values are within the specified ranges.

____ 7.3.14 Review Attachment 1, **AND** any valve that fails to meet the acceptance criteria shall be placed in the EOOS Logbook.

____ 7.3.15 Notify the Shift Manager the test of the Intake Cooling Water Valves is complete.

ATTACHMENT 1
(Page 6 of 44)

QA RECORD PAGE

Procedure Revision Date: 3 / 10 / 2010

INIT

7.3 Intake Cooling Water

7.3.3 Reason for performing this test:

X Quarterly IST
____ Increased Surveillance for _____
____ Position Indication Verification
____ Post Maintenance Test (W/O #) _____
____ Other _____

7.3.4 Stop Watch No: XXX Cal Due Date: XX/XX/XX

7.3.9 3A TPCW Hx Isolation Valve, POV-3-4882

Stroke Direction	1st Stroke (Seconds)	Acceptable Range	2nd Stroke (Seconds)	Required Action
CLOSE		126.90 to 210.00		> 210.00

____ a. Verify stroke times fall within the Acceptable Range.

____ b. Verify remote position indication **AND** locally observed position agree (N/A if not required).

____ c. Verify valve fail safe function.
SAT____ UNSAT____

POV-3-4882 is SAT _____ UNSAT _____ (Check one)

7.3.11 3B TPCW Hx Isolation Valve, POV-3-4883

Stroke Direction	1st Stroke (Seconds)	Acceptable Range	2nd Stroke (Seconds)	Required Action
CLOSE		144.89 to 210.00		> 210.00

____ a. Verify stroke times fall within the Acceptable Range.

____ b. Verify remote position indication **AND** locally observed position agree (N/A if not required).

____ c. Verify valve fail safe function.
SAT____ UNSAT____

POV-3-4883 is SAT _____ UNSAT _____ (Check one)