

Appendix D

Scenario Outline

Form ES-D-1

Op-Test No.: 2008 Scenario No.: 1

Facility: <u>Calvert Cliffs 1 & 2</u>	Scenario No.: <u>1</u>	Op-Test No.: <u>2008</u>
Examiners: _____	Operators: _____	_____
_____	_____	_____
<p>Turnover: Unit 1 was MOC at 100% for previous 6 months 2 hours ago power was reduced to 75% power to perform valve testing which was completed SAT. 11 & 12 charging pumps are running with boron equalization in progress. CVCS makeup is aligned for direct. No equipment out of service. Instructions for the shift are to return to 100% power at approximately 30% per hour.</p>		

Event No.	Malf. No.	Event Type*	Event Description
1		N (CRO/SRO) R (RO)	Raise reactor power from 75% to 100%
2	CCW002_01	C (CRO)	11 Component Cooling Pump Trip (TS CRS)
3	CVCS005	C (RO)	CVCS Backpressure Transmitter PT-201 Fails Low
4	125V001_04	C (SRO)	22 125V DC Bus Failure
5	RCS008_02	C (All)	11B RCP locked rotor
5	RPS005 RPS006	M (RO)	Auto Trip Relay Failure & Manual Trip Failure
6	TG005_01	C (CRO)	Stop Valve & Control Valve Fail As-Is
7	ESFAS001_02	C (RO)	SIAS B Failure
8	ESFAS012	M (ALL)	SGIS A & B Failure
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

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

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SCENARIO OVERVIEW

LOSS 22 DC BUS / ATWS

Initial Conditions: 75% Rated Thermal Power, MOC, following valve testing last shift. Crew will begin raising power to 100% power at approximately 30% per hour following shift turnover. CVCS system is currently in direct lineup. Pressurizer boron equalization in progress.

The scenario starts with a trip of 11 Component Cooling pump, after the crew verifies no common mode failure 12 Component Cooling pump is started IAW AOP-7C. This will resume CC flow to all components. LCO 3.7.5 should be entered due to both 12 & 13 CC pps's aligned to 14 480V bus. After switching the power supply for 13 CC pp the LCO can be exited.

CVCS Backpressure Transmitter 1-PT-201 fails low which causes backpressure regulator valves to go shut resulting in a loss of letdown. Crew will secure charging and letdown IAW OI-2A prior to exceeding 225" in PZR.

A loss of 22 125V DC bus occurs which will cause multiple alarms. The crew will implement AOP-7J for loss of the DC bus. The crew will de-energize ESFAS Channel ZG, AFAS Channel ZG, and RPS Channel D.

11B RCP will trip due to a locked rotor, this will cause numerous alarms. The crew should check RPS calling for a trip due to multiple alarms. Once crew identifies that reactor should have tripped CRS will order a reactor trip. The manual pushbuttons will not work causing the crew to perform alternate actions of de-energizing the CEDM MG sets.

When the reactor trips one set of turbine valves will fail to go shut causing an overcooling of the RCS. Failure of SGIS to shut MSIV's will require the CRO to manually shut them. The crew should recognize the SGIS failure and hold Tcold constant at current temperature using ADV's. SIAS B fails to actuate forcing RO to manually initiate SIAS.

After completing EOP-0 the CRS will implement EOP-8 due to the loss of 22 DC bus. VA-1 will not be met in EOP-8 and CRO should immediately begin working that safety function causing the RO to assess the rest of the safety functions. After all safety functions are assessed the RO should be assigned PIC-4 due to Pressure and Inventory Control not being met in EOP-0.

The scenario ends when VA-1 is completed by CRO and he is assigned HR-2.

INSTRUCTOR SCENARIO INFORMATION

- ___ 1. Reset to IC-18
- ___ 2. Perform switch check.
- ___ 3. Place simulator in CONTINUE, advance charts and clear alarm display.
- ___ 4. Place simulator in FREEZE.
- ___ 5. Enter Trigger
 - a. None
- ___ 6. Enter Malfunctions
 - ___ a. Trip 11 CC Pump.
CCW002_01 on F1
 - ___ b. CVCS Backpressure transmitter failure
CVCS005 on F2
 - ___ c. Loss of 22 125V DC Bus
125V001_04 on F3
 - ___ d. 11B RCP Locked Rotor
RCS008_02 on F4
 - ___ d. Auto Trip Failure & Manual Trip Failure
RPS005 & RPS006 at Time Zero
 - ___ e. Stop Valve #1 & Control Valve #1 Fail As-Is
TG005_01 on F5
 - ___ f. SIAS B failure
ESFAS001_02 at Time Zero
 - ___ g. SGIS A & B failure
ESFAS012 at Time Zero
- ___ 7. Enter Panel Overrides
 - a. None

8. Enter Remote Functions / Administrative
- ___ a. Align CVCS makeup for direct. (1-CVC-254 open, 1-CVC-256 shut, VCT Outlet 1-CVC-501-CV open with pink off normal magnet)
- ___ b. Place all PZR Heaters to on and adjust PIC-100 X & Y to \approx 2200 psia to equalize boron
- ___ 9. Set simulator time to real time, then place simulator in CONTINUE.
- ___ 10. Give crew briefing.
- | | | |
|----|---------------------------|---|
| a. | Present plant conditions: | 75% load at MOC 10,500 MWD/MTU |
| b. | Power history: | 100% for 9 months, 2 hours ago reduced to 75% for valve testing. Currently on step 6.1.J of OP-3. |
| c. | Equipment out of service: | None |
| d. | Abnormal conditions: | CVCS system is aligned for direct makeup and PZR boron equalization in progress with 2 charging pumps |
| e. | Surveillances due: | None |
| f. | Instructions for shift: | Raise power to 100% at approximately 30% per hour. |
- ___ 11. Allow crew 3-5 minutes to acclimate themselves with their positions.
- ___ 12. Instructions for the Booth Operator.
- a. Activate F1 Trip of 11 CC Pump when cued by the lead evaluator.
- b. Activate F2 CVCS Backpressure Transmitter (1-PT-201) fails low
- c. Activate F3 Loss of 22 DC Bus when cued by lead evaluator.
- d. Use Panel Override for alarm E-56 11B RCP Vibration 20 sec before F4 & F5
- e. Activate F4 & F5 11B RCP Locked Rotor (& Turbine valve fail as is) when cued by lead evaluator after CRO ordered to de-energize RPS channel D but prior to performance (differences in procedure for de-energizing RPS between the simulator and plant).

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RESPONSES TO CREW REQUEST

If a request and response is not listed, delay response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

	REQUEST	RESPONSE
1.	OWC/E&C investigate failure of 11 CC Pump	Acknowledge request. After 5 minutes report breaker tripped on overload.
2.	TBO investigate loss of 11 CC Pump	Acknowledge request. After 3 minutes report breaker tripped on overload
3	ABO investigate loss of 11 CC Pump	Acknowledge request. After 3 minutes report nothing abnormal at pump
4	TBO shift 13 CC pp to 11 480V Bus	Acknowledge request, after 1 minute use the system lineup file to perform, report complete when system lineup complete
5	OWC/E&C Investigate loss of 22 DC Bus	Acknowledge request
6	OWC de-energize ESFAS ZG & AFAS ZG	Acknowledge request

Critical Tasks

1. Evaluate common mode failure and start standby CC pump prior to reaching RCP temperature limits (thrust bearing 195°, CBO 200°).
2. Performs alternate actions for tripping reactor within 5 minutes of RCP trip.
3. Recognize Turbine SV/CV still open, shuts MSIV's prior to AFAS actuation.

Op-Test No.: <u>2008</u> Scenario No.: <u>1</u> Event No.: <u>1</u>		
Event Description: Raise Power from 75% to 100% (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	CRS	Direct RO & CRO to commence raising power IAW previously performed brief
	CRS	Contact Plant Chemistry to sample RCS for boron
	RO	Using OI-2B Section 6.2 add 1000 gallons of DI directly to RCS <ul style="list-style-type: none"> ▪ Determine volume to be added using Reactivity Plaque ▪ Get peer check of volume calculated ▪ Adjust makeup flow to approximately 20 gpm on 1-FIC-210X at 1C07 ▪ Set FQIS-210X on 1C07 to volume determined earlier ▪ Open 1-CVC-504 on 1C07 to align DI to charging pump suction ▪ Place FIC-210X on 1C07 to Auto ▪ Place M/U Mode Selector 1-HS-210 to Dilute on 1C07
	CRO	Adjust Turbine Load using Load Set to control Tcold on program <ul style="list-style-type: none"> ▪ Adjust ramp rate to $\approx 0.5\%$ per minute on Mk VI screen on 1C02 ▪ Adjust Load Ref Cmd to value greater than current load on MK VI screen on 1C02 to raise turbine load and reduce Tcold. ▪ Adjust Load Limit Setpoint to approximately 10% greater than current load on Mark VI screen on 1C02
	RO	Withdraw CEA's to raise power <ul style="list-style-type: none"> ▪ Select Manual Sequential on CEDS panel on 1C05 ▪ Place In-Hold-Out switch to Out to withdraw CEA's ▪ Constantly monitor nuclear power indications on 1C05 during CEA withdrawal

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>1</u> Event No.: <u>2</u>		
Event Description: 11 CCW Pump Trip (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	CRO/RO	Announce multiple alarms per management expectations
	CRS	CRS directs CRO to check RPS calling for a trip
	CRO	<p>Check RPS calling for a trip</p> <ul style="list-style-type: none"> ▪ Checks RPS for active trips (any 2 sets of red lights on same Trip Unit means trip condition) ▪ Checks RPS power supplies (2 RPS channels w/o power indicates trip condition) ▪ Checks RPS Matrix Relays (any combination of right side lights out with left side lights out (6 groups of 4 lights)) <p>Report RPS not calling for a trip</p>
	CRS	CRS directs RO to monitor primary
	RO	<p>Monitor the primary</p> <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level <p>Report primary is stable</p>

	CRO/RO	<p>Acknowledge alarms.</p> <ul style="list-style-type: none"> ▪ 1C06 E-45 SPDS Alarm ▪ 1C06 E-49 11A RCP AUX STATUS PANEL ▪ 1C06 E-53 11B RCP AUX STATUS PANEL ▪ 1C06 E-57 12A RCP AUX STATUS PANEL ▪ 1C06 E-61 12B RCP AUX STATUS PANEL ▪ 1C07 X-02, X-10, X-17, X-25 CCW FLOW LO ▪ 1C13 K-09 CC PP(S) DISCH PRESS LO ▪ 1C19 R-04 U-1 480V ESF U/VTRIP ▪ Plant Computer Alarm "11 CC Pump Stop"
	CRO	<p>Observes 11 CC pump is tripped.</p> <ul style="list-style-type: none"> ▪ Green indicating light for 11 CC pp 1-HS-3813 @ 1C13 ▪ Zero amps indicated for 11 CC pp @ 1C13 <p>Informs CRS of 11 CC pp trip, requests to place 1-HS-3813 in PTL.</p>
	CRS	<p>Implement AOP-7C "Loss of Component Cooling Water"</p> <p>Make plant page announcement per management expectations</p>
	CRS/CRO	<p>Evaluate for common mode failure</p> <ul style="list-style-type: none"> ▪ Checks CC Head Tank level @ 1C13 steady (verify no system rupture) ▪ Checks alarm R-04 "U-1 480V ESF U/VTRIP" @ 1C19 indicating an electrical fault <p>Start a standby CC pump prior to reaching RCP temperature limits (thrust bearing 195°, CBO 200°)</p> <ul style="list-style-type: none"> ▪ 12 CC pp should be started with 1-HS-3815

	CRS/RO	<p>Monitors RCP temperatures including trip criteria</p> <ul style="list-style-type: none"> ▪ Thrust bearing temp <195° at 1C06 <ul style="list-style-type: none"> ○ 1-TIA-158, 1-TIA-159 for 11A RCP ○ 1-TIA-168, 1-TIA-169 for 11B RCP ○ 1-TIA-178, 1-TIA-179 for 12A RCP ○ 1-TIA-188, 1-TIA-189 for 12B RCP ▪ Controlled Bleedoff temp <200° using plant computer
	CRS	<p>Refers to Tech Specs.</p> <ul style="list-style-type: none"> ▪ 3.7.5 Component Cooling System ▪ 3.6.6 Containment Spray and Cooling system <p>Declares 11 CC subsystem inoperable due to 12 & 13 CC pp's not having independent power supplies.</p>
	CRS/CRO	<p>Direct realignment of 13 CC pump to 11 480V Bus.</p> <ul style="list-style-type: none"> ▪ Place 13 CC pump 1-HS-3817 in PTL ▪ Call TBO to shift disconnects IAW AOP-7C Attachment 1
	CRO	<p>Place 13 CC pp handswitch 1-HS-3817 in Auto after TBO reports aligned to 11 480V Bus</p>
	CRS	<p>Declares 11 CC subsystem operable, exits Tech Specs.</p> <ul style="list-style-type: none"> ▪ 3.7.5 Component Cooling System ▪ 3.6.6 Containment Spray and Cooling system
	CRS	<p>Informs maintenance of need to investigate and repair.</p>
		* Shading indicates Critical Task

Op-Test No.: <u>2008</u> Scenario No.: <u>1</u> Event No.: <u>3</u>		
Event Description: CVCS Backpressure Transmitter Fails Low (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	RO	Acknowledge and announce alarm F9 "LETDOWN PRESSURE"
	RO	Recognize L/D backpressure valves shut on 1C07 and process variable on backpressure controller 1-PIC-201 is zero psig on 1C07 and report to CRS
	CRS	Direct RO to secure Charging and Letdown IAW OI-2A
	RO	<p>Using OI-2A Section 6.4 Reducing charging and letdown and Section 6.6 Secure charging and letdown</p> <ol style="list-style-type: none"> 1. Notify Radiation Safety and Chemistry that charging and letdown are being secured 2. Place 13 charging pump H/S in PTL on 1C07 3. Place Backup Charging Pump Selector to 12&13 position on 1C07 4. Stop 12 charging pump on 1C07 5. Place 13 charging pump H/S in normal on 1C07 6. Contact ABO and direct Zinc Addition Skid S/D 7. Shift L/D Throttle Valve Controller 1-HIC-110 to Manual on 1C07 8. Place 11 Charging Pump in PTL on 1C07 9. Shut Letdown Containment Isolations 1-CVC-515 & 1-CVC-516 on 1C07
	CRS	<ul style="list-style-type: none"> ▪ If PZR level exceeds 225 inches enter TS 3.4.9.A and verify PZR level lowering to < 225 inches.
	CRS	<ul style="list-style-type: none"> ▪ Direct OWC to contact I&C to investigate and repair 1-PT-201

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Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>1</u> Event No.: <u>4</u>		
Event Description: Loss of 22 DC Bus (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	CRO/RO	Announce multiple alarms per management expectations
	CRS	CRS directs CRO to check RPS calling for a trip
	CRO	<p>Check RPS calling for a trip</p> <ul style="list-style-type: none"> ▪ Checks RPS for active trips (any 2 sets of red lights on same Trip Unit means trip condition) ▪ Checks RPS power supplies (2 RPS channels w/o power indicates trip condition) ▪ Checks RPS Matrix Relays (any combination of right side lights out with left side lights out (6 groups of 4 lights) <p>Report RPS not calling for a trip</p>
	CRS	CRS directs RO to monitor primary
	RO	<p>Monitor the primary</p> <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level <p>Report primary is stable</p>
	RO/CRO	Acknowledge alarms (too many to list all)
	CRO	<p>Investigate bus loss</p> <ul style="list-style-type: none"> ▪ RPS Channel D de-energized ▪ 22 125VDC Bus indicates 0 VDC @ 1C24 ▪ Containment Press Transmitter Isolation handswitch 1-HS-5313D @ 1C10 de-energized <p>Report loss of 22 125VDC bus</p>

	CRS	<p>Implements AOP-7J "Loss of 125 Volt DC Power"</p> <p>Make plant page announcement per management expectations</p>
	CRS	<p>Directs PWS to de-energize ESFAS & AFAS channels ZG IAW OI-34 & OI-32B</p> <p>Directs CRO to de-energize RPS Channel D</p>
	CRO	<p>De-energize RPS Channel D</p> <ul style="list-style-type: none"> ▪ When CRO directed to de-energize RPS D initiate next malfunction
	CRS	<p>Determines applicable TS LCO's & TRM actions.</p> <ul style="list-style-type: none"> ▪ 3.8.4 DC Sources – Operating (Most Limiting) ▪ 3.8.7 Inverters – Operating ▪ 3.8.9 Distribution System – Operating ▪ 3.3.1 RPS Instrumentation – Operating ▪ 3.3.3 RPS Logic & Trip Initiation ▪ 3.3.4 ESFAS Instrumentation ▪ 3.3.9 CVCS Isolation Signal ▪ 3.3.10 Post Accident Monitoring Instrumentation ▪ 3.3.11 Remote shutdown Instrumentation ▪ 3.3.12 WR Neutron Flux Monitoring ▪ 15.3.1 Radiation Monitoring Instrumentation <p>NOTE – May not perform this step due to timing of scenario malfunctions, student may be asked about Tech Specs after scenario.</p>

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Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>1</u> Event No.: <u>5</u>		
Event Description: Locked rotor on 11B RCP and Reactor Trip EOP-0 (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	RO/CRO	Announce E-56 11B RCP Vibration alarm
	CRO/RO	Announce multiple alarms per management expectations
	CRS	CRS directs RO to monitor primary
	RO	<p>Monitor the primary</p> <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level <p>Report primary is not stable</p>
	CRS	CRS directs CRO to check RPS calling for a trip
	CRO	<p>Check RPS calling for a trip</p> <ul style="list-style-type: none"> ▪ Checks RPS for active trips (any 2 sets of red lights on same Trip Unit means trip condition) ▪ Checks RPS power supplies (2 RPS channels w/o power indicates trip condition) ▪ Checks RPS Matrix Relays (any combination of right side lights out with left side lights out (6 groups of 4 lights)) <p>Report RPS is calling for a trip</p>

	RO	<p>Recognize 11B RCP has a locked rotor</p> <ul style="list-style-type: none"> ▪ 11B RCP ammeter pegged high ▪ 1C06 E-56 11B RCP Vibration alarm ▪ 1C06 E43 Selected Computer Point ▪ 1C05 D-8 Hi Power Trip Reset Demand ▪ 1C05 D-35 CEA Withdrawal Prohibit ▪ 1C05 D-40 Tavg-Tref ▪ After 2 minutes w/o action 11B RCP Green Light Indication ▪ After 2 minutes w/o action 11B RCP indicates zero amps
	CRS	Directs Reactor trip, implements EOP-0
	RO	<p>Attempts Reactor trip @ 1C05 unsuccessfully</p> <ul style="list-style-type: none"> ▪ Depress both Reactor Trip Pushbuttons on 1C05
	RO	<p>Performs alternate actions for tripping reactor within 5 minutes of 11B RCP trip</p> <ul style="list-style-type: none"> ▪ at 1C20 open all 4 blue handled breaker handswitches ▪ Verify reactor S/D (prompt drop NI power & negative SUR) ▪ Energize 12A & 13A Buses from 1C20 (2 blue handled handswitches) (Not Critical)
	RO	<p>Verify all CEA's inserted</p> <p>Verify DI water makeup is secured</p> <p>Reports Reactivity Control is met</p>
	CRO	<p>Ensure Turbine Trip</p> <p>Recognize Turbine SV-1/CV-1 still open</p> <ul style="list-style-type: none"> ▪ At 1C02 check valve positions at any turbine control screen <p>Shuts MSIV's prior to AFAS actuation</p> <ul style="list-style-type: none"> ▪ At 1C03 using 1-HS4043 & 1-HS-4048 <p>Reports Turbine is tripped</p>

	All	<p>Recognize SGIS failure (may not get SGIS if MSIV's shut promptly)</p> <ul style="list-style-type: none"> ▪ S/G pressure < 685 psia (at 1C03 or plant computer) ▪ Tcold < 510°F (at 1C06 red LED digital or plant computer) ▪ SIAS actuation due to overcooling (SGIS &SIAS occur at approx same time on overcooling)
	CRS/CRO	<p>Open ADV's using HIC on 1C03 to hold RCS temp constant (\approx 40-50% output) (this step may not be done until CRO performs Heat Removal Safety Function)</p>
	CRO	<p>Performs Vital Aux Safety Function</p> <ul style="list-style-type: none"> ▪ Check 11 & 14 4KV buses energized (1C18 & 1C19) ▪ Checks 125V Buses @ 1C24 (22 DC bus de-energized) ▪ Checks 120V Vital Buses energized ▪ Checks 1Y09 & 1Y10 energized ▪ Checks Component Cooling flow to RCP's ▪ Contact ABO to check Switchgear Ventilation in service <p>Reports Vital Auxiliaries <u>not</u> met</p>
	RO	<p>Performs Pressure & Inventory Control Safety Function</p> <ul style="list-style-type: none"> ▪ Check RCS pressure and perform alternate actions <ul style="list-style-type: none"> ○ Operate PZR Heaters & Spray ○ Verify SIAS <ul style="list-style-type: none"> ▪ Checks HPSI pumps & HPSI Header valves ▪ Recognize SIAS B failure and manually actuate SIAS using pushbutton on 1C10 ▪ Secures 11B & 12A RCP's on 1C06 ▪ Check PZR Level ▪ Check RCS subcooling <p>Report Pressure and Inventory Safety Function not met (may be reported met if temperature not held due to SGIS failure)</p> <p>Verifies SIAS as part of PIC safety function</p>

	CRO	<p>Performs RCS Heat Removal Safety Function</p> <ul style="list-style-type: none"> ▪ Check S/G pressure & Tcold and perform alternate actions <ul style="list-style-type: none"> ○ Recognize S/G Pressure fell below 685 psia and SGIS failed ○ Open ADV's to \approx 40-50% to stabilize Tcold ▪ Recognizes loss of MFW and initiates AFW <ul style="list-style-type: none"> ○ Start an AFW pump by performing either: <ul style="list-style-type: none"> ▪ Open 1-MS-4070-CV & 1-MS4071-CV at 1C04 to start 11 AFW pump ▪ Place 13 AFW pump handswitch to start on 1C04 ○ Trip the SGFP's by depressing trip pushbuttons on 1C03 ○ Shut the S/G FW Isolations using handswitches on 1C03 ○ Operate AFW System to restore S/G levels to between (-)170 and (+)30 inches (AFW flow control setpoint between 150 gpm and 300 gpm on 1C04) ▪ Check at least 1 RCP operating in a loop with available S/G ▪ If RCP's are operating check $T_{hot} - T_{cold} < 10^{\circ}F$ <p>Reports Heat Removal safety Function not met due to low S/G pressure & low Tcold (may be called met if temperature not held due to SGIS failure)</p>
	CRO or RO	<p>Perform Containment Environment Safety Function</p> <ul style="list-style-type: none"> ▪ Check containment pressure < 0.7 psig at 1C10 ▪ Check containment temperature $< 120^{\circ}F$ ▪ Check containment radiation monitor alarms clear <p>Reports Containment Environment is met</p>
	CRO or RO	<p>Perform Rad Levels External to Containment Safety Function</p> <ul style="list-style-type: none"> ▪ Check RMS alarms are clear <p>Reports Rad Levels External to Containment Safety Function is met</p>

	CRS	<p>Perform EOP-0 brief</p> <ul style="list-style-type: none"> ▪ Ensure all are attentive ▪ Review Safety Functions not met <ul style="list-style-type: none"> ○ Vital Auxiliaries ○ Pressure & Inventory (if temp held) ○ RCS Heat Removal (if temp held) ▪ Review Safety system Actuations <ul style="list-style-type: none"> ○ SIAS (include SIAS B failure) ○ SGIS failure ▪ Solicit Input <p>Conclude the brief</p>
	CRS	<p>Refer to EOP-0 flowchart</p> <ul style="list-style-type: none"> ▪ Vital Auxiliaries not met with 22 DC bus de-energized consider EOP-8 ▪ Pressure and Inventory not met due with S/G pressure <800 psia consider EOP-4 ▪ Heat Removal not met with S/G press < 800 psia consider EOP-4 <p>Implements EOP-8 due to loss of 22 DC bus</p>
		<p>* Shading indicates Critical Task</p>

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>1</u> Event No.: <u>5</u>		
Event Description: EOP-8 (After EOP-0)		
Time	Position	Applicant's Actions or Behavior
	ALL	Evaluate Resource Assessment Table
	RO	Report RC-1 Met <ul style="list-style-type: none"> ▪ All CEA's inserted with negative SUR Report PIC-4 Met <ul style="list-style-type: none"> ▪ SIAS has actuated <ul style="list-style-type: none"> ○ 3 charging pumps running with RCS pressure >1270 psia ○ 11 & 13 HPSI pumps & 11 & 12 LPSI pumps running with 0 gpm injection due to RCS pressure >1270 psia ○ Core covered using RVLMS indication @ 1C05
	CRO	Report VA-1 Not Met <ul style="list-style-type: none"> ▪ 500 KV buses available <ul style="list-style-type: none"> ○ 11 & 14 4KV buses energized ○ 11,12,21 DC buses energized and 22 DC bus de-energized ○ 1Y09 & 1Y10 energized Commence working VA-1 immediately after reporting status to CRS
	CRS	Directs RO complete Resource Assessment Table

	<p>RO</p>	<p>Report HR-2 Met</p> <ul style="list-style-type: none"> ▪ At least 1 S/G > -350 inches using PAMS display on 1C04 <ul style="list-style-type: none"> ○ S/G level being restored with AFW flow ○ CET temperature < 50°F superheat using CET indication on 1C05 and steam table ○ with RCS pressure indication on 1C06 ▪ Feedwater available ▪ SIAS has actuated <ul style="list-style-type: none"> ○ 3 charging pumps running with RCS pressure >1270 psia ○ 11 & 13 HPSI pumps & 11 & 12 LPSI pumps running with 0 gpm injection due to RCS pressure >1270 psia ○ Core covered using RVLMS indication @ 1C05 <p>Report CE-1 Met</p> <ul style="list-style-type: none"> ▪ Containment pressure < 2.8 psig from 1C10 <ul style="list-style-type: none"> ○ Containment temperature < 220°F ▪ CIS not actuated ▪ Containment radiation alarms clear with no unexplained rise <p>Report RLEC-1 Met</p> <ul style="list-style-type: none"> ▪ Normal Radiation levels outside containment <ul style="list-style-type: none"> ○ Noble Gas Monitor alarm clear with no unexplained rise from 1C22 ○ Condenser off-gas RMS alarm clear with no unexplained rise from 1C22 ○ S/G B/D RMS alarm clear with no unexplained rise from 1C22 ○ Main Vent RMS alarm clear with no unexplained rise from 1C22 ▪ Containment pressure < 2.8 psig
	<p>CRS</p>	<p>Direct RO to commence PIC-4 (RC-1 if PIC reported met in EOP-0)</p>

	CRO	<p>Perform VA-1</p> <ul style="list-style-type: none"> ▪ Determines block step A is N/A (offsite power available) ▪ Determines steps B.1-5 are N/A ▪ Verifies 22 DC bus and 14 120VAC Vital bus de-energized and implements AOP-7J <ul style="list-style-type: none"> ○ Verify actions of AOP-7J complete from earlier implementation ▪ Determines steps B.8-10 are N/A ▪ Determines block step C is N/A <p>Report all steps for VA-1 evaluated, no actions can be taken until E&C returns 22 DC bus to service</p>
	CRS	Direct CRO to commence working HR-2 (may direct PIC if HR called met during EOP-0)
		Secure scenario after CRO directed to work HR-2
	CRS	Determines EAL H.A.1.1.1

Appendix D**Scenario Outline****Form ES-D-1**Op-Test No.: 2008 Scenario No.: 2Facility: Calvert Cliffs 1 & 2 Scenario No.: 2 Op-Test No.: 2008Examiners: _____ Operators: _____

Turnover: Unit 1 is at 100% power at EOC. 12 AFW pump tagged out for repair of overspeed trip device linkage (6 hours into 18 hour maintenance window).

Event No.	Malf. No.	Event Type*	Event Description
	AFW001_02		12 AFW Pump Failure
1	RCS026_01	I/N (RO)	PZR Level X Transmitter Failure (high)
2	CEDS012_37	C (ALL)	CEA 37 Drop
3	CEDS003	R (RO) C (RO/SRO)	CEDS Raise Relay sticks when CEA withdrawn
4	Downpower	R (RO) N (CRO/SRO)	Downpower due to expiration of CEA alignment time
5	RCS002	M (ALL)	RCS Leak of 100 GPM
6	CEDS010	C (RO)	Mechanical Binding of 2 CEA's (51 & 62)
7	RCS002	M (ALL)	RCS Leak increases to 200 GPM
8	Panel Override SIAS "B" Block	C (CRO)	SIAS B Block Failure

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)		Actual Attributes	--	--	--
1.	Total malfunctions (5–8)	/ /	7		
2.	Malfunctions after EOP entry (1–2)	/ /	3		
3.	Abnormal events (2–4)	/ /	4		
4.	Major transients (1–2)	/ /	2		
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.: 2008 Scenario No.: 2

SCENARIO OVERVIEW

DROPPED CEA/RCS LEAK

Initial Conditions: 100% Rated Thermal Power, EOC, 12 AFW pump OOS for repair of overspeed trip device linkage (6 hours into 18 hour maintenance window).

Scenario starts with Pressurizer level transmitter X instrument failing high. After identification of instrument failure channel Y level controller will be placed in service and PZR heater cutout selected to Y only (vice X/Y). Common tap analysis should be consulted and other instruments checked to ensure no instrument line leak. Letdown will isolate due to transient and will be placed back in service IAW OI-2A.

CEA 37 in Group 5 will drop completely causing multiple alarms. CRS will implement AOP-1B, with CRO lowering turbine load to restore Tcold to program. CRS will also notify OWC of CEA drop to ensure E&C response. When crew attempts to realign the CEA the outward motion relay will stick causing the CEA to continue withdrawing even after in/hold/out switch is released. CEDS will be placed in off stopping CEA motion. When crew realizes they cannot realign the CEA a power reduction to 70% power should be ordered.

During the power reduction IAW OP-3 an RCS leak will begin in excess of 1 charging pump. AOP-2A will be implemented which will eventually lead to a reactor trip. When reactor trips 2 CEA's will fail to insert forcing RO to borate RCS for Reactivity Control.

After the trip the leak will increase in size to 200 gpm. EOP-5 will be entered after completing EOP-0. The crew will begin a cooldown and depressurization to minimize leakage, during this step the crew will be unable to block SIAS B from 1C10 but can block locally at ESFAS Panel.

The scenario ends when the crew has throttled safety injection flow to prevent overfilling the pressurizer. CRS will declare EAL H.A.5.1.2.

INSTRUCTOR SCENARIO INFORMATION

- ___ 1. Reset to IC-14
- ___ 2. Perform switch check.
- ___ 3. Place simulator in CONTINUE, advance charts and clear alarm display.
- ___ 4. Place simulator in FREEZE.
- ___ 5. Enter Trigger
 - a. T1: CEDS In/Hold/Out switch moved

6. Enter Malfunctions
- ___ a. PZRLevel X Transmitter Fails High.
RCS026_01 (Low) on F1
 - ___ b. CEA 37 Drop
CEDS012_37 on F2
 - ___ c. CEDS Raise Relay sticks when CEA withdrawn
CEDS003 on T1
 - ___ d. RCS leak of 100 gpm
RCS002 10-100 gpm with 10 minute ramp on F3
 - ___ e. 12 AFW Pump Failure
AFW001_02 at Time Zero
 - ___ f. CEA Mechanical Binding on 2 CEA's (51 & 62)
CEDS010_51 & CEDS010_62 at Time Zero
7. Enter Panel Overrides
- ___ a. SIAS B Block Failure
SIAS B Block keyswitch to normal at Time Zero
8. Enter Remote Functions / Administrative
- ___ a. Place yellow tag on 12 AFW Pump trip pushbutton.
9. Set simulator time to real time, then place simulator in CONTINUE.
10. Give crew briefing.
- | | | |
|----|---------------------------|--|
| a. | Present plant conditions: | 100% load at EOC 19,100 MWD/MTU |
| b. | Power history: | 100% for 12 months |
| c. | Equipment out of service: | 12 AFW Pump OOS (repairing overspeed trip linkage 6 hrs into 18 hr window) |
| d. | Abnormal conditions: | None |
| e. | Surveillances due: | None |
| f. | Instructions for shift: | Maintain 100% power |
11. Allow crew 3-5 minutes to acclimate themselves with their positions.
12. Instructions for the Booth Operator.
- a. Activate F1 PZR Level X transmitter fails high when cued by the lead evaluator.
 - b. Activate F2 CEA 37 drop when cued by lead evaluator.
 - c. Remove CEDS012_37 After E&C reports fuse replaced.

- d. Use panel override to depress CMI Bypass button after RO pushes (keeps CMI bypassed)
- e. Activate F3 100 gpm RCS leak when cued by lead evaluator during expeditious power reduction at $\approx 75\%$.
- f. Modify RCS002 Raise RCS leak rate to 200 gpm when reactor trips.
- g. Block SIAS B Use remote function for ESFAS and block SIAS B, 1 minute after requested of PWS.

Op-Test No.: 2008 Scenario No.: 2

RESPONSES TO CREW REQUEST

If a request and response is not listed, delay response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

	REQUEST	RESPONSE
1.	TBO check 1C43 PZR level indication	Acknowledge request. After 2 minutes report 216 inches.
2.	OWC contact I&C to investigate PZR Level transmitter failure	Acknowledge request.
3	OWC contact EM shop to determine cause of misaligned CEA	After 5 minutes report blown 2 amp fuse where 5 amp fuse belonged. Request to replace fuse. After 1 minute report fuse replaced and CEA ready for re-alignment (recorder hooked up and ready).
4	NFM for Fxyt & Frt	Report Fxyt is 1.023 and Frt 1.58, 2 days ago
5	Chemistry sample both S/G's for activity IAW CP-436	Acknowledge request
6	PWS block SIAS B locally at ESFAS cabinet	Acknowledge request, After 1 minute block SIAS B using panel override for block H/S

Critical Tasks

1. Commence cooldown of RCS prior to subcooling lowering below 30°.
2. Borate RCS due to 2 stuck CEA's in EOP-0

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>2</u> Event No.: <u>1</u>		
Event Description: PZR Level X Transmitter Failure / Loss of Letdown (Evaluator Cue)		
Time	Position	Applicant's Actions or Behavior
	RO	Announces and acknowledges 1C06 alarms. <ul style="list-style-type: none"> ▪ Compares Pressurizer Level indicators <ul style="list-style-type: none"> ○ 1-LI-110X-1 & 1LI-110Y-1 Digital LED Indicators on 1C06 ○ 1-LR-110 PZR Level Recorder on 1C06 ○ 1-LI103 PZR Compensated Level Indicator on 1C06 ▪ Determines 1-LT-110X failed high. ▪ Informs CRS of failed instrument
	RO/CRO	Refers to 1C06 Alarm Manual for Alarm E-06
	RO	Shift Pressurizer Level Control Channels <ul style="list-style-type: none"> ▪ Shifts PZR LVL CH SEL 1-HS-110 to Channel "Y" ▪ Shift PZR HTR LO LVL CUT-OFF SEL 1-HS-100-3 to "Y" ▪ (If channels not switched within 45 sec then L/D will isolate)
	RO	Identifies L/D isolated.
	CRS	Refers to NO-1-200 Common Tap Analysis
	CRO	Monitor containment parameters to check for common tap RCS leak
	CRS	Directs CRO to confirm other transmitters not affected
	CRO	Verifies LT-110X is only affected transmitter
	CRS	Directs OWC to contact maintenance for repair
	CRS	Determines Tech Spec Actions <ul style="list-style-type: none"> ▪ 3.3.10.A Post Accident Monitoring Instrumentation
	CRS	Directs RO to secure charging and letdown IAW OI-2A prior to PZR Level exceeding 225 inches

	RO	<p>Secure Charging and Letdown</p> <ul style="list-style-type: none"> ▪ Notify CRS that Initial Condition for letdown operating not met ▪ Place CVCS IX BYPASS 1-CVC-520 to Bypass on 1C07 ▪ Shift L/D THROTTLE VLV CONTROLLER 1-HIC-110 to Manual on 1C07 ▪ Place 11 Charging Pump H/S in PTL on 1C07 ▪ Shut Letdown Containment Isolations <ul style="list-style-type: none"> ○ L/D Stop 1-CVC-515 on 1C07 ○ L/D CONTMT ISOL 1-CVC-516 on 1C07
	CRS	Direct RO to restore Charging and Letdown IAW OI-2A
	RO	<p>Restore Charging and Letdown</p> <ul style="list-style-type: none"> ▪ Place L/D PRESSURE CONTROLLER 1-PIC-201 in Manual with 20% output on 1C07 ▪ Place LETDOWN HX TEMP CONTR 1-TIC-223 in Manual with automatic setpoint at 110°F on 1C07 ▪ Place L/D THROTTLE VLV CONTROLLER 1-HIC-110 in Manual with 20% output on 1C07 ▪ Start 11 Charging Pump using 1-HS-224X on 1C07 ▪ Open L/D CNTMT ISOL's <ul style="list-style-type: none"> ○ L/D STOP 1-CVC-515 on 1C07 ○ L/D CONTMT ISOL 1-CVC-516 on 1C07 ▪ Adjust L/D PRESS CONTROLLER 1-PIC-201 to maintain L/D pressure 460 psig (440-480 psig) on 1C07 ▪ Shift L/D PRESS CONTROLLER 1-PIC-201 to Auto with 460 psig setpoint on 1C07 ▪ Adjust L/D THROTTLE 1-HIC-110 to stabilize PZR level (\approx 38 gpm) on 1C07 ▪ Match L/D THROTTLE VLV CONTROLLER 1-HIC-110 Auto & Manual flow signals using the Bias control on 1C07 ▪ Shift L/D THROTTLE CONTROLLER 1-HIC-110 to Auto on 1C07 ▪ Shift LETDOWN HX TEMP CONTR 1-TIC-223 to Auto on 1C07 ▪ When L/D HX temperature stabilizes place CVCS IX in service using 1-CVC-520 on 1C07

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>2</u> Event No.: <u>2</u>		
Event Description: Group 5 CEA 37 Dropped (Evaluator Cue)		
Time	Position	Applicant's Actions or Behavior
	CRO/RO	Announce multiple alarms per management expectations
	CRS	CRS directs CRO to check RPS calling for a trip
	CRO	<p>Check RPS calling for a trip</p> <ul style="list-style-type: none"> ▪ Checks RPS for active trips (any 2 sets of red lights on same Trip Unit means trip condition) ▪ Checks RPS power supplies (2 RPS channels w/o power indicates trip condition) ▪ Checks RPS Matrix Relays (any combination of right side lights out with left side lights out (6 groups of 4 lights)) <p>Report RPS not calling for a trip</p>
	CRS	CRS directs RO to monitor primary
	RO	<p>Monitor the primary</p> <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level <p>Report primary is not stable</p>
	RO	Identifies CEA-37 dropped
	CRS	Implements AOP-1B
	CRS	Directs CRO to lower turbine load to restore Tcold to program

	CRO	<p>Lowers turbine load to restore Tcold</p> <ul style="list-style-type: none"> ▪ Compare Reactor Power (ΔT Power Digital Indication @ 1C05) with plaque on panel 1C02 to determine program Tcold ▪ Operate Turbine Load Set Handswitch 1-CS-80 in Lower Direction to raise Tcold to match program Tcold
	CRS	Direct OWC to request E&C shop to determine cause of misalignment
	CRS	<p>Direct RO to realign CEA-37</p> <ul style="list-style-type: none"> ▪ Borate as necessary to maintain Reactor Power <ul style="list-style-type: none"> ○ Open 1-CVC-514 on 1C06 ○ Start 11 or 12 BA Pump for \approx 3-5 seconds ▪ Select Group 5 on CEDS panel on 1C05 ▪ Select CEA-37 on CEDS panel on 1C05 ▪ Select Manual Individual Mode on CEDS Panel on 1C05 ▪ Depress Group 5 Inhibit Bypass Pushbutton ▪ Depress and hold the CMI Bypass pushbutton for 5 seconds before and after CEA motion on 1C05 ▪ Place In-Hold-Out Switch to Out for 5.25 inches, then release. ▪ Recognize CEA continuing to withdraw, notifies CRS
	CRS	Direct RO to place CEDS to off
	RO	Places CEDS to off prior to high power pretrip alarm.
	RO	Informs CRS that CEA motion stops
	CRS	Refers to TS 3.1.4 Control Element Assembly Alignment
	CRS	Enters LCO 3.1.4.B One CEA misaligned by >15"
	CRS	<p>Determine CEA Alignment time</p> <ul style="list-style-type: none"> ▪ Contacts NFM for current Frt value ▪ Using COLR Figure 3.1.4 and given Frt value determines realignment time of 30 minutes
	CRS	<p>Determine CEA cannot be realigned within 30 minutes.</p> <p>Directs expeditious power reduction to 70%</p>

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>2</u> Event No.: <u>2 (Continued)</u>		
Event Description: Power Reduction to 70% (Realignment Time Expiration)		
Time	Position	Applicant's Actions or Behavior
	CRS	Directs expeditious power reduction to 70%
	CRS	Announces "Expeditious Power Reduction to 70 %" on plant page
	CRS/CRO	Notifies Chemistry of power reduction > 15% in 1 hour
	CRS/CRO	Notifies ESO of power reduction
	RO	Equalize Boron <ul style="list-style-type: none"> ▪ Energize all PZR Backup Htrs on 1C06 ▪ Lower PIC-100X & Y to \approx2200 psia on 1C06 to maintain pressure \approx 2250 psia due to additional heaters being energized
	RO	Borate from RWT IAW OP-3 <ul style="list-style-type: none"> ▪ Open RWT CHG PP SUCT 1-CVC-504-MOV on 1C06 ▪ Shut VCT OUTLET VLV 1-CVC-501-MOV on 1C06 ▪ When 2 minutes have elapsed (1 minute if 2nd charging pump started) ▪ Open VCT OUTLET VLV 1-CVC-501-MOV ▪ Shut RWT CHG PP SUCT 1-CVC-504-MOV ▪ When 5 minutes have elapsed begin boration again and repeat as necessary to lower power to 70%
	CRO	Lowers turbine load to maintain Tcold on program <ul style="list-style-type: none"> ▪ Compare Reactor Power (ΔT Power Digital Indication @ 1C05) with plaque on panel 1C02 to determine program Tcold ▪ Operate Turbine Load Set Handswitch 1-CS-80 in Lower Direction to raise Tcold to match program Tcold ▪ Adjust Load Limit Setpoint to approximately 10% greater than current load on Mark VI screen on 1C02

	RO	<p>Periodically compare all indications of power</p> <ul style="list-style-type: none"> ▪ PWR RANGE Meters on 1C05 (higher of NI or ΔT for each channel) ▪ Calorimetric Power from plant computer (point PA911) ▪ NI Power at 1C15 ▪ ΔT Power at 1C15
	CRS	When Power lowered to 70%, direct RO & CRO to level power
	RO	<p>Shift charging pump suction from RWT to VCT by:</p> <ul style="list-style-type: none"> ▪ Open 1-CVC-501-MOV VCT Outlet on 1C07 ▪ Shut 1-CVC-504-MOV RWT Charging Pump Suction on 1C07
	CRO	Make final adjustments to turbine load using Turbine Load Set Handswitch 1-CS-80 in Lower Direction to match Tcold to program Tcold

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>2</u> Event No.: <u>3</u>		
Event Description: RCS Leak / AOP-2A (After Power Lowered to ≈ 75%)		
Time	Position	Applicant's Actions or Behavior
	CRO	Announce and acknowledge containment normal sump alarm J-21 on 1C10
	CRO	Reference 1C10 Alarm Manual <ul style="list-style-type: none"> ▪ Drain Containment Sump IAW OI-17D Miscellaneous Waste System <ul style="list-style-type: none"> ○ Open Containment Sump Normal drain 1-EAD-5462-MOV using 1-HS5462 on 1C10 ○ Open Containment Sump Normal drain 1-EAD-5463-MOV using 1-HS5463 on 1C10 ○ When both valves indicate open for at least 5 seconds then shut both valves and note time containment sump alarm cleared. (this time can be used for determining leak rate)
	CRS	Direct RO to monitor primary
	RO	Monitor the primary <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level <p>Recognize lowering PZR level lowering with constant Tcold, also mismatch between charging and letdown flows</p>
	CRO	Announce and acknowledge containment normal sump alarm J-21 on 1C10 <ul style="list-style-type: none"> ▪ Estimate RCS leak rate (49 gallon sump / minutes between alarms = approximate leak rate)
	CRS	Implement AOP-2A <ul style="list-style-type: none"> ▪ Notify Radiation Safety that rad levels in Aux Bldg may be changing due to excessive RCS leakage ▪ Direct Chemistry to sample both S/G's for activity per CP-436 ▪ Proceeds to Section VI of AOP-2A "RCS Leakage Exceeds One Charging Pump Capacity"

	CRS	Directs RO to monitor for trip criteria <ul style="list-style-type: none"> ▪ PZR Pressure reaches TM/LP pretrip setpoint <ul style="list-style-type: none"> ○ alarm E-14 "TM/LP CH PRETRIP" on 1C05 ○ White Pretrip Lights on TM/LP Trip Units (T/U-7) on RPS 1C15
	RO	Control PZR Level <ul style="list-style-type: none"> ▪ Secure L/D <ul style="list-style-type: none"> ○ Shut 1-CVC-515 using 1-HS-2515 on 1C07 ○ Shut 1-CVC-516 using 1-HS-2516 on 1C07
	CRO	Check for S/G tube leak <ul style="list-style-type: none"> ▪ Observe for rise in any of the following: <ul style="list-style-type: none"> ○ S/G sample activities ○ Condenser Off-Gas radiation levels on 1-RI-1752 on 1C22 ○ S/G Blowdown radiation levels on 1-RIC-4095 or 1-RI-4014 on 1C22 ○ Main Steam radiation levels on 1-RIC-5421 or 1-RIC5422 on 1C22 ○ Main Steam N-16 radiation levels on 1-RIC-5421A or 1-RIC-5422A on 2C26 ○ Unexplained S/G water levels ○ Feed flow mismatch

	RO	<p>Attempt to isolate the leak</p> <ul style="list-style-type: none"> ▪ Verify Letdown isolated (1-CVC-515 & 516 shut) on 1C07 ▪ Verify no PORV leakage <ul style="list-style-type: none"> ○ Quench Tank Parameters on 1C06 ○ PORV discharge piping temps using plant computer points TY107 & T108 ○ Acoustic Monitor indications on 1C06 ▪ Verify RCS Sample Isolation 1-PS-5464-CV is shut on 1C10 ▪ Verify Reactor & PZR Vent Valves shut <ul style="list-style-type: none"> ○ 1-RC-103-SV on 1C06 ○ 1-RC-104-SV on 1C06 ○ 1-RC-105-SV on 1C06 ○ 1-RC-106-SV on 1C06 ▪ Determine if leak is on Charging Header <ul style="list-style-type: none"> ○ Stop all but one charging pump ○ Check charging header pressure > RCS pressure ○ Determine leak is not on the charging header ○ Restart charging pump previously secured ▪ Verify RCS leak is occurring in the containment <ul style="list-style-type: none"> ○ Verify containment pressure, temperature and humidity are rising on 1C10 ○ Start ALL available Containment Air Coolers in high speed and open Emergency Cooling Outlet Valves on 1C10 ▪ Determine no leakage in Component Cooling System <ul style="list-style-type: none"> ○ Check for rising trends on CC Head Tank on 1C13 ○ Check for rising trend on CC Radiation Monitor
	CRS	<p>Determine appropriate actions for RCS Leakage</p> <ul style="list-style-type: none"> ▪ Determines leak not isolated ▪ Directs Rx trip ▪ Implements EOP-0

Appendix D Required Operator Actions Form ES-D-2Op-Test No.: 2008 Scenario No.: 2 Event No.: 4Event Description: **EOP-0 (After Reactor Trip)**

Time	Position	Applicant's Actions or Behavior
	CRS	Directs EOP-0
	RO	<p>Performs Reactivity Control</p> <ul style="list-style-type: none"> ▪ Depress Manual Reactor Trip Pushbutton on 1C05 ▪ Check Reactor tripped using NI power indications on 1C05 ▪ Verifies more than 1 CEA failed to insert (CEA's 51 & 62) <ul style="list-style-type: none"> ○ Checks CVT Outlet Valve 1-CVC-512-CV is shut on 1C07 ○ Open BA Direct M/U Valve 1-CVC-514-MOV on 1C07 ○ Open BAST Gravity Feed Valves 1-CVC-508-MOV & 1-CVC-509-MOV on 1C07 ○ Check M/U Mode Selector Switch 1-HS-210 in Manual on 1C07 ○ Start 11 or 12 Boric Acid Pump at 1C07 ○ Shut VCT Outlet Valve 1-CVC-501-MOV on 1C07 ○ Check all Charging Pumps running ▪ Verify DI Water Makeup is secured <ul style="list-style-type: none"> ○ Check 11 & 12 RC makeup Pumps secured on 1C07 ○ Check VCT M/U 1-CVC-512-CV is shut on 1C07 ○ If aligned for direct makeup to RCS then shut RWT Charging Pump Suction 1-CVC-504-MOV on 1C07 <p>Reports Reactivity Control Complete</p>

	CRO	<p>Performs Turbine Trip</p> <ul style="list-style-type: none"> ▪ Check Reactor tripped then: <ul style="list-style-type: none"> ○ Depress both Turbine Trip Pushbuttons on 1C02 ○ Check Main Turbine stop Valves shut on MK VI screen ○ Check Turbine Speed drops on MK VI screen ○ Checks Turbine Generator Output Breakers open <ul style="list-style-type: none"> ▪ 11 GEN BUS BKR 0-CS-552-22 on 1C01 ▪ 11 GEN TIE BKR 0-CS-552-23 on 1C01 ○ Check Generator Field Breaker open on 1C01 ○ Check Generator Exciter Field breaker open on 1C01 ○ Check MSR 2nd Stage Steam source Valves are shut <ul style="list-style-type: none"> ▪ 1-MS-4025-MOV on 1C02 ▪ 1-MS-4026-MOV on 1C02 <p>Reports Turbine Trip Complete</p>
	CRO	<p>Performs Vital Aux</p> <ul style="list-style-type: none"> ▪ Check 11 or 14 4KV bus energized. ▪ Check ALL 125V DC BUS VOLTS greater than 105 volts on 1C24: <ul style="list-style-type: none"> ▪ 11 ▪ 12 ▪ 21 ▪ 22 ▪ Check at least THREE 120V AC Vital Buses are energized on 1C24: <ul style="list-style-type: none"> ▪ 11 ▪ 12 ▪ 13 ▪ 14 ▪ Check EITHER 1Y09 OR 1Y10 energized on 1C24. ▪ Verifies Component Cooling Flow to the RCP's by checking CC Pump operating at 1C13 and Containment Supply and Return CV's open on 1C10. <p>Reports Vital Auxiliaries Complete</p>

	RO	<p>Performs Press & Inventory including verifying alt actions</p> <ul style="list-style-type: none"> • Checks pressurizer pressure at 1C06 and determines that it is lowering and not trending to 2250 PSIA. • Verifies main spray CV's indicate shut on 1C06 • Determines PORV's not leaking by checking Pressurizer RV Flow Monitor approximately zero volts on 1C06 • Checks pressurizer level at 1C06 and determines that it is lowering and not trending to 160 inches. • Verifies CVCS letdown isolations CVC-515 and 516 shut and all charging pumps operating on 1C06 • Checks subcooling is greater than 30°F by PAMs display on 1C05 <p>Reports Press & Inventory not met due to PZR level & pressure trends</p>
	CRO	<p>Performs Core & RCS Heat Removal</p> <ul style="list-style-type: none"> • Verifies TBV's controlling S/G pressure 850-920 PSIA on 1C03 and Tcold 525-535°F on 1C05 • Checks S/G level (-)170" to (+) 50" on 1C03 • Verifies MFW operating by checking SGFP RPM and HP and LP steam stops open on 1C03. Checks positive DP on FRV PDI on 1C03. • Checks RCP operating red lights illuminated on 1C06 • Verifies Thot minus Tcold is less than 10°F by checking indicators on 1C06 <p>Reports Core and RCS Heat Removal complete</p>
	CRO	<p>Perform Containment Environment including verifying alt actions</p> <ul style="list-style-type: none"> • Checks Containment Pressure < 0.7 psig using narrow range pressure on 1C10 • Verifies Containment Temperature < 120°F using cavity and dome temperature indicators on 1C10. • Verifies Containment Gaseous RMS at 1C22 not in alarm with no abnormal rising trend <p>Reports Containment Environment not met due to negative trends in temperature and pressure (may call met based on trends)</p>

	CRO	<p>Perform Rad Levels External to Containment</p> <ul style="list-style-type: none"> • Check the following RMS alarms are clear with no unexplained rise: <ul style="list-style-type: none"> • U-1 Wide Range Noble Gas Monitor • U-1 Condensor Off Gas @ 1C22 • U-1 S/G Blowdown @ 1C22 • U-1 Main Vent Gaseous @ 1C22 <p>Reports Rad Levels External to Containment complete</p>
	CRS	<p>Perform EOP-0 brief</p> <ul style="list-style-type: none"> ▪ Ensure all are attentive ▪ Review Safety Functions not met <ul style="list-style-type: none"> ○ Pressure & Inventory due to PZR level trends ○ Containment Environment due to temperature and pressure trends (may be called met) ▪ Review Safety system Actuations <ul style="list-style-type: none"> ○ None ▪ Solicit Input <p>Conclude the brief</p>
	CRS	<p>Refer to EOP-0 flowchart</p> <ul style="list-style-type: none"> ▪ Pressure and Inventory not met with > 800 psia S/G pressure and no tube leakage indications, consider EOP-5 ▪ Containment Environment not met with normal S/G response, consider EOP-5 (may be called met) <p>Implements EOP-5 due to RCS Leakage</p>
		<p>* Shading indicates Critical Task</p>

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>2</u> Event No.: <u>6</u>		
Event Description: EOP-5 (After EOP-0)		
Time	Position	Applicant's Actions or Behavior
	CRS	Obtains EOP-5 placekeeper and performs EOP entry brief.
	CRO	Open Main & Aux HPSI Hdr Valves on 1C07 and 1C08
	CRO	Start 11 & 13 HPSI pumps on 1C07 and 1C08
	CRO	Attempt to Block SIAS on 1C10 when SIAS block permitted alarm annunciates
	CRO	Recognize failure of SIAS B to Block
	CRS/CRO	Contact PWS to locally block SIAS B at ESFAS cabinet
	RO	Perform RCP Trip Strategy <ul style="list-style-type: none"> • Trips 11A and 12B OR 11B and 12A RCP's if RCS pressure lowers to 1725 PSIA as a result of the event
	RO	Commence RCS Boration <ul style="list-style-type: none"> • Check Shut VCT M/U 1-CVC-512-CV at 1C07 • Open BA direct M/U 1-CVC-514-MOV at 1C07 • Open BAST Gravity Feed MOV's 1-CVC-508 and 509 MOV's at 1C07 • Verify M/U Mode HS-210 in manual at 1C07 • Start both BA Pumps at 1C07 • Shut VCT OUT Valve 1-CVC-501-MOV at 1C07 • Verify all charging pumps operating
	CRO	Commence Cooldown prior to subcooling <math><30^{\circ}</math> <ul style="list-style-type: none"> • Places TBV controller at 1C03 in manual and adjusts output to control RCS cooldown <math><100^{\circ}\text{F}</math> in any one hour period.
	CRO	Blocks SGIS A and B at 1C03 when SGIS Block Permitted alarms recieved

	RO	<p>Depressurize RCS to maintain subcooling</p> <ul style="list-style-type: none"> • De-energize Pressurizer Heaters at 1C06 • Use Main Spray if all RCP's are running • Use Aux Spray if any RCP is secured • Operate Pressurizer Spray to maintain subcooling as low as possible between 30 and 140°F based on CET temperatures AND above the RCP NPSH limits of Att.1
	CRO	<p>Throttle HPSI Flow</p> <ul style="list-style-type: none"> • Verifies > 30°F subcooling based on CET's from PAM's display at 1C05 • Verifies Pressurizer level >101 inches at 1C06 • Verifies S/G level > (-) 170" capable of being steamed and supplied feedwater • Verifies RVLMS indicates level above hot leg on PAM's display at 1C05 • Stops HPSI Pump and/or throttles HPSI MOV's to control Pressurizer level 101 to 180 inches and RCS subcooling 30-140°F based on CET's
		Secure Scenario after HPSI Flow is throttled
	CRS	Determines EAL H.A.5.1.2
		* Shading indicates a Critical Task

Appendix D

Scenario Outline

Form ES-D-1

Op-Test No.: 2008 Scenario No.: 3

Facility: <u>Calvert Cliffs 1 & 2</u>	Scenario No.: <u>3</u>	Op-Test No.: <u>2008</u>	
Examiners: _____	Operators: _____	_____	
_____	_____	_____	
Turnover: Unit 1 is at 100% power, MOL equilibrium conditions. 13 HPSI pump tagged out for repair of excessive vibration during last STP O-7B (3 hours into 36 hour maintenance window) IAS LCO 3.5.2.A.			
Event No.	Malf. No.	Event Type*	Event Description
1	RCS011_03	-----	12A RCP 1 st Stage Seal Failure
2	RPS007_02	I (SRO)	Channel B RPS Matrix Power Supply Failure (TS CRS)
3	RCS021	C (RO)	PORV 402 leak
4	RCS013_03	C (RO)	12A RCP 3 rd Stage Seal Failure
5	N/A	R (RO)(SRO) N(CRO)SRO	Perform Expeditious Reactor Shutdown due to 2 failed seals on 12 RCP
6	N/A	C (RO)	VCT Outlet MOV fails (1-CVC-501-MOV)
7	ESFA009	M (CRO)	Spurious CIS B Actuation
8	CD001	C (CRO)	Loss of Vacuum
9	MS002_01	M (All)	11 S/G Tube Leak (2 Tubes)
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Target Quantitative Attributes (Per Scenario; See Section D.5.d)		Actual Attributes	--	--	--
1.	Total malfunctions (5-8)	/ /	8		
2.	Malfunctions after EOP entry (1-2)	/ /	2		
3.	Abnormal events (2-4)	/ /	6		
4.	Major transients (1-2)	/ /	2		
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.: 2008 Scenario No.: 3

SCENARIO OVERVIEW

RCP SEALS/TUBE LEAK

Initial Conditions: 100% Rated Thermal Power, MOL, Equilibrium conditions. 13 HPSI pump tagged out for repair of excessive vibration during last STP O-7B (3 hours into 36 hour maintenance window) IAS LCO 3.5.2.A.

Scenario starts with 12A RCP 1st stage seal failure. The crew ensures only a single seal failed and notifies engineering.

Channel B RPS matrix power supply will fail causing multiple alarms at 1C05. After ensuring RPS is not calling for a trip the crew should enter LCO's 3.3.3.A & 3.3.3.B. The CRS should call OWC to get I&C working on repairs to the power supply problem.

After determining all LCO's calls for RPS, PORV 402 will start leaking requiring its block valve to be shut and Tech Specs addressed.

While CRS looking at Tech Specs for PORV leakage 12A RCP 3rd stage seal will start to fail over 5 minute period. This second seal failure will require an expeditious shutdown IAW Alarm Manual.

During the shutdown VCT Outlet valve will fail to shut forcing RO to reduce power using BAST's instead of RWT which is preferred method of OP-3.

During the shutdown a CIS B spurious actuation occurs, which causes a loss of component cooling water to the RCP's. The crew will be unable to reset the CIS B and a reactor trip will be ordered.

After verifying Reactivity Control in EOP-0 the RCP's should be secured. During EOP-0 a vacuum leak in the condenser develops causing a loss of Main Feedwater and TBV's. After completing EOP-0 a transition to EOP-2 should occur.

After a few steps are completed in EOP-2 a tube leak develops in 12 S/G causing the crew to transition to EOP-6.

The scenario will end when the 12 S/G is isolated IAW EOP-6. CRS will declare EAL H.A.5.1.2

INSTRUCTOR SCENARIO INFORMATION

- ___ 1. Reset to IC-24
- ___ 2. Perform switch check.
- ___ 3. Place simulator in CONTINUE, advance charts and clear alarm display.
- ___ 4. Place simulator in FREEZE.
- ___ 5. Enter Trigger
 - a. CEA #1 on bottom of core
- 6. Enter Malfunctions
 - ___ a. 12A RCP Lower Seal Failure
RCS011_03, 0-100% over a 2 minute ramp on F1
 - ___ b. Channel B RPS Matrix Power Supply Failure
RPS007_02 on F2
 - ___ c. PORV 402 leakage
RCS021 at 0-30% over 1 minute ramp on F3
 - ___ d. 12A RCP 3rd Stage Seal Failure
RCS013_03, 0-100% over 5 minute ramp on F4
 - ___ e. Spurious CIS B Actuation
ESFA009_02 on F5
 - ___ f. 11 S/G Tube Leak (2 Tubes)
MS002_01 at F6
 - ___ g. Loss of Condenser Vacuum
CD001 0-100% over 5 minute ramp on T1
 - ___ h. 13 HPSI Pump failure
SI002_03 at Time zero
- 7. Enter Panel Overrides
 - ___ a. VCT Outlet Valve Handswitch 1-HS-2501 to open (ensure actual H/S in Auto)
 - ___ b. VCT Outlet Valve Handswitch 1-HS-2501 auto white light on

8. Enter Remote Functions / Administrative
 - _____ a. Place yellow tag on 13 HPSI Pump H/S in PTL.
 - _____ b. Place red dot on H-20 “13 HPSI PP BKR L/U IMPR”
- _____ 9. Set simulator time to real time, then place simulator in CONTINUE.
- _____ 10. Give crew briefing.
 - a. Present plant conditions: 100% load at MOL 10,885 MWD/MTU
 - b. Power history: 100% for 9 months
 - c. Equipment out of service: 13 HPSI Pump OOS (repairing excessive vibration during STP-O-7, 3 hrs into 36 hr window)
 - d. Abnormal conditions: None
 - e. Surveillances due: None
 - f. Instructions for shift: Maintain 100% power
- _____ 11. Allow crew 3-5 minutes to acclimate themselves with their positions.
- _____ 12. Instructions for the Booth Operator.
 - a. Activate F1 12A RCP Lower Seal Failure when cued by the lead evaluator.
 - b. Activate F2 Channel B RPS Matrix Power Supply Failure when cued by lead evaluator.
 - c. Activate F3 PORV 402 Leakage when cued by lead evaluator.
 - d. Activate F4 12A RCP 3rd Stage Seal Failure when cued by lead evaluator.
 - e. Activate F5 Spurious CIS B Actuation when cued by lead shortly after crew commences expeditious shutdown.
 - f. Activate F6 11 S/G Tube Leak (2 Tubes) when cued by lead

Op-Test No.: 2008 Scenario No.: 3

RESPONSES TO CREW REQUEST

If a request and response is not listed, delay response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

	REQUEST	RESPONSE
1.	OWC contact Engineering about 12 A RCP lower seal failure	Acknowledge request.
2.	OWC contact I&C to investigate loss of RPS matrix power supply	Acknowledge request.
3.	OWC contact Engineering about PORV 402 Leakage	Acknowledge request
4.	OWC contact Engineering about 12 A RCP upper seal failure	Acknowledge request
5.	ABO/PPO check 1-CVC-501	Acknowledge request, after 5 minutes report "Valve appears open with nothing unusual"
6.	PWS attempt reset of CIS B locally at ESFAS cabinet	Acknowledge request, After 2 minute give ESFAS door alarm then clear alarm after another 2 minutes. Call CR and report "unable to reset CIS B locally"
7.	TBO check condenser for vacuum leak	Acknowledge request
8.	Chemistry sample both S/G's for activity	Acknowledge request, after 15 minutes report activity in 11 S/G

Critical Tasks

1. Secures all RCP's within 3 minutes of reaching RCP temperature limits.
2. Isolate 11 S/G prior to S/G filling solid and MSSV's opening.

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>3</u> Event No.: <u>1</u>		
Event Description: 12A RCP 1st Stage Failure (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	RO	Announce and acknowledges alarm E-59 "12A RCP Seal" on 1C06
	RO	Evaluates 12A RCP, determines lower seal failure
	CRO	Evaluate Alarm Manual <ul style="list-style-type: none"> ▪ Checks Controlled Bleed-Off flow and determines normal (vapor seal not failed) ▪ Verifies only 1 failed seal and notifies CRS of need to contact Engineering
	CRS	Directs RO to monitor other RCP seals
	CRS	Notifies Engineering of seal failure

Time	Position	Applicant's Actions or Behavior
Op-Test No.: <u>2008</u> Scenario No.: <u>3</u> Event No.: <u>2</u>		
Event Description: Channel B RPS Matrix Power Supply Failure (Evaluator's Cue)		
	CRO/RO	Announce multiple alarms per management expectations (may only announce alarms D-1 & D-3 and not announce multiple alarms)
	CRS	CRS directs CRO to check RPS calling for a trip (may not direct this if not announce as multiple alarms)
	CRO	<p>Check RPS calling for a trip</p> <ul style="list-style-type: none"> ▪ Checks RPS for active trips (any 2 sets of red lights on same Trip Unit means trip condition) ▪ Checks RPS power supplies (2 RPS channels w/o power indicates trip condition) ▪ Checks RPS Matrix Relays (any combination of right side lights out with left side lights out (6 groups of 4 lights) <p>Report RPS not calling for a trip</p>
	CRS	CRS directs RO to monitor primary
	RO	<p>Monitor the primary</p> <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level <p>Report primary is stable</p>
	All	<p>CRS directs RO & CRO to evaluate alarms</p> <ul style="list-style-type: none"> ▪ D-1 CEA TCB 11/TCB 15 TRIP ▪ D-3 CEA TCB 12/TCB 16 TRIP
	CRO	Report loss of Matrix Power Supply
	CRS	Direct OWC to Contact I&C about RPS Matrix power supply failure

	CRS	Evaluate Tech Specs. Reactor Protective System Logic and Trip Initiation <ul style="list-style-type: none">▪ Enter LCO Action Statement 3.3.3.A & 3.3.3.B
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Appendix D Required Operator Actions

Op-Test No.: <u>2008</u> Scenario No.: <u>3</u> Event No.: <u>3</u>		
Event Description: PORV 402 Leakage (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	RO	Announce and acknowledge alarm E-1 "QUENCH TANK TEMP/PRESS/LEVEL" and E-22 "PORV/SAFETY VLV ACOUSTIC MON"
	CRO	Review Alarm Manual for alarm E-22 <ul style="list-style-type: none"> ▪ Verify no high RCS pressure condition exists ▪ Place PORV 402 Override handswitch 1-HS-1402 in "OVERRIDE TO CLOSE" at 1C06 (may not be performed) ▪ SHUT PORV Block valve 1-RC-403 at 1C07 ▪ Monitor PORV tailpiece temperatures using plant computer points T106, T107, and T108 ▪ Inform CRS to refer to Tech Specs 3.4.11 & 3.4.12
	CRS	Refer to Tech Specs <ul style="list-style-type: none"> ▪ Enter Tech spec Action Statement 3.4.11.A <ul style="list-style-type: none"> ○ Ensure block valve shut with power maintained

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>3</u> Event No.: <u>4, 5, 6</u>		
Event Description: 12A RCP 3rd Stage Failure , Expeditious power reduction , VCT Outlet Valve failure (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	RO	Announce and acknowledge computer alarm 12A Controlled Bleedoff Flow High Temp and later reflash of alarm E-59 "12A RCP Seal" on 1C06
	RO	Evaluates 12A RCP, determines a upper seal failure
	CRO	Evaluate Alarm Manual <ul style="list-style-type: none"> ▪ Checks Controlled Bleed-Off flow and determines normal (vapor seal not failed) ▪ Verifies 2 failed seals and notifies CRS of need for expeditious shutdown and need to secure 12 A RCP when reactor is shutdown
	CRS	Recognize need for expeditious shutdown to protect against RCS leak from RCP seals
	CRS	Directs an expeditious shutdown
	CRS	Notifies Chemistry of power reduction > 15% in 1 hour
	CRS/CRO	Notifies ESO of power reduction
	RO	Equalize Boron <ul style="list-style-type: none"> ▪ Energize all PZR Backup Htrs on 1C06 ▪ Lower PIC-100X & Y to ≈ 2200 psia on 1C06 to maintain pressure ≈ 2250 psia due to additional heaters being energized

	RO	<p>Borate from RWT IAW OP-3</p> <ul style="list-style-type: none"> ▪ Open RWT CHG PP SUCT 1-CVC-504-MOV on 1C06 ▪ Attempts to Shut VCT OUTLET VLV 1-CVC-501-MOV on 1C06 ▪ Report failure of 1-CVC-501 to shut to CRS ▪ Recommend performing power reduction using fast borations IAW OI-2B Section 6.12 (\approx 10 second fast borations every 3-5 minutes) ▪ Open BA Direct Makeup 1-CVC-514-MOV on 1C07 ▪ Start 11 or 12 Boric Acid Pump on 1C07 for time agreed upon previously ▪ Shut BA Direct Makeup 1-CVC-514-MOV on 1C07 ▪ Repeat fast borations as necessary
	CRO	<p>Lowers turbine load to maintain Tcold on program</p> <ul style="list-style-type: none"> ▪ Compare Reactor Power (ΔT Power Digital Indication @ 1C05) with plaque on panel 1C02 to determine program Tcold ▪ Operate Turbine Load Set Handswitch 1-CS-80 in Lower Direction to raise Tcold to match program Tcold ▪ Adjust Load Limit Setpoint to approximately 10% greater than current load on Mark VI screen on 1C02
	RO	Periodically compare all indications of power
	CRS	Notifies Engineering of 2 nd seal failure

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>3</u> Event No.: <u>7</u>		
Event Description: Spurious CIS B (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	RO/CRO	Announce and acknowledge alarm G-6 "ACTUATION SYS CIS TRIP" alarm on 1C08
	CRS	Direct RO to monitor primary
	RO	<p>Monitor the primary</p> <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level <p>Report primary is stable</p>
	RO	<p>Monitor RCP temperatures for trip criteria</p> <ul style="list-style-type: none"> ▪ Controlled Bleed-Off Temperature >200°F ▪ Bearing Temperatures > 195°F
	CRO	<p>Determines CIS alarm is not valid</p> <ul style="list-style-type: none"> ▪ Checks containment parameters normal <ul style="list-style-type: none"> ○ Containment narrow range pressure at ≈ 0 psig ○ Containment temperature and humidity not changed since shift turnover.

	CRO	<p>Attempt to reset CIS IAW EOP Attachment 4</p> <ul style="list-style-type: none"> ▪ Match H/S's with an asterisk <ul style="list-style-type: none"> ○ Shut CC CNTMT SUPPLY 1-CC-3832-CV on 1C10 ○ Shut CC CNTMT RETURN 1-CC-3833-CV on 1C10 ○ Verify Shut IA CNTMT ISOL 1-IA-2080-MOV on 1C10 ○ Verify 1-IA-2080-MOV OVERRIDE 1-HS-2080A to normal on 1C10 ▪ Depress CIS RESET Channel A on 1C09 and CIS RESET Channel B on 1C10 ▪ Recognize CIS not reset and inform CRS
	CRS	Contact PWS and request reset of CIS locally at ESFAS Panel in Cable Spreading Room
	RO	<p>Recognize trip criteria being met (may order trip prior to exceeding trip criteria)</p> <ul style="list-style-type: none"> ▪ Controlled Bleed-Off temperature exceeding 200°F
	CRS	Directs Reactor Trip

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>3</u> Event No.: <u>8</u>		
Event Description: EOP-0 and Loss of Vacuum (After Reactor Trip)		
Time	Position	Applicant's Actions or Behavior
	CRS	Directs EOP-0
	RO	<p>Performs Reactivity Control</p> <ul style="list-style-type: none"> ▪ Depress Manual Reactor Trip Pushbutton on 1C05 ▪ Check Reactor tripped using NI power indications on 1C05 ▪ Verifies no more than 1 CEA failed to insert ▪ Verify DI Water Makeup is secured <ul style="list-style-type: none"> ○ Check 11 & 12 RC makeup Pumps secured on 1C07 ○ Check VCT M/U 1-CVC-512-CV is shut on 1C07 ○ If aligned for direct makeup to RCS then shut RWT Charging Pump Suction 1-CVC-504-MOV on 1C07 <p>Reports Reactivity Control Complete</p>
	RO	Secures 11B RCP within 3 minutes of reaching RCP limits (thrust bearing 195°, CBO 200°) and trips all other RCP's prior to exceeding RCP limits for 3 minutes.

	<p>CRO</p>	<p>Performs Turbine Trip</p> <ul style="list-style-type: none"> ▪ Check Reactor tripped then: <ul style="list-style-type: none"> ○ Depress both Turbine Trip Pushbuttons on 1C02 ○ Check Main Turbine stop Valves shut on MK VI screen ○ Check Turbine Speed drops on MK VI screen ○ Checks Turbine Generator Output Breakers open <ul style="list-style-type: none"> ▪ 11 GEN BUS BKR 0-CS-552-22 on 1C01 ▪ 11 GEN TIE BKR 0-CS-552-23 on 1C01 ○ Check Generator Field Breaker open on 1C01 ○ Check Generator Exciter Field breaker open on 1C01 ○ Check MSR 2nd Stage Steam source Valves are shut <ul style="list-style-type: none"> ▪ 1-MS-4025-MOV on 1C02 ▪ 1-MS-4026-MOV on 1C02 <p>Reports Turbine Trip Complete</p>
	<p>CRO</p>	<p>Performs Vital Aux</p> <ul style="list-style-type: none"> ▪ Check 11 or 14 4KV bus energized. ▪ Check ALL 125V DC BUS VOLTS greater than 105 volts on 1C24: <ul style="list-style-type: none"> ▪ 11 ▪ 12 ▪ 21 ▪ 22 ▪ Check at least THREE 120V AC Vital Buses are energized on 1C24: <ul style="list-style-type: none"> ▪ 11 ▪ 12 ▪ 13 ▪ 14 ▪ Check EITHER 1Y09 OR 1Y10 energized on 1C24. ▪ Verifies no Component Cooling Flow to the RCP's by checking CC Pump operating at 1C13 and Containment Supply Valve open and Containment Return Valve shut on 1C10. Verifies all 4 RCP's secured by checking green indicating lights and zero amps at 1C06. <p>Reports Vital Auxiliaries Complete</p>

	RO	<p>Performs Press & Inventory including verifying alt actions</p> <ul style="list-style-type: none"> • Checks pressurizer pressure at 1C06 and between 1850 and 2300 psia and trending to 2250 psia. • Checks pressurizer level at 1C06 and between 80 and 180 inches and trending to 160 inches. • Checks subcooling is greater than 30°F by Pam's display on 1C05 <p>Reports Press & Inventory is complete</p>
	CRO	<p>Performs Core & RCS Heat Removal</p> <ul style="list-style-type: none"> • Operate ADV's in manual (≈40-50% output) to control S/G pressure 850 to 920 psia and Tcold between 525 and 535°F (TBV's inoperative due to vacuum leak) • Checks S/G level (-)170" to (+) 50" on 1C03 • Recognizes MFW secured due to loss of vacuum and initiates AFW <ul style="list-style-type: none"> ○ Start an AFW pump by performing either: <ul style="list-style-type: none"> ▪ Open 1-MS-4070-CV & 1-MS4071-CV at 1C04 to start 11 AFW pump ▪ Place 13 AFW pump handswitch to start on 1C04 ○ Trip the SGFP's by depressing trip pushbuttons on 1C03 ○ Shut the S/G FW Isolations using handswitches on 1C03 ○ Operate AFW System to restore S/G levels to between (-)170 and (+)30 inches (AFW flow control setpoint between 150 gpm and 300 gpm on 1C04) • Checks RCP not operating green lights illuminated on 1C06 <p>Reports Core and RCS Heat Removal cannot be met due to no operating RCP's</p>
	CRO	<p>Perform Containment Environment including verifying alt actions</p> <ul style="list-style-type: none"> • Checks Containment Pressure < 0.7 psig using narrow range pressure on 1C10 • Verifies Containment Temperature < 120°F using cavity and dome temperature indicators on 1C10. • Verifies Containment Gaseous RMS at 1C22 not in alarm with no abnormal rising trend <p>Reports Containment Environment is complete</p>

	CRO	<p>Perform Rad Levels External to Containment</p> <ul style="list-style-type: none"> • Check the following RMS alarms are clear with no unexplained rise: <ul style="list-style-type: none"> • U-1 Wide Range Noble Gas Monitor • U-1 Condenser Off Gas @ 1C22 • U-1 S/G Blowdown @ 1C22 • U-1 Main Vent Gaseous @ 1C22 <p>Reports Rad Levels External to Containment complete</p>
	CRS	<p>Perform EOP-0 brief</p> <ul style="list-style-type: none"> ▪ Ensure all are attentive ▪ Review Safety Functions not met <ul style="list-style-type: none"> ○ Core and RCS Heat Removal ▪ Review Safety system Actuations <ul style="list-style-type: none"> ○ Spurious/Invalid CIS ▪ Solicit Input <p>Conclude the brief</p>
	CRS	<p>Refer to EOP-0 flowchart</p> <ul style="list-style-type: none"> ▪ Heat Removal not met due to no RCP's, consider EOP-2 <p>Implements EOP-2 due to loss of RCS forced circulation</p>

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>3</u> Event No.: <u>8</u>		
Event Description: EOP-2 (Following EOP-0)		
Time	Position	Applicant's Actions or Behavior
	CRS	Hold EOP-2 Entry Brief using EOP-2 placekeeper
	CRS	Assign Step E Restore Component Cooling flow to CRO
	CRO	<p>Perform Step E Restore Component Cooling Flow</p> <ul style="list-style-type: none"> ▪ Shut CC Containment Supply Valve 1-CC-3832-CV using handswitch on 1C10 ▪ Verify 11 CC pump running ▪ Verify either 11 or 12 CCHX in service with 11 or 12 SW header in service (both HX's and SW headers should be in service) ▪ Prepare to record highest RCP CBO & Lower Seal Temperatures attained (these should be recorded just prior to restoring Component Cooling Flow to the Containment) <p>Inform CRS that Step E is as complete as possible without resetting CIS, and request another step.</p>
	CRS	Assign step G Establish RCS Heat Sink to the CRO

	CRO	<p>Perform Step G Establish RCS heat Sink</p> <ul style="list-style-type: none"> ▪ Operate ADV's in manual to continue maintaining S/G Press between 850 and 920 psia and Tcold between 525 and 535°F ▪ Establish AFW flow using 11 AFW Pump <ul style="list-style-type: none"> ○ Verify Steam Train Block Valves open with handswitches in auto ○ Open AFW Steam Supply Valves <ul style="list-style-type: none"> ▪ 1-MS-4070 on 1C04 ▪ 1-MS-4071 on 1C04 ○ Ensure 11 AFW pump discharge pressure at least 100 psi greater than S/G Pressure ○ Place 13 AFW Pump H/S in PTL on 1C04 ○ Slowly raise and maintain S/G level to between (-)24 to (+)30 inches using S/G Flow control valves <ul style="list-style-type: none"> ▪ 1-AFW-4511-CV on 1C04 ▪ 1-AFW-4512-CV on 1C04 ○ Contact TBO to ensure AFW Pump Room ventilation maintaining temperature < 130°F ▪ Secure the Main Feed System <ul style="list-style-type: none"> ○ Trip both SGFP using pushbuttons on 1C03 ○ Place all Condensate Booster Pump handswitches in PTL on 1C03 ○ Place all Condensate Pump handswitches in PTL on 1C03 ○ Place both Heater Drain Pump handswitches in PTL on 1C03 ○ Shut S/G Feedwater Isolation valves <ul style="list-style-type: none"> ▪ 1-FW-4516-MOV on 1C03 ▪ 1-FW-4517-MOV on 1C03 ○ Place Hotwell Level controller 1-LIC*4405 in manual with 50% output ○ Protect S/G BD against waterhammer by shutting the following: <ul style="list-style-type: none"> ▪ 1-BD-4010-CV on 1C03 ▪ 1-BD-4011-CV on 1C03 ▪ 1-BD-4012-CV on 1C03 ▪ 1-BD-4013-CV on 1C03 ▪ 1-CD-410 in Turbine Bldg ▪ 1-CD-411 in Turbine Bldg
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	CRS	Assign Step H Maintain PZR Level to the RO
	RO	Maintain PZR Level between 101 and 180 inches <ul style="list-style-type: none"> ▪ Operate Charging and Letdown to restore and maintain level
	ALL	Recognize S/G tube rupture by: <ul style="list-style-type: none"> ▪ Lowering PZR level ▪ Lowering trend on RCS Pressure ▪ No change in Containment Parameters ▪ SIAS actuation on low RCS Pressure ▪ Rising trend in 11 S/G
	CRS	Evaluate EOP-0 diagnostic flowchart and determine EOP-6 is appropriate Evaluate EOP-6 ISFSC to verify it is correct EOP (Crew may enter EOP-8 Functional Recovery Procedure, following steps would be the same but crew may be delayed by \approx 10 minutes due to extra steps associated with EOP-8)

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: 2008 Scenario No.: 3 Event No.: 9Event Description: **S/G Tube Leak (EOP-6) (Evaluator's Cue after steps assigned in EOP-2)**

Time	Position	Applicant's Actions or Behavior
	CRS	Transition to EOP-6 and hold entry brief using placekeeper
	CRS	Direct RO to perform Step D Monitor RCS Depressurization
	RO	Monitor RCS Depressurization <ul style="list-style-type: none"> ▪ Verify SIAS <ul style="list-style-type: none"> ○ Verify Alarm window G-5 "Actuation Sys SIAS Trip" is in ○ Ensure 11 & 13 HPSI pumps started on 1C08 & 1C09 ○ Ensure Main & Aux HPSI Header Valves Open on 1C08 & 1C09 ▪ If SIAS actuated then: <ul style="list-style-type: none"> ○ Verify following pumps running: <ul style="list-style-type: none"> ▪ 11 HPSI on 1C08 ▪ 13 HPSI on 1C09 ▪ 11 LPSI on 1C08 ▪ 12 LPSI on 1C09 ▪ All charging pumps on 1C07 ○ Verify HPSI flow per EOP Attachment 10 when RCS temp <1270 psia
	CRS	Direct RO to perform Step F Commence RCS Boration

	RO	<p>Commence RCS Boration</p> <ul style="list-style-type: none">▪ Verify boration in progress as follows:<ul style="list-style-type: none">○ VCT Makeup Valve 1-CVC-512 is shut on 1C07○ Boric Acid Direct Makeup Valve 1-CVC-514 is open on 1C07○ BAST Gravity Feed Valves are open on 1C07<ul style="list-style-type: none">▪ 1-CVC-508-MOV▪ 1-CVC-509-MOV○ 11 & 12 Boric Acid Pumps are running on 1C07○ RWT Charging Pump Suction Valve 1-CVC-504 is shut on 1C07○ VCT Outlet Valve 1-CVC-501-MOV is shut on 1C07(May direct local operation to shut)○ All Charging Pumps running on 1C07▪ Record time RCS boration commenced
	CRS	Direct CRO to perform Step G Commence RCS Cooldown

	CRO	<p>Commence RCS cooldown</p> <ul style="list-style-type: none"> ▪ Block SGIS when SGIS Block Permitted alarms C-53 & C-54 on 1C03 are received ▪ Record Open and Close times for 11 ADV for dose calculations ▪ Open ADV's to 100% using 1-HIC-4056 on 1C03 ▪ When Thot reaches 515°F, adjust ADV controller to ≈40-50% ▪ Establish AFW flow using 13 AFW pump <ul style="list-style-type: none"> ○ Place AFW motor train block valve handswitches to open <ul style="list-style-type: none"> ▪ 1-AFW-4522-CV on 1C04 ▪ 1-AFW-4523-CV on 1C04 ▪ 1-AFW-4532-CV on 1C04 ▪ 1-AFW-4533-CV on 1C04 ○ Start 13 AFW Pump ○ Restore and maintain S/G Level between (-)24 to (+)30 inches using: <ul style="list-style-type: none"> ▪ 1-AFW-4525-CV on 1C04 ▪ 1-AFW-4535-CV on 1C04 ▪ Secure the Main Feed System <ul style="list-style-type: none"> ○ Trip both SGFP using pushbuttons on 1C03 ○ Place all Condensate Booster Pump handswitches in PTL on 1C03 ○ Place all Condensate Pump handswitches in PTL on 1C03 ○ Place both Heater Drain Pump handswitches in PTL on 1C03 ○ Shut S/G Feedwater Isolation valves <ul style="list-style-type: none"> ▪ 1-FW-4516-MOV on 1C03 ▪ 1-FW-4517-MOV on 1C03 ○ Place Hotwell Level controller 1-LIC*4405 in manual with 50% output ○ Protect S/G BD against waterhammer by shutting the following: <ul style="list-style-type: none"> ▪ 1-BD-4010-CV on 1C03 ▪ 1-BD-4011-CV on 1C03 ▪ 1-BD-4012-CV on 1C03 ▪ 1-BD-4013-CV on 1C03 ▪ 1-CD-410 in Turbine Bldg ▪ 1-CD-411 in Turbine Bldg
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	CRS	Direct CRO to perform Step J Identify, Isolate and Confirm Affected S/G
	CRO	<p>Identify, Isolate and Confirm Affected S/G</p> <ul style="list-style-type: none"> ▪ Identify 11 S/G as the most affected S/G <ul style="list-style-type: none"> ○ S/G samples ○ Main Steam Effluent Radiation Monitor ○ S/G Level change when not feeding ○ Post trip S/G Level trends ▪ When $T_{hot} < 515^{\circ}\text{F}$ then isolate 11 S/G <ul style="list-style-type: none"> ○ ___ Shut 11 ADV by directing TBO verify 11 ADV Controller at 0% on 1C43, then align Hand Transfer valves for 11 ADV to 1C43 ○ ___ Shut 11 MSIV on 1C03 ○ ___ Verify 11 MSIV Bypass 1-MS-4045-MOV Shut on 1C03 ○ ___ Verify 11 SG FW ISOL 1-FW-4516-MOV Shut on 1C03 ○ ___ Shut 1-MS-4070 & 4070A using handswitch on 1C03 ○ ___ Shut 11 SG AFW Block Valves <ul style="list-style-type: none"> ▪ 1-AFW-4520 on 1C04 ▪ 1-AFW-4521 on 1C04 ▪ 1-AFW-4522 on 1C04 ▪ 1-AFW-4523 on 1C04 ○ ___ Shut 11 S/G B/D valves <ul style="list-style-type: none"> ▪ 1-BD-4010-CV on 1C03 ▪ 1-BD-4011-CV on 1C03 ○ ___ Shut MS UPSTREAM DRN ISOL VLVS with 1-HS 6622 in Close on 1C02 ○ ___ Call for ABO or OSO to verify S/G Safety Valves NOT leaking
	CRS	Direct RO to perform Step I Depressurize the RCS to reduce subcooling

	RO	<p>Maintain subcooling as low as possible with these limits:</p> <ul style="list-style-type: none"> ▪ Subcooling between 25 and 140°F using CET's ▪ RCS pressure < 900 psia ▪ RCS pressure approximately equal to S/G pressure <p>Lower subcooling by:</p> <ul style="list-style-type: none"> ▪ De-energize all PZR Heaters on 1C06 ▪ Initiate Aux Spray <ul style="list-style-type: none"> ○ Record PZR water temperature and Charging temperature from indicators on 1C06 & 1C07 ○ Open Aux Spray Valve 1-CVC-517-CV on 1C07 ○ Shut Loop Charging Valves <ul style="list-style-type: none"> ▪ 1-CVC-518-CV on 1C07 ▪ 1-CVC-519-CV on 1C07 ○ Shift PZR Spray Controller 1-HIC-100 to manual with 0% output on 1C06 <p>Depressurize RCS to ≈ 25° Subcooling (minimize RCS leak rate)</p>
		Secure Scenario after 11 S/G isolated
	CRS	Determines EAL H.A.5.1.2
		* Shading indicates critical task

Appendix D

Scenario Outline

Op-Test No.: 2008 Scenario No.: 4

Facility: <u>Calvert Cliffs 1 & 2</u>	Scenario No.: <u>4</u>	Op-Test No.: <u>2008</u>
Examiners: _____	Operators: _____	
_____	_____	
_____	_____	

Turnover: Unit 1 is at 100% power, MOC, Equilibrium Conditions. 12 AFW pump tagged out for repair of overspeed trip device linkage (6 hours into 18 hour maintenance window).

Event No.	Malfunction No.	Event Type*	Event Description
1	Downpower	R (RON) N (CRO/SRO)	TSO-SO directed downpower
2	NI0011_01	I (RO)	Channel A NI Power Summer Failure
3	CVCS004_01	C (RO)	11 Charging Pump coupling failure
4	FW018_02	I (CRO)	12 FRV Controller Failure
5	CD008	C (CRO)	Condensate header rupture
6	SWYD002	M (ALL)	Loss of Offsite Power
7	4KV001_01	C (CRO)	11 4KV bus fault
8	AFW001_01	C(CRO)	11 AFW Pump Failure

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes	--	--	--
1. Total malfunctions (5-8)	/ /	7		
2. Malfunctions after EOP entry (1-2)	/ /	2		
3. Abnormal events (2-4)	/ /	3		
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.: 2008 Scenario No.: 4

SCENARIO OVERVIEW

NI POWER SUMMER/LOSS OF ALL FEED

Initial Condition is steady state at 100% power with 12 AFW pump tagged out for repair of overspeed trip device linkage (6 hours into 18 hour maintenance window). 12 Charging pump is the running charging pump.

Scenario starts with a call from TSO-SO that a transformer problem requires U-1 gross electrical output be reduced to 600 MWE as soon as possible. This will cause the crew to perform a rapid downpower IAW OP-3.

During the downpower a NI channel A power summer amp fails causing multiple alarms. Once crew identifies failed power summer amp NO-1-200 should be referenced and LCO's 3.3.1.A & 3.3.1.D should be entered. CRO will bypass channel A trip units 1,2,7,8,10. The downpower should be continued.

11 Charging pump coupling breaks causing PZR level to lower, when failed coupling is discovered the crew will select 12 charging pump as the running pump and place 11 Charging Pump H/S in PTL.

A failure of the 12 S/G Main FRV controller will cause the FRV to fail to the D/P controller in manual. AOP-3G should be implemented. After verifying a good setpoint signal the CRO will commence auto operation with the Main Feed Bypass valve.

Once Feedwater is auto a condensate header rupture will occur causing AOP-3G entry and trip of reactor and securing main feed & condensate.

Once reactor is tripped a loss of offsite power will occur concurrent with a fault on the 11 4KV bus. This will cause a loss of all A train components. During EOP-0 the CRO will need to start 12 CC pp to prevent a RCS leak from the RCP seals. During the wrap up brief for EOP-0 the 11 AFW pump will trip causing a loss of all feedwater. CRS should implement EOP-3.

During EOP-3 the crew will cool down the primary using available S/G inventory and commence once through core cooling when S/G level reaches -350". CRS should direct tying MCC 114 to MCC 104 to maximize PORV flow.

Scenario ends when crew has determined OTCC will be successful IAW EOP Attachments. CRS will declare Alert based on either A.A.7.1.2 or H.A.2.1.2

INSTRUCTOR SCENARIO INFORMATION

- ___ 1. Reset to IC-24
- ___ 2. Perform switch check.
- ___ 3. Place simulator in CONTINUE, advance charts and clear alarm display.
- ___ 4. Place simulator in FREEZE.
- ___ 5. Enter Trigger
 - a. None
- ___ 6. Enter Malfunctions
 - ___ a. Channel A NI Power Summer Failure
NI0011_01 on F1
 - ___ b. 11 Charging Pump coupling failure
CVCS003_01 on F2
 - ___ c. 12 FRV Controller Failure
FW018_02 on F3
 - ___ d. Condensate Header Rupture
CD008 on F4
 - ___ e. Loss of Offsite Power
SWYD002 on F5
 - ___ f. 11 4KV bus fault
4KV001_01 on F6
 - ___ g. 11 AFW Pump Failure
AFW001_01 on F7
 - ___ h. 12 AFW Pump Failure
AFW001_02 at Time Zero
- ___ 7. Enter Panel Overrides
 - ___ a. None
- ___ 8. Enter Remote Functions / Administrative
 - a. Place yellow tag on 12 AFW Pump trip pushbutton.
- ___ 9. Set simulator time to real time, then place simulator in CONTINUE.

- _____ 10. Give crew briefing.
- | | | |
|----|---------------------------|--|
| a. | Present plant conditions: | 100% load at MOC 10500 MWD/MTU |
| b. | Power history: | 100% for 6 months |
| c. | Equipment out of service: | 12 AFW Pump OOS (repairing overspeed trip linkage 6 hrs into 18 hr window) |
| d. | Abnormal conditions: | None |
| e. | Surveillances due: | None |
| f. | Instructions for shift: | Maintain 100% power |
- _____ 11. Allow crew 3-5 minutes to acclimate themselves with their positions.
12. Instructions for the Booth Operator.
- Activate F1 Channel A NI Power Summer Failure when cued by the lead evaluator.
 - Activate F2 11 Charging Pump coupling failure when cued evaluator.
 - Activate F3 12 FRV Controller Failure when cued by lead evaluator.
 - Activate F4 Condensate header rupture when cued by lead evaluator.
 - Activate F5 & F6 Loss of Offsite Power & 11 4KV bus fault at same time when cued by lead evaluator after reactor trip.
 - Activate F7 11 AFW Pump Failure when cued by lead evaluator

Op-Test No.: 2008 Scenario No.: 4

RESPONSES TO CREW REQUEST

If a request and response is not listed, delay response until reviewed with the examiner. If one request is dependent upon completion of another, then subsequent actions should not be responded to until the appropriate time delay has been observed. Responses to routine requests, which have no effect the scenario, do not require examiner clearance.

	REQUEST	RESPONSE
1.	OWC contact IM for assistance for NI Power Summer	Acknowledge Request
2.	ABO check 11 charging pump	Acknowledge Request, after 2 minutes report broken coupling
3.	ABO check suction pressure oscillation on 12 charging pump	Acknowledge Request, after 1 minute report no pressure oscillations
4.	OWC contact Engineering & IM for FRV Controller Failure	Acknowledge Request
5.	TBO/PPO check location of condensate header rupture	Acknowledge request, after 2 minutes report leak is at common discharge of condensate booster pumps
6.	PWS tie 1Y09 to 1Y10 with 1Y10 supplying IAW local plaque	Acknowledge Request, after 4 minutes tie 1Y09 to 1Y10
7.	TBO shift 13 charging pump to 14 480V Bus	Acknowledge Request, after 1 minute shift power supply
8.	ABO/PPO check SWGR Ventilation in service	Acknowledge Request, after 2 minutes report SWGR Ventilation in service
9.	ABO/PPO operate ADV's locally with chain operator	Acknowledge Request, after 2 minutes open ADV's to requested position.
10.	OWC/TBO check 11 AFW pp	Acknowledge Request, after 2 minutes report 11 AFW pp appears seized.
11.	U2 CRO align 23 AFW pp to supply U-1	Acknowledge Request, after 2 minutes report cross-connect valve will not open, OWC informed
12.	OWC expedite return of 12 AFW pp to service	Acknowledge Request
13.	ABO/PPO/PWS tie MCC-114 to MCC-104	Acknowledge Request, after 5 minutes tie MCC's using Remote Function

Critical Tasks

1. Starts 12 Component Cooling Pump prior to exceeding RCP temperature limits. (thrust bearing 195°, CBO 200°).
2. Commence OTCC within 5 minutes of both S/G's <-350" or Tcold rising 5°uncontrollably (must be commenced prior to CET temperature reaching 560°F)

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>4</u> Event No.: <u>1</u>		
Event Description: TSO-SO calls requesting 600 MWe ASAP (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	CRS	Direct RO & CRO to perform rapid Downpower IAW OP-3 to 600 MWe gross
	RO	<p>Borate the RCS</p> <ol style="list-style-type: none"> 1. Open BA Direct M/U Valve 1-CVC-514-MOV on 1C07 2. Start 12 charging pump 3. Start 11 or 12 BA Pump for 30 seconds then secure pump started 4. Shut BA Direct M/U Valve 1-CVC-514-MOV on 1C07 5. Open RWT CHG PP Suction valve 1-CVC-504-MOV on 1C07 6. Shut VCT Outlet Valve 1-CVC-501-MOV on 1C07
	CRO	Adjust turbine load to maintain Tcold within 5°F of program (not to exceed 548°F) using manual adjust switch 1-CS-80 or using auto on Mk6 Turbine Control Computer flat panel display on 1C02
	RO	Insert CEA's as needed by selecting Manual Sequential control at 1C05 and operating the In-Hold-Out switch to the insert direction. CEA's should be operated in ≈10-15 inch increments not to exceed transient insertion limits.
	RO	<p>Initiate Pressurizer Spray flow to help equalize PZR boron concentration.</p> <ol style="list-style-type: none"> 1. Energize all PZR Backup heaters on 1C05 2. Adjust setpoint of Pressurizer Pressure controller 1-PIC-100X & Y to ≈ 2200 psia to maintain RCS pressure ≈ 2250 psia.
	CRS	When 600 MWe gross output is reached, direct securing from rapid downpower
	RO	<p>Restore Charging pump suction to VCT:</p> <ol style="list-style-type: none"> 1. Open VCT Outlet Valve 1-CVC-501-MOV on 1C07 2. Shut RWT CHG PP Suction valve 1-CVC-504-MOV on 1C07

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>4</u> Event No.: <u>2</u>		
Event Description: Channel A NI Power Summer Failure (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	CRO/RO	Announce alarm D-22 on IC06 per management expectations
	CRS	CRS directs RO to monitor primary
	RO	Monitor the primary <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level Report primary is stable
	CRO	Recognize power summer failure on channel A and informs CRS
	CRS	Reference NO-1-200 matrix for T.S. applicability Direct CRO to bypass RPS A Trip Units 1,2,7,8,10
	CRO	Bypass Trip Units Channel A IAW OI-6. <ul style="list-style-type: none"> ▪ Ensure CRS checking Tech Specs ▪ Insert bypass key and turn clockwise to Bypass for following T/U's: <ul style="list-style-type: none"> ○ 1 Hi Power ○ 2 Hi Rate ○ 7 TM/LP Press ○ 8 Loss of Load ○ 10 Axial Power
	CRS	Enter RPS Instrumentation Tech Spec Action Statements <ul style="list-style-type: none"> ▪ LCO 3.3.1.A ▪ LCO 3.3.1.D
	RO	Evaluate Alarm Manual for compensatory actions

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>4</u> Event No.: <u>2</u>		
Event Description: 11 Charging Pump Coupling Failure (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	RO	Announce and acknowledge alarm F-45 "CHG HDR FLOW LO PRESS LO" on 1C07
	RO	Recognize failure of 11 charging pump coupling <ul style="list-style-type: none"> ▪ Charging header flow 0 gpm on 1C07 ▪ 11 Charging Pump red light lit on 1C07 ▪ 11 Charging Pump indicating low amps on 1C07 Inform CRS
	CRS	Direct RO to shift to 12 Charging Pump IAW OI-2A
	RO	Shift to 12 Charging Pump <ul style="list-style-type: none"> ▪ Notify Radiation Safety of new charging pump lineup ▪ Place 12 Charging Pump handswitch to start on 1C07 ▪ Direct ABO to check suction pressure oscillations < 4 psig ▪ Place 13 Charging Pump in PTL on 1C07 ▪ Place Backup Charging Pump Select handswitch in the "13 & 11" position on 1C07 ▪ Stop 11 Charging Pump on 1C07 ▪ Place 13 Charging Pump handswitch in normal on 1C07

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>4</u> Event No.: <u>3</u>		
Event Description: 12 FRV Controller Failure (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	CRO/RO	Acknowledge and announce 1C06 E-43 Selected Computer Point Alarm
	CRO	Reports 12 FRV controller failed, and now in manual control using the D/P controller on 1C03
	CRS	CRS directs RO to monitor primary
	RO	Monitor the primary <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level Report primary is stable
	CRS	Implement AOP-3G
	CRS	Direct RO to monitor for trip criteria <ul style="list-style-type: none"> ▪ S/G level approaching (+)50 inches ▪ Tcold lowers to 515°F
	CRO	Place 1-HS-4517C in Main Fail position on 1C03
	CRO	Adjust 1-PDI-4517 in manual control on 1C03 to maintain 12 S/G level approximately zero inches
	CRO	Verify S/G FW Main & Bypass Valve Controllers are in Manual on 1C03

	CRO	<p>Shift the S/G FW Bypass Valve Controller to Bypass Override Operation (may decide not to perform)</p> <ul style="list-style-type: none">▪ Verify Plasma Display at 1C36 is activated▪ Select “Menu” option on plasma display▪ Select “4 Display” (Channel Bypass) on plasma display▪ Press “Disabled” on plasma display▪ Verify plasma display displays “ENABLED”▪ Verify BYP OVERRIDE light on 1C03 is lit for 12 FRV▪ Adjust the 12 S/G FW Bypass Valve and Main Valve using controllers in manual:<ul style="list-style-type: none">○ 12 S/G FW Bypass Controller output \approx 70%○ 12 S/G FW Main FRV (using PDI Controller) for \approx zero inches▪ When above conditions are met and it is desired then place the 12 S/G Bypass Valve Controller to Auto
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Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>4</u> Event No.: <u>4</u>		
Event Description: Condensate header Rupture (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	CRO/RO	Announce multiple alarms per management expectations
	CRS	CRS directs CRO to check RPS calling for a trip
	CRO	<p>Check RPS calling for a trip</p> <ul style="list-style-type: none"> ▪ Checks RPS for active trips (any 2 sets of red lights on same Trip Unit means trip condition) ▪ Checks RPS power supplies (2 RPS channels w/o power indicates trip condition) ▪ Checks RPS Matrix Relays (any combination of right side lights out with left side lights out (6 groups of 4 lights)) <p>Report RPS not calling for a trip</p>
	CRS	CRS directs RO to monitor primary
	RO	<p>Monitor the primary</p> <ul style="list-style-type: none"> ▪ Check Reactor Power ▪ Check RCS temperatures ▪ Check RCS pressure ▪ Check PZR level <p>Report primary is not stable</p>
	CRO	Recognize condensate header rupture and report to CRS
	CRS	Implement AOP-3G, directs RO to trip reactor and CRO to secure condensate and feed IAW AOP-3G Section VIII Step A

	RO	<p>Depress Reactor trip pushbuttons on 1C05 and perform EOP-0, Reactivity Control</p> <ul style="list-style-type: none"> ▪ Depress Manual Reactor Trip Pushbutton on 1C05 ▪ Check Reactor tripped using NI power indications on 1C05 ▪ Verifies all CEAs fully inserted ▪ Verify DI Water Makeup is secured <ul style="list-style-type: none"> ○ Check 11 & 12 RC makeup Pumps secured on 1C07 ○ Check VCT M/U 1-CVC-512-CV is shut on 1C07 ○ If aligned for direct makeup to RCS then shut RWT Charging Pump Suction 1-CVC-504-MOV on 1C07 <p>Reports Reactivity Control Complete</p>
	CRO	<p>Secure Feed and Condensate IAW AOP-3G</p> <ol style="list-style-type: none"> 1. Trip both SGFP's 2. Secure following pumps and place handswitches in PTL <ul style="list-style-type: none"> ▪ Condensate Booster Pumps on 1C03 ▪ Condensate Pumps on 1C03 ▪ Heater Drain Pumps on 1C03 3. Shut SG FW Isolation Valves: <ul style="list-style-type: none"> ▪ 1-FW-4516-MOV on 1C03 ▪ 1-FW-4517-MOV on 1C03 4. Start an AFW Pump (11 or 13) on 1C04

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: <u>2008</u> Scenario No.: <u>4</u> Event No.: <u>5</u>		
Event Description: Loss of Offsite Power & 11 4KV bus fault, EOP-0 (Evaluator's Cue)		
Time	Position	Applicant's Actions or Behavior
	RO	Places 13 Charging pump in PTL on 1C07 and directs TBO to shift 13 charging pump to 14 480v Bus When power supply is shifted for 13 Charging Pump then start 13 Charging Pump
	CRO	Performs Turbine Trip <ul style="list-style-type: none"> ▪ Check Reactor tripped then: <ul style="list-style-type: none"> ○ Depress both Turbine Trip Pushbuttons on 1C02 ○ Check Main Turbine stop Valves shut on MK VI screen ○ Check Turbine Speed drops on MK VI screen ○ Checks Turbine Generator Output Breakers open <ul style="list-style-type: none"> ▪ 11 GEN BUS BKR 0-CS-552-22 on 1C01 ▪ 11 GEN TIE BKR 0-CS-552-23 on 1C01 ○ Check Generator Field Breaker open on 1C01 ○ Check Generator Exciter Field breaker open on 1C01 ○ Ensure MSR 2nd Stage Steam source Valves are shut <ul style="list-style-type: none"> ▪ 1-MS-4025-MOV on 1C02 cannot be verified due to loss of power effects <ul style="list-style-type: none"> ➤ Direct TBO to manually shut <ul style="list-style-type: none"> ○ 1-MS-4018-MOV ○ 1-MS-4017-MOV ➤ Direct TBO to verify MSR Panel Loader Panels are set to zero ▪ 1-MS-4026-MOV on 1C02
		Reports Turbine Trip Complete

	CRO	<p>Performs Vital Aux</p> <ul style="list-style-type: none"> ▪ Check 11 or 14 4KV bus energized. (14 4KV Bus is energized) ▪ Depress 0C DG Emergency Start Pushbutton 0-HS-0707 on 1C20A ▪ Check ALL 125V DC BUS VOLTS greater than 105 volts on 1C24: <ul style="list-style-type: none"> ▪ 11 ▪ 12 ▪ 21 ▪ 22 ▪ Check at least THREE 120V AC Vital Buses are energized on 1C24: <ul style="list-style-type: none"> ▪ 11 ▪ 12 ▪ 13 ▪ 14 ▪ Check EITHER 1Y09 OR 1Y10 energized on 1C24. (1Y10 is energized) ▪ Verifies Component Cooling Flow to the RCP's <ul style="list-style-type: none"> ○ Starts 12 CC pp (11 CC pp tripped due to 11 4KV bus loss) ▪ Direct ABO to verify switchgear ventilation in service IAW OI-22H <p>Reports Vital Auxiliaries Complete</p>
	CRO	Direct OSO to locally trip 1A D/G due to running without auxiliaries
	CRS	Direct OWC to contact E&C to investigate loss of 11 4KV Bus
	RO	<p>Performs Press & Inventory</p> <ul style="list-style-type: none"> • Checks pressurizer pressure at 1C06 between 1850 and 2300 psia and trending to 2250 PSIA on 1C06 • Checks pressurizer level at 1C06 between 80 and 180 inches and trending to 160 inches on 1C06 • Checks subcooling is greater than 30°F by PAMs display on 1C05 <p>Reports Press & Inventory is complete</p>

	CRO	<p>Performs Core & RCS Heat Removal</p> <ul style="list-style-type: none"> • TBV and ADV Controllers have lost power <ul style="list-style-type: none"> ○ Directs ABO/PPO to manually open 11 & 12 ADV's to 40-50% open using chain operator ○ Maintains S/G pressures between 850 and 920 psia and Tcold between 525 and 535°F • Checks S/G level (-)170" to (+) 50" on 1C03 <ul style="list-style-type: none"> ○ Main Feedwater lost due to loss of power effects ○ Start an AFW pump: <ul style="list-style-type: none"> ▪ Open 1-MS-4070-CV & 1-MS4071-CV at 1C04 to start 11 AFW pump ○ Trip the SGFP's by depressing trip pushbuttons on 1C03 ○ Shut the S/G FW Isolations using handswitches on 1C03 <ul style="list-style-type: none"> ▪ 11 S/G Feedwater isolation does not have power, direct an extra ABO to shut manually ○ Operate AFW System to restore S/G levels to between (-)170 and (+)30 inches (AFW flow control setpoint between 150 gpm and 300 gpm on 1C04) • Checks RCP not operating green lights illuminated on 1C06 <p>Reports Core and RCS Heat Removal cannot be met due to no operating RCP's</p>
	CRS	Contact PWS to tie 1Y09 to 1Y10 IAW local plaque
	CRO	<p>Perform Containment Environment including verifying alt actions</p> <ul style="list-style-type: none"> • Checks Containment Pressure < 0.7 psig using narrow range pressure on 1C10 • Verifies Containment Temperature < 120°F using cavity and dome temperature indicators on 1C10. (Loss of power effects prevents) <ul style="list-style-type: none"> ○ Verifies 13 & 14 Containment Air Coolers operating in Fast Speed on 1C10 ○ Opens 13 & 14 Containment Air Coolers Emergency Outlet Valves on 1C10 • Verifies Containment Gaseous RMS at 1C22 not in alarm with no abnormal rising trend (Loss of power effects prevents) <ul style="list-style-type: none"> ○ No valid alarm received, no Iodine Filter Units should be started on 1C10 <p>Reports Containment Environment complete (May call cannot be met due to loss of power effects)</p>

	CRO	<p>Perform Rad Levels External to Containment</p> <ul style="list-style-type: none"> • Check the following RMS alarms are clear with no unexplained rise: (Due to loss of power effects, cannot verify alarms clear) <ul style="list-style-type: none"> • U-1 Wide Range Noble Gas Monitor • U-1 Condenser Off Gas @ 1C22 • U-1 S/G Blowdown @ 1C22 • U-1 Main Vent Gaseous @ 1C22 <p>Reports Rad Levels External to Containment cannot be met due to loss of power effects</p>
	CRS	Direct PWS to tie 1Y09 to 1Y10 IAW local plaque
	CRO	<p>After 1Y09 tied to 1Y10, control of ADV's can be returned to 1C03.</p> <ul style="list-style-type: none"> ▪ Place ADV controller to desired output ▪ Direct ABO/PPO to remove mechanical gag on ADV's
* Shading indicates Critical Task		

Appendix D**Required Operator Actions****Form ES-D-2**

Op-Test No.: <u>2008</u> Scenario No.: <u>4</u> Event No.: <u>6</u>		
Event Description: Loss of 11 AFW Pump / Still in EOP-0 (Evaluator's Cue, ≈ 3 minutes after pump started)		
Time	Position	Applicant's Actions or Behavior
	CRO	Recognize 11 AFW Trip and report to CRS
	CRO	Contact TBO to investigate failure of 11 AFW Pump
	CRO	Re-evaluate Core and RCS Heat Removal Safety Function Report Core & RCS Heat Removal cannot be met due to no Feedwater and no operating RCP's
	CRS	Contact OWC to expedite repairs to 12 AFW Pump
	CRS	Perform EOP-0 brief <ul style="list-style-type: none"> ▪ Ensure all are attentive ▪ Review Safety Functions not met <ul style="list-style-type: none"> ○ Core and RCS Heat Removal due to no Feedwater and no operating RCP's ○ Containment Environment due to loss of power effects ○ Rad Levels External to Containment due to loss of power effects ▪ Review Safety system Actuations <ul style="list-style-type: none"> ○ None (Chance of AFAS depending on timing) ▪ Solicit Input Conclude the brief
	CRS	Refer to EOP-0 flowchart <ul style="list-style-type: none"> ▪ Heat Removal not met due to no Feedwater, consider EOP-3 Implements EOP-3 due to loss of all feedwater

Appendix D

Required Operator Actions

Form ES-D-2

Op-Test No.: 2008 Scenario No.: 4 Event No.: 5Event Description: **EOP-3**

Time	Position	Applicant's Actions or Behavior
	CRS	Hold EOP-3 Entry Brief using EOP-3 placekeeper
	CRS	Direct CRO to perform step E "Minimize S/G Inventory Loss"
	CRO	Verify S/G Blowdown Valves shut on 1C03 <ul style="list-style-type: none"> ▪ 1-BD-4010-CV ▪ 1-BD-4011-CV ▪ 1-BD-4012-CV ▪ 1-BD-4013-CV
	CRS	Direct RO to perform Step F "Commence RCS Boration"
	RO	Commence RCS Boration <ul style="list-style-type: none"> ▪ Verify boration in progress as follows: <ul style="list-style-type: none"> ○ VCT Makeup Valve 1-CVC-512 is shut on 1C07 ○ Boric Acid Direct Makeup Valve 1-CVC-514 is open on 1C07 ○ BAST Gravity Feed Valves are open on 1C07(Action may be delayed due to loss of power) <ul style="list-style-type: none"> ▪ 1-CVC-508-MOV ▪ 1-CVC-509-MOV ○ Verify M/U Mode Selector Switch 1-HS-210 in Manual on 1C07 ○ Start 12 Boric Acid Pump on 1C07 ○ VCT Outlet Valve 1-CVC-501-MOV is shut on 1C07(Action may be delayed due to loss of power) ○ 12 & 13 Charging Pumps running on 1C07 ▪ Record time RCS boration commenced ▪ Record BAST Levels
	CRS	Direct CRO to perform step G "Commence Natural Circulation Cooldown to Tcold < 465°F"

	CRO	<p>Commence rapid cooldown to 465°F</p> <ul style="list-style-type: none"> ▪ If at any time both S/G Levels reach (-)350 inches or Tcold rises uncontrollably by 5°F, then initiate Once Through Core Cooling per Step J ▪ Block SGIS <ul style="list-style-type: none"> ○ When SGIS A Block Permitted alarm is received on 1C03 then block SGIS A using keyswitches on 1C03 ○ When SGIS B Block Permitted alarm is received on 1C03 then block SGIS B using keyswitches on 1C03 ▪ Block SIAS <ul style="list-style-type: none"> ○ When PZR Pressure Block A Permitted alarm is received on 1C08 then block SIAS A using keyswitches on 1C10 ○ When PZR Pressure Block B Permitted alarm is received on 1C08 then block SIAS B using keyswitches on 1C10 ▪ Shut both MSIV's due to loss of offsite power ▪ Open ADV's fully using controller at 1C03 while maintaining the following: <ul style="list-style-type: none"> ○ Cooldown less than 100°F in any one hour ○ Subcooling between 30 and 140°based on CET temperatures on 1C05 ○ Pressurizer level between 50 and 180 inches
	CRS	Direct OWC to contact maintenance for AFW pp's & 1A DG(if not done during EOP-0)
	CRS	Direct RO to perform step J "Initiate Once Through Core Cooling"

RO	<p>Initiate Once Through Core Cooling within 5 minutes of both S/G's < -350"</p> <p>___ Place all PZR Heater H/S's in off on 1C06</p> <p>___ Shuts L/D isolation valves</p> <ul style="list-style-type: none"> ▪ 1-CVC-515-CV on 1C07 ▪ 1-CVC-516-CV on 1C07 <p>___ Ensures 12 & 13 charging pumps started</p> <p>___ Operate Both PORV's <u>(not to be performed until (-)350 inches)</u></p> <ul style="list-style-type: none"> ▪ When PZR Pressure Block A Permitted alarm is received on 1C08 then block SIAS A using keyswitches on 1C10 ▪ When PZR Pressure Block B Permitted alarm is received on 1C08 then block SIAS B using keyswitches on 1C10 ▪ Verify Both PORV Block Valves Open <ul style="list-style-type: none"> ○ 1-RC-403-MOV on 1C06 ○ 1-RC-405-MOV on 1C06 (may still be de-energized) ▪ Place PORV OVERRIDE handswitches in "Manual Open" <ul style="list-style-type: none"> ○ 1-HS-1402 on 1C03 ○ 1-HS-1404 on 1C03 ▪ Verify both PORV's Open (PORV 402 may not have power) <p>___ Starts 12 & 13 HPSI pumps on 1C09</p> <p>___ Opens Main & Aux HPSI Header Valves</p> <ul style="list-style-type: none"> ▪ 1-SI-616-MOV on 1C08 ▪ 1-SI-626-MOV on 1C08 ▪ 1-SI-636-MOV on 1C09 ▪ 1-SI-646-MOV on 1C09 ▪ 1-SI-617-MOV on 1C08 (may still be de-energized) ▪ 1-SI-627-MOV on 1C08 (may still be de-energized) ▪ 1-SI-637-MOV on 1C09 (may still be de-energized) ▪ 1-SI-647-MOV on 1C09 (may still be de-energized) ▪ <p>___ Verifies 13 & 14 CAC's in high speed with 8" SRW valves open on 1C10</p> <p>___ Verifies HPSI flow per attachment 10 when RCS pressure lowers to 1270 psia & CET's constant or lowering</p> <p>___ Direct PWS to locally initiate SIAS A6 & B6 at ESFAS Cabinets in CSR</p> <p>___ Checks attachment 17 OTCC matrix (Recognize need for 2nd PORV for OTCC to be successful)</p>
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	CRS	Direct CRO to perform step Q "Restore from Loss of Power"
	CRS	Direct PWS to tie MCC 114 to MCC 104 IAW Step Q.5.b on page 50 of EOP-3
		Secure Scenario when OTCC initiated and crew recognizes need to restore power to MCC 114 to be successful
	CRS	EAL A.A.7.1.2 or H.A.2.1.2
		* Shading indicates Critical Task