

# Sequoyah Nuclear Station 1 & 2

# **Operating Test Number 2010302**

## **Contents**

**Seven Scenarios** 

Each Scenario tab contains the following:

- ES-D-1 Form
- Scenario Booth Instruction File
- Scenario Turnover Handout
- ES-D-2 Form

Facility: Examiners: Initial Condition Turnover: Target CTs: Event No.	Sequoyah 	according to 0-0 bow to Multiple Fa hallenge develop e SI Flow prior t	Scenario No.: Oper GO-5, Normal Power C aulted SGs in order to be to the PTS CST o RCS overpressuriza	pperatic minimi tion (P	1   ze F 	Op Test No.: RCS cooldown ra	NRC
Initial Condition Turnover: Target CTs: Event No.	ns: ≈35% Increase power a Throttle AFW Flo (orange-path) ch Terminate/reduc Malf. No.	according to 0-0 ow to Multiple Fa hallenge develop e SI Flow prior t	GO-5, Normal Power C aulted SGs in order to bs to the PTS CST o RCS overpressuriza	)peratio minimi tion (P	on ze F	RCS cooldown ra	ate before a severe alve lifting)
Turnover: Target CTs: Event No.	Increase power a Throttle AFW Flo (orange-path) ch Terminate/reduc Malf. No.	according to 0-C ow to Multiple Fa hallenge develop e SI Flow prior t	GO-5, Normal Power C aulted SGs in order to bs to the PTS CST o RCS overpressuriza	peratic minimi tion (P	on ze F ress	RCS cooldown ra	ate before a severe alve lifting)
Target CTs: Event No.	Throttle AFW Flo (orange-path) ch Terminate/reduc Malf. No.	ow to Multiple Fa allenge develop e SI Flow prior t Event Type*	aulted SGs in order to os to the PTS CST o RCS overpressuriza	minimi tion (P	ze F ress	RCS cooldown ra	ate before a severe alve lifting)
Event No.	Malf. No.	Event Type*	0 KCS overpressuriza	tion (P	ress	surizer Safety Va	alve lifting)
	man. no.			-			
1. T+0	N/A	R - RO N – SRO/BOP	Event Description           Normal Power Increase: Place MSRs in service (Hot Start)				
2. T+20	CV06B CV01B	C - RO TS - SRO	1B-B CCP Aux LO P operator response	ump A	ctua	ttes w/1B-B CCF	P Trip- Delayed for
3. T+35	CC14 CC20	C - BOP TS - SRO	Component Cooling 1-FCV-70-63 fails to	Line Br open a	eak utor	(within make-up matically	o capacity)
4. T+50	CV18B	C – RO TS - SRO	#2 RCP #2 Seal Fail	ure			
5. T+65 Z Z	RW09 ZDITIC2448SW1 ZDITIC2448SW3	R - RO C - BOP	Stator Cooling Water	Loss-	MT	Trip, No Rx Trip	)
6. T+70	MS03A MS03B MS03C MS03D	M - Crew	MS Safety VIvs lift 1p	er SG	on a	all SGs	

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#### Scenario Outline

#### Scenario 1 Summary

The crew will assume the shift with the unit at ~35% in MODE 1 in 0-GO-5 Section 5.1 Power Ascension From 30% to 100%. Shift directions are to continue power escalation to 100% RTP.

Following completion of crew turnover, at the SRO's direction, the BOP will place the MSRs in service (hot start; HP Bundle warming valves are open from the previous shift) in preparation for continuing plant power escalation (Section 5.1 Power Ascension From 30% to 100% Step 21 [21.1-21.11]).

When the MSRs are aligned for service, at the direction of the Lead Examiner, initiate the next event, 1B-B CCP Aux LO Pump Actuates w/1B-B CCP Trip; the trip is delayed for 5 minutes to allow for operator recognition and response (remove trip if crew identifies and acts to transfer CCPs prior to 5-minute delay). The crew will respond by either transferring from 1B-B CCP to 1A-A CCP per 1-SO-62-1, Section 8.10, Changing From 1B-B CCP to 1A-A CCP or using alarm response procedures (ARPs) 1-AR-M6-C, D-3 and 1-AR-M1B, E-3 directing entry into AOP-M.09 for the CCP trip. After charging is restored and normal letdown returned to service as necessary, the SRO will identify Tech Specs: 3.5.2, TRM items: 3.1.2.4.

At the Lead Examiner direction, initiate the next event, a Component Cooling System leak occurs within the capacity of make-up however, the make-up flow control valve, 1-FCV-70-63 fails to open automatically requiring the operator action. Crew will respond by using ARPs 0-AR-M27B-B C-2, C-3 and, as necessary, AOP-M-03, Loss of Component Cooling Water, Section 2.4 to stabilize CCS inventory while continuing to identify the leak, which is outside containment. SRO will identify Tech Specs: 3.7.3.

Following TS identification, at Lead Examiner direction, initiate the next event, #2 RCP #2 Seal Failure- excessive seal leakage. The crew will respond using ARPs 1-AR-M5-B, A-3, B-2. The RO will follow the ARP directing #2 RCP Standpipe fill directing entry into AOP-R.04, Reactor Coolant Pump (RCP) Malfunctions Section 2.4 and 1-SO-68-2, RCP Ops for the failure. The SRO will identify Tech Specs 3.4.6.2.

Following TS identification, at Lead Examiner direction, initiate the next event, Main Generator high temperatures due to Stator Water Cooling and Hydrogen Cooling RCW TCVs failing closed. The crew will respond using ARPs 1-AR-M1-A, A-1, B-4, that direct entry into AOP-S.06, Turbine Trip, Section 2.0 for the failure. If the unit is not reduced to <15% power within 45 seconds, an automatic MT trip will occur. Expectation is that the crew will trip the MT, stabilize plant power using manual Rod Control and Steam Dumps following the MT trip but prior to exceeding Reactor Trip conditions. If the crew attempts a rapid power reduction, AOP-C.03, Rapid Load Reduction, Section 2.0 will be used.

When the plant is stable, at Lead Examiner direction, initiate the next event, MS Safety Valves lift on all SGs. The crew will respond using ARPs 1-AR-M5-A, A-6; 1-AR-M6-B A-7, B-7, C-7, D-7 directing entry into AOP-S.05, Steam or Feedwater Leak, Section 2.0. If alarm 1-AR-M6-A E-2 indicating an excessive cooldown, the crew will manually trip the reactor.

Following the Reactor Trip, the crew will enter E-0, Reactor Trip or SI to stabilize the plant and diagnose the steam leak event. They should transition to E-2, Faulted Steam Generator Isolation then to ECA-2.1, Uncontrolled Depressurization of All Steam Generators to stabilize RCS cooldown by minimizing feedwater flow to affected SGs.

EOP flow: E-0 - E-2 - ECA-2.1.

Scenario Termination: as directed by the Lead Examiner; following completion of ECA-2.1, Step 14, SI termination determination.

PSA significant task: Start EDG, 1B-B CCP and RCP Seal Leak determination PSA significant DAS: Multiple MSLB PSA significant component failure: Secondary Safety Valve failure



# NRC 1009 ESG-1 Booth Instruction File

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EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/ROOTH
		FEEDBACK
Simulator IC	IC-120 Perform switch check. Allow the simulator to run for at least 3 minutes before loading SCEN file or starting the exercise. This will initialize ICS. Load SCENS: <u>1009 NRC ESG-1</u> • Place simulator in RUN. • Place OOS equipment in required position with tags. Clear alarms	<ul> <li>35%, BOL ~150 MWD/MTU CB 'D' Rods @ 185 steps, all others @ 228 steps; [B] = 1465 ppm; Ba Blender setting: 38% Xe/Sm @ equilibrium</li> <li><u>Console Operator actions: Place simulator in run and perform</u> <u>the following:</u></li> <li>Allow the simulator to run before loading SCEN file.</li> <li>Place the MODE 1 sign on 1-M-4</li> <li>Place Train Week A sign</li> </ul>
MFs, RFs, ORs are active when the SCN file is loaded.		
1.	N/A	Normal Power Increase: perform 0-GO-5 Section 5.1 Step 21, Placing MSRs in service, MSR Cold Start as directed. <u>Support staff:</u> as expected for power increase per 0-GO-5
2.	IMF CV06B f:1 k:2 IMF CV01B f:1 d:300 k:2	<ul> <li>1B-B CCP Aux LO Pump Actuates</li> <li>1B-B CCP Trip- Delayed for operator response</li> <li><u>1)- Support staff:</u> If dispatched, wait ~2 minutes, report as AB AUO some oil leaking from an oil supply line on 1B-B CCP, local oil pressure indication stable but lower than normal.</li> <li><u>2)- Support staff:</u> If CCP trips: report as AB AUO- pump motor is hot to the touch;</li> <li>If MCR AUO dispatched, wait ~2 minutes, report breaker is tripped on Instantaneous over current.</li> </ul>
3.	IMF CC20 f:1 k:3 IMF CC14 f:32 k:3	1-FCV-70-63 fails to open automatically         Component Cooling Line Break- C-S Pp Disch Hdr (within make-up capacity)         Support staff:       If requested, report U2 make-up is in progress as expected.
If AUOs dispatched:	IRF CCR15 f:1 k:13	Demin Head Tank Make-up @ ~400 gpm <u>Support staff:</u> if dispatched to respond 1-AR-M15-B, E-3, wait 2 minutes insert k: 13 and report DI Head Tank make-up is in progress.

# NRC 1009 ESG-1 Booth Instruction File

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EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH FEEDBACK
When Appx B performance requested,	IMF AN_OV_604 f:2 k:23	1-XA-55-M6-E A-4, "480V REAC MOV BD 1B1-B/1B2-B TRANSFER SWITCH IN AUX MODE": Any mode selector switch on Reactor MOV Bd 1B1-B or 1B2-B in 'Auxiliary' position.
		<u>Support staff:</u> When dispatched, wait 1 minute, insert k:23 and report as AUO, Appendix B valves transferred to 'AUXILIARY", standing by.
		<u>Support staff:</u> When directed by the MCR staff, insert k:33 to sequentially close specified valves; report as AUO valves are positioned to 'CLOSE'.
		<u>Support staff:</u> If requested, report as AB AUO water flow from CCS piping break subsiding.
When MCR	IRF CCRV12 f:0 k:33	Closes the following Appendix B Valves:
staff directs,	IRF CCRV75 f:0 d:5 k:33 IRF CCR2V75 f:0 d:10 k:33	1-FCV-70-12, CCS HX 0B1 and 0B2 Outlet 1-FCV-70-75- U1 B-Trn to C-S Pump. 2-FCV-70-75- U2 B-Trn to C-S Pump.
INSTRUCTOR I	NOTE: delete AN_OV_604 when	n directed by the MCR staff to remove power from Appx. B Valves.
		<u>Support staff:</u> If dispatched, wait ~2 minutes, report as the AB AUO, water on the floor around the CC Hxs on AB El. 714' and running down the stairs; location appears to be on the common inlet to the 0B1/0B2 CCS Hx.
		If requested to check the Flood Mode PnI, report LS-40-54, 55 @714'3" increasing;
		If requested to TB 685'local panel, report LS-59-180A/B Demin Water Storage Tank level low is the cause
4.	IMF CV18B f:10 r:30 k:4	#2 RCP #2 Seal Failure
		<u>Support staff:</u> respond as requested for normal plant shutdown per the GOs.
5.	IMF RW09 f:1 k:5 IOR ZDITIC2448SW1 f:1 k:5 IOR ZDITIC2448SW3 f:2 k:5	Stator Cooling Water Loss- MT Trip, No Rx Trip RCW to H2 Coolers fail
		<u>Support staff:</u> if requested, TB AUO reports 1-TCV-24-48 indicates closed; bypass jammed- will not open; local SCW temperature is increasing.
6.	IMF MS03A f:1 r:20 k:6 IMF MS03B f:1 r:21 k:6	MS Safety VIvs lift 1 per SG on all SGs
	IMF MS03C f:1 r:22 k:6 IMF MS03D f:1 r:23 k:6	<u>Support staff:</u> if requested, OS AUO, Security, etc. reports steam discharging from the roof of East & West Valve Vaults and is not a safety issue at this time.
Termination Cr	iteria: ECA-2.1. Step 14. SI te	rmination determination.



1009 ESG-1 Page 1 of 5

SHIFT TURNOVER CHECKLIST	Page 1. of 3	Today
Part 1 - Completed by Off-going Shift	/ Reviewed by On-coming Shi	ft
Mode 2, 35% RTP		phone Authentication Code
Grid Risk: Green		<u>oddc</u>
		Until 0800 XXXX
RCS Leakage ID .02 gpm, UNID .02 gpm		After 0800 YYYY
	Common Tech Spec Actions	
None		
	U-1 Tech Spec Actions	
None		
- Nora	Protected Equipment	
• None		×
<ul> <li>Increase power to 100% BTD in case</li> </ul>	Shift Priorities	
Rx Engineering Spreadsheet for power	rdance with 0-GO-5 Section 5.1.	
Use TI-40 Pre-Conditioned power lev	el as applicable	ly for SRO verification.
<ul> <li>Note: This restart is 24 hours follow</li> </ul>	ng a shutdown that occurred aft	er 5 days of continuous operation at
100% RTP. There are no fuel defect	3.	er o days of continuous operation at
Part 2 – Performed by on-coming shift		
Verify your current qualifications	Review Oper	ating Log since last held shift or 3
	da	ivs, whichever is less
Standing Orders / Shift Orders	TACF	Immediate required reading
LCO Actions		· · · · · · · · · · · · · · · · · · ·
Part 3 - Performed by both off-going a	nd op-coming shift	
	na on-conning sinit	
U wark down of MCR Control Boards		

1009 ESG-1 Page 2 of 5

SHIFT TURNOVER CHECKLIST	Page 2. of 3	Today
• Train <u>A</u> Week	MAIN CONTROL ROOM (7690)	
• None	OUTSIDE (7666) [593-5214]	
• None	AUXILIARY BUILDING (7775)	
• None	IRBINE BUILDING (7771) (593-845	55)

Sumawood .

1009 ESG-1 Page 3 of 5

## SHIFT TURNOVER CHECKLIST

### Page 3. of 3

Today

	Disabled Annunciators							
PANEL	WINDOW	ANNUNCIATOR	WO / PER Number					

#### Equipment Off-Normal (Pink Tags)

UNID And Noun Name	Panel	Problem Description	WO / PER Number

#### MCR WO LIST

ID And Noun Name	Panel	Problem Description	WO/PER Number

### UNIT ONE REACTIVITY BRIEF Date: Today Time: Now

		Genera	al Information	
RCS Boron: 1465 ppm	n Today	BA Cor	ntroller Setpoint: 38% *	RCS B-10 Depletion: 2 ppm
Operable BAT: A BAT A Boron: 685		<b>0</b> ppm	BAT C Boron: 6850ppm	RWST Boron: 2601 ppm
Nomina	I Gallons per rod ste	p from 18	9: 17 gallons of acid, 75	gallons of water
* \ / a wife a la a wife a la la la la				

\* Verify boric acid flow controller is set at Adjusted BA Controller Setting iaw 0-SO-62-7 section 5.1

Estimated values for a 1° Change in Tave \*\*

Gallons of acid: 22

Gallons of water: 94

Rod Steps: 1

Estimated rods/boron for emergency step power reduction \*\* (Assuming Xenon equilibrium and no reactivity effects due to Xenon. 2/3 total reactivity from rods, 1/3 from boron)

Power reduction amount	Estimated Final Rod Position	Estimated boron addition		
10%	181 Steps on bank D	93 gallons		
30%	161 Steps on bank D	291 gallons		
50%	n/a	n/a		

\*:

These values are approximations and not intended nor expected to be exact. The values may be superceded by Rx Engineering or SO-62-7 calculated values. These values are calculated assuming 100% steady state power operation only. Engineering data last updated one week ago. Data Valid until three weeks from now.

Previous Shift Reactivity Manipulations

Remarks: Use Reactivity Manipulation spread sheet from Rx Eng.

Current Shift Estimated Reactivity Manipulations

Remarks: Use Reactivity Manipulation spread sheet from Rx Eng. Verify data using 0-SO-62-7.

Rx Power – 35% MWD/MTU – 1000 Xenon – 1842 PCM Equilibrium Samarium ~972 PCM

Last Dilution Complete ~1 hour ago.

Next Unit 1 Flux Map is scheduled: three

three weeks from now

Unit Supervisor:

Name/Date

1009 ESG-1 Page 5 of 5

		<u> </u>		moti y morma	uon	
 E			Boron	Results		
	Sample Point	Units	Boron	Date / Time	Goal	Limit
	U1 RCS	ppm	1465	Today / Now	Variable	Variable
	U2 RCS	ppm	816	Today / Now	Variable	Variable
	U1 RWST	ppm	2601	Today / Now	2550 - 2650	2500 - 2700
	U2 RWST	ppm	2569	Today / Now	2550 - 2650	2500 - 2700
	BAT A	ppm	6850	Today / Now	Variable	Variable
	BAT B	ppm	6850	Today / Now	Variable	Variable
	BAT C	ppm	6850	Today / Now	Variable	Variable
ſ	U1 CLA #1	ppm	2556	Today / Now	2470-2630	2400-2700
	U1 CLA #2	ppm	2575	Today / Now	2470-2630	2400-2700
	U1 CLA #3	ppm	2591	Today / Now	2470-2630	2400-2700
	U1 CLA #4	ppm	2589	Today / Now	2470-2630	2400-2700
ſ	U2 CLA #1	ppm	2531	Today / Now	2470-2630	2400-2700
	U2 CLA #2	ppm	2650	Today / Now	2470-2630	2400-2700
	U2 CLA #3	ppm	2522	Today / Now	2470-2630	2400-2700
	U2 CLA #4	ppm	2526	Today / Now	2470-2630	2400-2700
	Spent Fuel Pool	ppm	2547	Today / Now	<u>≥</u> 2050	<u>≥</u> 2000
	L	ithium Resi	ults		Goal	Midpoint
	U1 RCS	ppm	1.1	Today / Now	>1	>1
	U2 RCS	ppm	2.43	Today / Now	2.18-2.48	2.33

Primary to Secondary Leakrate Information (Total CPM RM-90-99/119)						
Indicator	Units	U1	Date / Time	U2	Date/Time	
SI 50 S/G Leakage?	Yes/No	No	Today / Now	No	Today / Now	
SI 137.5 CVE Leakrate	gpd	< 0.1	Today / Now	< 0.1	Today / Now	
5 gpd leak equivalent	cpm	115	Today / Now	68	Today / Now	
15 gpd (30 min increase)	cpm	265	Today / Now	83	Today / Now	
30 gpd leak equivalent	cpm	490	Today / Now	206	Today / Now	
75 gpd leak equivalent	cpm	1165	Today / Now	455	Today / Now	
150 gpd leak equivalent	cpm	2290	Today / Now	870	Today / Now	
CVE Air Inleakage	cfm	10	Today / Now	12.5	Today / Now	
Bkgd on 99/119	cfm	40	Today / Now	40	Today / Now	
Steady state conditions	are necessary	for an accurat	e determination of leak ra	ate using the CVE	Rad Monitor	

### **Operations Chemistry Information**



Appendix	D		Scena	rio Outline		Attachm	ent				
Op Test No.:	NRC	Scenario #		Event #	1	Page <u>1</u> of					
Event Descri	otion: 35%	6 Plant Power In	crease, Pla	ace MSRs in ser	vice (Hot Start)						
Time	Position			Applicant	s Actions or be	havior					
Simulator	Operator: No a	ction require	d for Ev	ent 1							
Indication	s available: Non	e; Crew will	perform	startup IAW	0-GO-5, Sectio	on 5.1.					
T = 0	Following con in service (ho preparation fo to 100% Step	ng completion of crew turnover, at the SRO's direction, the BOP will place the MSRs ce (hot start; HP Bundle warming valves are open from the previous shift) in tion for continuing plant power escalation (Section 5.1 Power Ascension From 30% 5 Step 21 [21.1-21.11]).									
		Direct BOP 21, Place th	to perfor ne MSRs	rm 0-GO-5 No in service.	ormal Power Op	erations, Section 5.1,	Ste				
	SRO	According to the evolutio Concentrati	o pre-shi n and su on Contr	ft briefing, the bsequent pov ol. Section 6.	e RO will control ver increase usi 2 that follows th	Tave-Tref deviation on ng 0-SO-62-7 Boron is event quide.	duri				
	SPO	[21] WH	<b>EN</b> >35%	turbine load							
	0110	[21.1] IF cold startN/A									
	BOP	[21.2]	CLO	SE the followi	ng steam inlet le	eakoff isolation valves					
			MSR	VALVE	POSITION	INITIALS					
				1-679	CLOSED						
			A-1	1-714	CLOSED						
			B_1	1-680	CLOSED						
				1-715	CLOSED						
			C-1	1-681	CLOSED						
				1-716	CLOSED						
			A-2	1-682	CLOSED						
				1-717	CLOSED						
			B-2	1-683	CLOSED						
				1-/18	CLOSED						
			C-2	1-084							
				17113	CLOSED						
		<u> </u>		NOT	ſE						
	Due to inter	locks on MSR 2: Open FCV-	l valves, 1-241 ar	bypass valve nd when full o	s must be open pen, then open	ed prior to main isol v FCV-1-141.	ralv				

			Scenario Outline		Attachmer	nt
Op Test No.:	NRC	Scenario #	1 Event #	1 F	Page <u>2</u> of	Ę
Event Descripti	on: 35%	Plant Power	Increase, Place MSRs in servic	e (Hot Start)		
Time	Position		Applicant's	Actions or behavi	or	
	BOP	[21.3]	ENSURE MSR HP s	team supplies ALI	GNED as follows:	
		MSR	EQUIPMENT	HANDSWITCH	POSITION	
		Δ1	MSR BYPASS ISOL	HS-1-241A	OPEN	
			MSR MAIN ISOL	HS-1-141A	OPEN	
		R1	MSR BYPASS ISOL	HS-1-243A	OPEN	Γ
			MSR MAIN ISOL	HS-1-143A	OPEN	Γ
		C1	MSR BYPASS ISOL	HS-1-245A	OPEN	
			MSR MAIN ISOL	HS-1-145A	OPEN	
		Δ2	MSR BYPASS ISOL	HS-1-235A	OPEN	
			MSR MAIN ISOL	HS-1-135A	OPEN	Ι
		82	MSR BYPASS ISOL	HS-1-237A	OPEN	
			MSR MAIN ISOL	HS-1-137A	OPEN	
		C2	MSR BYPASS ISOL	HS-1-239A	OPEN	
			MSR MAIN ISOL	HS-1-139A	OPEN	Γ
Op Test No.: Event Descriptio			NOTES	5		
	1) Control 2) MSR Co Hot Star	ontrol valve	p open for 120 minutes for s ramp open from the 400 is previously depressed d	or turbine cold start D°F position to full o luring performance	open in one hour w of 0-GO-4 or 0-G(	/hi D-
	1) Control 2) MSR Co Hot Star BOP	ontrol valve t button wa [21.4] reh	p open for 120 minutes for s ramp open from the 400 is previously depressed of DEPRESS the RAMF eater control panel to initi	or turbine cold start D°F position to full of luring performance P pushbutton on the late steam flow to t	ppen in one hour w of 0-GO-4 or 0-GO e moisture separat he reheater	/hi D cor
	1) Control 2) MSR Co Hot Star BOP BOP	[21.4] [21.5] [21.5]	p open for 120 minutes for s ramp open from the 400 is previously depressed of DEPRESS the RAMF eater control panel to initian IF MSR controls will I RFORM the following:	or turbine cold start D°F position to full of luring performance P pushbutton on the late steam flow to t	open in one hour w of 0-GO-4 or 0-GG e moisture separat he reheater	/ho D- cor
	1) Control 2) MSR Co Hot Star BOP BOP	[21.4] [21.5] [21.5] [21.5] [21.5] [21.5]	p open for 120 minutes for s ramp open from the 400 is previously depressed of DEPRESS the RAMF eater control panel to initi IF MSR controls will I RFORM the following: DEPRESS MANUAL pust	Provident of the second start of the second st	open in one hour w of 0-GO-4 or 0-GG e moisture separat he reheater	
	1) Control 2) MSR Co Hot Star BOP BOP	[21.4] [21.4] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.6] [2	p open for 120 minutes for s ramp open from the 400 is previously depressed of DEPRESS the RAMF eater control panel to initi IF MSR controls will I RFORM the following: DEPRESS MANUAL push ADJUST manual potentic approx. 120 minutes WHI	PF position to full of luring performance P pushbutton on the late steam flow to t NOT function in RA hbutton on MSR co ometer to gradually LE continuing in th	open in one hour w of 0-GO-4 or 0-GO e moisture separat he reheater MP mode, <b>THEN</b> ontrol panel. open MSR TCVs o is procedure.	/he D cor
	1) Control 2) MSR Co Hot Star BOP BOP	[21.4] [21.4] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.5] [21.6] [2	p open for 120 minutes for s ramp open from the 400 is previously depressed of DEPRESS the RAMF eater control panel to initi IF MSR controls will I RFORM the following: DEPRESS MANUAL pust ADJUST manual potentic approx. 120 minutes WHI	Provident of the start of the start of the second start of the sec	open in one hour w of 0-GO-4 or 0-GO e moisture separat he reheater MP mode, <b>THEN</b> ontrol panel. open MSR TCVs o is procedure.	

	Appendix D	Appendix D Scenario Outline						Attachment 1				
for the second s	Op Test No.:	NRC	Scenario #	1	Event #	1	Page	3	of	57		
Concert States	Event Description:	35%	6 Plant Power Inc	crease, Plac	ce MSRs in ser	vice (Hot Start)						

Time	Position		Applicant's	Actions or behave	/ior	
	BOP	[21.7]	CLOSE all MSR START	TUP vents (6-1 thr	u 6-91) on pane	el XS-6-1.
		[21.8]	PERFORM App. C to lo	cally isolate MSR	startun vents	
	BOP	[21.9]	ENSURE MSR HP stear	m warming valves	are CLOSED:	
		MSR	EQUIPMENT	HANDSWITCH	POSITION	1
		A1	MSR WARMING LINE	HS-1-142	CLOSED	
		B1	MSR WARMING LINE	HS-1-144	CLOSED	
		C1	MSR WARMING LINE	HS-1-146	CLOSED	Π
		A2	MSR WARMING LINE	HS-1-136	CLOSED	
		B2	MSR WARMING LINE	HS-1-138	CLOSED	
		C2	MSR WARMING LINE	HS-1-140	CLOSED	
	SRO	[21.10 thi <b>Ri</b> pc	P] IF this power ascens rough March 31, THEN EFER to 0-PI-OPS-000-00 position of MSR doghouses	sion is during the r 06.0 and consult S s' vent dampers.	months of Octob System Enginee	ber 1 r for
	SRO	[21.11 Se Ol	] IF this power ascenseptember 30, THEN PEN MSR doghouses' ve	sion is during the r nt dampers.	nonths of April	1 through
	Benchboard determine he	instrument eater shell s	NOTE s PI-5-87A for #7 heater a side pressure.	and PI-5-84A for #6	bheater may be	used to
		[22] IF condit	#7 heater drain tank (HD tion, <b>THEN</b>	T) pressure is indi	cating an overp	ressure
		PERF HDT	<b>FORM</b> 1, 2-SO-5-3, Section overpressurization.	on 8.0, Infrequent	Operation to pre	event #7

C

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Appendix D			Scena	rio Outline	· · · · · · · · · · · · · · · · · · ·		Atta	ichme	nt 1
Op Test No.:	NRC	Scenario #	1	Event #	1	Page	4	of	57
Event Descriptio	on: 35%	% Plant Power Incre	ase, Pla	ace MSRs in servi	ce (Hot Start)				
Time	Position			Applicant's	Actions or b	ehavior			<u></u>
		[23] WHEN	l appro	oximately 40%	turbine load	•			

Lead Examiner: when power change is sufficient to record a reactivity manipulation, cue the next event.

	Appendix D	Appendix D       Scenario Outline         Op Test No.:       NRC       Scenario # _1 _ Event #1			Atta	chme	ent 1			
( <sup></sup>	Op Test No.:	NRC	Scenario #	1	Event #	1	Page	5	of	57
	Event Description:	359	% Plant Power In	crease, Pla	ce MSRs in s	ervice (Hot Start)	-		ľ	

	Time	Position	A	plicant's Actions or	behavior	
		0-SO-6	62-7 Boron Concentratio	on Control, Section 6	.2 Dilute	
	Evaluator Not	e: Dilutions w subsequer hour as de	ill be performed based on ht power escalation, large termined by the crew.	the RE-provided Rea volume dilutions will b	ctivity Spreads be divided even	heet; during ly over each
		An extra ba pressurize	ank of pressurizer heaters	(Back-up Group 1C)	will be energize	ed to cause
		RO	[1] ENSURE unit is <u>NO</u> positive reactivity ac	<u>T</u> in a Tech Spec or T Iditions. <b>[C.1]</b>	RM action that	prohibits
		NOTE HU	JT level increase of 1% is	equal to 1380 gallons	s (TI-28 fig. C.2	:1).
		RO	[2] ENSURE sufficient of expected amounts of	capacity available in th f CVCS letdown: ( <b>N/A</b>	ne HUT selecte if <u>not</u> used)	d to receive
			HUT	LEVEL	INITIALS	
C			A	%		
			В	%		
		RO	[3] ENSURE makeup sy with Section 5.1.	ystem is aligned for <b>Al</b>	UTO operation	in accordance
		RO	[4] RECORD the quanti boron concentrationgals	ty of dilution water rec using Appendix D.(N	uired to achiev I/A for minor po	re desired ower changes)
		NOTE Du init	le to eyeball interpolation tial calculation. The follow	the verified calculation ing signoff indicates the second s	n may slightly c nat any differer	liffer from the ices in the two
		RO	<ul> <li>Sults have been discussed</li> <li>[5] PERFORM Appendia</li> <li>Amount of Boric Acid</li> <li>SRO to verify data fr</li> </ul>	d and are close enoug x I Independent Verific d or Primary Water. (N om Rx Engineering)	h to be conside cation of Calcul //A if App. D wa	ered validated. ation for as performed by
		RO	[6] PLACE [HS-62-140/ to the STOP position	A], Boric Acid Supply t	to Blender Flow	Control Switch

Appendix D	)	Scenario Outline	Attachment 1
Op Test No.:	NRC	Scenario # _ 1 1	Page 6 of 57
Event Descripti	on: 35%	Plant Power Increase, Place MSRs in service (Hot Start)	
Time	Position	Applicant's Actions or behav	lior
	0-SO-	62-7 Boron Concentration Control. Section 6.2 Dilu	ite
	RO	[7] PLACE [HS-62-140B], CVCS Makeup Selector position.	Switch to the <b>DILUTE</b>
	RO	[8] ENSURE [HS-62-140D], Boric Acid Valve to the (Green light is LIT).	Blender is <b>CLOSED</b>
	RO	[9] SET [FQ-62-142], Batch Integrator for the desire	d quantity
	NOTE P gi	rimary Water Flow Controller <b>[FC-62-142]</b> receives its pom) from setpoint potentiometer (dial indicator) located etpoint of 35% corresponds to a 70 gpm primary water	reference signal (70 on panel M-6. A flow rate
	RO	[10] ADJUST [FC-62-142], Primary Makeup Wate the desired flow rate	er Flow Controller for
	RO	[11] PLACE [ <u>HS-62-140A]</u> , Boric Acid Supply to I Switch to the <b>START</b> position.	Blender Flow Control
	NOTE: FI	ow oscillations and/or erratic controller response may peration of Primary Water Flow Controller <b>[FC-62-142]</b> ist.	require manual until stable conditions
	RO	[12] VERIFY the following;	
		[a] Inlet to top of VCT [FCV-62-128] is OPEN.	
		[b] Primary Water flow by [FI-62-142A] OR [FQ-	<b>62-142</b> ].
	NOTE: Al sig Ba nc wa	ternate dilution in small amounts is acceptable on a reg gnificant changes in seal water temperature or seal lea atches of 5 to 10 gallons may be added through FCV-6 t to exceed once per 30 minutes. ICS points for No. 1 ater temperatures on the RCPs should be monitored du	gular basis, provided r koff are indicated. 2-144 on a frequency seal leakoffs and sea uring and after dilution
	RO	[13] IF primary water addition to the bottom of the desired, THEN	VCT <b>[FCV-62-144]</b> is
	RO	[a] CLOSE [FCV-62-128] with [HS-62-128].	
	RO	[b] OPEN [FCV-62-144] with [HS-62-144]	

Appendix D	Appendix D /p Test No.:NRC		Scenario	Outline			Attac	hmen		
Op Test No.:	NRC	Scenario #	1	Event #	1	Page	7	of		
Event Descriptio	n:	35% Plant Power Ir	crease, Place	MSRs in servic	ce (Hot Start)					
Time	Positi	on		Applicant's	Actions or b	ehavior				
	0-	SO-62-7 Boron	Concentrat	tion Control	, Section 6.2	Dilute				
	RO	[c] VE	<b>RIFY</b> Prima	ry Water flow	v by <b>[FI-62-1</b> 4	42A] OR [F	Q-62-1	<b>42</b> ].		
	NOTE	It may take ap indicated on n	proximately uclear instru	15 minutes	before any ch or RCS tempe	hanges to r erature indic	eactivity	y are		
		[14] MONITOR nuclear instrumentation and reactor coolant temperature to ensure the proper response from dilution.								
		[15] IF THEN OPEN	[ <b>LI-62-129]</b> , ENSURE [ <u>I</u> S to divert e	Volume Con <u>CV-62-118</u> xcess water	ntrol Tank Lev , Volume Cor to the Holdup	vel, increas htrol Tank [ o Tanks.	es to 6: Divert V	3 perce alve		
		[16] Wł	IEN dilution	is complete	, THEN			<u> </u>		
			STOP posi	<u>2-140A</u> J, Boi tion.		nder Flow	Control	Switch		
		[b] IF   <u>144</u>	FCV-62-14 I with [HS-	<u>4]</u> was previ 62-144].	ously OPENE	D, THEN C	CLOSE	[FCV-		
		[c] VE 142	RIFY no prii 2].	mary water f	low on either	[FI-62-142	62-142A] OR [FQ-6			
Lead Examin	er may dir are asso until all	ect initiation of ociated with per dilutions are co	the next ev formance o mplete.	ent at his d of repetitive	iscretion. So dilutions or	teps on the may not b	e next f e perfo	wo pa ormed		
		[ <b>17] IF</b> prequire page)	ower increa d, <b>THEN</b> us	ase in progre e this table t	ess and additi to re-perform	onal dilutio steps <b>[4]</b> th	ns will t rough	be [ <b>18]</b> (n		
		[19] RE	ALIGN the I ance with S	olender cont ection 5.1.	rols for AUTC	) makeup to	o the C	VCS ir		
		[20] EN	SURE dilution	on(s) is logg	ed in Unit Na	rrative Log.				
	NOTE	Sample may b power and the	e obtained a unit respon	at normal RC se following	CS sample int the dilution is	ervals prov as expected	ided the ed.	ə unit i		
		[ <b>21] IF</b> F obtain I	RCS boron s RCS boron	sample is rec sample.	quired, <b>THEN</b>	NOTIFY C	hem La	ab to		
	1									

	Appendix D			Scenar	io Outline			Attachm	ient 1
and the second second	Op Test No.:	NRC	Scenario #	1	Event #	1	Page	<u>8</u> of	57
2 	Event Description:	359	% Plant Power Inc	rease, Pla	ce MSRs in service	e (Hot Start)			
	Time	Position			Applicant's	Actions or beh	avior		
		0-SO	-62-7 Boron (	Concentr	ation Control,	Section 6.2 Di	lute		
	[4] RECORD the	quantity of d	STE	P uired to o	chiovo dooirod h		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
	concentration	using Apper	ndix D.	ulleu lu a	chieve deslied bi	51011			
	[5] PERFORM Ap	pendix I, IV	of Calculation fo	r amount	of BA or PW.			Quantity	Quantity
	[6] PLACE [HS-62 STOP position	<b>2-140A]</b> , Bor n.	ic Acid Supply t	o Blender	Flow Control Sw	vitch to the			SRO / 1 <sup>st</sup> CV
	[7] PLACE [ <u>HS-6</u> 2	<b>2-140B]</b> , CV	CS Makeup Sel	ector Swit	ch to the DILUTI	E position.			
	[8] ENSURE [ <u>HS</u> -	62-140D] Bo	oric Acid Valve to	o Blender	is CLOSED (Gre	een light LIT).			
	[9] SET [FQ-62-14	<b>42]</b> , Batch In	tegrator for the	desired qu	uantity.				
	[10] ADJUST [FC rate.	<u>-62-142],</u> Pr	mary Makeup V	Vater Flov	v Controller for th	e desired flow	/ 1 <sup>st</sup> CV		
	[11] PLACE [ <u>HS-</u> [	<b>62-140A]</b> , BA	A Supply to Bler	der Flow	Control Switch to	START.		$\frac{1}{1^{\text{st}}} \frac{1}{CV}$	/
~	[12] VERIFY the fa [a] Inlet to to [b] Primary V	ollowing: p of VCT <b>[FC</b> Vater flow by	<b>:V-62-128]</b> is Ol [FI-62-142A] o	PEN. r [FQ-62-′	142].				
	[13] IF PW additio bottom of the [a] CLOSE []	n to top of V VCT <b>[FCV-(</b> F <b>CV-62-128]</b>	CT [ <b>FCV-62-12</b> 62-144] is desire with [ <b>HS-62-12</b> 8	8] is not w ed, THEN 8]	varranted, but PV	V addition to the			
	[b] OPEN [ <u>F</u>	<u>CV-62-144</u> ] \	with <b>[HS-62-144</b>	].					
	[c] VERIFY F	Primary Wate	r flow by [FI-62	-142A] or	[FQ-62-142].				
	[14] MONITOR nu proper respon	iclear instrun	nentation and re tion.	actor coo	lant temperature	to ensure the			
	[15] IF [ <u>LI-62-129</u> [ <u>LCV-62-118</u> [16] WHEN dilution	, VCT level, <u>], VCT Diver</u> n is complete	t Valve, OPENS	percent, to divert	THEN ENSURE excess water to	the HUTs.			
	[a] PLACE [ [b] IF [FCV-6	HS-62-140A 62-1441 was	, Boric Acid to I	Blender F	low Control Swite	ch to STOP	/	/	/
	with [HS- [c] VERIFY	62-144]. no primary w	ater flow on eith	er [ <b>FI-62</b> -	142A] or [FQ-62	-142].			
	[d] ENSURE	[FCV-62-12	B] is CLOSED.		E				
	[18] IF Step [17] PERFORM	will be repe	eated, <b>THEN</b> a:						
	[a] PLACE [	HS-62-140B	, CVCS Makeu	p Selecto	r Switch to the <b>A</b>	UTO position	/ 1 <sup>st</sup> CV		
	[b] PLACE [] [c] ENSURE	HS-62-140A dilution is lo	, BA to Blender gged in Unit Na	Flow Cor	ntrol Switch to <b>S</b> 1 g.	<b>FART</b> position.			]

Appendix D		Scenario Outline	Attachment 1
Op Test No.:	NRC	Scenario # _ 1 Event # _ 2 Page	of5
Event Descripti	on: 1B	-B CCP Aux LO Pump Actuates w/1B-B CCP Trip- Delayed for operator re	sponse
Time	Position	Applicant's Actions or Behavior	
Simulator O	perator: Whe	n directed, initiate Event 2	
Indications Annuncia OR • 1- • 1- 1-M-5 ind	available: tors: No annu service; AR-M1-B, E-3, AR-M6-C, D-3, dications:	nicators as crew identifies CCP Io lube oil condition and remo MOTOR TRIPOUT PNL 1-M-1 THRU 1-M-6 FS-62-93A/B CHARGING LINE FLOW ABNORMAL	ves 1B-B CCP fro
• 1-	HS-62-104A,	Handswitch Red Lube Oil Pressure Lo Light illuminates	
T = 20		Identifies Red Lube Oil Pressure Lo Light, adheres to operator a 63-PIP-00-003, notifies SRO	aid by handswitch,
	RO	TS 3.5.2 Action a: w/ 1 or more trains inoperable & w/ at least a equivalent to a single OPERABLE ECCS train available, restore status w/i 72 hrs or HT STBY w/i next 6 hrs & in HT SHDN w/i fe	100% ECCS flow to OPERABLE bllowing 6 hrs.
		TR 3.1.2.4: At least 2 CCPs shall be OPERABLE Action: w/ only 1 CCP OPERABLE, restore at least 2 w/i 72 hrs borated to a SDM equivalent to at least 1% delta k/k at 200°F w restore at least 2 CCPs to OPERABLE w/i next 7 days or HT SH	or HT STBY & /i next 6 hrs; 1DN w/i next 30 hr
Evaluator No	ote: if RO ide Section & the 5-mir CCP, inc	ntifies the lube oil condition, the crew should transfer CCPs t 3.10, (following); if the crew fails to identify the 1B-B CCP lo lu uute mark, 1B-B CCP will trip. ARPs will direct AOP-M.09 en luding (following) SO-62-1 Section 8.10.	using 1-SO-62-1, ube oil condition, try for the tripped
		1-SO-62-1, Section 8.10	11
	SRO	Directs implementation of 1-SO-62-1. Section 8 10 starting	n at Sten 1
		stagnant piping which may cause a reactivity event when p later.	ump is restarted
	NOTE 1: T R ar	vo CCPs may be in operation for the purpose of swapping pu CS is NOT water solid and requirements of 3.4.12 (time for s e met.	umps only if the wapping pumps)
	NOTE 2: Si pu ch be	arting idle CCP may cause a small reactivity change if boron imp casing and suction/discharge piping is different than RC ange is normally negative due to drop in RCS boron over co positive if RCS boron was lower when idle CCP was stoppe	concentration in S. This reactivity re life, but could ed.
	BOP	[1] ENSURE an "A" Train CCS and ERCW in service	

Appendix D			Scenar	io Outline			Attac	chmer	nt 1
Op Test No.:	NRC	NRC Scenario # 1 Event # 2 Page 10							
Event Descriptio	on: 1B	-B CCP Aux LO F	ump Actua	tes w/1B-B CCP <sup>-</sup>	Trip- Delayed fo	r operator res	ponse		
Time	Position			Applicant's	Actions or Bel	havior			
	NOTE: C •	CP oil reservo Static Oil Le	oir sight g evel betwe	ass level guida en 1/3 and 2/3	ance: 3 of sight gla	ss height			
	BOP	Operating C [2] <b>DISPA</b> it is rea	Dil Level b ICH appr dy for ope	etween 1/4 an opriate operate eration.	d 2/3 of sight or to locally in	t glass heig nspect 1A-A	ht Vpump	to ens	sur
	NOTE 1: W in ca	/hen RCS tem capable of injection	perature ection into ting into t	is less than 35 ) RCS. During he RCS for ≤ ′	0°F, LCO 3.4 pump swapc 1 hour.	1.12 require over, two CC	s one ( CPs ma	CCP to ty be	) b
	NOTE 2: W ad re	Then RCS tem cceptable with activity condit	perature out single ion of the	is >350°F, one failure consid Reactor and t	e OPERABLE eration on th he limited co	ECCS sub e basis of the re cooling re	system ne stab equiren	n is le nents.	
	SRO	[3] IF RCS	temperat	ure is <350°F.	<b>N/A</b>				
	RO	[4] WHEN CCP in	ready to s	start 1A-A CCF	P, THEN PLA	CE [1-HS-0	62-108	<b>A]</b> 1A-	A
	NOTE: Si m re	topping a CCF omentary whit maining on in	P may res te indicati dicates pr	ult in receipt o on light on 1-H oper relay ope	f a motor ove IS-62-104A. Pration.	rload annur The white li	nciation ght NO	n and a T	3
	RO	[5] WHEN PLA	ready to s CE [1-HS	hutdown 1B-E - <b>62-104A]</b> 1B-	B CCP, <b>THEN</b> B CCP in <b>ST</b>	I OP.			
	RO	[6] ENSUR	E 1B-B C	CP control sw	itch [1-HS-62	2-104A1 in A	A-AUTC	).	
1	NOTE: If	RCS tempera	ture is <3	50°F, the follow	wing step	N/A		-	
		[7] <b>IF</b> RCS	temperat	ure is <350°F	and N/A				

				 	the second s	

**END OF TEXT** 

 Evaluator Note:
 The following CREW Brief and Notification actions are not contained in the procedure.

 CREW Brief would typically be conducted for this event as time allows prior to the next event.

 Notifications should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.

	Appendix D	endix D Scenario Outline								Attachment 1		
C	Op Test No.: Event Description:	NRC 1B-	Scenario #	1	Event #	2	_ Page	11	of	57		
							operator res	ponse				
	Time	Position			Applicar	nt's Actions or Beha	vior	<u></u>				
			Operations	s Manage	<u>ment</u> - Typic	cally Shift Manage	ər.					
			<u>Maintenan</u> ( <b>Note:</b> Mai	<u>ce Perso</u> intenance	nnel – Typic notification	ally Maintenance may be delegate	Shift Sup d to the S	ervisor hift Ma	(MSS	6). ').		

Lead Examiner may cue next event when 1A-A CCP is in service and 1B-B CCP is stopped.

Арј	pendix D			Scenar	io Outline			Atta	chme	ent 1
ОрТ	Fest No.:	NRC	Scenario #	1	Event #	2	Page	12	of	57
Ever	nt Description:	1B-	-B CCP Aux LO P	ump Actua	tes w/1B-B CCF	P Trip- Delayed for op	perator res	ponse		

Time	Position	Applicant's Actions or Behavior
	I	AOP-M.09, Loss Of Charging
	RO	Identifies Red Lube Oil Pressure Lo Light, adheres to operator aid by handswitch, 1- 63-PIP-00-003, notifies SRO
		TS 3.5.2 Action a: w/ 1 or more trains inoperable & w/ at least 100% ECCS flow equivalent to a single OPERABLE ECCS train available, restore to OPERABLE status w/i 72 hrs or HT STBY w/i next 6 hrs & in HT SHDN w/i following 6 hrs. TR 3.1.2.4: At least 2 CCPs shall be OPERABLE Action: w/ only 1 CCP OPERABLE, restore at least 2 w/i 72 hrs or HT STBY & borated to a SDM equivalent to at least 1% delta k/k at 200°F w/i next 6 hrs; Restore at least 2 CCPs to OPERABLE w/i next 7 days or HT SHDN w/i next 30 hrs.
Evaluator Not	e: The crew d AOP-M.09	lid not identify the 1B-B CCP lo lube oil condition, 1B-B CCP will tripped, for the tripped CCP.
	SRO	Directs implementation of AOP-M.09 Section 2.0:
	RO	[1] CHECK any CCP RUNNING.
	RO	[2] <b>MONITOR</b> if CCP(s) should be stopped <b>N/A</b>
	RO	[3] CHECK BOTH CCPs STOPPED.
	RO	[4] ENSURE normal letdown ISOLATED:
		• FCV-62-72 CLOSED
		FCV-62-73 CLOSED
		FCV-62-74 CLOSED.
	RO	[5] ENSURE excess letdown ISOLATED:
		FCV-62-54 CLOSED
		FCV-62-55 CLOSED.

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	Appendix D			Scenar	io Outline			Atta	chme	nt 1
<u></u>	Op Test No.:	NRC	Scenario #	1	Event #	2	Page	13	of	57
	Event Description:	1B-	B CCP Aux LO F	Pump Actua	ites w/1B-B C	CP Trip- Delayed for op	erator res	ponse		

	Time	Position	Applicant's Actions or Behavior
		CAUTION	If both RCP thermal barrier cooling flow and seal injection flow have beer lost, RCP seals will overheat rapidly.
		NOTE	If all RCP seal cooling has been lost, this AOP takes precedence over AOP-R.04, RCP Malfunctions, and AOP-M.03, Loss of Component Cooling Water.
		RO	[6] <b>MONITOR</b> RCP lower bearing and seal water temperatures:
			<ul> <li>If any RCP lower bearing temp or seal water temp is greater that 225°F, THEN GO TO Notes prior to Step 18.</li> </ul>
		RO	<ul><li>[7] CHECK charging/seal injection header INTACT. (NO indication of rupture)</li></ul>
		RO	[8] ENSURE CCP suction path established:
			a. CHECK SI signal NOT actuated.
			b. ENSURE suction from VCT established:
			VCT level greater than 13%
			LCV-62-132 and LCV-62-133     VCT Outlet to CCP OPEN.
		CAUTION:	If gas intrusion is suspected, NO CCP should be started UNTIL CCP has been vented (addressed in later steps).
		RO	[9] CHECK if any CCP available for immediate start:
			CCP available
			AND
			gas intrusion is NOT suspected.
$\sim L$		CREW	[10] <b>DISPATCH</b> AUO to locally verify CCP is ready to be started.
And the second sec		NOTE	If RCP thermal barrier cooling is established and sufficient time exists for local inspection of the standby pump, then CCP start in Step 11 should be delayed until after inspection is completed.

Op Test No.:	NRC	Scenario # _ 1 Event # _ 2 Page _ 14 of						
Event Description:	1B-	B CCP Aux LO Pump Actuates w/1B-B CCP Trip- Delayed for operator response						
Time	Position	Applicant's Actions or Behavior						
	RO	[11] <b>START</b> available CCP.						
	RO	[12] CHECK SI signal NOT actuated.						
	RO	[13] MONITOR CCP suction aligned to VCT.						
	SRO	<ul> <li>[14] ENSURE normal charging and letdown established USING EA- Establishing Normal Charging and Letdown.</li> <li>(EA-62-5 follows this event guide)</li> </ul>						
		[15] <b>NOTIFY</b> STA or other available licensed operator to refer to App Tech Spec Impacts.						
		[16] <b>NOTIFY</b> SM to evaluate OPDP-9, Emergent Issue Response.						
		[17] GO TO appropriate plant procedure.						
		END OF TEXT						

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	Appendix D			Scenari	io Outline			Atta	chme	ent 1
form.	Op Test No.:	NRC	Scenario #	1	Event #	2	Page	15	of	57
A CALLER .	Event Description:	1B-	B CCP Aux LO F	<sup>o</sup> ump Actuat	tes w/1B-B CCI	<sup>o</sup> Trip- Delayed for op	perator res	ponse		

	Time	Position		Applicant's Actions or Behavior									
-	4	EA	-62-5	, Establishing Normal Charging and Letdown.									
			4.0	4.0 OPERATOR ACTIONS									
_			4.1	Section Applicability									
		SRO	2. II	2. IF normal letdown flow is to be established, THEN GO TO Section 4.3.									
			4.3	Establishing Normal Letdown Flow									
-		NOTE	EA-( Norr	A-62-3, Establishing Excess Letdown, may be utilized if Iormal Letdown cannot be established.									
		RO	1.	. IF charging flow NOT established, THEN PERFORM Section 4.2.									
		RO	2.	VERIFY pressurizer level greater than 17%.									
-			3.	ENSURE letdown orifice isolation valves CLO	SED:								
				LETDOWN ORIFICE ISOLATION VALVES	CLOSED √								
				FCV-62-72									
				FCV-62-73									
				FCV-62-74	Ω								
			4. (	OPEN letdown isolation valves:									
				LETDOWN ISOLATION VALVES	OPEN √								
				FCV-62-69									
				FCV-62-70									
				FCV-62-77									

Appendix D			Scenario	Outline	· · · · · ·		Attac	hme	n
Op Test No.:	NRC	Scenario #	1	Event #	2	Page	16	of	
	" IB		Pump Actuates	3 w/1B-B CCP	Trip- Delayed for ope	erator resp	onse		
Time	Position			Applicant's	Actions or Behavio	or			
	NOTE	Placir to res actua	ng cooling wa toring letdow ting and fully	ater on the L vn flow shou v opening TC	etdown Heat Ex ld prevent TIS-62 2V-70-192.	changer 2-79B/A	prior from	· · · · · · · · · · · · · · · · · · ·	
		5. <b>PLAC</b>	E [HIC-62-78	3] in MANUA	AL, AND OPEN [	[TCV-70-	<b>-192]</b> to	o ~50	19
		6. PLAC ADJU	E letdown pr ST output be	essure contr tween 40%	oller <b>[PCV-62-8</b> 1 and 50%, (50%-6	1] in MAN 60% ope	NUAL a n).	ind	
		7. ADJU: line.	ST charging	flow as nece	essary to prevent	flashing	in the	letdo	~~~
		8. OPEN	letdown o	rifice isola	tion valves as	needed	1:		
		I	ETDOWN C	RIFICE ISO	LATION VALVE	s (	DPEN √		
				FCV-62-7	72				
				FCV-62-7	73				
				FCV-62-7	74				
	NOTE	Norma	al letdown pro	essure is 32	5 psig at normal	operatin	g		
		9. ADJUS desired	<b>ST</b> letdown p I pressure.	ressure cont	troller [PCV-62-8	<b>31]</b> outpu	t to obt	ain	
		10. ADJUS existing	ST letdown p g pressure.	ressure conf	troller <b>[PCV-62-8</b>	81] setpo	int to m	natch	
			letdown pre		oller IPCV-62-81		0		
						1	<u>~.</u>	••••••	

	)		Scena	rio Outline			Attac	chme
Op Test No.:	NRC	Scenario #	1	Event #	2	Page	17	of
Event Descript	tion: 1B-l	B CCP Aux LO F	<sup>o</sup> ump Actua	ates w/1B-B CCP	Trip- Delayed fo	r operator res	ponse	
Time	Position			Applicant's	s Actions or Bel	havior		
	NOTE	Norm	al letdow	n temperature	is ~100°F.			
		12. ADJUS indicate	T [HIC-6 ed on [TI-	2-78A] to obta 62-78].	ain desired let	down temp	erature	as
				70.41 - 4117	~~~~~			
			: [HIC-62	-78Aj in AUTO	J.			
	NOTE	Let of 7 val	down ten FIS-62-79 ve TCV-7	nperature may )B/A, which ca (0-192 to fully	y swing due to luses letdown open.	repeated a temperatu	actuatio re contr	n rol
		14. <b>IF</b> nece followin	essary to a	stabilize letdov	wn temperatu	re, THEN P	ERFOR	RM th
		a. <b>PLA</b> OPE	CE [HIC EN direct	<b>-62-78A]</b> in M ion.	ANUAL and <b>A</b>	ADJUST co	ntroller	outpu
		b. WH app	EN letdov roximatel	wn heat excha y 100°F, <b>THE</b>	inger outlet te NPLACE [HIC	mperature <b>2-62-78A]</b> i	is stabil n AUTC	ized a ).
		15. ENSUR	E high te	emperature div	ert valve <b>[HS</b>	<b>-62-79A]</b> in	DEMIN	l posi
		16. ADJUS injectior	T chargir flow and	ng and letdowr d pressurizer l	n as necessar evel.	y to mainta	in RCP	seal
				EN	D OF TEXT			

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	Appendix D		Required Operator Ac	tions	Form ES-D-2				
C	Op Test No.: Event Descriptio	NRC n: Corr	Scenario # <u>1</u> Event #	<u> </u>	18 of 57 open automatically				
	Time	Position	Applic	ant's Actions or Behavior					
	Simulator Op Indications/A Annunciat 0-M-27B • 0-XA-5 • 0-XA-5 Indications • 1-LI-70 • 1-LI-70 • 2-LI-70 • 2-LI-70 Significant R Annunciat • 1-XA-5	Derator: When Narms or: 5-27B-B C-2, "C 5-27B-D C-2, "C 5-27B-D C-2, "C 5-27B-D C-2, "C 5-3A CCS SUR 6-99A CCS SUR	JNIT 1 CCS SURGE TANK LEVEL ABNORMAL" D-2, "UNIT 1 CCS CURGE TK LVL LO AUTO MAKEUP JNIT 2 CCS SURGE TANK LEVEL ABNORMAL" D-2, "UNIT 1 CCS CURGE TK LVL LO AUTO MAKEUP GE TK A OUTLET LEVEL ("B" Header) indicates a lowering level GE TK A INLET LEVEL ("A" Header) indicates a lowering level GE TK A OUTLET LEVEL ("A" Header) indicates a lowering level GE TK A INLET LEVEL indicates a lowering level GE TK A INLET LEVEL indicates a lowering level MINIT A INLET LEVEL indicates a lowering level DE TK A INLET LEVEL indicates a lowering level DE TK A INLET LEVEL indicates a lowering level MINIT A INLET LEVEL INDICATES A LOWERING LEVEL MINIT A INLET LEVEL INDICATES A LOWERING LEVEL						
C	• T + 35	E-3, "LS BOP	59-180A/B DEM WTR AND CASK Respond to 0-M-27 alarms in a	DECON SYS ABN CONDITIO	N"				
	Evaluator No	te: 0-M-27 Pa Cooling W and make Prompts to available o	nel alarms from <b>both units</b> will a ater System operating alignmen up alarms, expected make-up to be provided by the Simulator o n Simulator Panel 0-M-27.	actuate due to the common ( t. If the BOP responds to <b>U2</b> the <b>U2</b> surge tank is operat perator if contacted for <b>U2</b> in	Component 2 surge tank level ing as expected. dications not				
		BOP	From 0-AR-M27B-B C-2, BOF [3] IF surge tank level is low, T [a] DISPATCH operator to i	<b>will inform SRO:</b> HEN nvestigate problem.					
		SRO	[b] IF sufficient level cannot THEN GO TO AOP-M.03, <i>Loss of</i>	be maintained, Component Cooling Water.					
C		BOP	From 0-AR-M27B-B D-2, BOP [1] CHECK surge tank level by	will inform SRO: observing [1-LI-70-63A]					
		BOP	[2] VERIFY 1-LCV-70-63 OPE	N.					

	Appendix D		Requir		Form ES-D-2						
	Op Test No.: Event Descriptio	NRCn: Con	Scenario #	1 Event #	3 capacity) 1-FCV-7	Page 0-63 fails to c	19 open au	of tomati	57 cally		
	Time	Position		Applicant's	Actions or Beha	vior					
	Evaluator No	ote: BOP iden light lit, RI 0-M-27B.	tifies U1 make-up ED light dark), no	o valve 1-FCV-70-63 tifies SRO and oper	3 failed to open ns valve using l	automatic handswitch	ally (G ì 1-HS	REE -70-6	N i3 at		
	Evaluator No	te: SRO/BOF determine	e identifies CCS s s make-up contro	Surge Tank level sta olled to maintain lev	bilizing/level re el.	eturning to	norma	l;			
	event guide.										
		CREW	[3] DISPATCH	operator for local in	spection to de	termine pro	blem.				
		SRO	[4] VERIFY pro Compone Cooling W	oper valve alignmen <i>nt Cooling Water Sy</i> /ater System Train E	t in accordance <i>istem</i> Train A, a 3.	accordance with 1-SO-70-1, m Train A, and 0-SO-70-1 Component					
		BOP	[5] MONITOR problems.	level in both surge ta	anks to determ	ine seal lea	akage	retur	n		
		RO/BOP	[6] MONITOR I	level increase in poc ent.	ket sump for p	ossible CC	S leak	( insid	de		
		SRO/BOP	[7] IF sufficient of Compo	level cannot be mai nent Cooling Water	intained, <b>THEN</b> for emergency	<b>I GO TO</b> A makeup in	OP-M. structi	.03, <i>L</i> ons.	.oss [C.1]		
	Evaluator No	te: SRO/Crew applicable to dispatch available f	/ may go to AOP . Since the leak n AUOs to make or the CCS Syste	-M.03, <i>Loss of Com</i> is within the capacit up to the DI Water S em	ponent Cooling y of make-up w System to ensu	y <i>Water;</i> Se vater flow, f ire make-u	ection 2 the cre p inver	2.4 is w ne ntory	eds is		
$\bigcirc$		US	US may use or Section 2.4 Tra this event. Bas ("B" Header) is	refer to AOP-M-03, in B CCS Header Fa ed on indications of lowering.	Loss of Comp ailure; Steps 1- 1-LI-70-99A, C	onent Cool -4 are adec CCS Surge	<i>ing Wa</i> juate t Tank	ater; o ado A Ou	dress itlet		
Sec. of		CAUTION:	If any Containm pump may expe	ent Spray Pump is i prience bearing failu	running with No re after 10 min	O CCS coc utes.	oling, s	pray			

.

	Appendix D		Rec	uired Op	erator Actions	5		Fo	rm ES	-D-2	
	Op Test No.: Event Descriptio	NRC n: Com	Scenario # nponent Cooling I	1 _ine Break	Event #	3 capacity) 1-FCV-7	Page 70-63 fails to	20 p open a	of _	57 cally	
	Time	Position			Applicant's	Actions or Beha	ivior				
		BOP	1. DISPAT and PEF	CH opera	ators with radi alve manipula	os to Auxiliary ations.	Building	to LOC	ATE fa	ailure	
		BOP	2. DISPAT App. R V	<b>CH</b> an op /alves Re	perator with ra equired by Se	idio to perform ction 2.4.	Appendix	к В, Ор	eratio	n of	
		SRO/BOP	3. CHECK ERCW Flow	3. <b>CHECK</b> ERCW flows NORMAL for plant conditions: ERCW Flows are normal- crew moves on							
		NOTE: In the event of a "B" train line break the surge tank baffle prevents the "A" tra from draining to less than 57% indicated level.							train		
		NOTE: Appendix G lists expected responses to various CCS surge tank levels									
C		SRO/BOP	<ul> <li>4. MONITOR Train B CCS surge tank level between 65% a</li> <li>1(2)-LI-70-99A, Unit 1(2) B CCS Surge Tank Level.</li> <li>(RNO Required)</li> </ul>					and 8	5%.		
		SRO/BOP	RNO: IF CCS surg makeup star	e tank le ts.	vel is less tha	n 64%, <b>THEN</b>	ENSURE	surge	tank a	uto	
		BOP	IF necessary operator to p • Manu OR • ALIG Eme	y to locall berform th ually mak <b>iN</b> ERCW rgency M	y initiate surg ne following: e up from der / supply <b>USIN</b> akeup. <b>[C.1]</b>	e tank makeup nin water, I <b>G</b> Appendix E	o, <b>THEN E</b> , Aligning	DISPAT	°CH		
		NOTE: P si BOP	ressure range ervice. Plant 5. MONITO	provided condition	is expected s may cause lowing:	value based or values to be or	n one Tra utside the	in B C( expect	CS pur ted rar	np in 1ge.	
C			• 0B1/0 psig) (RNO Requi	0B2 CCS ired)	HX inlet pres	sure NORMAL	an 20%. ₋ (betwee	n 90 ar	nd 118		

		Required Operator Actions					
Op Test No.:	NRC	Scenario # _ 1 _ Event # 3	Page 21 of				
Event Description:	Cor	ponent Cooling Line Break (within make-up capacity) 1-FCV-70-	-63 fails to open automatic				
Time	Position	Applicant's Actions or Behavi	ior				
Evaluator Note	Train B CCS Pump cavitation is not expected if the crew initiates make-up and isolates the leak per the following step RNO.						
		<b>RNO:</b> IF any Train B CCS pump is cavitating <b>OR</b> has lost affected pump.	t suction, THEN STOF				
		IF any of the following conditions exists:					
	BOP	loss of surge tank level is imminent					
		OR					
		Irain B header break is indicated     which requires isolation					
		OR					
		Train B CCS flow has been lost.					
	BOP	THEN PERFORM the following:	•				
	BOP	a. STOP and LOCK OUT Train B pumps:					
		CCS Pump currently aligned to Train B (C-S)	S, 1B-B, or 2B-B)				
		1B-B Containment Spray Pump					
		2B-B Containment Spray Pump					
	BOP	b. CLOSE Train B ESF Header Isol Valves:					
		O-FCV-70-12, 0B1/0B2 HX Outlet [Rx MOV	Bd 1B2-B Compt. 12				
		<ul> <li>1-FCV-70-75, RHR HX B Return Isol [Rx M0 14B]</li> </ul>	OV Bd 1B2-B Compt.				
		2-FCV-70-75, RHR HX B Return Isol [Rx M( 14B]	OV Bd 2B2-B Compt.				
	SRO	c. IF in Mode 4, 5, or 6, THEN N/A					
Evaluator Note:	SRO/BOF	determines CCS Surge Tank manual make-up is ad	equate and will be				

	Appendix D		Ree	quired O	perator Actions	S		Fo	rm ES	-D-2
C	Op Test No.: Event Description:	NRCCom	Scenario #	1 Line Breal	Event #	3 capacity) 1-FCV	Page -70-63 fails to	22 open a	of utomati	57 cally
	Time	Position	1		A	A - 41	•			

Time	Position	Applicant's Actions or Behavior
Evaluator No	ote: The fo proced	llowing CREW Brief and Notification actions are not contained in the lure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prio to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		Maintenance Personnel – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).
Lead Examin	ner may cue ne Tech Specs	xt event when CCS Surge Tank level is being controlled manually and have been identified.

 $\bigcirc$
SQ	N	LOSS OF	F COMP	ONENT C	OOLING WATE	R	AOI	P-M.0	13
Op Test No.: Event Description	<u>NRC</u> n: Co	Scenario #	1 Line Breal	Event # k (within make	3 e-up capacity) 1-FC∨	Page 7-70-63 fails to	_23_ open au	of tomatio	5 cally
		Re	quired O	perator Act	tions		For	m ES	-D-2

Page 1 of 1

## APPENDIX G

## CCS SURGE TANK LEVEL SWITCH SETPOINTS

TANK LEVEL (INCHES)	TANK LEVEL (PERCENT)	EXPECTED RESPONSE
124*	100%	NONE (Upper tap)
105"	85%	LS-70-99A/B ANN. "Surge Tank Level Abnormal" (high level)
90"	73%	LS-70-63B/A or LS-70-63C/B- Closes Demin. Auto Make Up Valve
105" to 79"	85% to 64%	Normal Operating Range
79"	64%	LS-70-63D Ann. "Surge Tank Level Low Auto Makeup Initiated" LS-70-63A/B or LS-70-63CA Open Demin. Auto Makeup Valve LCV-70-63
75°	61%	LS-70-99B/A ANN. "Surge Tank Level Abnormal" (low level)
71"	57%	NONE (TOP OF BAFFLE)
0"	0%	NONE (LOWER TAP)

	Appendix D		Required Operator Actions Form ES-D-2								
	Op Test No.: Event Descriptio	<u>NRC</u>	Scenario # <u>1</u> Event # <u>4</u> Page <u>24</u> of <u>57</u> RCP #2 Seal Failure								
	Time	Position	Applicant's Actions or Behavior								
	Simulator O	perator: Whe	n directed, initiate Event 4								
	Alarms/India 1-M-5 Annuncia • 1-XA- • Indicatior	cations availal tor: 55-5B A-3, "FS- B-2, "LS 62-23 "BCP SE	01e: 62-10 REAC COOL PMPS SEAL LEAKOFF LOW FLOW" 62-19A REAC COOL PMP 2 STANDPIPE LVL HIGH-LOW"								
	• 1-FR-0	62-24 "RCP SEA	AL LEAKOFF-LOW RANGE " trend indicates >0.9 gpm AL LEAKOFF-LOW RANGE" trend indicates ≈1-2 gpm								
	T = 35	RO	<ul> <li>Respond in accordance with Alarm Response Procedures</li> <li>Refer to ARP 1-AR-M5B A-3, verifies: <ul> <li>leakoff and #1 Seal ΔP less than 275 psid,</li> <li>#1 Seal return isolation valve open</li> <li>Acknowledges MODE 1 or 2 operation and refers SRO to AOP-R.04</li> </ul> </li> <li>AND continues ARP review</li> </ul>								
C		RO	Refer to ARP 1-AR-M5B B-2, verifies Corrective Actions [1] not applicable:								
			[1] IF window 3 (A-3), REAC COOL PMPS SEAL LEAKOFF LOW FLOW is in alarm state in conjunction with this alarm (REAC COOL PMP STANDPIPE LVL HIGH-LOW), THEN GO TO window 3 (A-3) for Corrective Actions.								
	Evaluator No	o <b>te:</b> RO deterr NOTE 1 Th do	nines #2 seal leakoff is high; #1 & 3 normal and continues with ARP (following). e Hi-Low alarm can be determined by making up to the RCP standpipe. If the alarm es not clear, then it can be assumed the level is high or the level switch has failed. If								
		NOTE 2 A I	e alarm clears, then it can be assumed the level was low. High RCP standpipe level in conjunction with reduced No. 1 Seal Leakoff flow and reasing flow to the RCDT is indicative of a failed No. 2 Seal.								
		NOTE 3 Lo fai	w standpipe level with increased flow to the Cntmt FI & Eq Sump is indicative of a ed No. 3 seal.								
		RO	[2] ATTEMPT to clear alarm by performing the following:								
10			[a] OPEN [1-FCV-81-14] RCP 2 Standpipe Makeup Water.								
			[b] IF alarm clears, THEN CONTINUE standpipe fill for ~15 seconds OR until high alarm is actuated AND								
			CLOSE [1-FCV-81-14] RCP 2 Standpipe Makeup Water.								

	Appendix D		Required Operator Actions Form ES-D-2								
C	Op Test No.: Event Descriptio	NRC	Scenario # <u>1</u> Event # <u>4</u> Page <u>25</u> of <u>57</u> RCP #2 Seal Failure								
	Time	Position	Applicant's Actions of Babavian								
		RO	[c] IF alarm does not clear, THEN CLOSE [1-FCV-81-14] RCP 2 Standpipe Makeup Water after ~3-4 minutes.								
		RO	[3] CHECK [1-FR-62-24], RCP Seal Leakoff High Range, to determine if any changes in seal return flow								
		RO	[4] NOTIFY Radwaste to MONITOR RCDT parameters (level, temperature								
C		RO	<ul> <li>[5] IF RCP Standpipe Level Alarm fails to clear (high standpipe level) OR clears and reoccurs (low standpipe level), THEN GO TO AOP-R.04, <i>Reactor Coolant Pump Malfunctions.</i></li> </ul>								
		SRO	Determines AOP-R.04, Reactor Coolant Pump Malfunctions Section 2.4, "#2 Seal Leakoff High Flow (high RCP standpipe level) on ANY RCP" entry is appropriate								
	Sec	tion 2.4, "#2 S	AOP-R.04, Reactor Coolant Pump Malfunctions Seal Leakoff High Flow (high RCP standpipe level) on ANY RCP"								
		RO	<ol> <li>EVALUATE RCP standpipe alarms:</li> <li>a. CHECK RCP standpipe level alarm(s) LIT [M-5B, window A-2, B-2, C-2, D-2]</li> </ol>								
		CREW	<ul> <li>b. MONITOR RCDT parameters at Radwaste Panel [Aux Bldg, el. 669']:</li> </ul>								
$\bigcirc$			Level, LI-77-1     Pressure, PI-77-2     Temporature, TI 77-21								

-	Appendix D		Required Operator Actions Form ES								
$\bigcirc$	Op Test No.:	NRC	Scenario #		Event #	4	Page	26	of	57	
	Event Description	n: #2 R	CP #2 Seal Fa	CP #2 Seal Failure							
	Time	Position			Applicant's	Actions or Beha	vior				
		RO	c. <b>FILL</b> Resp	affected	I RCP standpipe	e <b>USING</b> AR-N	/I-5B, Anr	nunciate	or		
			RO reviews	RCP 2	[window B-2] Al	RP; may/may	not re-pe	rform.			
	Evaluator No	te: Appendix /	A, RCDT Lev	el Rate-	of-Change follo	ws this event ç	guide				
		RO	2. MONIT	<b>OR</b> #2 s	eal INTACT on	affected RCP:					
	VERIFY #2 seal leakoff less than or equal to 0.5 gpm USING     Appendix A, RCDT Level Rate-of-Change.     (RNO Required)								NG		
	VERIFY RCP vibration is within limits of annune M5-A (window D-3) VIBRATION & LOOSE PAR ALM.							or respo MONI	onse ´ TORII	1-AR- NG	
$\bigcirc$			(RNO NOT	Require	ed)						
~~~			RNO: PERFORM the following within 8 hours:								
			a. <b>PERFO</b>	RM norr	nal plant shutdo	own <b>USING</b> ap	propriate	plant p	proced	dure.	
	Evaluator No	tes: 0-GO-5 Se	ection 5.3, "P	ower Re	duction From 1	00% to 30%" f	ollows thi	s even	t guid	e.	
		Operator r b. below a reactor trip	esponsible fo s directed by at ~20%).	or perform the SR(	ming the remair O following reac	nder of AOP-R stor shutdown o	.04 will po (0-GO-5 o	erform directs	RNO a mar	Step nually	
		The remain in EPM-4,	nder of AOP- User's Guide	-R.04 wil ə.	l be performed	in the single-p	erformer	mode a	as def	fined	
		RO	b. WHEN	reactor i	s shutdown or t	ripped, <b>THEN</b>	PERFOR	<b>RM</b> the f	follow	ring:	
			1) STC	OP and L	OCK OUT affe	cted RCP					
1999 - L.			2) PUL • > • >	_ <b>L TO D</b> (S-68-2[ (S-68-2]	<b>EFEAT</b> affected D (∆T) M (T-avg)	d loop ∆T and `	T-avg:				

Appendix D	pendix D Required Operator Actions Form							rm ES	3-D	
Op Test No.:	NRC	Scenario #	1	Event #	4	Page	27	of		
Event Descriptio	on: #2	RCP #2 Seal Fa	ailure							
Time	Position		Applicant's Actions or Behavior							
	SRO	3. CONSU	LT Eng	ineering:						
		a. NOT	IFY Eng	ineering to prov	vide recomme	endations.				
		opera	ation.	need to consul	with Westing	ghouse for	continu	ied R	CP	
Evaluator No	ote: Followi	ng the reactor	shutdow	n as directed	by the SRO t	he operato		nciblo	fo	
	perform	ning Step 4 RN	O from	AOP-R.04 Sec	tion 2.4 will c	omplete RI	IO Ste	p b.	10	
	RO	4. CHECK	RCPs 1	and 2 RUNNI	NG.					
	RO	RNO: CLOSE affe	ected loc	op's pressurizer	spray valve.					
		RO takes 1- MANUAL ar	PIC-68- nd CLOS	340B, LOOP 2 SE	PZR SPRAY	CONTRO	L toggl	e swit	ch	
		5. EVALU	ATE EP	P-1, Emergend	y Plan Initiat	ing Conditi	ons Ma	trix.		
		6. <b>EVALU</b> • 3.4.6.2,	ATE the RCS Op	following Tech perational Leak	Specs for ap	oplicability:				
		BOUNDARY or HT STBY	LEAKAG	E or primary-to- hrs & CLD SHD	secondary leal	kage, reduce 3 30 hrs.	e w/i lim	RE iits w/i	41	
		7. GO TO a	appropri	ate plant proce	dure.		·····			
Evaluator No	te: The follow	ving CREW Br	ief and <b>I</b>	Notification acti	ons are not c	ontained in	the pr	ocedu	ire	
		CREW Brief to the next e	f would t vent.	typically be cor	ducted for th	is event as	time a	llows	pri	
		Notification addressed b	s should by the pro	d be addressed ocedure or in th	as applicabl	e if not spe ef.	cifically	/		
		Operations	Manage	<u>ment</u> - Typically	/ Shift Manag	jer.		()		
		(Note: Main	tenance	notification ma	y be delegate	e Snift Supe ed to the S	ervisor hift Mai	(MSS nager)	). )	

Appendix	D	Required Operator Actions Form							-D-2	
Op Test No.	: <u>NRC</u>	Scenario #	1	Event #	5	Page	28	of	57	
Event Desci	iption: Stat	or Cooling Water	·Loss-MT	Trip, No Rx Trip				_		
Time	Position			Applicant's	Actions or Beh	avior				
Simulator	Operator: Wher	n directed, in	itiate Eve	ent 5						
Alarms/In Annun 1-M-1	dications availat ciators:	ble:								
• 1-> Indica	(A-55-1A A-1, "GE B-4, "GE tions:	EN STATOR TE EN STATOR CO	EMPERAT	URE HIGH" FAILURE"						
• Inc	licator 1-TI-35-76 "(	GENERATOR	H2 TEMP'	' trending to to	p of scale (in	dicator scal	e: 50-1	50°F)		
T = 65	CREW	The crew w AOP-S.06,	ill respon Turbine T	d using ARPs rip, Section 2.	1-AR-M1-A, A D for the failu	A-1, B-4, th re.	at dire	ct entr	ry into	
		If the unit is trip will occu	not reduc 	ced to <15% p	ower within 4	5 seconds,	an au	tomati	ic MT	
Evaluator	Note: The cre the H2 o modes	w may respo cold TCV not	nd to a H controll	l2 Cooler tem ing. It will not	perature ala respond in	rm from IC the AUTO	S & d or AN	iscov NUAL	er -	
	1-A	R-M1-A A-1, "GEN STATOR TEMPERATURE HIGH"								
	NOTE: The The	applicable co 'U' points are	applicable computer points may be viewed by typing [ <b>show60 STATALM</b> ]. U' points are the delta-T's between the inlet and each applicable outlet.							
	BOP	[1] CHECK Plant computer to DETERMINE Thermocouple in alarm state o if instrument failure has occurred.							te or	
	NOTE: If ala obta term	arm occurs an in TC tempera inal board) in	d the Plai atures loc	nt computer is ally (temporary	inoperable T / instrumenta	HEN dispa ition conne	tch per cted to	sonne local	ere	
	BOP	[2] MONITC Monitorir	<b>R</b> Stator	Coil Temperat	ures in accor s.	dance with	0-SO	.35-4,	<i>1</i> 3	
	BOP	[3] IF Gener REFER t with this	ator Coo o Alarm F instructio	ling Failure ala Response B-4 <sup>-</sup> n.	rm (window l for Corrective	B-4) is also Actions w	prese hile co	nt, <b>TH</b> ntinuir	<b>EN</b> ng	
Evaluator	Note: Alarm R	esponse R-4	Actions fr	llow this ARP						

	Appendix D Required Operator Actions Form E									5-D-2
(	Op Test No.:	NRC	Scenario #	1	Event #	5	Page	29	of	57
Concernent of	Event Descripti	on: Sta	ator Cooling Water	Cooling Water Loss- MT Trip, No Rx Trip						
	Time	Position			Applicant's	Actions or Beh	avior			
		BOP	[ <b>4</b> ] IF ∆T is is greate loading t	greater r than o o limit S	than or equal to r equal to 183°f tator Temperat	o 55°F (31°C) <sup>-</sup> (84°C), <b>THE</b> ure to less tha	or Stator ( EN REDUC an alarm se	Dutlet t E gene etpoint.	emper erator	rature
		BOP/ SRO	[5] IF Stator (P-9) N	· Outlet <b>I/A</b>	temperature	and Reactor F	Power is gr	eater t	han 50	0%
	Evaluator Note: SRO/Crew decides AOP-S.06, Turbine Trip is appropriate; it follows this event guide.									
		BOP	[6] IF Stator Reactor I AOP-S.0	Outlet Power is 6, <i>Turb</i>	temperature is g s less than 50% <i>ine Trip.</i>	greater than c (P-9), <b>THEN</b>	or equal to TRIP turbir	192°F( าe and	89°C) <b>GO T</b> (	. and O
C		BOP	<ul> <li>[7] IF SCW temps are greater than 50 deg. C (122 deg. F) AND 1- TCV-24-52 is NOT controlling properly, THEN:</li> <li>[a] OPEN [1-VLV-24-541] TCV Bypass as required to maintain SCW temperatures 35 - 50 deg. C (86 - 122 deg. F)</li> <li>[b] PERFORM 0-SO-35-4 Monitoring Generator Parameters to BYPASS and ISOLATE 1-TCV-24-52</li> </ul>							
		1- CAUTION SRO/ Crew	AR-M1-A B-4, If Unit is greate delay. [1] IF possib accordan <i>Injection</i>	" <b>GEN S</b> er than <i>"</i> ble <b>RED</b> ice with AOP-C.	TATOR COOL 15% power then UCE load to les appropriate pro 03. Rapid Shut	SYS FAILUR Unit Trip will s than 15% w cedure: E-0, down or Rapi	RE" occur afte vithin 45 se Reactor Tr d Load Re	r 45-se conds rip or S	in afety	time
C		BOP	[2] DISPATO [2] DISPATO [a] ENSU [b] EVAL accord [c] ENSU accord	CH pers IRE one UATE S dance v dance v	onnel to Stator Stator Cooling Start of Reserve vith 0-SO-35-2, w Cooling Wate vith 0-SO-35-2,	Cooling Syste Water Pump Stator Coolin Stator Coolin r Aligned to H Stator Coolin	em. RUNNING ng Water F g Water S leat Excha g Water S	3. Pump ir ystem. ngers i ystem.	י אטדי  וח	
		BOP	[3] CHECK s	Stator C	Cooling System SO-35-2.	Operation wit	hin normal	opera	ting	

	Appendix D	Required Operator Actions						Fo	rm E٤	S-D-2
(	Op Test No.:	NRC	Scenario #	1	Event #	5	Page	30	of	57
	Event Description:	Sta	itor Cooling Water			-				

Time	Position	Applicant's Actions or Behavior							
	BOP	[4] IF Unit is greater than 15% power AND alarm has been lit for greater than 45 seconds, THEN ENSURE Unit Trip.							
Evaluator No	<b>ote:</b> The follow	ing CREW Brief and Notification actions are not contained in the procedure.							
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.							
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.							
		Operations Management - Typically Shift Manager.							
		Maintenance Personnel – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).							
Lead Examir	Lead Examiner may cue the next event when the crew determines a plant shutdown is required.								

Appendix D	Required Operator Actions						Form ES-D-2		S-D-2
Op Test No.:	NRC	Scenario #	1	Event #	5	Page	31	of	57
Event Description:	Sta	tor Cooling Wate	r Loss- MT	Trip, No Rx	Trip				

	Time	Position	Applicant's Actions or Behavior
		A	OP-S.06, Turbine Trip Below P-9 (50% Power)
		Crew	Diagnose conditions; determine Turbine Trip caused by Stator Cooling Water problem. SRO directs AOP-S.06 implementation.
		BOP	<ol> <li>VERIFY turbine TRIPPED:</li> <li>CHECK turbine stop valves CLOSED.</li> </ol>
		RO	2. CHECK reactor power less than 20%.
$\bigcirc$		SRO/RO	<ol> <li>WHEN reactor power is less than 20%, THEN ENSURE rod control in MANUAL.</li> </ol>
		RO	<b>RNO:</b> <b>ENSURE</b> control rods inserting in AUTO or MANUAL to reduce Tave and power.
		BOP	4. CHECK main generator PCBs OPEN after 30 second time delay [M-1].
		BOP	5. MONITOR feedwater and condensate system:
			a. CHECK at least one Main Feedwater Pump RUNNING.
			<ul> <li>MONITOR at least two Intermediate Pressure Feedwater Heaters IN SERVICE. (No more than one heater string isolation).</li> </ul>
			c. <b>MONITOR</b> at least two Low Pressure Feedwater Heaters IN SERVICE. (No more than one heater string isolation).
$\sim$		CAUTION E	Excessive feedwater flow may cause an ESF actuation due to rapidly decreasing steam generator pressure.
			6. CHECK S/G narrow range levels STABLE at or trending to program value.

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		Red	quired Ope	rator Actions	·		Fo	rm ES	S-D
Op Test No.: Event Descriptio	NRC	Scenario # ator Cooling Water	1 Loss- MT Tr	Event #	5	Page	32	of _	
Time	D 141								
Time	Position		rbine Tuir	Applicant's	Actions or Beha	avior			
	<b>,</b>	7 MAINTA		D Below P-9	(50% Powe	er)			
		steam d	umps:			manual ro	d contr	ol and	1 
		a. CHE	CK steam	dumps OPEF	RATING to co	ntrol T-avç	<b>j</b> .		
		b. CHE capal	CK reactor bilities.	power withir	n steam dump	and feed	water s	system	)
		8. ANNOU	NCE turbir	ne trip <b>USING</b>	PA system.				
		9. MONITO	<b>)R</b> pressur	izer level cor	ntrol				
		a. CHE	CK pressu	ırizer level gr	eater than 17	%.			
		b. VER	IFY letdow	n IN SERVIC	E				
		c. CHE	CK pressu	ırizer level tre	ending to prog	ram level.			
		10. <b>MONITC</b>	<b>R</b> Pressur	izer Pressure	e control:				
		• Press 2210	urizer pres psig to 220	ssure stable a 60 psig)	at or trending	to 2235 ps	sig (noi	mal ra	anę
	NOTE: Fail	ing open the #	3 heater d	rain tank byp	ass LCV-6-10	)5A and 10	)5B ma	ay prev	ve
	nea		ion. ater Drain	Tank Pumpo				o follo	:
		a. STO	P all #3 He	eater Drain Ta	ank Pumps ar	d PLACE	in PUI		•Wi )-
		b. DISP Drain	ATCH ope	erator to perfo ass valves.	orm Appendix	A to fail o	pen #3	B Heat	er
		c. <b>CLO</b>	SE the foll	owing #3 Hea	ater Drain Tar	nk pump di	ischarg	je valv	/es
		• F(	CV-6-108						
		• F(	CV-6-109						

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	Appendix D		Rec	quired O	perator Act	ions			Fo	rm ES	S-D-2
(	Op Test No.:	NRC	Scenario #		Event #		5	Page	33	of	57
Contraction of the second seco	Event Description:	Sta	tor Cooling Water	Loss- MT	Trip, No Rx 1	rip		_			

	Time	Positio	n Applicant's Actions or Behavior
			AOP-S.06, Turbine Trip Below P-9 (50% Power)
			12. ENSURE moisture separator reheaters ISOLATED:
			a. <b>DEPRESS</b> RESET on MSR control panel XX-47-3000.
			<li>b. CLOSE HP steam isolation values to MSRs and VERIFY status on panel XX-1-145:</li>
			• FCV-1-141
			• FCV-1-241
			• FCV-1-135
			• FCV-1-235
			• FCV-1-143
			• FCV-1-243
			• FCV-1-137
and the second s			• FCV-1-237
$\bigcirc$			• FCV-1-145
			• FCV-1-245
			• FCV-1-139
			• FCV-1-239
			c. CLOSE MSR Operating Vents.
			d. OPEN MSR Startup Vents.
		NOTE: 0	-GO-4 requires Reactor power at approximately 13-15% for Turbine Roll.
			13. EVALUATE Reactor power reduction to less than 15%.
-			14. IF Reactor Power drops by greater than 15% in one hour, THEN NOTIFY Chemistry to initiate conditional portions of SI-53, SI-407.2 and 0-SI-
-			CEM-000-415.
m, l			
Same -			15. SHUT DOWN unnecessary plant equipment USING 0-GO-12, Realignment of Secondary Equipment Following Reactor/Turbine Trip

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-			Required Operator Actions Form ES-D					
	Op Test No.: Event Descriptio	<u>NRC_</u> n: Sta	Scenario # <u>1</u> Event # <u>5</u> Page <u>34</u> of tor Cooling Water Loss- MT Trip, No Rx Trip					
	Time	Position	Applicant's Actions or Behavior					
		Ą	OP-S.06, Turbine Trip Below P-9 (50% Power)					
			16. CHECK the following to determine cause of trip:					
			a. Electrical trip:					
			Electrical Control Board					
-			Relay targets [relay room]					
			b. Fault inside generator:					
			Generator H2 pressure					
-			Generator Core Condition Monitor					
			<ul> <li>17. IF Turbine to be returned to service, THEN PERFORM one of the following:</li> <li>GO TO 0-GO-4, Power Ascension from less than 5% Reactor Pow to 30% Reactor Power.</li> </ul>					
-			GO TO 0-GO-11, Turbine Shutdown Without Reactor Shutdown.					
-		CAUTION:	Reactor operation at low power levels for extended periods may challenge reactivity control due to xenon changes. 18. <b>CHECK</b> Reactor power greater than 5%.					
			<ul> <li>19. IF Reactor to be shutdown OR power reduced to less than 15%, THEI GO TO 0-GO-6, Power Reduction from 30% Reactor Power to Hot Standby.</li> </ul>					
			END OF SECTION					
	Evaluator Not	te: SRO/CRE stable per	W may conduct a brief at this time and should return/insure reactor power is AOP-S.06, Turbine Trip Below P-9 (50% Power).					

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Op Test No.:     NRC     Scenario #     1     Event #     5     Page     35     of       Event Description:     Stator Cooling Water Loss- MT Trip No By Trip	S-D-2	m ES	For		······································	perator Actions	quired O	Re		Appendix D	
Event Description: Stator Cooling Water Loss- MT Trip, No Ry Trip	57	of _	35	Page	5	Event #	1	Scenario #	NRC	Op Test No.:	Contraction of the second seco
		_				Trip, No Rx Trip	r Loss- MT	tor Cooling Wate	Sta	Event Description:	

		AOP-C.03, Rapid Shutdown or Load Reduction
Time	Position	Applicant's Actions or Behavior
	SRO	1. ENSURE CREW has been briefed on reactivity management expectations USING Appendix E.
		(SRO determines plant power reduction rate. According to AOP-C.03, that rate may be 1-4%/minute; and may be varied during the power reduction/ shutdown based on SRO determination/direction.)
с		
	CREW	<ul> <li>2. NOTIFY following personnel of rapid shutdown or load reduction:</li> <li>Load Coordinator</li> <li>Chemistry</li> <li>RADCON</li> <li>Plant Management</li> </ul>
	CREW	3. MONITOR reactor/turbine trip NOT required USING Appendix A, Reactor and Turbine Trip Criteria.
		RNO:
		<b>IF</b> reactor trip is required <b>OR</b> turbine trip is required above 50% power, <b>THEN TRIP</b> reactor and <b>GO TO</b> E-0, Reactor Trip or Safety Injection.
		OR
		IF turbine trip is required below 50% power, <b>THEN TRIP</b> turbine and <b>GO TO</b> AOP-S.06, Turbine Trip.
	BOP	4. CHECK VALVE POSITION LIMIT light DARK on EHC panel. [M-2]
	If Necessary: BOP	<b>RNO:</b> <b>RESTORE</b> turbine control <b>USING</b> Appendix C, Turbine Runback Restoration.
	NOTE: BAT step	is preferred boration source. Boration volume and flowrates listed in following are recommendations and may be adjusted as necessary.
	RO	5. IF borating from BAT,
		PERFORM the following:
		a. DETERMINE recommended boration volume:
		<ul> <li>~800 gal to reduce power from 100% to 20%</li> <li>OR</li> </ul>

	Appendix D		Re	quired O	perator Act	ions		Fo	rm ES	S-D-2
6	Op Test No.:	NRC	Scenario #	1	Event #	5	Page	36	of	57
And the second s	Event Description:	Sta	tor Cooling Wate	r Loss- MT	Trip, No Rx T	rip				

AOP-C.03, Rapid Shutdown or Load Reduction							
Time	Position	Applicant's Actions or Behavior					
		<ul> <li>10 gal for each 1% power reductio OR</li> </ul>	n				
		<ul> <li>volume recommended by Reactor</li> </ul>	Engineering				
	RO/ SRO	<ul> <li>b. DETERMINE recommended bor from Reactor Engineering:</li> </ul>	ration flowrate from	n table below or			
		TURBINE LOAD REDUCTION RATE (%/min) 1% 2%	BORATION FLOWRATE ~15 gpm ~30 gpm				
			~45 gpm				
		4 78	~70 gpm				
	SRO	c. ENSURE concurrence obtained and flowrate.	from US and STA	for boration volum			
	RO	d. PLACE boric acid transfer pump	aligned to blende	r in FAST speed.			
	RO	e. ADJUST FCV-62-138 to establis	sh desired flow rate	Э.			
		f. <b>CONTROL</b> boration flow as required	uired to inject desir	ed boric acid			
	RO	g. GO TO Step 7.					
	SRO	7. INITIATE load reduction as follows:		v			
	BOP	<ul> <li>a. ADJUST load rate to desired value</li> <li>between 1% and 4% per min OR</li> <li>between 1% and 3% per min (App. D)</li> <li>OR</li> </ul>	ue: nute if borating via nute if borating via	FCV-62-138 normal boration			
		2% or 3% per minute if boratir	ng from RWST.				

	Appendix D		Rec	quired O	perator Act	ions		Fo	rm ES	S-D-2
<u> </u>	Op Test No.:	NRC	Scenario #	1	Event #	5	Page	37	of	57
	Event Description:	Sta	tor Cooling Water	Loss- MT	Trip, No Rx <sup>-</sup>	Trip			•	

		AOP-C.03, Rapid Shutdown or Load Reduction							
Time	Position	Applicant's	s Actions or Behavior						
	BOP	b. ADJUST setter for desired	power level:						
		90%	76						
		80%							
		70%	46						
		60%	40						
		50%	35						
		40%	30						
		30%	25						
		20% or less	15						
Evaluator N	l <b>ote</b> : Main Tu initiated	bine vibration malfunction will start	ramping in when turbine load reduction is						
	BOP	c. INITIATE turbine load reduc	ction by depressing GO pushbutton						
	SRO/	d. CONTROL turbine load red	uction as necessary to reduce power to						
	BOP	desired level.	· ·						
	RO	8. MONITOR T-avg/T-ref mismatc	h:						
		a. CHECK T-ref indication AV							
		b. MONITOR automatic rod co	ontrol maintaining T-avg/T-ref mismatch						
		less than 3°F.							
	BOP	9 MONITOR automatic control of MEW nump around AVAILABLE							
	ber of Merrirer automatic control of Mir W pump speed AVAILABLE.								
	BOP	)P 10. STOP secondary plant equipment USING Appendix B, Second Equipment.							
	NOTE: If LE raise autor	<sup>-</sup> M thermal power (U2118) is inoper d by 3 steps. Rod insertion limit alar natically adjusted when LEFM is ino	able, rod insertion limit curve must be ms and ICS display are NOT perable.						
	RO	11. MONITOR control rods above COLR.	low-low insertion limit USING ICS or						

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p Test No.:	NRC	Scenario #	1	Event #	5	Page	38	of	57
vent Description:	Sta	tor Cooling Wate	r Loss- MT	Trip, No Rx <sup>-</sup>	Trip				
\ \	o Test No.: /ent Description:	o Test No.: <u>NRC</u> /ent Description: Sta	o Test No.: <u>NRC</u> Scenario # vent Description: Stator Cooling Wate	o Test No.: <u>NRC</u> Scenario # <u>1</u> vent Description: Stator Cooling Water Loss- MT	p Test No.: <u>NRC</u> Scenario # <u>1</u> Event # vent Description: Stator Cooling Water Loss- MT Trip, No Rx	p Test No.: <u>NRC</u> Scenario # <u>1</u> Event # <u>5</u> vent Description: Stator Cooling Water Loss- MT Trip, No Rx Trip	o Test No.: <u>NRC</u> Scenario # <u>1</u> Event # <u>5</u> Page vent Description: Stator Cooling Water Loss- MT Trip, No Rx Trip	o Test No.: NRC Scenario # 1 Event # 5 Page 38 vent Description: Stator Cooling Water Loss- MT Trip, No Rx Trip	p Test No.: <u>NRC</u> Scenario # <u>1</u> Event # <u>5</u> Page <u>38</u> of

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	Position	Applicant's Actions or Behavior
	NOTE: Initia	ating plant shutdown required by Tech Specs requires 4-hour NRC notificatio SPP-3.5, Regulatory Reporting Requirements.
	SRO	<ul> <li>12. EVALUATE Tech Specs/TRM for applicability:</li> <li>3.2.1, Axial Flux Difference</li> <li>3.1.1.1, Shutdown Margin</li> <li>3.1.3.6, Rod Insertion Limits</li> <li>TRM 3.1.2.2, Boration Flowpaths</li> </ul>
	SRO	13. EVALUATE EPIP-1, Emergency Plan Initiating Conditions Matrix.
	RO	14. PERFORM the following to reduce boron concentration difference between Pzr and RCS loops:
	RO	a. CHECK at least one normal spray valve AVAILABLE.
	RO	b. ENSURE at least one backup heater group ENERGIZED.
	RO	c. ENSURE spray valve(s) responds to control RCS pressure.
	CREW	<ol> <li>WHEN reactor power change exceeds 15% within one hour, THEN NOTIFY Chemistry to initiate sampling as required by 0-SI-CEI 000-050.0, 0-SI-CEM-030-407.2 and 0-SI-CEM-030-415.0.</li> </ol>
	CREW	16. MONITOR if turbine load reduction can be stopped:
	SRO	a. CHECK the following conditions met:
		<ul> <li>reactor shutdown is NOT needed</li> <li>turbine shutdown is NOT needed</li> <li>turbine load at desired power level (further load reduction NOT needed)</li> </ul>
	ROD	b. SIOP turbine load reduction by depressing HOLD.

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	Appendix D		Form ES-D-2							
(	Op Test No.:	NRC	Scenario #	1	Event #	5	Page	39	of	57
Sector Contraction	Event Description:	Sta	Stator Cooling Water Loss- MT Trip, No Rx Trip							

		AOP-C.03, Rapid Shutdown or Load Reduction
Time	Position	Applicant's Actions or Behavior
	RO	<ul> <li>WHEN control rods are above the low-low insertion limit, THEN</li> <li>STOP boration flow.</li> </ul>
	CREW	d. NOTIFY Chem Lab to sample RCS for boron concentration.
		<ul> <li>e. T-avg within 3°F of T-ref USING one of the following:</li> <li>AUTO or MANUAL rod control</li> <li>dilution or boration USING 0-SO-62-7.</li> </ul>
	RO	f. CHECK reactor power greater than 50%.
	RO/ SRO	g. DETERMINE Tech Spec AFD limits for current power level USING ICS (Primary Mimics, Doghouse Display) or COLR.
	RO	h. CHECK AFD within Tech Spec limits on at least three operable power range NIS channels.
	RO/ SRO	I. IF AFD is outside target band, THEN INITIATE 0-SI-NUC-000- 044.0,Axial Flux Difference.
	600	
	SRO	J. INITIATE performance of 0-SI-OPS-092-078.0, Power Range Neutron Flux Channel Calibration By Heat Balance Comparison.
	BOb	k. CHECK C-7 LOSS OF LOAD INTERLOCK [M-4A window E-5] DARK.
	NOTE: Time	in core life, expected Xenon changes, and planned power changes should be idered when evaluating need for boration or dilution.
	SRO	L. CONSULT Reactor Engineering and STA regarding ΔI control and compensating for Xe changes.
	SRO/ RO	m. PERFORM the following as necessary to control ΔI and maintain T- avg on program:

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	Appendix D		Required Operator Actions						Form ES-D-2			
0	Op Test No.:	NRC	Scenario #	1	Event #	5	Page	40	of	57		
	Event Description:	Sta			-							

	1	AOP-C.03, Rapid Shutdown or Load Reduction
Time	Position	Applicant's Actions or Behavior
		<ul> <li>INITIATE boration or dilution as necessary USING 0-SO-62-7, Boron Concentration Control</li> </ul>
		OPERATE control rods as necessary.
	RO	n. CHECK at least one normal Pzr spray valve OPERABLE.
	SRO	<ul> <li>DETERMINE appropriate procedure based upon power level and cause of rapid shutdown:</li> </ul>
		Other applicable AOP
		OR
		<ul> <li>0-GO-5, Normal Power Operation</li> </ul>
		(if greater than approximately 30% power)
		OR
		<ul> <li>0-GO-4, Power Ascension from Less than 5% to 30% Power (if less than approximately 30%)</li> </ul>
	SRO	p. GO TO appropriate plant instruction.
Evaluator No	ote: SRO/CRE\ stable per	N may conduct a brief at this time and should return/insure reactor power is AOP-S.06, Turbine Trip Below P-9 (50% Power).
Evaluator No	ote: The followi	ng CREW Brief and Notification actions are not contained in the procedure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).
Lead Examin	ier may cue ne	xt event when the CREW has stabilized plant power.

	Appendix D		Re	quired Opera	d Operator Actions Form ES-D-2							
(	Op Test No.: Event Descripti	NRC	Scenario # Safety VIvs lift 1	E	vent # Gs	6	Page	41	of _	57		
	Time	Position			Applicant's A	ctions or Behav	/ior					
	Simulator Operator: When directed, initiate Event 6											
	<ul> <li>Indications available:</li> <li>Indicators:</li> <li>1-M-4</li> <li>1-FI-1-3A, 3B, SG-1 STEAM FLOW CH-1 &amp; 2: Increasing steam flow</li> <li>1-FI-1-10A, 10B, SG-2 STEAM FLOW CH-1 &amp; 2: Increasing steam flow</li> <li>1-FI-1-21A, 21B, SG-3 STEAM FLOW CH-1 &amp; 2: Increasing steam flow</li> <li>1-FI-1-28A, 28B, SG-4 STEAM FLOW CH-1 &amp; 2: Increasing steam flow</li> <li>1-XI-92-5005C, 5006C, 5007C, 5008C, RX POWER CH-I-IV N-41 - 44, NOS Power Range indicators: Increasing reactor power</li> <li>1-XR-92-5001, NUCLEAR POWER NR-45: Increasing trends on power ranges selected.</li> </ul> Indicators: <ul> <li>1-M-5</li> <li>1-TI-68-2E, 25E, 44E, 67E LOOPs 1-4 TAVG Decreasing temperature indications (w/ no rod motion)</li> <li>1-TR-68-2B, RCS/TURBINE TEMP Recorder trending away from programmed value</li> </ul> Annunicators: <ul> <li>1-M-5</li> <li>1-AR-M5A A-6, "TS-68-2M/N BC LOOPS T AV/C (AUCT T AV/C DEDAL HIGH LOW)"</li> </ul>											
	1-AR- 1-M-6 1-AR- 1-AR- 1-AR- 1-AR- Significa Annur	M3A A-6, TS-6 M6B A-7, "FS-3 M6B B-7, "FS-3 M6B C-7, "FS-3 M6B D-7, "FS-3 nt Resultant A nciator 1-XA-55	-35B STM GEN -48B STM GEN -90B STM GEN -103B STM GEI Alarms/Indicat -6A Window E-	LOOP 1 STE LOOP 2 STE LOOP 3 STE LOOP 3 STE N LOOP 4 ST tions: 1: TS-68-2J	AMFEEDW/ AMFEEDW/ AMFEEDW/ EAMFEEDW/ EAMFEEDW	G DEVN HIGH-I ATER FLOW M ATER FLOW M ATER FLOW M /ATER FLOW I	.OW" ISMATCH ISMATCH ISMATCH MISMATCH PPS LO LO	" " H D TAVG				
	1 = 70	CREW	Refer to alarr	n response p	procedures	and carries ou	it the follo	wing a	ctions	•		
	Evaluator No	ote: If alarm 1 actuates reactor.	-AR-M6-A E-2 indicating an e	, TS-68-2J R excessive coo	EACTOR Coldown, the	COOLANT LO	OPS LO L ide to ma	.O TAV nually f	/G trip th	e		
	Evaluator No	ote: Personne for worse	el safety is not a ning conditions	a concern wi s but no pers	th this stear onnel safet	n leak location y-based action	ו; the crev s are req	v shoul uired a	ld mor	nitor time.		
		Crew	Diagnose cor	nditions; SRC	D directs AC	)P-S.06 imple	mentation					
		Crew	1. MONITO	R personnel	safety:	•	•					
			a. <b>IF</b> ste perso	am or feedw nnel, <b>THEN</b>	ater lines ne PERFORM	eed to be imm the following:	ediately is	solated	to pro	otect		
		RO	1) TF	RIP the react	or.							
$\bigcirc$		BOP	2) IF M	leak is on st SIVs.	eam lines <b>C</b>	<b>)R</b> source is u	nknown, 1	THEN (	CLOS	E		
"Tanan"		BOP	3) IF PE	leak is on fe ERFORM the	edwater line following:	es OR source	is unknow	vn, <b>THE</b>	EN			
			a)	) TRIP MFW	pumps.							

		Required Operator Actions Form ES
Op Test No.:	NRC	Scenario # Event # 6 Page42 of _
Appendix D Op Test No.: Event Description: Time P I I I I I I I I I I I I I I I I I I	on: M	IS Safety VIvs lift 1 per SG on all SGs
Time	Position	Applicant's Actions or Behavior
		b) CLOSE Feed Reg Valves.
	RO	4) <b>GO TO</b> E-0, Reactor Trip or Safety Injection.
	BOP	2. MONITOR steam generator levels STABLE on program.
	BOP	3. CHECK the following:
		S/G atmospheric relief valves CLOSED
		steam dumps CLOSED.
	BOP	4. CHECK main turbine on line. (RNO required)
		RNO a. is required:
		MONITOR the following actions:
		a. IF unit is in Mode 1 or 2 AND reactor power is rising due to uncontroll cooldown. THEN PERFORM the following:
		1) <b>TRIP</b> the reactor.
		2) WHEN reactor is tripped, THEN CLOSE MSIVs.
		3) GO TO E-0, Reactor Trip or Safety Injection.
		END OF SECTION
	SRO	IF a reactor trip is directed, THEN GO TO E-0, <i>Reactor Trip or Safety Injection</i> .
	SRO	Direct Manual Rx Trip
	SRO	Enter and Direct E-0 Immediate Operator Actions (IOAs)
LEAD EXAM	INER: Crew	will trip the reactor and transition to E-0 as previously stated

	Appendix D		Re	quired O	perator Act	lions	Form ES-D					
<u> </u>	Op Test No.:	NRC	Scenario #	1	Event #	6	Page	43	of	57		
Care 1	Event Description:	MS	MS Safety VIvs lift 1 per SG on all SGs									

	Time	Position	Applicant's Actions or Behavior						
			E-0, Reactor Trip or Safety Injection						
	Evaluator No	te: Following surveys I discovery event in	g IOA performance, prior to Steps 1-4 immediate action verification, RO/BOP MCBs for any expected automatic system response that failed to occur. Upon y, they may take manual action(s) to align plant systems as expected for the progress. (Ref. EPM-4, Prudent Operator Actions)						
	Annunicators	/Indications a	s specified at Event 6 initiation						
		Note 1 Steps	s 1 through 4 are immediate action steps						
	Note 2 This procedure has a foldout page								
		RO	<ol> <li>VERIFY reactor TRIPPED:         <ul> <li>Reactor trip breakers OPEN</li> <li>Reactor trip bypass breakers DISCONNECTED or OPEN</li> <li>Neutron flux DROPPING</li> <li>Rod bottom lights LIT</li> <li>Rod position indicators less than or equal to 12 steps.</li> </ul> </li> </ol>						
$\bigcirc$									
		BOP	<ul> <li>2. VERIFY turbine TRIPPED:</li> <li>Turbine stop valves CLOSED.</li> </ul>						
		BOP	<ul> <li>3. VERIFY at least one train of shutdown boards ENERGIZED.</li> <li>Attempt to restore power to at least ONE train of shutdown boards</li> <li>Place DG 1A-A control switch in START</li> <li>Verify Train A Shutdown Boards ENERGIZED</li> </ul>						
		RO	<ul> <li>4. DETERMINE if SI actuated:</li> <li>ECCS pumps RUNNING.</li> <li>Any SI alarm LIT [M-4D] (SI will be actuated)</li> <li>(RNO Required)</li> </ul>						
Ċ		RO/BOP	<ul> <li>RNO:</li> <li>DETERMINE if SI required: <ul> <li>a. IF any of the following conditions exists:</li> <li>S/G pressure less than 600 psig,</li> <li>OR</li> <li>RCS pressure less than 1870 psig,</li> <li>OR</li> <li>Containment pressure greater than 1.5 psig.</li> </ul> </li> </ul>						

	Appendix D		Require	Required Operator Actions							
	Op Test No.: Event Description:	Page <u>44</u> of <u>57</u>									
	Time	Position		Applicant's	Actions or Beha	vior					
			E-0, Reacto	or Trip or Safety In	ijection						
	Evaluator Note:	SRO/cre depress	w should exercise urization during pe	should exercise <b>FOLDOUT PAGE</b> <u>EVENT DIAGNOSTICS</u> for SG ization during performance of the prudent operator actions (POAs)							
		Correct	POAs implemente	d would then result	t in ALL MSIVs	closed and SI actuated.					
	FOLDOUT PAGE										
			RCP TRIP CRI	<u> [ERIA</u> – N/A							
			EVENT DIAGN	OSTICS							
			• IF any S/G	pressure is dropp	ing uncontroll	ed, THEN PERFORM the					
		RO/BOP	a. CLOSE MSIVs and MSIV bypass valves								
and the second s			b. IF any S/	G pressure continue	es to drop unc	ontrolled, <b>THEN</b>					
$\bigcirc$		RO	1) ENSU	IRE SI actuated.							
			<ol> <li>IF at least one S/G is intact (S/G pressure controlled or rising), THENContinuing Actions N/A</li> </ol>								
				An official and the second sec							
	Evaluator Note:	Actions f	or ES-0.5 are con	tained in attachme	nt at back of so	cenario guide.					
		Following Section 2	g the reactor shute 2.4 Step 4 RNO S	down, the operator tep b as directed.	responsible fo	r performing AOP-R.04					
		RO	b. WHEN react	tor is shutdown or t	ripped, <b>THEN</b>	PERFORM the following:					
-			1) STOP ar	nd LOCK OUT affe	cted RCP						
			2) PULL TO • XS-68 • XS-68	<b>D DEFEAT</b> affected 3-2D (∆T) 3-2M (T-avg)	l loop ∆T and <sup>-</sup>	T-avg:					
		BOP	5. PERFORM I procedure.	ES-0.5, Equipment	Verifications V	VHILE continuing in this					
0											
		RO	6. DETERMINE a. CHECK b. CHECK one S/G.	E if secondary heat total AFW flow grea narrow range level	sink available: ater than 440 g greater than 1	: ipm. 0% [25 ADV] in at least					

	Appendix D	Required Operator Actions Form ES-D-2									
	Op Test No.: Event Description:	NRC Scenario # 1 Event # 6 Page 45									
	Time	Position	Applicant's Actions or Behavior								
			E-0, Reactor Trip or Safety Injection								
			<ul> <li>CONTROL feed flow to maintain narrow range level between 10% [25% ADV] and 50% in all S/Gs.</li> </ul>								
			(Heat Sink is available from AFW:>440 gpm available.)								
		RO	7. CHECK if main steam lines should be isolated:								
			a. CHECK if any of the following conditions have occurred:								
			<ul> <li>Any S/G pressure less than 600 psig OR</li> </ul>								
			Any S/G pressure dropping UNCONTROLLED.     OR								
			Phase B actuation								
			b. ENSURE MSIVs and MSIV bypass valves CLOSED								
			c. ENSURE applicable Foldout Page actions COMPLETED								
C											
		RO	<ul> <li>8. CHECK RCP trip criteria:</li> <li>a. CHECK the following:</li> <li>RCS pressure less than 1250 psig. AND</li> <li>At least one CCP OR SI pump RUNNING</li> <li>b. STOP RCPs</li> </ul>								
		RO	<ul> <li>9. MONITOR RCS temperatures:</li> <li>IF any RCP running, THEN CHECK T-avg stable at or trending between 547°F and °F.</li> <li>OR</li> <li>IF RCPs stopped, THEN CHECK T-cold stable or trending to between 547°F and 552°F.</li> </ul>								
Ċ		RO	<ul> <li>10. CHECK pressurizer PORVs, safeties, and spray valves:</li> <li>a. Pressurizer PORVs CLOSED.</li> <li>b. Pressurizer safety valves CLOSED.</li> <li>c. Normal spray valves CLOSED.</li> <li>d. Power to at least one block valve AVAILABLE.</li> <li>e. At least one block valve OPEN.</li> </ul>								

	Appendix D		Required Operator Actions	Form ES-D-2						
	Op Test No.: Event Descriptio	NRC	cenario # <u>1</u> Event # <u>6</u> Page <u>46</u> of _							
	Time	Position	Applicant's Actions or Behavior							
		1	E-0, Reactor Trip or Safety Injection							
		CREW	<ul> <li>11. DETERMINE S/G secondary pressure boundaries are INTACT:</li> <li>CHECK all S/G pressures CONTROLLED or RISING.</li> <li>CHECK all S/G pressures greater than 140 psig.</li> <li>(RNO Required)</li> </ul>							
			PNO.							
		SRO	PERFORM the following:							
Evaluator Note: at Step 11.a, MONITOR status trees, the crew will implement status tree m via SPDS. When a RED or ORANGE path status tree is observed, the SR designate one of the Board operators (typically the BOP) to verify status tree conditions using 1-FR-0, UNIT 1 STATUS TREES. Once verified, the SRC direct the crew to transition to the appropriate RED and/or ORANGE path procedure(s)										
		Crew	a. MONITOR status trees.							
		SRO	b.GO TO E-2, Faulted Steam Generator Isolation.Crew transitions to E-2, Faulted Steam Generator Isolation.							

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		Appendix D	Required Operator Actions						Form ES-D-2				
C	1 <sup>000 - 1</sup> 1	Op Test No.:	NRC	Scenario #	1	Event #	6	Page	47	of	57		
		Event Description:	MS										

	E-2, Faulted Steam Generator Isolation								
CAUTION: U	nisolating a faulted S/G or secondary break should NOT be considered NLESS needed for RCS cooldown.								
RO	1. CHECK MSIVs and MSIV bypass valves CLOSED.								
RO	2. CHECK ANY S/G secondary pressure boundary INTACT:								
	Any S/G pressure CONTROLLED or RISING. (RNO required)								
	RNO:								
	<b>IF</b> all S/G pressures dropping in an uncontrolled manner, <b>THEN GO TO</b> ECA-2.1, Uncontrolled Depressurization of All Steam Generators.								
SRO	Directs transition to ECA-2.1 Uncontrolled Depressurization of All Steam Generators								
	END OF TEXT								

 $\bigcirc$ 

-	Appendix D		Rec	quired Op	perator Act	tions		For	rm ES	S-D-2
	Op Test No.:	NRC	Scenario #	1	Event #	6	Page	48	of	57
San I.	Event Description:	MS	Safety VIvs lift 1	per SG on	all SGs					

Time	Position	Applicant's Actions or Behavior
	EC	A-2.1, Depressurization of All Steam Generators.
	CAUTION: Is	solating both steam supplies to the TD AFW pump when it is the only source
	0	f feed flow will result in loss of secondary heat sink.
	NOTE: This	procedure has a foldout page.
		1. CHECK secondary pressure boundary:
		a. CHECK the following:
		<ul> <li>MSIVs and MSIV bypass valves CLOSED</li> </ul>
		<ul> <li>MFW regulating valves and reg bypass valves CLOSED</li> </ul>
		MFW isolation valves CLOSED
		Atmospheric reliefs CLOSED
		S/G blowdown valves CLOSED
		b. CHECK MD AFW pumps RUNNING.
		c. CLOSE TD AFW pump steam supply valve FCV-1-17 or FCV-1-18.
Critical Ta	<b>sk to:</b> Throttle AFW	/ Flow to Multiple Faulted SGs in order to minimize RCS cooldown rate before a
	severe (orar	nge-path) challenge develops to the PTS CST
	NOTE Redu	cing total feed flow to less than 440 gpm, as directed in this procedure, does
	total t	require implementation of FR-H.1, Loss of Secondary Heat Sink, as long as a feed flow canability of 440 gpm is available
		2 CONTROL food flow to minimize RCS cooldown:
		2. CHECK T cold cooldown rate loss than 40005 (br
	RO	a. CHECK 1-cold cooldown rate less than 100°F/nr.
Critical		RNO required
Task	BOP	a <b>REDUCE</b> feed flow to 50 gpm to each S/C
		OPEN MD AFW pump regire valves ECV 3 400 and ECV 3 401 as
	BOP	necessary to control flow
	SRO	<b>CO TO</b> Substep 2 c (AFR column)
		AEP 2 a MONITOP S/G parrow range lavale grader than 400/ [050/ AD) 4
	BOP	AER 2.C. MONITOR S/G harrow range levels greater than 10% [25% ADV].
	ROP	KNO:
	BOP	AER 2.c. MONITOR S/G narrow range levels greater than 10% [25% ADV]. (RNO required)

	Appendix D		Required Operator Actions Form ES-D-2
$\bigcirc$	Op Test No.: Event Description	<u>NRC</u>	Scenario # _ 1 Event # _ 6 Page _ 49 of _ 57 Safety VIvs lift 1 per SG on all SGs
	Time	Position	Applicant's Actions or Behavior
		RO	d. MONITOR T-hot indications STABLE or DROPPING.
		SRO/ RO	3. MAINTAIN shutdown margin adequate:
			<ul> <li>a. NOTIFY Chem Lab to sample RCS boron concentration.</li> <li>b. CHECK shutdown margin ADEQUATE USING 0-SI-NUC-000-038.0, Shutdown Margin.</li> </ul>
		RO	MONITOR if RCPs should be stopped:     a. CHECK if the following conditions exist:
Ô			<ul> <li>RCS subcooling based on core exit T/Cs less than 40°F</li> <li>AND</li> <li>RCS pressure less than 1250 psig</li> </ul>
Service .			At least one CCP OR SL pump RUNNING
			b. STOP RCPs.
			5. CHECK CST level greater than 5%.
		CAUTION: A	Any time a pressurizer PORV opens, there is a possibility that it may stick
			6. MONITOR pressurizer PORVs and block valves: a. Power to block valves AVAILABLE
			b. Pressurizer PORVs CLOSED c. At least one block valve OPEN.
			<ul> <li>7. VERIFY secondary radiation NORMAL:</li> <li>a. CHECK secondary radiation NORMAL USING Appendix A, Secondary Pad Manitara</li> </ul>
~			<ul> <li>b. NOTIFY Chem Lab to take periodic S/G activity samples.</li> <li>c. WHEN Chem Lab is ready to sample S/Gs, THEN PERFORM the following:</li> </ul>

	Appendix D			Required O	perator Actions	3		For	m ES	S-D-2
	Op Test No.: Event Description:	NRC MS	Scenario Safety VIvs	# lift 1 per SG on	Event #	6	Page	50	of	57
	······································									
		Position			Applicant's	Actions or Behavio	r			
		· · · · · · · · · · · · · · · · · · ·	1	) ENSURE	Phase A RES	ET.				
			2	2) ENSURE	FCV-15-43 Blo	owdown Flow Cor	ntrol val	ve CL(	DSEE	).
			;	b) OPEN blo	wdown isolatio	on valves.				
			d.	NOTIFY RA	DCON to surve	ey main steamline	s and S	S/G blo	wdov	vn.
			e.	when S/G	samples comp	leted, THEN CLO	SE blov	vdown	isola	ition
			8. DE	TERMINE if	RHR pumps s	hould be stopped				
			<u>a.</u>	CHECK RH	R pump suction	n aligned to RWS	Τ.			
			<u>b.</u>	CHECK RCS	S pressure:					
			1	) Greater th	an 300 psig					
			2	) STABLE (	or RISING.					
			С.	RESET SI si	gnal.					
			d.	STOP RHR	pumps and <b>PL</b>	ACE in A-AUTO.	·			
Contraction of the second seco			е.	MONITOR R	RCS pressure <u>c</u>	greater than 300 p	sig.			
			9. <b>MC</b>	<b>NITOR</b> shut	down boards c	continuously energ	gized.			
							<u> </u>			
			10. <b>MC</b>	<b>NITOR</b> if co	ntainment spra	y should be stopp	bed:			
		·	a.	CHECK any	containment s	pray pump RUNN	IING.			
			b.	CHECK cont	tainment press	ure less than 2.0	psig.			
			С.	CHECK cont	ainment spray	suction aligned to	RWS	Γ.		
			d.	RESET Cont	ainment Spray	1.				
			е.	STOP contai	nment spray p	umps and PLACE	E in A-A	UTO.		
			f.	CLOSE cont	ainment spray	discharge valves:				
			•	FCV-72-39	9					
			•	FCV-72-2.						
, ,			44 110							
-			11. MO	NITOR IT CON	ntainment vacu	ium control should	d be ret	urned	to no	rmal:
			<u>a.</u>	CHECK cont	ainment press	ure less than 1.0	psig.		•• ••	
			b. (	VERIFY cont 6K]	ainment vacuu	um relief isolation	valves	OPEN	: [Par	nel
			•	FCV-30-46	6					
New York			•	FCV-30-47	7					
Ļ			•	FCV-30-48	3.					

-	Appendix D		Red	quired Op	perator Act	lions		Fo	rm ES	3-D-2
(***.	Op Test No.:	NRC	Scenario #	1	Event #	6	Page	51	of	57
	Event Description:	MS	Safety VIvs lift 1	per SG on a	all SGs				•	

Time	Position	Applicant's Actions or Behavior
		12. CHECK RWST level greater than 27%.
		13. DETERMINE if CLAs should be isolated:
		a. CHECK RCS pressure less than 100 psig.
		b. CHECK power to CLA isolation valves AVAILABLE.
		c. <b>RESET</b> SI signal.
		d. CLOSE CLA isolation valves.
		14. MONITOR SI termination criteria:
		a. RCS subcooling based on core exit T/Cs greater than 40°F.
		b. RCS pressure STABLE or RISING.
		c. Pressurizer level greater than 10% [20% ADV].
Critical Task:	Terminate/re lifting)	educe SI Flow prior to RCS overpressurization (Pressurizer Safety Valve
	CAUTION: S	teps 15 through 25 terminate SI. Transition to E-2, Faulted Steam Generator
	ls S	solation, via the Foldout Page is NOT appropriate UNTIL after completion of tep 25.
Lead Exami	ner may term terminatio	inate the scenario following completion of ECA-2.1, Step 14, SI on determination.

	Appendix D		Required Operator Actions	Form ES-D-2
	Op Test No.: Event Description:	<u>NRC</u> Equ	Scenario # <u>1</u> Event # <u>ES-0.5</u> Pag	je <u>52</u> of <u>57</u>
	Time	Position	Applicant's Actions or Behavior	
			ES-0.5, EQUIPMENT VERIFICATIONS	
	Evaluator Note:	BOP con (includin	npletes ES-0.5 including Appendices A & B and reports ig any discrepancies and actions taken) to SRO.	s completion
		BOP	1. VERIFY D/Gs RUNNING.	
		BOP	2. VERIFY D/G ERCW supply valves OPEN.	
		BOP	3. <b>VERIFY</b> at least four ERCW pumps RUNNING	
C		BOP	<ul> <li>4. VERIFY CCS pumps RUNNING</li> <li>Pump 1A-A (2A-A)</li> <li>Pump 1B-B (2B-B)</li> <li>Pump C-S</li> </ul>	
		BOP	5. VERIFY EGTS fans RUNNING.	
		BOP	6. VERIFY generator breakers OPEN.	
		Crew	<ol> <li>NOTIFY at least two AUOs to report to MCR to be a actions.</li> </ol>	vailable for local
Ċ		BOP	<ul> <li>8. VERIFY AFW pumps RUNNING:</li> <li>a. MD AFW pumps</li> <li>b. TD AFW pump.</li> </ul>	

	Appendix D		Required Operator Actions	Form ES-D-2
C	Op Test No.: Event Description:	NRC n: Equi	Scenario # <u>1</u> Event # <u>ES-0.5</u> Page	_53_of _57
	Time	Position	Applicant's Actions or Behavior	
			ES-0.5, EQUIPMENT VERIFICATIONS	
		NOTE: AFW taker S/G.	level control valves should NOT be repositioned if manual a to control S/G levels, to establish flow due to failure, or to i	action has been solate a faulted
			<ol> <li>9. CHECK AFW valve alignment:</li> <li>a. VERIFY MD AFW LCVs in AUTO.</li> </ol>	
		BOP	<ul> <li>b. VERIFY TD AFW LCVs OPEN.</li> <li>c. VERIFY MD AFW pump recirculation valves FCV- 401 CLOSED.</li> </ul>	3-400 and FCV-3-
C		BOP	<ul> <li>10. VERIFY MFW Isolation:</li> <li>a. MFW pumps TRIPPED</li> <li>b. ENSURE the following:</li> <li>MFW regulating valves CLOSED</li> <li>MFW regulating bypass valve controller outputs 2</li> <li>MFW isolation valves CLOSED</li> </ul>	ZERO
		BOP	<ul> <li>11. MONITOR ECCS operation:</li> <li>a. VERIFY ECCS pumps RUNNING:</li> <li>CCPs:</li> <li>RHR pumps</li> <li>SI pumps</li> </ul>	
			b. VERIFY CCP flow through CCPIT.	
			c. CHECK RCS pressure less than 1500 psig.	
			d. VERIFY SI pump flow.	
			e. CHECK RCS pressure less than 300 psig.	
		BOP	12. VERIFY ESF systems ALIGNED:	
Ċ			<ul> <li>a. Phase A ACTUATED:</li> <li>PHASE A TRAIN A alarm LIT [M-6C, B5].</li> <li>PHASE A TRAIN B alarm LIT [M-6C, B6].</li> </ul>	

	Appendix D		F	Required O	perator Action	IS		Fo	rm ES	5-D-2
C	Op Test No.: Event Description:	<u>NRC</u> Equ	Scenario # uipment verifica	1ations	Event #	ES-0.5	Page	54	of	57
	T:									
	Time	Position			Applicant'	s Actions or Beh	avior			
			ES-0.	5, EQUIPN		CATIONS				
			b. (	Cntmt Vent CNTMT CNTMT	Isolation ACT VENT ISOLA VENT ISOLA	UATED: TION TRAIN A TION TRAIN B	alarm LIT alarm LIT	「[M-60 「[M-60	C, C5]. C, C6].	, ,
			C. 5	Status mon 6C DAR 6D DAR 6E LIT ( 6H DAR 6J LIT.	itor panels: K K DUTSIDE outl	ined area				
C			d. T	rain A stati CNTMT PHASE	us panel 6K: VENT GREEI A GREEN	N				
			e. T •	rain B statu CNTMT PHASE	us panel 6L: VENT GREEI A GREEN	N				
	Evaluator Note:	<b>Critical Ta</b> cooling eq CSF	<b>ask</b> is to ma uipment be	inually actu fore an extr	ate at least th reme (red-path	e minimum cor n) challenge de	nplement velops to	of cont the cor	tainme	ent ient
		(ES-0.5 St	ep 13 direc	ts completi	on by BOP du	ring procedure	performar	nce)		
		BOP	13. <b>MON</b>	ITOR for co	ontainment sp	ray and Phase	B actuatio	on:		
			a. C • O	HECK for a Phase B R	any of the follo	owing:	0			
$\bigcirc$				Containin	nent pressule	greater (fidf) 2.	o psig			
	Critical Task		b. <b>V</b>	ERIFY con	tainment spra	y INITIATED:				

		Required Operator Actions	Form ES-
Op Test No.: Event Descriptio	NRC n: Equ	Scenario # <u>1</u> Event # <u>ES-0.5</u> ipment verifications	Page55 of
Time	Position	Applicant's Actions or B	ehavior
		ES-0.5, EQUIPMENT VERIFICATIONS	
Critical Task		<ol> <li>Containment spray pumps RUNNI</li> <li>Containment spray header isolation 72-2 OPEN.</li> <li>Containment spray recirculation va ECV-72-13 CLOSED</li> </ol>	NG. n valves FCV-72-39 and F lves to RWST FCV-72-34
		<ul> <li>4) Containment spray header flow gre</li> <li>5) Panel 6E LIT.</li> </ul>	ater than 4750 gpm per tra
		<ul> <li>c. VERIFY Phase B ACTUATED:</li> <li>PHASE B TRAIN A alarm LIT [M-6C</li> <li>PHASE B TRAIN B alarm LIT [M-6C</li> </ul>	c, A5]. c, A6].
		d. ENSURE RCPs STOPPED.	
		<ul> <li>e. VERIFY Phase B valves CLOSED:</li> <li>Panel 6K PHASE B GREEN.</li> <li>Panel 6L PHASE B GREEN.</li> </ul>	
		f. WHEN 10 minutes have elapsed, THEI return fans RUNNING.	N ENSURE containment a
		14. <b>MONITOR</b> if containment vacuum relief isc closed:	plation valves should be
		<ul> <li>a. CHECK containment pressure greater</li> <li>b. CHECK cntmnt vacuum relief isolation [Pnl 6K MANUAL]</li> <li>FCV-30-46</li> <li>FCV/ 20, 47</li> </ul>	than 1.5 psig. valves CLOSED:

	Appendix D		Required Operator Actions Form ES-D-2
C	Op Test No.: Event Description:	NRC Equi	Scenario # _ 1 Event # _ ES-0.5 Page _ 56 of _ 57 _ pment verifications
	Time	Position	Applicant's Actions or Behavior
	<u></u>		ES-0.5, EQUIPMENT VERIFICATIONS
		BOP	<ul> <li>15. CHECK secondary and containment rad monitors USING the following:</li> <li>Appendix A, Secondary Rad Monitors (attached)</li> <li>Appendix B, Containment Rad Monitors. (attached)</li> </ul>
		BOP	16. WHEN directed by E-0, THEN PERFORM Appendix D, Hydrogen Mitigation Actions
			<ul> <li>17. CHECK pocket sump pumps STOPPED: [M-15, upper left corner]</li> <li>HS-77-410, Rx Bldg Aux Floor and Equipment Drain Sump pump A</li> </ul>
$\bigcirc$			HS-77-411, Rx Bldg Aux Floor and Equipment Drain Sump pump B.
		BOP	18. DISPATCH personnel to perform EA-0-1, Equipment Checks Following ESF Actuation.
		BOP	19. ENSURE plant announcement has been made regarding Reactor Trip and SI.
	Evaluator Note:	BOP com (including discrepar	pletes ES-0.5 including Appendices A & B and reports completion g any discrepancies and actions taken, i.e.: containment Spray operating acies per ES-0.5 Step 13) to SRO.
			END (ES-0.5, EQUIPMENT VERIFICATIONS)

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		Required Operator Actions				Form ES-D-2				
C	Op Test No.:	NRC	Scenario #	1	Event #	ES-0.5	Page	57	of	57
E	Event Description:	Equipment verifications								

 	(ES-0.5, EQUIPMENT VERIFICATIONS)			
APPENDIX A SECONDARY RAD MONITORS				
BOP	<ol> <li>CHECK following rad monitors including available trends prior to isolation:</li> </ol>			
	<ul> <li>Condenser exhaust recorder RR-90-119</li> <li>S/G blowdown recorder RR-90-120</li> <li>Main steam line rad monitors</li> <li>Post-Accident Main Steam Line rad recorder RR-90-268B points 3 (blue), 4 (violet), 5 (black), and 6 (brown). [M-31 (back of M-30)]</li> </ul>			
BOP	<ol> <li>IF secondary radiation is HIGH, THEN ENSURE Unit Supervisor notified.</li> </ol>			
	END OF TEXT			

	APPENDIX B
-	CONTAINMENT RAD MONITORS
BOP	<ol> <li>CHECK following rad monitors:         <ul> <li>Upper containment high range rad monitors RM-90-271 and RM-90-272 NORMAL [M-30]</li> <li>Lower containment high range rad monitors RM-90-273 and RM-90-274 NORMAL [M-30]</li> <li>Containment rad recorders RR-90-112 and RR-90-106 NORMAL [M-12] (prior to isolation).</li> </ul> </li> </ol>
BOP	<ol> <li>IF secondary radiation is HIGH, THEN ENSURE Unit Supervisor notified.</li> </ol>
	END OF TEXT

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Appendix	D	Scenario Outline				
Facility: Examiners:	Sequoyah		Scenario No.: 2 Op Te Operators:	est No.: NRC		
Initial Conditio	ons: 100%	stable				
Turnover:	0-GO-5 Secti	on 5.2, 'At Pov	ver Conditions' is in effect			
Target CTs:	Isolate the fa Manually actu extreme (red	ulted SG befor uate at least th -path) challeng	e transition out of E-2 e minimum complement of containment coo e develops to the containment CSF	oling equipment before an		
Event No.	Malf. No.	Event Type*	Event Description			
1. T+0	RW02A	C – BOP	A RCW Pp Trip w/ EHC Fluid Tank Temp	Abnormal (High)		
2. T+10	CV09	I – RO	VCT Level Transmitter 62-130-A Fails Hig	jh		
3. T+20	RX26G	I – BOP TS – SRO	#4 SG Ch 1 PT-1-27A Fails High			
4. T+30	ZDIHS255A	R – RO N – Crew	LP FW Htr String Isolation 1-FCV-2-55, 1A5 Cond Outlet Fails Clos			
5. T+50	CV04	C – RO N – Crew TS – SRO	CVCS Leak in Aux Building (on Letdown I	ine; ~90 gpm)		
6. T+65	MS01B	M – All	#2 Main Steam Line Break Inside Contain	ment		
7. T+65	CS02A RP16K644B [pre-insert]	C – RO	1A Containment Spray Pump Sheared Sh Containment Spray Pump 1B-B discharge	laft ∌ Valve Auto Open Fails		
* (N)or	mal, (R)eactivity,	(I)nstrument,	(C)omponent, (M)ajor			
#### Scenario 2 Summary

The crew assumes shift with the unit at 100% RTP, all systems' controls normal and in automatic as expected. 0-GO-5 Section 5.2, 'At Power Conditions' is in effect. Crew directions are to maintain 100% RTP.

Following completion of crew turnover and at the direction of the Lead Examiner, initiates A RCW Pp Trip w/ EHC Fluid Tank Temp Abnormal (High). The crew will respond using alarm response procedure (ARP) 1 AR-M2A B-2, 1-AR-M15A B-7 that will direct the crew to AOP-M.05, Loss of Raw Cooling Water.

When the plant is stable, at Lead Examiner direction, initiate the next event, VCT Level Transmitter 62-130-A Fails High. The crew will respond using ARP 1-AR-M6-C A-3, which directs the actions for this failure including 1-SO-62-1 for manual make-up and VCT Divert Valve 1-LCV-62-118 control.

At Lead Examiner direction, initiate the next event,#4 SG Ch 1 PT-1-27A Fails High The crew will respond using ARPs 1-AR-M6-B, D-2, D-3 directing entry into AOP-I.06, Steam Generator Instrument Malfunction, Section 2.1 for the instrument failure. The crew may respond to 1-AR-M5A A-7, B-7 that will direct entry into AOP-S.01, Main Feedwater Malfunctions, Section 2.1, Unit 1 Failure of Automatic S/G Level Control; which will transition to AOP-I.06; this is also an acceptable procedural path in response to the alarms and indications presented. The SRO will identify Tech Specs: 3.3.2.1 Functional Unit 4.d action 17, 3.3.3.7.

At the Lead Examiner direction, initiate the next event, LP Feedwater Heater String Isolation. The crew will respond using alarm response procedures (ARPs) 1-AR-M2-C E-1 directing entry into AOP-S.04, Condensate or Heater Drains Malfunction, Section 2.3, Feedwater Heater String Isolation. The crew is expected to perform a plant power reduction to <86% power using either 0-GO-5, Normal Power Operation or AOP-C.03, Rapid Shutdown or Load Reduction for the LP heater string isolation.

When the plant is stable, at Lead Examiner direction, initiate the next event, CVCS Leak in Aux Building (on Letdown line). The crew will respond using ARPs 1-AR-M5A C-3 and/or 1-AR-M6-C A-4, B-4, C-3 directing entry into AOP-R.05, Section 2.1, RCS Leak in Mode 1-3. Following letdown isolation, the crew may place Excess Letdown in service according to 1-SO-62-6, Excess Letdown as directed by the ARP for letdown line leak; or use EA-62-3, Establishing Excess Letdown directed by the AOP. The SRO will identify Tech Specs: 3.4.6.2 action a.

When the plant is stable, at the Lead Examiner direction, #2 Main Steam Line Break inside Containment occurs resulting in the crew decision to manually trip the reactor based on increasing reactor power with automatic rod motion, decreasing MG megawatts-electric and increasing Main Steam flow. The crew will carry out the immediate operator actions (IOAs) of E-0, Reactor Trip or Safety Injection and proceed to transition to E-2, Faulted Steam Generator Isolation.

Following the Steam Break, containment pressure conditions will meet the automatic containment spray actuation setpoint. 1A -A Containment Spray Pump start results in a sheared-shaft condition; 1B-B Containment Pump will start but its discharge valve fails to open automatically requiring recognition and manual action to place at least 1 spray train in service.

Following the Reactor Trip the crew will identify a high containment pressure condition while monitoring Critical Safety Function Status Trees and transition from procedure/step currently in effect to FR-Z.1, High Containment Pressure. The crew will proceed through FR-Z.1 return to previous procedure/step in effect.

EOP flow: E-0 - E-2 - FR-Z.1 - E-2 - ES-1.1

Scenario Termination: as directed by the Lead Examiner; Completion of E-2 Step 7.e, SI Termination criteria determination.

PSA significant task: Isolate Faulted Steam Generator Isolate AFW to the faulted SG within 10 minutes after a steam line break PSA significant component failure: 1A-A Containment Spray Pump

Steam line



# NRC 1009 ESG-2 Booth Instruction File

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7-16-2010

EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH FEEDBACK
Simulator IC	ator IC IC-16 Perform switch check. Allow the simulator to run for at least 3 minutes before loading SCEN file or starting the exercise. This will initialize ICS.	100%, BOL ~150 MWD/MTU CB 'D' Rods @ 216 steps, all others @ 228 steps; [B] = 1120 ppm; Ba Blender setting: 27.5% Xe/Sm @ equilibrium <u>Console Operator actions: Place simulator in run</u> <u>and perform the following:</u>
	Load SCENS: <u>1009 NRC ESG-2</u>	<ul> <li>Allow the simulator to run before loading SCEN file.</li> <li>Place the MODE 1 sign on 1-M-4</li> <li>Place Train Week A sign</li> </ul>
	Place simulator in RUN. Place OOS equipment in required position with tags. Clear alarms.	Ensure A & B RCW Pumps in service.
MFs, RFs, ORs are	IMF CS02A f:1	1A-A Containment Spray Pump Sheared Shaft
active when the SCN file is loaded.	IMF RP16K644B f:1	1B-B Containment Spray Pump Discharge Valve Auto Open Fails
1.	IMF RW02A f:1 k:1 IMF AN_OV_84 f:2 d:60 k:1	A RCW Pp Trip w/ TS-47-5 ELECTRO-HYD FLUID TANK TEMP ABNORMAL
		<ul> <li><u>Support staff report</u>: if dispatched, wait ~3 minutes, report as TB AUO from:</li> <li>No apparent RCW Sys. water ruptures/leakage;</li> <li>'A' RCW Pp- pump motor is hot to the touch;</li> <li>480V UtBD area- A RCWP breaker open, Amptector Relay fault.</li> <li>Local EHC Reservoir temperature ~135°F and heaters are off.</li> </ul>
		<u>Support staff report</u> : If dispatched, AB AUO to AB EI 734' behind the CCS Surge Tank to inspect the RCW Booster Pumps; field evaluation feedback - no problems
INTRUCTOR NOTE: delete Malf	DMF AN_OV_84 d:60	Simulates RCW system restoration.
after one standby RCW Pp is started		<u>Support staff report</u> : if dispatched, wait ~5 minutes, report as TB AUO that RCW system conditions are returning to normal (~110-115°F on EHC Temp.).
2.	IMF CV09 f:1 k:2	VCT Level Transmitter 62-130-A Fails High
		<ul> <li><u>Support staff report</u>: If dispatched to the Aux Control Room, report VCT Ch LT-62-129C reading '38'% (same as MCR indicator LI-62-129);</li> <li>If MSS is contacted, inform the crew that I&amp;C techs will report to the MCR in ~25 minutes.</li> </ul>
3.	IMF RX26G f:115 r:60 k:3	#4 SG Ch 1 PressureTransmitter-1-27A Fails High
		<u>Support staff report</u> : When MSS is contacted, inform the crew that I&C will report to the MCR in ~35 minutes.

# NRC 1009 ESG-2 Booth Instruction File

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 $\left( \begin{array}{c} \end{array} \right)$ 

EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH FEEDBACK
4.	IOR ZDIHS255A f:0 k:4	LP FW Htr String Isolation 1-FCV-2-55, 1A5 Cond Outlet Fails Closed Support staff report: When MSS is contacted, inform the crew that Mechanical or Electrical maintenance (whichever is requested) will report to the MCR in ~25 minutes.
5.	IMF CV04 f:100 r:30 k:5	CVCS Leak in Aux Building (on Letdown line) Support staff report: If dispatched, report as AB AUO
6.	IMF MS01B f:10 r:120 k:6	Main Steam Line Break Inside Containment <u>Support staff report</u> : none
7.	IMF CS02A f:1 IMF RP16K644B f:1 [Pre-insert]	1A Containment Spray Pump Sheared Shaft Containment Spray Pump 1B-B discharge Valve Auto Open Fails <u>Support staff report</u> : none
If dispatched to perform EA-32-1: If dispatched to perform EA-32-2:	IRF IAR01 f:1 k:18 IRF IAR02 f:1 d:10 k:18 IRF IAR06 f:1 d:15 k:28 IRF IAR07 f:1 d:20 k:28 IRF IAR08 f:1 d:2;5 k:28	Re-start A & B CACs Restore Essential, Non-Essential CA to Containment, 1-FCVs-32-80, 102 and 110
Termination Criteria	: Completion of E-2 Step 7.	e, SI Termination criteria determination



1009 ESG-2 Page 1 of 5

SHIFT TURNOVER CHECK	LIST	Page 1. of 3			Today		
Part 1 - Completed by Off-going Shift / Reviewed by On-coming Shift							
Mode 1, 100% Power PSA Risk: Green			NRC ph	one Authentica	tion <u>Code</u>		
Grid Risk: Green RCS Leakage ID .14 gpm, UNI	D .05 gpm			Until 0800 XXX After 0800 YYY	X Y		
	Comm	on Tech Spec Ac	tions				
<u>LCO/TRM</u> - none -	Equipmen - none	<u>t INOP</u> -	-	<u>Time INOP</u>	<u>Owner</u>		
	U-1	Tech Spec Actio	ns				
<u>LCO/TRM</u> - none -	Equipment - none	t INOP -	- - -	Time INOP	<u>Owner</u>		
	Pro	tected Equipme	nt				
		Shift Priorities					
Part 2 – Performed by on-c	oming shift						
Verify your current qualif	ications	Review Ope whichever is les	erating Lo	og since last held	shift or 3 days,		
ODMIs / Standing Orders	s / Shift Orders	TACFs		Immediate re	quired reading		
LCO Actions	Integrated So Reviewed for the only)	chedule e shift (SRO	Acti assumi	ve procedures fil ng shift)	e (within 1 hour of		
PERs (applicable to this unit)     Operator workarounds, burdens, and challenges							
Part 3 – Performed by both	off-going and o	n-coming shift					
Walk down of MCR Cont	rol Boards						

SHIFT TURNOVER CHECKLIST	Page 2. of 3	Today
- Train A Weak	MAIN CONTROL ROOM (7690)	
• IIdill <u>A</u> week		
	OUTSIDE (/000) [393-3214]	
	AUXILIARY BUILDING (7775)	
	<u> </u>	<u>)</u>

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1009 ESG-2 Page 3 of 5

# SHIFT TURNOVER CHECKLIST

## Page 3. of 3

Today

Disabled Annunciators					
PANEL	WINDOW	ANNUNCIATOR	WO / PER Number		

## Equipment Off-Normal (Pink Tags)

UNID And Noun Name	Panel	Problem Description	WO / PER Number

#### MCR WO LIST

ID And Noun Name	Panel	Problem Description	WO/PER Number
		· · · · · · · · · · · · · · · · · · ·	

# UNIT ONE REACTIVITY BRIEF

Date: Today Time: Now

		Genera	al Information	
RCS Boron: 1120 ppr	n Today	BA Cor	ntroller Setpoint: 27.5%	RCS B-10 Depletion: 7 ppm
Operable BAT: A	BAT A Boron: 68	<b>50</b> ppm	BAT C Boron: 6850ppm	RWST Boron: 2601 ppm
Nominal	Gallons per rod ste	ep from 2	19: 7 gallons of acid, 36	gallons of water

\* Verify boric acid flow controller is set at Adjusted BA Controller Setting iaw 0-SO-62-7 section 5.1

Estimated values for a 1° Change in Tave \*\*

Gallons of acid: 26

Gallons of water: 138

Rod Steps: 4

Estimated rods/boron for emergency step power reduction \*\* (Assuming Xenon equilibrium and no reactivity effects due to Xenon. 2/3 total reactivity from rods, 1/3 from boron)

Power reduction amount	Estimated Final Rod Position	Estimated boron addition	
10%	198 Steps on bank D	101 gallons	
30%	174 Steps on bank D	295 gallons	
50%	152 Steps on bank D	485 gallons	

\*\* These values are approximations and not intended nor expected to be exact. The values may be superceded by Rx Engineering or SO-62-7 calculated values. These values are calculated assuming 100% steady state power operation only. Engineering data last updated **one week ago**. Data Valid until **one week from now**.

## Previous Shift Reactivity Manipulations

Number of dilutions: 0***	Number of borations: 0	Rod steps in: 0
Gallons per dilution: 0	Gallons per boration: 0	Rod steps out: 0
Total amount diluted: 0	Total amount borated: 0	Net change: 0 IN/Out

## Current Shift Estimated Reactivity Manipulations

Number of dilutions: 0	Number of borations: 0	Rod steps in: 0
Gallons per dilution: 0	Gallons per boration: 0	Rod steps out: 0
Total expected dilution: 0	Total expected boration: 0	Net change: 0 In/Out

#### Remarks:

Next Unit 1 Flux Map is scheduled - three weeks from now

Unit Supervisor:

Name/Date

1009 ESG-2 Page 5 of 5

Operations Chemistry Information							
	Boron Results						
Sample Point	Units	Boron	Date / Time	Goal	Limit		
U1 RCS	ppm	1120	Today / Now	Variable	Variable		
U2 RCS	ppm	648	Today / Now	Variable	Variable		
U1 RWST	ppm	2601	Today / Now	2550 - 2650	2500 - 2700		
U2 RWST	ppm	2569	Today / Now	2550 - 2650	2500 - 2700		
BAT A	ppm	6850	Today / Now	Variable	Variable		
BAT B	ppm	6850	Today / Now	Variable	Variable		
BAT C	ppm	6850	Today / Now	Variable	Variable		
U1 CLA #1	ppm	2556	Today / Now	2470-2630	2400-2700		
U1 CLA #2	ppm	2575	Today / Now	2470-2630	2400-2700		
U1 CLA #3	ppm	2591	Today / Now	2470-2630	2400-2700		
U1 CLA #4	ppm	2589	Today / Now	2470-2630	2400-2700		
U2 CLA #1	ppm	2531	Today / Now	2470-2630	2400-2700		
U2 CLA #2	ppm	2650	Today / Now	2470-2630	2400-2700		
U2 CLA #3	ppm	2522	Today / Now	2470-2630	2400-2700		
U2 CLA #4	ppm	2526	Today / Now	2470-2630	2400-2700		
Spent Fuel Pool	ppm	2547	Today / Now	<u>≥</u> 2050	<u>&gt;</u> 2000		
Ľ	ithium Res	ults		Goal	Midpoint		
U1 RCS Lithium	ppm	1.8	Today / Now	1.69-1.89	1.79		
U2 RCS Lithium	ppm	3.49	Today / Now	3.39-3.69	3.54		

Primary to Secondary Leakrate Information (Total CPM RM-90-99/119)							
Indicator	Units	U1	Date / Time	U2	Date/Time		
SI 50 S/G Leakage?	Yes/No	No	Today / Now	No	Today / Now		
SI 137.5 CVE Leakrate	gpd	< 0.1	Today / Now	< 0.1	Today / Now		
5 gpd leak equivalent	cpm	115	Today / Now	68	Today / Now		
15 gpd (30 min increase)	cpm	265	Today / Now	83	Today / Now		
30 gpd leak equivalent	cpm	490	Today / Now	206	Today / Now		
75 gpd leak equivalent	cpm	1165	Today / Now	455	Today / Now		
150 gpd leak equivalent	cpm	2290	Today / Now	870	Today / Now		
CVE Air Inleakage	cfm	10	Today / Now	12.5	Today / Now		
Bkgd on 99/119	cfm	40	Today / Now	40	Today / Now		
Steady state conditions	are necessary	for an accurate	e determination of leak	rate using the CVE	Rad Monitor		



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-	Appendix D			Attachment			nt			
	Op Test No.:	NRC	Scenario #	2	Event #	1	Page	1	of	5
	Event Description	on: 1A	A RCW Pp Trip, Stby Pump Auto-Start Failure w/ EHC Fluid Tank Temp Abnormal (				ormal (H	igh)		
	Time	Position			Applicant's	Actions or be	havior			
	Simulator O	perator: at Le	ad Examiner	direction	, insert Event	1				
	Indications/	Alarms								
	Annuncia 1-M-1	ators: 5								
	• 1-	- XA-55-15A B-7,	, "MOTOR TRIF	OUT"						
	Indicatio	ns:								
	• 0-	-PI-24-22. RCW	HEADER PRE	SSURE de	creased to ~6(	-63 peig				
		,				-os psig				
	Significa	nt Resultant /	Alarms/Indica	tions:						
	1-M-2 ● 1_`	ΧΔ-55-2Δ R-2 ·	TS-47-5 EI EC							
	• 1-2	A-55-2A B-2,	13-4/-3 ELEU		FLUID I ANK I	EMP ABNORI	MAL"			
	T = 0	Following co	mpletion of cre	ew turnov	er, w/ A & B R	CW Pumps in	service, cr	ew dire	ections	s ar
-		to maintain 10	00% RTP				······			
		BOP	notifies SRO						ind	
			Diagnoses '	, A' RCW F	Pump trip, stan	dby RCW Pu	mn start fai	lure		
					,			iaro.		
		BOP	On 1-M-15,	0-PI-24-2	2: 70-78 psig l	Normal RCW	Header Pre	essure	•	
				System p	ressure will fal	l to 60-63 psig	g;			
-			Defers to an	Auto-Star	t Setpoint: 35	osig decreasi	ng			
			Refers to an	a impiem	ents Motor Tri	pout alarm AH	RP Step 3:			
		505	131 IF RCW	pump is t	ripped. THEN					
		ВОР	[a] DISP	ATCH op	erator to that p	piece of equip	ment or bre	eaker		
			comp	partment f	o determine c	ause of tripou	t.			
_			[b] REFI	ER to AO	P-M.05, Loss o	of Raw Coolin	g Water.			
			1							
		SRO	Enters AOP	•M.05, Lo	ss of Raw Coc	ling Water				
		SRO	Enters AOP 1. <b>DISPAT</b> following	-M.05, Lo CH opera :	ss of Raw Coc tors with radio	ling Water s to the Turbi	ne Building	to per	form	the
		SRO	Enters AOP 1. <b>DISPAT</b> following a. <b>DET</b>	-M.05, Lo CH opera : ERMINE	ss of Raw Coc tors with radio whether RCW	ling Water s to the Turbin header INTA	ne Building CT.	to per	form	the
		SRO	Enters AOP 1. <b>DISPAT</b> following a. <b>DET</b> b. <b>EVA</b> ITB 6	-M.05, Lo CH opera : <b>ERMINE</b> v - <b>UATE</b> no -1. 6621	ss of Raw Coc tors with radio whether RCW eed to START	ling Water s to the Turbin header INTA additional Tu	ne Building CT. rbine Build	to per	form mp pu	the
		SRO	Enters AOP 1. <b>DISPAT</b> following a. <b>DET</b> b. <b>EVA</b> [TB e	-M.05, Lo CH opera : <b>ERMINE</b> v LUATE no il. 662]	ss of Raw Coc tors with radio whether RCW eed to START	ling Water s to the Turbin header INTA additional Tu	ne Building CT. rbine Build	to per	form mp pu	the

Appendix D	ppendix D Scenario Outline						Attachment 1			
Op Test No.:	NRC	Scenario #	2	Event #	1	Page	2	of	55	
Event Descriptio	n: 1A	RCW Pp Trip, Stl	oy Pump /	Auto-Start Failure w	/ EHC Fluid Ta	nk Temp Abno	ormal (H	ligh)		

	111110	FOSILION	Applicant's Actions of benavior					
		CAUTION: I	LCO 3.7.15 (for Train A MCR Chiller) and TR 3.7.14 (for Train A EBR Chiller)					
		1	may apply if 0-FCV-67-205, Train A ERCW to Station Air Compressors, is open					
		1	with ERCW temperature greater than 81°F.					
		<b>NOTE:</b> Glycol chiller package operation is interlocked with raw cooling water press						
		Chill	er packages may stop and start if pressure is oscillating.					
			2. CHECK PI-24-22, RCW header pressure greater than or equal to 68 psig.					
(RNO required)								
		BOP	PERFORM the following:					
	Evaluator No	te: Following not to alig	the RCW Pump start, restoring system conditions to normal, SRO may choose n ERCW due to Tech Spec implications.					
		BOP	b. ENSURE ERCW cooling aligned to Station Air Compressors:					
C.			1) OPEN [0-FCV-67-208] 1B ERCW Supply Header Isolation [M-27A].					
			2) IF 1B ERCW Supply to Station Air Compressors is unavailable, THEN					
"Margar""			OPEN [0-FCV-67-205] 1A Supply Header Isolation					
		BOP	<ul> <li>DISPATCH operators to the glycol chillers and EVALUATE need for chiller(s) SHUTDOWN.</li> </ul>					
		BOP	3. <b>MONITOR</b> control air header pressure greater than 88 psig.					
			[0-PI-32-200, 1-M-15]					
			4. MONITOR GEN STATOR TEMPERATURE HIGH alarm DARK					
		BOD	[M-1A, A-1].					
		DOF						
			Annunciator Dark					
			5 MONITOR GEN   FADS BUS CI R AIR TEMP HIGH alarm DARK					
			[M-1B, E-2].					
		BOP						
			Annunciator Dark					

Appendix D	)	Scenario Outline	Attachment			
Op Test No.:	NRC	Scenario # _ 2	Page <u>3</u> of			
Event Descripti	on: 1A	RCW Pp Trip, Stby Pump Auto-Start Failure w/ EHC Fluid Tank Temp Abnormal (High)				
Time	Position	Applicant's Actions or behavi	or			
	BOP/ SRO	<ol> <li>MONITOR ability to maintain unit operation based</li> <li>RCW Sys Capabilities restored by pump start in Start i</li></ol>	on RCW capabilitie tep 2 RNO a.			
	SRO	7. SHUTDOWN equipment cooled by RCW as neces	ssary.			
		Determines further equipment shutdown not nece	ssary			
		8. <b>MONITOR</b> temperatures associated with the follow NORMAL:	ving equipment			
		Determines load reduction not necessary				
Evaluator N	ote: SRO/BOF	dispatched the AB AUO to AB EI 734' behind the U1 s RCW Booster Pumps: field evaluation feedback - no r	ide CCS Surge Tan			
	SRO	9. CHECK RCW booster pumps for PROPER OPER	ATION.			
		Suction pressure.				
		Discharge pressure.				
		No signs of cavitation.				
		No signs of pump run out.				
	SRO	10. <b>DETERMINE</b> whether CCW pump(s) are feeding a stopped.	a rupture and should			
	SRO	11. INITIATE repairs, and GO TO appropriate plant pr	ocedure.			

Appendix D			Scena	ario Outline			Atta	chme	nt 1
Op Test No.: Event Description:	<u>NRC</u> 1A	Scenario # RCW Pp Trip, St	2 by Pump /	Event #	1 w/ EHC Fluid Ta	Page ank Temp Abn	4 ormal (H	of High)	55
Time	Position			Applicant's	Actions or t	pehavior			
Evaluator Not	e: The fe	ollowing CRE	N Brief a	and Notification	actions are	not containe	ed in th	e	

 <b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
Operations Management - Typically Shift Manager. <u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).

Op Test No.:       NRC       Scenario #       2       Event #       2       Page 5       of         Event Description:       VCT Level Transmitter 62-130-A Fails High         Time Position Applicant's Actions or Behavior         Simulator Operator: When directed, initiate Event 2         Indications: Annunciation:         Annunciators:         1-M-6         •         •         Indications:         1-M-6         •         •         Identifies 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW         Indications:         1-M-6         •         1-M-6         •         1-M-6         •         1-M-6         •         1-M-6         •         1-M-6         1-M-6         1-LEVEL Indicates full scale, 100%         1-H-62-130, VCT LEVEL Indicates full scale, 100%         1-H-62-130, VCT LEVEL Indicates full scale, 100%	Appendix [	)		Scenario	o Outline			Atta	chme	nf
Event Description:       VCT Level Transmitter 62-130-A Fails High         Time       Position       Applicant's Actions or Behavior         Simulator Operator:       When directed, initiate Event 2         Indications/Annunciation:       Annunclators:         1-M-6       •       1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW         Indications:       1-M-6       •         1-LI-62-129, VCT LEVEL indicates full scale, 100%       •         •       1-LI-62-130, LETDOWN DIVERT TO HUT         T = 10       RO       Identifies 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW" acknowledges alarm and, notifies SRO:         Image: Comparison of the event of th	Op Test No.:	NRC	Scenario #	2	Event #	2	Page	5	of	
Time         Position         Applicant's Actions or Behavior           Simulator Operator:         When directed, initiate Event 2         Indications: Annunciators: 1-M-6         •           1-M-6         •         1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW         Indications: 1-M-6           1-M-6         •         1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW           Indications:         1-M-6         •         1-LI-62-129, VCT LEVEL indicates full scale, 100%           •         1-LI-62-129, VCT LEVEL indicates full scale, 100%         •         1-HS-62-118A, LETDOWN DIVERT TO HUT           T = 10         RO         Identifies 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW" acknowledges alarm and, notifies SRO:           Image: State in the intermediate intermedinet interedinatermediate intermedinet intermediate intermedinet i	Event Descript	ion: VC	T Level Transmitter 62-130-A Fails High							
Approximative Additions of Behavior         Simulator Operator: When directed, initiate Event 2         Indications/Annunciation: Annunciators: 1-M-6       •         1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW         Indications: 1-M-6       •         1-His-62-129, VCT LEVEL indicates full scale, 100%         •       1-Li-62-129, VCT LEVEL indicates full scale, 100%         •       1-His-62-118A, LETDOWN DIVERT TO HUT         T       T       Identifies 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW" acknowledges alarm and, notifies SRO:         RO       Diagnoses VCT Level instrument failure, Probable Causes:         RO       1. High Level         [a] VCT divert valve malfunction or misaligned.         [b] Letdown flow rate greater than makeup flow rate.         [c] 1-LT-62-130A failing high.         RO       Step 1:         CAUTION:       If actual level is permitted to become low, charging pump gas intrusion cou occur. [C.5]         NOTE 1:       High failure of 1-LT-62-129A or 1-LT-62-130A defeats auto switch over to RWST on low level.         NOTE 3:       High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.         NOTE 5:       Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poi L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-129 (1-M-6	Time	Position			Applicantia	Actions on Dah				
Similator of periods         Indications/Annunciation:         Annunciators:         1-M-6         • 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW         Indications:         1-M-6         • 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK         Identifies 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK         LEVEL HI-LOW" acknowledges alarm and, notifies SRO:         Diagnoses VCT Level instrument failure, Probable Causes:         RO       Identifies 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK         LEVEL HI-LOW" acknowledges alarm and, notifies SRO:       Identifies 1-XX-65-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK         LEVEL HI-LOW" acknowledges alarm and, notifies SRO:       Identifies 1-VX-62-130/B VOLUME CONTROL TANK         LEVEL HI-LOW" acknowledges alarm and, notifies SRO:       Identifies 1-VX-62-130A failing high.         RO       Refers to and implements Volume Control rank Level alarm ARP startin Step 1:         CAUTION:       If actual level is permitted to become low, charging pump gas intrusion cou occur. [C.5]         NOTE 1:       High failure of 1-LT-62-129A or 1-LT-62-130A defeats auto switch over to RWST on low level.         NOTE 3:       High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.	Simulator (	)perator: M/bo	n directed in	iticto Evo	Applicant s	Actions of ben				
•       1-LI-62-129, VCT LEVEL indicates full scale, 100%         •       1-LI-62-129, VCT LEVEL indicates full scale, 100%         •       1-HS-62-118A, LETDOWN DIVERT TO HUT         T = 10       RO       Identifies 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW" acknowledges alarm and, notifies SRO:         Image: Comparison of the structure of the s	Indications Annuncia 1-M-6 • 1 Indicatio	/Annunciation: ators: 6 -XX-55-6C A-3, " ns:	LS-62-129A/B	VOLUME	CONTROL TA	NK LEVEL HI-I	_OW			
T = 10       RO       Identifies 1-XX-55-6C A-3, "LS-62-129A/B VOLUME CONTROL TANK LEVEL HI-LOW" acknowledges alarm and, notifies SRO:         RO       Diagnoses VCT Level instrument failure, <b>Probable Causes</b> : <ol> <li>High Level</li> <li>VCT divert valve malfunction or misaligned.</li> <li>Letdown flow rate greater than makeup flow rate.</li> <li>1-LT-62-130A failing high.</li> </ol> RO       Refers to and implements Volume Control Tank Level alarm ARP startin Step 1:         CAUTION:       If actual level is permitted to become low, charging pump gas intrusion cou occur. [C.5]         NOTE 1:       High failure of 1-LT-62-129A or 1-LT-62-130A defeats auto switch over to RWST on low level.         NOTE 3:       High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.         NOTE 5:       Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poi L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-129C (1-L-10). [C.5]         [1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).	1-M-6 • 1 • 1	3 -LI-62-129, VCT -HS-62-118A, LE	LEVEL indicat	es full scal RT TO HUT	e, 100%					
RO       Diagnoses VCT Level instrument failure, Probable Causes:         1. High Level       [a] VCT divert valve malfunction or misaligned.         [b] Letdown flow rate greater than makeup flow rate.       [c] 1-LT-62-130A failing high.         RO       Refers to and implements Volume Control Tank Level alarm ARP startin Step 1:         CAUTION:       If actual level is permitted to become low, charging pump gas intrusion cou occur. [C.5]         NOTE 1:       High failure of 1-LT-62-129A or 1-LT-62-130A defeats auto switch over to RWST on low level.         NOTE 3:       High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.         NOTE 5:       Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poi L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-1292 (1-L-10). [C.5]         [1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).	T = 10	RO	Identifies 1 LEVEL HI-	-XX-55-6C LOW" ackr	A-3, "LS-62- nowledges al	-129A/B VOLL arm and, notifi	JME CON es SRO:	TROL 1	ANK	
RO       1. High Level         [a] VCT divert valve malfunction or misaligned.         [b] Letdown flow rate greater than makeup flow rate.         [c] 1-LT-62-130A failing high.         RO       Refers to and implements Volume Control Tank Level alarm ARP startin Step 1:         CAUTION:       If actual level is permitted to become low, charging pump gas intrusion couoccur. [C.5]         NOTE 1:       High failure of 1-LT-62-129A or 1-LT-62-130A defeats auto switch over to RWST on low level.         NOTE 3:       High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.         NOTE 5:       Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poi L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-129C (1-L-10). [C.5]         [1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).			Diagnoses VCT Level instrument failure, <b>Probable Causes</b> :							
Image: Second State Product And Provide Hamilton of History of Histo		RU	al VCT	/ei divert valv	e malfunction	or misaliane	4			
Image:			[b] Letdo	own flow ra	ate greater th	an makeup flo	w rate.			
RO       Refers to and implements Volume Control Tank Level alarm ARP startin Step 1:         CAUTION:       If actual level is permitted to become low, charging pump gas intrusion couoccur. [C.5]         NOTE 1:       High failure of 1-LT-62-129A or 1-LT-62-130A defeats auto switch over to RWST on low level.         NOTE 3:       High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.         NOTE 5:       Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poi L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-129C (1-L-10). [C.5]         [1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).			[c] 1-LT-	-62-130A f	ailing high.					
CAUTION:       If actual level is permitted to become low, charging pump gas intrusion couloccur. [C.5]         NOTE 1:       High failure of 1-LT-62-129A or 1-LT-62-130A defeats auto switch over to RWST on low level.         NOTE 3:       High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.         NOTE 5:       Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poil L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-129C (1-L-10). [C.5]         [1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).		RO	Refers to a Step 1:	nd implem	ents Volume	Control Tank	Level alar	m ARP	starti	n
NOTE 1:High failure of 1-LT-62-129A or 1-LT-62-130A defeats auto switch over to RWST on low level.NOTE 3:High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.NOTE 5:Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poi L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-129C (1-L-10). [C.5][1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).		CAUTION:	If actual level is permitted to become low, charging pump gas intrusion con occur. [C.5]					u		
NOTE 3:       High failure of 1-LT-62-130A will divert letdown and prevent Auto makeup. LI-62-129 will indicate actual level.         NOTE 5:       Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poi L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-129C (1-L-10). [C.5]         [1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).		NOTE 1:	High failure o <sup>.</sup> RWST on low	f 1-LT-62-′ ⁄ level.	129A or 1-LT	-62-130A defe	ats auto s	witch o	ver to	1
NOTE 5:Symptom of partial loss of reference leg 1-LT-62-130A and -130C. Log poi L0112A (1-LT-62-130A) indicating higher than 1-LI-62-129 (1-M-6) and 1-L 62-129C (1-L-10). [C.5][1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).		NOTE 3:	High failure of LI-62-129 will	f 1-LT-62-′ indicate a	130A will dive ctual level.	ert letdown and	d prevent /	Auto ma	akeup	•.
[1] COMPARE indicated level between [1-LI-62-129] (1-M-6) and ICS computer point L0112A (1-LT-62-130).		NOTE 5:	Symptom of p L0112A (1-LT 62-129C (1-L-	oartial loss -62-130A) -10). <b>[C.5]</b>	of reference indicating hi	leg 1-LT-62-13 gher than 1-LI	30A and - -62-129 (1	130C. L -M-6) a	og po and 1-	)ir ∙L
			[1] COMPA compute	RE indication indication in the second secon	ted level betv <b>112A</b> (1-LT-6	veen <b>[1-Ll-62-</b> 2-130).	<b>129]</b> (1-M	-6) and	ICS	
										-

	Appendix D			Scenar	io Outline			Atta	chme	∍nt 1
1	Op Test No.:	NRC	Scenario #	2	Event #	2	Page	6	of	55
	Event Description:	VC	T Level Transmit	ter 62-130- <i>i</i>	A Fails High					

Time	Position	Applicant's Actions or Behavior
	RO	[3] IF 1-LT-62-129A or 130A failed high, THEN ENSURE [1-LCV-62-118] in VCT position USING [1-HS-62-118A] AND manually operate as required to maintain VCT level.
		Operator places 1-HS-62-118A in the 'V.C. Tk' position
		[6] IF HIGH level, THEN
		[a] ENSURE [1-LCV-62-118] aligned to HUT.
	RO	[b] STOP VCT makeup
		Operator verifies <b>1-HS-62-118A</b> in the <b>'V.C. Tk'</b> position, proper VCT level (~20-44%) and no make-up in progress.
	SPOU	[8] IF a small RCS leak is indicated, THEN GO TO AOP-R.05, RCS Leak
	Crew	[9] EVALUATE EPIP-1 Emergency Plan Class Matrix
	CIEW	
		No action required.
Evaluator No	te: The fol proced	lowing CREW Brief and Notification actions are not contained in the ure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		Maintenance Personnel – Typically Maintenance Shift Supervisor (MSS).
		(Note: Maintenance notification may be delegated to the Shift Manager).
Lead Examin	er may cue ne	xt event when VCT level stable and make-up capability determined.

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		Required Operator Actions Form ES-D-2
Op Test No.:	NRC	Scenario # _ 2 Event # _ 3 Page _ 7 of _ 55
Event Descriptio	n: #4 :	SG Ch 1 PT-1-27A Fails High
Time	Position	Applicant's Actions or Behavior
Simulator Op Indications/A Annunciat 1-M-5	oerator: Whe Marms ors:	n directed, initiate Event 3
• 1-XA-5 •	5-5A A-7, "FS B-7, "LS	5-3-35A STEAM GEN FEEDWATER FLOW HIGH" 5-3-42D STEAM GEN LVL HIGH-LOW DEVIATION"
1-M-6 ● 1-XA-5 ●	5-6B D-2, "PS D-3, "PS	S-1-27AN LOW STEAMLINE PRESSURE LOOP 4" S-1-27AR HIGH NEGATIVE RATE STEAMLINE PRESSURE LOOP 4
Indications:	<i>D-</i> 3, FX	- 1-27 AK HIGH NEGATIVE RATE STEAMLINE PRESSURE LOOP 4
1-M-4		
• 1-PI-1- • 1-FI-3-	27A, SG-4 PRE 103A, 103B SG	SSURE: indicator trending to or at '0' scale; i-4 INLET FLOW CH-1, 2: increasing feed flow greater than steam flow trend;
T + 20	BOP	Identifies 1-PI-1-27A, SG-4 PRESSURE indicator trending upscale, and #4 SG Feed flow increasing and notifies SRO:
	RO	Monitors reactor stable and refers to and assists with associated ARP implementation (for alarms listed above).
	BOP	Diagnoses #4 SG Pressure instrument upscale failure;
		On 1-M-3, identifies #4 SG FRV demand increasing and position indication moving 'OPEN'
	BOP	Implements AOP-S.01 Section 2.1 Step 1 Immediate Operator Actions
		(IOAs) as defined in EPM-4, User's Guide
		AOP-S.01, Main Feedwater Malfunctions, Section 2.1, Unit 1 Failure of Automatic S/G Level Control:
	NOTE St	ep 1 is an IMMEDIATE ACTION.
	NOTE Sta BOP	ep 1 is an IMMEDIATE ACTION. 1. RESTORE steam generator level(s):
	NOTE Sta BOP	ep 1 is an IMMEDIATE ACTION.         1. RESTORE steam generator level(s):         a. PLACE affected feedwater reg valve controller(s) in MANUAL.
	NOTE St BOP	ep 1 is an IMMEDIATE ACTION.         1. RESTORE steam generator level(s):         a. PLACE affected feedwater reg valve controller(s) in MANUAL.         b. CONTROL feedwater flow on affected S/G(s) to restore level to program.

	Appendix D		Required Operator Actions Form ES-D-2
	Op Test No.: Event Descriptic	NRC on: #4 S	Scenario # _ 2 Event # _ 3 Page _ 8 of _ 55 SG Ch 1 PT-1-27A Fails High
	Time	Position	Applicant's Actions or Behavior
			RNO: IF any S/G pressure instrument has failed, THEN GO TO AOP-I.06, Steam Generator Instrument Malfunction
		SRO	Transitions to AOP-I.06, Steam Generator Instrument Malfunction Section 2.1, Unit 1 S/G (Steamline) Pressure Instrument Malfunction
			AOP-I.06, Steam Generator Instrument Malfunction
		NOTE: Cha	nnels I and II steam pressure instruments provide compensation to steam flow
		sign	als which input to S/G Water Level Control.
		BOP	1. VERIFY unaffected steam flow channel SELECTED:
			• S/G #1: 1-XS-1-3D
			<ul> <li>S/G #2: 1-XS-1-10D</li> </ul>
$\cap$			• S/G #3: 1-XS-1-21D
			• S/G #4: 1-XS-1-28D.
			(RNO required)
		BOD	RNO:
		вор	PERFORM the following:
			a. ENSURE affected level controller(s) in MANUAL:
			• S/G #1: 1-FIC-3-35A
			• S/G #2: 1-FIC-3-48A
			• S/G #3: 1-FIC-3-90A
			• S/G #4: 1-FIC-3-103A.
		BOP	<ul> <li>MATCH steam flow and feedwater flow on affected S/G USING MFW reg valve</li> </ul>
		BOD	C TRANSEED approxisted Stoom Elow as laster switch to alternate shows a
l			C. INANSFER associated Steam Flow selector Switch to alternate channel:

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Op Test No.:	NRC	Scenario #	E	vent # 3	Page 9	of					
Event Descriptio	n: #4	SG Ch 1 PT-1-27A Fails High									
Time	Position			Applicant's Actions c	or Behavior						
			LOOP	TRANSFER SWITCH	FLOW INDICATOR						
			S/G #1	1-XS-1-3D	FI-1-3A						
					FI-1-3B						
			S/G #2	1-XS-1-10D	FI-1-10A						
					FI-1-10B						
			S/G #3	1-XS-1-21D	FI-1-21A						
					FI-1-21B						
			S/G #4	1-XS-1-28D	FI-1-28A						
					FI-1-28B						
	BOP	e. IF auto MFW re	control of affe	ected MFW reg valv	ve(s) is available, <b>THE</b>	EN PL					
	SRO	2. EVALU	ATE the follo	wing Tech Specs for	or applicability:						
	3.3.2.1, Engineered Safety Feature Actuation System Instrum Functional Unit 4.d Steam Line Pressure-Low- Action 17: w/ OPE less than Total, SU and/or PWR OPs may proceed provided: a. INOPERABLE Ch tripped w/i 6 hrs. b. Minimum Chs OPERABLE met; however, INOPERABLE Ch I to 4 hrs for surveillance testing of other Chs per 4.3.2.1.1.										
3.3.3.5, Remote Shutdown Instrumentation – NOTE 1- Not App											
		3.3.3.7, Instrument restore to next 6 hrs.	Accident Mor 8 – Action 1.a OPERABLE W/	itoring Instrumenta a: W/ # of chs 1 les i 30 days or HT ST	ation s than minimum req BY w/i 6 hrs, in HT SH	uired, DN w/					
	NOTE: If p	If performing AOP in conjunction with AOP-I.11 for Eagle LCP failu									

	Appendix D		Form ES-D-2							
C	Op Test No.:	NRC	Scenario #	2	Event #	3	Page	10	of	55
A second	Event Description:	#4 SG Ch 1 PT-1-27A Fails High								

	Time	Position			Applicant's	Actions or Be	havior						
	TimePositionApplicant's Actions or BehaviorSRO3. NOTIFY I&C to remove failed S/G pressure instrument from service USING appropriate Appendix:VIDENTPROT NUMBERAPPENDIX CH1P-1-2A (P-514)I1P-1-2B (P-515)II1P-1-2B (P-516)IV2P-1-9A (P-524)I2P-1-9B (P-525)II2P-1-9B (P-526)III3P-1-20A (P-534)I3P-1-20B (P-535)II4P-1-20B (P-535)II4P-1-23 (P-536)III1P-1-27A (P-544)I3P-1-27A (P-544)I1P-1-27A (P-544)I1P-1-27A (P-544)I												
LOOP         INSTRUMENT NUMBER         PROT CH         APPENDIX           1         P-1-2A (P-514)         I         A           1         P-1-2B (P-515)         II         B           P-1-5 (P-516)         IV         C           2         P-1-9A (P-524)         I         D           2         P-1-9B (P-525)         II         E           P-1-12 (P-526)         III         F           P-1-20A (P-534)         I         G													
					P-1-2A (P-514)	1	Α						
				1	P-1-2B (P-515)	11	В						
					P-1-5 (P-516)	IV	С						
					P-1-9A (P-524)		D						
				2	P-1-9B (P-525)	11	E						
					P-1-12 (P-526)	8	F						
					P-1-20A (P-534)	1	G						
				3	P-1-20B (P-535)	11	Н						
~					P-1-23 (P-536)	111	I						
					P-1-27A (P-544)	ł	J						
				4	P-1-27B (P-545)	Ĩ	к						
					P-1-30 (P-546)	IV	L						
		NOTE: Core impa SRO	<ul> <li>thermal power indication (U1118 and U2118) is NOT expected to be acted by failure of a single steam pressure instrument.</li> <li>4. CHECK ICS point U2118 OPERABLE.</li> <li>5. GO TO appropriate plant procedure</li> </ul>										
Ev	valuator Not	te: The fol	END OF SECTION  Illowing CREW Brief and Notification actions are not contained in the										
		proced	ure. CRE to th	EW Brief ne next e	would typically be convent.	ducted for th	nis event as time	allows p					
			Noti addi Ope	ification ressed by rations N	<b>s</b> should be addressed y the procedure or in th /anagement - Typically	as applicab e CREW br Shift Mana	le if not specifica ief. ger.	lly					

Op Test No.:     NRC     Scenario #     2     Event #     3     Page     11     of     55       Event Description:     #4 SG Ch 1 PT-1-27A Fails High		Appendix D	Form ES-D-2								
Event Description: #4 SG Ch 1 PT-1-27A Fails High	(	Op Test No.:	NRC	Scenario #	2	Event #	3	Page	11	of	55
		Event Description:	#4 SG Ch 1 PT-1-27A Fails High								

Time	Position	Applicant's Actions or Behavior						
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).						
Lead Examir Feed Reg Va	ner may cue ne live returned to	ext event when an OPERABLE steam flow channel is selected, affected automatic control and Tech Specs have been identified.						

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Appendix D		Required Operator Actions	Form ES							
Op Test No.: Event Descript	NRC	Scenario # _ 2 Event # _ 4 FW Htr String Isolation 1-FCV-2-55, 1A5 Cond Outlet Fails Close	Page <u>12</u> of							
	)									
lime	Position	Applicant's Actions or Behavi	ior							
Indications Annunci 1-M-2 • 1										
Significant Resultant Alarms/Indications: 1-M-3										
• 1	э -PI-2-129, MFP	NLET PRESS indicator trending down								
• 1	-PI-2-77, CBP	UCTION PRESS indicator trending down								
T = 30	BOP	Identifies LP FW Htr String Isolation Valve 1-FCV-2	2-55 in midposition/cl							
	RO	Monitors reactor power stable and refers to/assists implementation.	with associated ARF							
	BOP	Diagnoses (on 1-M-3) 1 train of Low Pressure Heat	ters isolated;							
	BOP	Implements 1-AR-M2-C E-1 ARP Step#:								
		[4] IF heaters A-5, A-6, and A-7 isolate, THEN GO Condensate or Heater Drains Malfunction.	<b>TO</b> AOP-S.04,							
	SRO/BOP	Implements AOP-S.04, Condensate Or Heater Drai	ins Malfunction							
		AOD S M. Condensate on Useter Dust								
		AOP-S.04, Condensate or Heater Drain Section 2.3 Feedwater Heater Strin	ns Malfunction,							
		AOP-S.04, Condensate or Heater Drain Section 2.3 Feedwater Heater Strin 1. ENSURE affected heater string ISOLATED:	ns Malfunction, ng Isolation							
	BOD	<ul> <li>AOP-S.04, Condensate or Heater Drain Section 2.3 Feedwater Heater Strin</li> <li>1. ENSURE affected heater string ISOLATED:</li> <li>Condensate inlet isolation valve CLOSED.</li> </ul>	ns Malfunction, ng Isolation							

Appendix D		Red	quired O	perator Acti	ons		Foi	rm ES	3-D-2
 Op Test No.:	NRC	Scenario #	_ 2	Event #	4	Page	13	of	55
Event Description:	LP	FW Htr String Iso	lation 1-FC	CV-2-55, 1A5 (	Cond Outlet Fails Clos	ed		•	

Time	Position	Applicant's Actions or Behavior							
	BOP	Condensate outlet isolation valve CLOSED.							
	SRO	<ul> <li>Extraction steam isolation valve(s) CLOSED. (NOT applicable for low pressure heater strings)</li> </ul>							
		Step not applicable							
	BOP	2. MONITOR condensate flownath:							
		a. CHECK for isolation of all three heater strings.							
		RNO:							
		a. GO TO Caution prior to Step 3.							
	CAUTION	Feedwater tomporature changes may include the state							
	BOP	eedwater temperature changes may impact core thermal power.							
	DOF	3. MONITOR Steam generator levels returning to program. [M-4]							
	RO	4. MONITOR reactor power:							
		a. CHECK ICS thermal power indication AVAILABLE.							
	RO	<ul> <li>REDUCE turbine load as necessary to maintain 10 minute average power less than applicable limit (3455 or 3411 MWt)</li> </ul>							
·····		Notifies SRO actual core power exceeding RTP limits indicated on ICS							
Evaluator N	ote: Due to the power will may choos	loss of the single string of low pressure feedwater heaters, core thermal exceed the 100% RTP limit. Load adjustment will be necessary. The crew se to lower plant power now by small MT load decreases.							
	CAUTION: F p p	teducing turbine load too rapidly could result in further drop in condensate ressure due to reduction in heater drain flow. Recommended load rate is 1% er minute if turbine load reduction is needed.							
	NOTE: Seve	re MFW pump cavitation is likely if inlet pressure is less than 250 psig.							
		5. <b>MONITOR</b> Feedwater pump inlet pressure greater than 320 psig. [M-3, PI-2-129]							
		<ol> <li>MONITOR Condensate Booster pump suction pressure greater than 100 psig. [M-3, PI-2-77]</li> </ol>							

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	Appendix D		Re	quired C	perator Actions		4.95-11	For	n ES	-D-2		
ggt to draw P Magazy sone	Op Test No.: Event Description	NRC LP I	Scenario # <sup>=</sup> W Htr String Iso	2 lation 1-F	Event #	4 I Outlet Fails Clo	Page	14	of _	55		
	Time	Position										
	Evaluator Not	e: Plant pow crew shou	//er reduction t uld chose AOI	r reduction to <86% will be required to comply with the following step. The d chose AOP-C.03, Rapid shutdown or Load Reduction. AOP-C.03 steps								
		NOTE: Pow	er reduction is required based on LP turbine limitations. Recommended load									
		SRO/ Crew	7. IF Low reduction following	Pressure on to less g:	Heater String than 86% (Un	has isolated, <sup>-</sup> it 1) or 90% (L	a. THEN INIT Jnit 2) USI	IATE tu NG one	urbine of th	e load Ne		
		<u></u>	• 0-G	0-5, N	ormal Power (	Operation	- <u></u>					
			• AO	P-C.03,	Rapid shutdo	wn or Load	Reduction	٦.				
		BOP	8. <b>DISPAT</b> isolation	<b>CH</b> an one of the other of the	operator to chec 706' and 685']	k heater level	ls and inve	stigate	caus	e of		
		Crew	<ol> <li>NOTIFY Maintenance to investigate and initiate repair of affected equipment.</li> </ol>									
		SRO/ BOP	10. <b>REFER</b> Moisture	<b>TO</b> apple Separa	licable section c ator Reheaters.	of 1,2-SO-5-1,	Feedwate	r Heate	ers ar	nd		
		SRO	11. <b>GO TO</b>	appropri	ate plant proce	dure.						
		·····	END OF SECTION									
	Evaluator Note	: The follow	wing CREW Brief and Notification actions are not contained in the procedure.									
			<b>CREW Brief</b> would typically be conducted for this event as time allows to the next event.							prior		
			<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.									
			Operations Maintenanc ( <b>Note:</b> Main	<u>Manage</u> e Persor tenance	<u>ment</u> - Typically <u>nnel</u> – Typically notification ma	/ Shift Manage Maintenance y be delegate	er. Shift Supe d to the Sl	ervisor ( hift Man	MSS ager	). ).		

	Appendix D	Form ES-D-2								
<u> </u>	Op Test No.:	NRC	Scenario #	2	Event #	4	Page	15	of	55
Carrie	Event Description:	LP	PFW Htr String Iso	lation 1-F	CV-2-55, 1A5 (	Cond Outlet Fails Clos	sed			

			AOP-C.03, Rapid Shutdown or Load Reduction
	Time	Position	Applicant's Actions or Behavior
		SRO	<ol> <li>ENSURE CREW has been briefed on reactivity management expectations USING Appendix E.</li> </ol>
			SRO determines plant power reduction rate. According to AOP-C.03, that rate may be 1-4%/minute; and may be varied during the power reduction/ shutdown based on SRO determination/direction.
	Evaluator No	ote: AOP-S.( turbine li is neede	<b>D4 Section 2.3 Step 7 NOTE:</b> Power reduction is required based on LP mitations. Recommended load rate is 1% per minute if turbine load reduction d.
		SRO, cre	ew should select 1% load rate change for this power change.
	С		
Ċ		CREW	<ul> <li>2. NOTIFY following personnel of rapid shutdown or load reduction:</li> <li>Load Coordinator</li> <li>Chemistry</li> <li>RADCON</li> <li>Plant Management</li> </ul>
		CREW	3. MONITOR reactor/turbine trip NOT required USING Appendix A, Reactor and Turbine Trip Criteria.
		BOP	4. CHECK VALVE POSITION LIMIT light DARK on EHC panel. [M-2]
		If Necessary: BOP	RNO: RESTORE turbine control USING Appendix C, Turbine Runback Restoration.
		NOTE: BAT step	is preferred boration source. Boration volume and flowrates listed in following are recommendations and may be adjusted as necessary.
		RO	5. IF borating from BAT, THEN PERFORM the following:
			a. DETERMINE recommended boration volume:
( )			<ul> <li>~800 gal to reduce power from 100% to 20%</li> <li>OR</li> </ul>
Sec.			<ul> <li>10 gal for each 1% power reduction</li> <li>OR</li> </ul>
			<ul> <li>volume recommended by Reactor Engineering</li> </ul>

	Appendix D	Required Operator Actions						Form ES-D-2			
(	Op Test No.:	NRC	Scenario #	2	Event #	4	Page	16	of	55	
and a second	Event Description:	LP	FW Htr String Iso	lation 1-FC	CV-2-55, 1A5 Co	ond Outlet Fails Closec	1				

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		AOP-C.03, Rapid Shutdown or Load Reduction							
Time	Position	Applicant's Actions or Behavior							
	RO/ SRO	<ul> <li>b. DETERMINE recommended boration flowrate from table below or from Reactor Engineering:</li> </ul>							
		TURBINE LOAD REDUCTION RATEBORATION FLOWRATE(%/min)FLOWRATE1%~15 gpm2%~30 gpm3%~45 gpm4%~70 gpm							
	SRO	c. ENSURE concurrence obtained from US and STA for boration volume and flowrate.							
	RO	d. PLACE boric acid transfer pump aligned to blender in FAST speed.							
	RO	e. ADJUST FCV-62-138 to establish desired flow rate.							
		f. <b>CONTROL</b> boration flow as required to inject desired boric acid volume.							
	RO	g. GO TO Step 7.							
	SRO	7. INITIATE load reduction as follows:							
	BOP	<ul> <li>a. ADJUST load rate to desired value:</li> <li>between 1% and 4% per minute if borating via FCV-62-138 OR</li> <li>between 1% and 3% per minute if borating via normal boration (App. D)</li> <li>OR</li> <li>2% or 3% per minute if borating from RWST.</li> </ul>							

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	Appendix D		Rec	quired O	perator Actic	ons		Foi	rm ES	3-D-2
<u> </u>	Op Test No.:	NRC	Scenario #	2	Event #	4	Page	17	of	55
Op Eve	Event Description:	LP	FW Htr String Isol	lation 1-FC	CV-2-55, 1A5 C	ond Outlet Fails Closed	l		_	

		AOP-C.03, Rapid Shutdown or L	oad Reduction					
Time	Position	Applicant's Actions or Behavior						
	BOP	b. ADJUST setter for desired	d power level:					
		DESIRED	RECOMMENDED	7				
		RX POWER LEVEL	SETTER VALUE					
		90%	76	-				
		80%	56					
		70%	46					
		60%	40					
		50%	35					
		40%	30	-				
		30%	25	-				
		20% or less	15					
	BOP	c. INITIATE turbine load red	uction by depressing G	O pushbutton.				
	SDO/							
	SKU/	u. CONTROL TURDING 10ad reduction as necessary to reduce power to						
	ВОР	desired level.						
	RO	8. MONITOR T-avg/T-ref mismat	tch:					
		a. CHECK T-ref indication AVAILABLE.						
		b. MONITOR automatic rod	control maintaining T-av	vg/T-ref mismatch				
		less than 3°F.						
	BOP	9. MONITOR automatic control o	f MFW pump speed AV	AILABLE.				
	BOD	10 STOP secondary plant equip	mont LISING Annondiv	P. Secondary Diant				
	вор	Equipment.		b, Secondary Plant				
	NOTE: if LE	FM thermal power (U2118) is inop	erable, 3 steps must rai	se rod insertion limit				
	curve	e. Rod insertion limit alarms and IC LEFM is inoperable.	S display are NOT auto	omatically adjusted				
	RO	11. MONITOR control rods above	e low-low insertion limit	USING ICS or				
		COLR.						

	Appendix D		Rec	quired C	perator Act	ions		Foi	rm E٤	3-D-2
1999 T	Op Test No.:	NRC	Scenario #	2	Event #	4	Page	18	of	55
narge ar S	Event Description:	LP	FW Htr String Isol	lation 1-F	CV-2-55, 1A5	Cond Outlet Fails Close	d			

		AOP-C.03, Rapid Shutdown or Load Reduction
Time	Position	Applicant's Actions or Behavior
	NOTE: Initia per s	ting plant shutdown required by Tech Specs requires 4-hour NRC notification SPP-3.5, Regulatory Reporting Requirements.
	SRO	<ul> <li>12. EVALUATE Tech Specs/TRM for applicability:</li> <li>3.2.1, Axial Flux Difference</li> <li>3.1.1.1, Shutdown Margin</li> <li>3.1.3.6, Rod Insertion Limits</li> <li>TRM 3.1.2.2, Boration Flowpaths</li> </ul>
		13. EVALUATE EPIP-1. Emergency Plan Initiating Conditions Matrix
	RO	14. PERFORM the following to reduce boron concentration difference between Pzr and RCS loops:
	RO	a. CHECK at least one normal spray valve AVAILABLE
	RO	b. ENSURE at least one backup heater group ENERGIZED.
	RO	c. ENSURE spray valve(s) responds to control RCS pressure.
	CREW	<ol> <li>WHEN reactor power change exceeds 15% within one hour, THEN NOTIFY Chemistry to initiate sampling as required by 0-SI-CEM- 000-050.0, 0-SI-CEM-030-407.2 and 0-SI-CEM-030-415.0.</li> </ol>
	CREW	16. MONITOR if turbine load reduction can be stopped:
	SRO	<ul> <li>a. CHECK the following conditions met:</li> <li>reactor shutdown is NOT needed</li> <li>turbine shutdown is NOT needed</li> <li>turbine load at desired power level (further load reduction NOT needed)</li> </ul>
	BOP	b. STOP turbine load reduction by depressing HOLD.
	RO	c. WHEN control rods are above the low-low insertion limit, THEN STOP boration flow.

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	Appendix D Required Operator Actions							Fo	rm ES	3-D-2
(	Op Test No.:	NRC	Scenario #	2	Event #	4	Page	19	of	55
	Event Description:	LP	FW Htr String Iso	ł						

		AOP-C.03, Rapid Shutdown or Load Reduction
Time	Position	Applicant's Actions or Behavior
	CREW	d. NOTIFY Chem Lab to sample RCS for boron concentration.
		e. T-avg within 3°F of T-ref USING one of the following:
		AUTO or MANUAL rod control
		dilution or boration USING 0-SO-62-7.
	RO	f. CHECK reactor power greater than 50%.
	RO/	a. DETERMINE Tech Spec AED limits for current power level USING
	SRO	ICS (Primary Mimics, Doghouse Display) or COLR.
	RO	<ul> <li>h. CHECK AFD within Tech Spec limits on at least three operable power range NIS channels.</li> </ul>
	RO/	I. IF AFD is outside target band, THEN INITIATE 0-SI-NUC-000-044.0.
	SRO	Axial Flux Difference.
	SRO	J. INITIATE performance of 0-SI-OPS-092-078.0, Power Range Neutron
		ridx Charmer Calibration By Heat Balance Companson.
	BOP	k. CHECK C-7 LOSS OF LOAD INTERLOCK [M-4A window E-5] DARK
	NOTE: Time cons	in core life, expected Xenon changes, and planned power changes should be dered when evaluating need for boration or dilution.
	SRO	L. CONSULT Reactor Engineering and STA regarding ΔI control and compensating for Xe changes.
	SRO/ RO	m. PERFORM the following as necessary to control ΔI and maintain T- avg on program:
		<ul> <li>INITIATE boration or dilution as necessary USING 0-SO-62-7, Boron Concentration Control</li> </ul>
		OPERATE CONTROL FORS as necessary.

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	Appendix D		Rec	quired O	perator Actions	3		Fo	rm ES	3-D-2
	Op Test No.:	NRC	Scenario #	2	Event #	4	Page	_20	of	55
	Event Description:	LP	FW Htr String Iso	lation 1-F(	CV-2-55, 1A5 Con	d Outlet Fails Cl	losed			

fl<sup>enne</sup>r,

		AOP-C.03, Rapid Shutdown or Load Reduction				
Time	Position	Applicant's Actions or Behavior				
	RO	n. CHECK at least one normal Pzr spray valve OPERABLE				
	SRO	<ul> <li>DETERMINE appropriate procedure based upon power level and cause of rapid shutdown:</li> </ul>				
		Other applicable AOP				
		OR				
	<ul> <li>0-GO-5, Normal Power Operation</li> </ul>					
		(if greater than approximately 30% power)				
		OR				
		<ul> <li>0-GO-4, Power Ascension from Less than 5% to 30% Power (if less than approximately 30%)</li> </ul>				
	SRO	p. GO TO appropriate plant instruction.				
Evaluator No	ote: SRO/CRE\ stable per	<i>N</i> may conduct a brief at this time and should return/ensure reactor power is AOP-S.06, Turbine Trip Below P-9 (50% Power).				
Evaluator No	ote: The followi	ng CREW Brief and Notification actions are not contained in the procedure.				
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.				
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.				
		Operations Management - Typically Shift Manager.				
		Maintenance Personnel – Typically Maintenance Shift Supervisor (MSS) (Note: Maintenance notification may be delegated to the Shift Manager).				
l						

Lead Examiner may cue next event when the CREW has stabilized plant power.

	Appendix D		Red	quired Op	erator Actions	3		For	m ES	-D-2
(	Op Test No.:	NRC	Scenario #	2	Event #	5	Page	21	of _	55
Sec. 1	Event Description	: с	VCS Leak in Aux B	uilding (on	Letdown line; ~90	0 gpm)				
	Time	Position			Applicant's	Actions or Beha	vior		à <u></u>	
	Simulator Ope	erator: Wh	en directed, ini	tiate Eve	ent 5					
	Annunciato Annunciato 1-M-5	arms ors:								
	• 1-X/	A-55-5A C-	3, "LS-68-335D/E	PRESSU	IRIZER LEVEL	HIGH-LOW"				
	1-M-6									
	• 1-X/	A-55-6C A- B-	4, "TS-62-78 LTE 4, "FS-62-82 LOV	N HX OU						
	•	C-	3, "PS-62-122A/E	3 VOLUM	E CONTROL T	ANK PRESS H	LOW"			
	Indications:									
	1-М-6 ● 1-ТІ	-62-78, LETI			P decreasing:					
	• 1-PI	-62-81, LET	DOWN HX OUTL	ET PRES	SURE decreas	ing;				
	• 1-FI	-62-82, LETI		ET FLOW	decreasing;					
	Significant	t Resultant	Alarms/Indicat	ions:						
	• 1-LI-	-62-129, VC <sup>-</sup>	LEVEL trending	g down						
	• 1-X <i>I</i>	<b>\-55-6С А-</b>	3, "LS-62-129A/E		E CONTROL T	ANK LEVEL HI	LOW"			
	T = 65	RO	Identifies Iov	vering V	CT level and ir	ncreasing char	ging flow;	notifies	SRO	)
				*						
			Monitora pla	nt otoblo	and refere to	lessiste with se		400		
		BOP	implementat	ion.		assists with as	sociated	ARP		
										-
		RO	Determines	loss of R	CS inventory,	implements 1-	AR-M5-A	C-3 AF	RP an	d
					, AUG Led	and Leak SU		nincatio		
			Entore AOD		P Look and L	ook Course 1-	ontificati -	n Cast		
		SRO	RCS Leak in	n MODE	1-3	Lean Source 10	enuncatio	Section	UN 2.1	3
C										

Appendix D		Rec	quired C	Operator Acti	ons		Fo	rm Es	S-D-2
Op Test No.:	NRC	Scenario #	2	Event #	5	Page	22	of	55
Event Description:	C\	/CS Leak in Aux B	uilding (o	n Letdown line	; ~90 gpm)				

Time	Position	Applicant's Actions or Behavior						
·	RO	1. CONTROL charging flow using one CCP:						
		<ul> <li>ADJUST FCV-62-93 and FCV-62-89</li> </ul>						
		as necessary to maintain pzr level						
		on program.						
		MAINTAIN seal injection flow						
		at least 6 gpm to each RCP.						
		2. MONITOR pressurizer level STABLE or RISING.						
	RO	(RNO required)						
	PO	RNO:						
	RU	IF sufficient time is available, THEN ISOLATE normal and excess letdowr						
		a. ENSURE FCV-62-72, 73, and 74						
		CLOSED.						
		b. CLOSE FCV-62-69 and 70.						
		c. ENSURE FCV-62-54 and 55						
		CLOSED.						
	RO/	IF loss of pressurizer level is imminent OR low pressure reactor trip						
	SRO	(1970 psig) is imminent, THEN PERFORM the following:						
		a. TRIP the reactor.						
		b INITIATE Sofety Injustion						
		b. MITIATE Salely Injection.						
		c. GO TO E-0, Reactor Trip or						
		Safety Injection.						
		3. <b>MONITOR</b> containment pressure STABLE or DROPPING.						
	RO	Determines no effect on containment pressure						
		-						
	CAUTION:	If Unit is in Mode 3 with low pressurizer pressure SI NOT blocked, SI should						

Appendix D	Required Operator Actions					Form ES-D-2			
Op Test No.:	NRC	Scenario #	2	Event #	5	Page	_23	of	55
Event Description:	C۱	/CS Leak in Aux E	uilding (o	n Letdown line; ~9	0 gpm)				
Time	Position			Applicant's	Actions or Po	houiar			

Time	Position	Applicant's Actions or Behavior
	RO	4. MONITOR RCS pressure STABLE or RISING.
	RO	<ol> <li>MAINTAIN VCT level greater than 13% USING automatic or manual makeup.</li> </ol>
		RNO: IF leak is on charging header…N/A
	RO	IF VCT level CANNOT be maintained, THEN PERFORM the following:
		a. ENSURE CCP suction aligned to RWST:
		<ol> <li>OPEN LCV-62-135 and -136.</li> <li>CLOSE LCV-62-132 and 133.</li> </ol>
	SRO	<ul> <li>b. IF in MODE 1 or 2, THEN TRIP the reactor and GO TO E-0, Reactor Trip or Safety Injection.</li> </ul>

**Evaluator Note:** SRO assigns BOP to perform appendices (attached at the end of this event guide) as appropriate.

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	appiopi					
N	IOTE 1:	Appendix I or J may be used to estimate RCS leak rate.				
N	IOTE 2:	If letdown was isolated in Step 2, the leak rate may have exceeded capacity of one CCP in the normal charging alignment (EAL 1.2.2P).				
		6. EVALUATE EPIP-1, Emergency Plan Classification Matrix.				
	SRO	7. <b>EVALUATE</b> Tech Spec/TRM LCOs <b>USING</b> Appendix K, Evaluating Tech Specs and TRM (attached at the end of this event guide).				
	BOP	8. CHECK secondary side radiation NORMAL				
	Crew	9. STOP containment purging and venting:				
	BOP	10. CHECK containment airborne activity RISING. (RM-90-106 or 112)				

Appendix D		Required Operator Actions			Form ES-D-			
Op Test No.: Event Descripti	NRC on: CV	NRC Scenario # 2 Event # 5 Page 24 of 55 CVCS Leak in Aux Building (on Letdown line; ~90 gpm)						
Time	Position		Applicant's	Actions or Be	havior			
Evaluator N	ote: Crew s RNO tr to isola	should have identifi ransitions the crew ate thee identified le	ed leak source in S to step 23 or allows eakage source; in th	tep 2 when L s using select nis case step	etdown wa ted step(s)	s isolat from st	ed; S teps 1	tep 2-2
	Crew	11. CHECK leakage source UNKNOWN. (RNO required)						
		RNO: IF leakage source is KNOWN, THEN PERFORM the following:						
		a. <b>REFER TO</b>	applicable action ir	n Steps 12 th	rough 22.			
		b. IF leakage source can be isolated, THEN ENSURE leak ISOLATED.						
		c. GO TO Step	) 23.					
	RO	12. CHECK pres	ssurizer PORVs NO	ORMAL:				
	RO/	13. ISOLATE le	tdown					
	Crew		Crew should have identified leak source as Letdown in Step 2 when it was isolated.					
RO		a. ENSURE the following letdown orifice valves CLOSED:						
		<ul> <li>FCV-6.</li> </ul>	2-72					····
		• FCV-6	2-73					
		• FCV-6:	2-74					
	RO	b. ENSURE	the following letdo	wn isolation	valves CLC	SED:		
		• FCV-6	2-69					
		• FCV-6	2-70					
		• FCV-6	2-77					
	RO	c. CHECK	eak ISOLATED bas	ed upon the	following:			
		conta	inment parameters	;				
	BOP	estim	ated leak rate USI	NG Appendix	l or J.			

Appendix D		Required Operator Actions Form ES-D-2												
Op Test No.:	NRC	Scenario # <u>2</u> Event # <u>5</u> Page <u>25</u> of <u>5</u>												
		CS Leak in Aux Building (on Letdown line; ~90 gpm)												
Time	Position	Applicant's Actions or Behavior												
	RO	d. ENSURE the following charging header isolation valves CLOSED:												
• FCV-62-90														
		• FCV-62-91												
	SRO	e. GO TO Step 23.												
	BOP	23. <b>MONITOR</b> auxiliary building radiation and HELB recorders NORMAL.												
	24. CHECK leak IDENTIFIED and ISOLATED USING available methods Leak identified and isolated; leak rate determination being tracked fro previous Appendices implementation.													
	SRO/ Crew	25. <b>MONITOR</b> if charging and letdown should be restored:												
	SRO	a. CHECK letdown ISOLATED.												
		h CHECK pzr level:												
		level greater than or equal to program level												
		c. CHECK charging and normal letdown AVAILABLE:												
		piping INTACT												
		valves OPERABLE												
		Train A CCS in service.												
		(RNO required)												
		RNO:												
	Appendix D Op Test No.: Event Description Time	Appendix D          Op Test No.:       NRC         Event Description:       CV         Time       Position         RO       RO         SRO       BOP         BOP       BOP         SRO/       Crew         SRO       SRO/         SRO       SRO												
		endix D Required Operator Actions							Form ES-D-2					
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Op Te	st No.:	NRC	Scenario #	2	Event #	5	Page	26	of .	55				
Event	Description:	CV	CS Leak in Aux B	uilding (on	Letdown line; ~9	0 gpm)								

<ul> <li>26. MONITOR if pressurizer heaters should be restored:</li> <li>a. CHECK pressurizer level greater than 20% and rising.</li> <li>b. ENSURE pressurizer heaters in service as required.</li> <li>27. IF containment purging or venting is neededN/A</li> </ul>
<ul> <li>a. CHECK pressurizer level greater than 20% and rising.</li> <li>b. ENSURE pressurizer heaters in service as required.</li> <li>27. IF containment purging or venting is neededN/A</li> </ul>
<ul> <li>b. ENSURE pressurizer heaters in service as required.</li> <li>27. IF containment purging or venting is neededN/A</li> </ul>
27. IF containment purging or venting is neededN/A
27. IF containment purging or venting is neededN/A
28. INITIATE leak repairs.
29. GO TO appropriate plant procedure.
END OF SECTION
wing CREW Brief and Notification actions are not contained in the procedure.
<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
<b>Operations Management</b> - Typically Shift Manager.
Maintenance Personnel – Typically Maintenance Shift Supervisor (MSS).

Lead Examiner may cue the next event when Tech Specs have been identified, Excess Letdown in service and the crew has stabilized Pzr Level.

Appendix D	Required Operator Actions	Form ES-D-2
Op Test No.: Event Description:	NRC Scenario # 2 Event # 5 CVCS Leak in Aux Building (on Letdown line; ~90 gpm)	Page <u>27</u> of <u>55</u>
SQN	RCS LEAK AND LEAK SOURCE IDENTIFICATION	AOP-R.05 Rev. 14

APPENDIX I

Page 1 of 1

## ESTIMATING RCS LEAK RATE USING CVCS FLOW BALANCE

NOTE 1 This method is recommended when leak requires rise in charging flow greater than ~10 gpm. Appendix J is more accurate for smaller leak rates.

NOTE 2 This appendix assumes RCS temperature and charging flow are approximately constant.

	INITIAL	FINAL	CHANGE
PZR Level			[1] (negative for level decrease)
Time			[2]
Charging Flow		[3]	
Letdown Flow		[4]	
Total RCP Seal Return Flow		[5]	

## Pressurizer Level Conversion

Pres	Pressurizer level change			conversion factor		Time Change		Pzr Level Rate of Change (positive for level rising)			
		%	Х	62 gal / %	÷	I	min	=		gpm	
step [1] above			_			step [2] above			[6]		
				Leak	Rate	Calculation					
Charging Flow	Lei	tdown	Flow	Seal Return Flow	ł	Pzr Level Rate of Change		Instrument error correction factor	_	RCS Leak Rate	
step [3] above		p [4] a	above	step [5] above		step [6] above	*	э урш	= .	gpm	

Page 73 of 80

Appendix D		Form ES-D-2							
Op Test No.:	NRC	Scenario #	2	Event #	5	Page	28	of	55
Event Description:	CV	CVCS Leak in Aux Building (on Letdown line; ~90 gpm)							
sou		DOOLEAK				AOP	P 05		

Page 1 of 1

Rev. 14

#### APPENDIX J

## ESTIMATING RCS LEAK RATE USING VCT AND PZR LEVEL

CAUTION This appendix CANNOT be used during VCT makeup, boration, or dilution.

NOTE This appendix assumes RCS temperature is approximately constant.

. . . . . .

	VCT LEVEL (%)	PZR LEVEL (%)	TIME (min)
INITIAL			
FINAL			
CHANGE	[1]	[2]	[3]
	(positive for level decrease)	(positive for level decrease)	

### VCT Level Conversion

VCT level change		conversion factor		Time Change		VCT Level Rate of Change (positive for level lowering)
%	X	20 gal / %	÷	mir	ן =	gpm
step [1] above				step [3] above		[4]
		Pressur	izer L	evel Conversion	L	
Pressurizer level change		conversion factor		Time Change		Pzr Level Rate of Change (positive for level lowering)
%	X.	62 gal / %	. ÷ .	min	=	gpm
step [2] above				step [3] above		[5]
		Leal	k Rat	e Calculation		
VCT Level Rate of Chang	je	Pzr Rate o	Leve f Cha	l R( nge	CS Le	eak Rate
step [4] abov	e	+step [t	5] abo	=		gpm

Appendix D	Required Operator Actions							Form ES-D-2			
Op Test No.:	NRC	Scenario #	2	Event #	5	Page	29	of	5		
Event Description:	CV	CVCS Leak in Aux Building (on Letdown line; ~90 gpm)									
SQN											

#### Page 1 of 1

### APPENDIX K

#### EVALUATING TECH SPECS AND TRM

#### EVALUATE the following Tech Spec/TRM LCOs for applicability:

- 3.2.5, DNB parameters may be applicable depending on Letdown isolation: 3.2.5.b. Pressurizer Pressure would be applicable ACTION: w/ any of the above parameters exceeding its limit, restore w/i its limit w/i 2 hrs or reduce THERMAL POWER <5% of RTP w/i next 4 hrs.
- 3.4.3.1, Safety and Relief Valves-Operating N/A
- 3.4.3.2, Relief Valves-Operating- N/A

3.4.6.2.a, RCS Leakage – PRESSURE BOUNDARY LEAKAGE: <u>ACTION a.</u>: w/ any PRESSURE BOUNDARY LEAKAGE not w/i limits, be in HOT STANDBY w/i 6 hrs & CLD SHDN w/i following 30 hrs.

- 3.4.6.3, RCS Pressure Isolation Valve Leakage N/A
- TRM 3.4.11, Reactor Coolant System Head Vents N/A
- 3.4.12, Low Temperature Overpressure Protection Systems N/A
- 3.6.1.4, Containment Pressure depending on leak size
- 3.6.1.5, Containment Air Temperature depending on leak size

	Appendix D		3-D-2							
C	Op Test No.:	NRC	Scenario #	2	Event #	5	Page	30	of	55
	Event Description:	CV								

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C

		EA-62-3, Establishing Excess Letdown
Time	Position	Applicant's Actions or Behavior
		4.0 OPERATOR ACTIONS
		4.1 Placing Excess Letdown in Service
	NOTE: It so be follo	eal return valves FCV-62-61 or FCV-62-63 are closed, excess letdown flow will routed to PRT via relief valve 62-636. Reopening FCV-62-61 and FCV-62-63 owing a Phase A Isolation is addressed in applicable EOP steps.
		1. <b>IF</b> excess letdown is only letdown flowpath, THEN CONTROL charging flow as necessary to prevent high pressurizer level.
		<ol> <li>IF high activity levels in RCS are suspected, THEN NOTIFY Radiological Control (Radcon) section to monitor plant radiological conditions as required.</li> </ol>
		3. ENSURE CCS inlet to excess letdown heat exchanger [FCV-70-143] OPEN.
		4. ENSURE CCS outlet to excess letdown heat exchanger [FCV-70-85] OPEN.
		<ol> <li>VERIFY CCS flow to excess letdown heat exchanger greater than 230 gpm, as indicated on.[FI-70-84].</li> </ol>
		6. ENSURE excess letdown divert valve [FCV-62-59] in NORMAL.
		7. OPEN excess letdown isolation valve [FCV-62-54].
		8. OPEN excess letdown isolation valve [FCV-62-55].
	NOTE: UNI 200 62-6 Grir	T 1 ONLY Normally the temperature read on 1-TI-62-58 should be less than °F. If operation requires temperatures greater than 200°F, the pressure at 1-PI- 64 (local indicator El. 690 PnI. L-46) should be less than 100 psig to protect the mell valves.

	Appendix D Required Operator Actions							Form ES-D-2					
6	Op Test No.:	NRC	Scenario #	2	Event #	5	Page	31	of	55			
	Event Description:	CV	CS Leak in Aux E	Building (on	Letdown line	; ~90 gpm)			_				

•

		EA-62-3, Establishing Excess Letdown
Time	Position	Applicant's Actions or Behavior
		<ol> <li>ADJUST excess letdown flow control valve [FCV-62-56] as necessary to control flow WHILE maintaining heat exchanger outlet temperature less than 200°F (240°F on Unit 1), as indicated on [TI-62-58].</li> </ol>
		10. NOTIFY RADCON excess letdown has been placed in service.
		11. RETURN TO procedure and step in effect.
		END OF SECTION
Lead Examin service and t	ier may cue th the crew has s	ne next event when Tech Specs have been identified, Excess Letdown in stabilized Pzr Level.

		For	m ES	3-D-2						
) Test No.:	NRC	Scenario #	2	Event #	5	Page	32	of	55	
ent Description:	CVCS Leak in Aux Building (on Letdown line; ~90 gpm)									
	• Test No.: ent Description:	• Test No.: <u>NRC</u> ent Description: CVC	• Test No.: <u>NRC</u> Scenario # ent Description: CVCS Leak in Aux E	ent Description: CVCS Leak in Aux Building (on	• Test No.:NRC Scenario #2 Event # ent Description: CVCS Leak in Aux Building (on Letdown line	ent Description: CVCS Leak in Aux Building (on Letdown line; ~90 gpm)	ent Description: CVCS Leak in Aux Building (on Letdown line; ~90 gpm)	ent Description: CVCS Leak in Aux Building (on Letdown line; ~90 gpm)	Test No.: <u>NRC</u> Scenario # <u>2</u> Event # <u>5</u> Page <u>32</u> of ent Description: CVCS Leak in Aux Building (on Letdown line; ~90 gpm)	

			1-SO-62-6, Excess Letdown							
	Time	Position	Applicant's Actions or Behavior							
		ARP 1-AR-M 7.b.: Place E	6-C B-4, FS-62-82 LOW PRESS LTDN FLOW HIGH PRESSURE HIGH step excess Letdown in service in accordance with 1-SO-62-6, Excess Letdown							
			5.0 STARTUP/STANDBY READINESS							
		NOTE 1: W	hen excess letdown is placed in service the containment radiation monitors ay show some changes in particulate reading.							
		NOTE 2: Co pu	pordinate the following steps with AUO stationed at 0-L-2 to monitor RCDT for imp operation as required during the 50 gallon flush.							
			[1] ENSURE [1-FCV-62-93] is in MANUAL and							
			[a] OPERATE [1-FCV-62-93] USING [1-HIC-62-93A] as required to regulate charging flow to keep pressurizer level on program.							
			[b] OPERATE [1-FCV-62-89] USING [1-HIC-62-89A] as required to maintain RCP seal flows in limits.							
			[2] NOTIFY RADCON that Excess Letdown is being placed in service							
			[3] ENSURE [1-FCV-70-143] CCS water to the excess letdown heat exchanger is OPEN.							
			[4] ENSURE [1-FCV-70-85] Excess Letdown							
		NOTE: Sto Ex	ep <b>[5]</b> will prevent subjecting the CVCS piping downstream of the cess Letdown HX to a temperature above the design value.							
			[5] ENSURE [1-FI-70-84] is indicating greater than 230 gpm.							
,										
1			[6] PLACE [1-FCV-62-59] Excess Letdown 3-way Divert Valve in DIVERT.							

	Appendix D	Required Operator Actions							Form ES-D-2			
C	Op Test No.:	NRC	Scenario #	2	Event #	5	Page	33	of	55		
	Event Description:	CV										

				1-SO-62-6, Exces	ss Letdown				
	Time	Position		Ap	oplicant's Actions or Behavi	or			
		CAUTION: F m n	CV 62 neans f ot be a	-63 has replaced RCI for isolating seal flow. available if FCV-62-63	P seal leak-off isolation v The normal letdown pat is CLOSED.	alves as the prim th for excess letdo	ary own will		
		NOTE: Back	c flow	through the RCP se	als will occur should the	ne RCP seal leal	koff		
		Isola		alves fail to their OF	'EN position on loss of	air or electrical	power.		
excess letdown will be aligned for NORMAL operation, 7									
			][	a] ENSURE the fol	lowing are CLOSED:	,			
				VALVE ID	FUNCTION	INITIALS			
				1-FCV-62-53	RCP's Seal Bypass				
				1-FCV-62-9	No. 1 Seal Return				
$\cap$				1-FCV-62-22	No. 2 Seal Return				
				1-FCV-62-35	No. 3 Seal Return				
				1-FCV-62-48	No. 4 Seal Return				
			[	b] ENSURE [1-FC	/-62-63] is OPEN.				
			[8] <b>(</b>	OPEN [1-FCV-62-5 /alve.	4] Cold Leg Loop #3 E	xcess Letdown i	isolation		
			[9] <b>(</b>	<b>DPEN [1-FCV-62-5</b> /alve.	5] Excess Letdown co	ntainment isolati	on		
			[10] <b>(</b>	OPEN [1-FCV-62-5	6] slowly to flush piping	g to RCDT.			
Ċ			[11] <b>\</b> F	WHEN approximate CV-62-56], Excess	ly 50 gallons have flus Letdown Flow Contro	hed, <b>THEN CLC</b> I Valve.	DSE [1-		

Appendix D		Re	Form ES-D-2						
Op Test No.:	NRC	Scenario #	2	Event #	5	Page	34	of	55
Event Description:	C/	/CS Leak in Aux B	suilding (or	n Letdown line; -	~90 gpm)				

1-SO-62-6, Excess Letdown								
Time	Position	Applicant's Actions or Behavior						
		[12] PLACE [1-FCV-62-59] Excess Letdown 3-way Divert Valve in NORMAL.						
	NOTE 1:	Normally the temperature read on 1-TI-62-58 should be less than 200°I If operation requires temperatures greater than 200°F, the pressure at PI-62-64 (local indicator EI. 690 PnI L-46) should be less than 100 psig to protect the Grinnell valves.						
	NOTE 2:	Operation above 200°F will require that Systems Engineering be notified to allow an evaluation of the need for valve maintenance. [13] <b>OPEN [1-FCV-62-56]</b> slowly to increase excess letdown flow to desired amount, not to exceed 240°F heat exchanger outlet temperature, as indicated on 1-TI-62-58.						
		[14] <b>NOTIFY</b> RADCON that Excess Letdown has been placed in service.						
		END OF TEXT						

Lead Examiner may cue the next event when Tech Specs are identified, Excess Letdown in service and Pzr Level stabilized.

Appendix D	C D Required Operator Actions							Form ES-D-2		
Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	35	of	55	
Event Descripti	on: Ma Sp	ain Steam Line Bre oray Pump 1B-B Di	eak Inside sch VIv A	Containment w/ 1 uto Open Failure	A Cntmt Spray P	ump Shearec	l Shaft &	، Cntmr	nt	
Time	Position			Applicant's	Actions or Beha	avior				
Simulator O	perator: Whe	en directed, ini	itiate Ev	vent 6, 7			2 10 10 10 10 10 10 10 10 10 10 10 10 10			
Indications/	Alarms			· · · · · · · · · · · · · · · · · · ·						
1-M-4 Indicator • 1-FI-1 • 1-FI-1 • 1-FI-1 • 1-FI-1 • 1-FI-1 • 1-FI-1 • 1-XI-9 • 1-XI-9 • 1-XI-9 • 1-XI-9 • 1-XR- 1-M-5 Annunic • 1-XA-	rs: -3A, 3B, SG-1 3 -10A, 10B, SG- -21A, 21B, SG- -28A, 28B, SG- 02-5005C, RX P 02-5006C, RX P 02-5007C, RX P 02-5008C, RX P 02-5008C	STEAM FLOW C 2 STEAM FLOW 3 STEAM FLOW 4 STEAM FLOW OWER CH-I N-4 OWER CH-II N-4 OWER CH-II N-4 OWER CH-II N-4 OWER CH-IV N- EAR POWER N	CH-1 & 2: / CH-1 & / CH-1 & / CH-1 & 1: Increa 12: Increa 43: Increa 44: Increa 44: Increa 00PS T /	Increasing ste 2: Increasing s 2: Increasing s 3: Increasing s asing reactor p asing reactor p asing reactor p casing reactor p creasing reactor p creasing reactor p creasing reactor p	am flow steam flow steam flow steam flow ower ower oower oower oower oon power rang	ges selecte 1-LOW"	ed.			
Indicator • 1-TI-6 • 1-TR-0	rs: 8-2E, 25E, 44E, 68-2B, RCS/TU	, 67E LOOPs 1-4 RBINE TEMP Re	TAVG I	Decreasing tem trending away f	perature indic	ow ations (w/ r ned value	ו no rod ו	motior	ו)	
1-M-6 Annunica • 1-AR- • 1-AR- • 1-AR- • 1-AR- Indicator	ators: M6B A-7, "FS-3 M6B B-7, "FS-3 M6B C-7, "FS-3 M6B D-7, "FS-3 °s:	8-35B STM GEN 8-48B STM GEN 8-90B STM GEN 8-103B STM GEI	LOOP 1 LOOP 2 LOOP 3 N LOOP	STEAMFEEDW STEAMFEEDW STEAMFEEDW 4 STEAMFEED	/ATER FLOW I /ATER FLOW I /ATER FLOW I WATER FLOW	MISMATCH MISMATCH MISMATCH MISMATCI	" " H			
<ul><li>1-PDI-</li><li>Significa</li><li>Annur</li></ul>	-30-42, 43, 44, 4 nt Resultant / nciator 1-XA-55	I5, CNTMT PRES Alarms/Indicat 5-6A Window E-	SSURE V ions: 1: TS-68	WIDE RANGE Ir 3-2J REACTOR	ndicators trend	ling up (1.5 OPS LO LC	psi-SI ) TAVG	Actua	tion)	
T = 70	CREW	Refer to alarn	n respor	nse procedures	and carries o	ut the follo	wing a	ctions	:	
Evaluator No	ote: If alarm 1 actuates reactor.	I-AR-M6-A E-2, indicating an e	, TS-68- xcessive	2J REACTOR	COOLANT LC crew may de	OOPS LO L cide to ma	O TAV	/G trip the	e	
Evaluator No	ote: Personne crew sho	el safety is not a uld monitor for	a concei worseni	n since this ste	eam break is in out no personr	nside the c nel safety-b	ontainr	nent; action:	the s are	

required at this time.

	Appendix D		Ree	quired Op	perator Act	ions		Fo	rm ES	3-D-2
ration .	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	_36	of	55
	Event Description:	Mai Spr	n Steam Line Bre ay Pump 1B-B Di	eak Inside C isch Vlv Au	Containment to Open Failu	w/ 1A Cntmt Spray Pum ure	p Sheared	l Shaft 8	k Cntmr	nt

Time	Position	Applicant's Actions or Pohovior
		May abases to anter AOD 0.05. Of the OD 5. In the test of
		injection actuation conditions based on either containment, prossure or
	SRO	steamline pressure should cause the crew to manually trip the reactor and
		initiate SI shortly after the event is initiated
		AOP-S.05, Steam Or Feedwater Leak
		1. MONITOR personnel safety:
		a. <b>IF</b> steam or feedwater lines need to be immediately isolated to protect personnel, <b>THEN PERFORM</b> the following:
		1) <b>TRIP</b> the reactor.
		<ol> <li>IF leak is on steam lines OR source is unknown, THEN CLOSE MSIVs.</li> </ol>
		<ol> <li>IF leak is on feedwater lines OR source is unknown, THEN PERFORM the following:</li> </ol>
		a) <b>TRIP</b> MFW pumps.
		b) CLOSE Feed Reg Valves.
		4) GO TO E-0, Reactor Trip or Safety Injection.
		2. MONITOR steam generator levels STABLE on program.
		3. CHECK the following:
		S/G atmospheric relief valves CLOSED
		steam dumps CLOSED.
		4. CHECK main turbine on line.
Evaluator No	te: Since this	s is a " <b>MONITOR</b> " step, the crew may continue in the procedure while
	developir	ig a reactor vs. turbine power trend ( <b>RNO</b> second bullet). If so, steps 6 or 7
	should be	the decision point and therefore transition to reactor trip and E-0
	implemer	Itation. If an excessive delta between reactor and secondary power develops,
		may decide to the the reactor and transition to E-U here.

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	Appendix D	Required Operator Actions							Form ES-D-2		
$\sim$	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	37	of	55	
	Event Description:	Mai Spr	in Steam Line Bre ray Pump 1B-B D	eak Inside C lisch VIv Aut	containment to Open Failu	w/ 1A Cntmt Spray Pum ire	p Shearec	I Shaft 8	k Cntmi	nt	

Time	Position	Applicant's Actions or Behavior						
	RO	5. <b>MONITOR</b> the following:						
		reactor power STABLE						
		(RNO required)						
		<ul> <li>reactor power less than or equal to 100% (3455 MWt).</li> </ul>						
	BOP	RNO: REDUCE turbine load as necessaryN/A						
		IF any of the following conditions exist:						
	Crew	<ul> <li>greater than 35 MWe load drop is required to maintain reactor power less than or equal to 100%</li> <li>OR</li> </ul>						
	Crew	<ul> <li>steam leak results in reactor power rising by 3% or more</li> <li>OR</li> </ul>						
	Crew	reactor power CANNOT be controlled by turbine load reduction						
	RO BOP SRO	THEN PERFORM the following:         a. TRIP the reactor.         b. WHEN reactor is tripped, THEN CLOSE MSIVs.         c. GO TO E-0, Reactor Trip or Safety Injection.						
Evaluator N	ote: Since this developir ave, and	s is a " <b>MONITOR</b> " step, the crew may continue in the procedure while ng a T-ave vs. T-ref trend. The 3° delta between actual RCS temperature, T- programmed reference temperature, T-ref is the range the system is capable of						
	restoring transient normal ra reactor a	following a normal load change. 5° delta is based on the maximum load for the RCS. Step 6 insures that RCS temperature is controlled within these anges; if the crew cannot control these limits, they should decide to trip the nd transition to E-0.						
	RO	<ol> <li>MONITOR T-avg within 3°F of T-ref.</li> <li>(RNO required)</li> </ol>						
	SRO/ BOP	<b>RNO:</b> <b>REDUCE</b> turbine load as necessary to maintain T-avg within 3°F of T-ref (or program value).						
	SRO	IF T-avg CANNOT be maintained within 5°F of T-ref (or program value).						

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	Appendix D		Re	quired Op	perator Act	ions		Fo	rm ES	5-D-2
<u> </u>	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	38	of	55
	Event Description:	Mai Spr	n Steam Line Bre ay Pump 1B-B D	eak Inside ( isch VIv Au	Containment v to Open Failu	ͷ/ 1A Cntmt Spray Pur Ire	np Sheared	l Shaft &	& Cntmr	nt

Time	Position	Applicant's Actions or Behavior						
		THEN PERFORM the following:						
	RO	a. TRIP the reactor						
	BOP	b. WHEN reactor is tripped, THEN CLOSE MSIVs.						
	Crew	c. GO TO E-0, Reactor Trip or Safety Injection.						
	SPO	IF a reactor trip is directed,						
	SKU	THEN GO TO E-0, Reactor Trip or Safety Injection.						
	SRO	Direct Manual Rx Trip						
	SRO	Enter and Direct E-0 Immediate Operator Actions (IOAs)						
Evaluator No	ote: Since this developir pressure. of pressu E-0.	s is a <b>"MONITOR"</b> step, the crew may continue in the procedure while ng a containment pressure trend. Si actuation is at 1.5 psig containment The SRO should set a trigger value, which is variable depending on the rate re rise. If attained, the crew should decide to trip the reactor and transition to						
	NOTE: Tec	h Spec LCO 3.6.1.4 is applicable if containment pressure exceeds 0.3 psig.						
	RO	7. MONITOR containment pressure STABLE						
	RO	<b>RNO:</b> IF containment pressure is approaching 1.5 psig, <b>THEN PERFORM</b> the following:						
		a. TRIP the reactor.						
		b. WHEN reactor is tripped, THEN PERFORM the following:						
		<ol> <li>INITIATE Safety Injection.</li> <li>CLOSE MSIVs.</li> </ol>						
		c. GO TO E-0, Reactor Trip or Safety Injection.						
	SRO	IF a reactor trip is directed, THEN GO TO E-0. Reactor Trip or Safety Injection						
	SRO	Direct Manual Rx Trip						
	SRO	Enter and Direct E-0 Immediate Operator Actions (IOAs)						
I								

C,	Appendix D Required Operator Actions									5-D-2
	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	39	of _	55
	Event Description:	Ma Sp	in Steam Line Bre ray Pump 1B-B Di	eak Inside sch VIv Au	Containment w/ 1 uto Open Failure	A Cntmt Spray Pu	Imp Sheared	l Shaft 8	k Cntmr	nt

	Time	Position	Applicant's Actions or Behavior					
	Evaluator No	te: Following surveys l discovery event in	g IOA performance, prior to Steps 1-4 immediate action verification, RO/BOP MCBs for any expected automatic system response that failed to occur. Upon /, they may take manual action(s) to align plant systems as expected for the progress. [Ref. EPM-4, Prudent Operator Actions (POAs)]					
			E-0, Reactor Trip or Safety Injection					
	Annunicators/Indications as specified at Event 6 initiation							
		Note 1 Steps	s 1 through 4 are immediate action steps					
	Note 2 This procedure has a foldout page							
C		RO	<ol> <li>VERIFY reactor TRIPPED:         <ul> <li>Reactor trip breakers OPEN</li> <li>Reactor trip bypass breakers DISCONNECTED or OPEN</li> <li>Neutron flux DROPPING</li> <li>Rod bottom lights LIT</li> <li>Rod position indicators less than or equal to 12 steps.</li> </ul> </li> </ol>					
		BOP	<ul> <li>2. VERIFY turbine TRIPPED:</li> <li>Turbine stop valves CLOSED.</li> </ul>					
		BOP	<ul> <li>3. VERIFY at least one train of shutdown boards ENERGIZED.</li> <li>Attempt to restore power to at least ONE train of shutdown boards</li> <li>Place DG 1A-A control switch in START</li> <li>Verify Train A Shutdown Boards ENERGIZED</li> </ul>					
and the second		RO	<ul> <li>4. DETERMINE if SI actuated:</li> <li>ECCS pumps RUNNING.</li> <li>Any SI alarm LIT [M-4D] (SI will be actuated)</li> </ul>					
		RO/BOP	<ul> <li>RNO:</li> <li>DETERMINE if SI required:</li> <li>a. IF any of the following conditions exists:</li> <li>S/G pressure less than 600 psig,</li> </ul>					

		Required Operator Actions For						m ES	
Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	40	of	
Event Descriptio	on: Mai Spr	n Steam Line Bre ay Pump 1B-B Di	ak Inside C sch VIv Aut	ontainment w/ ′ o Open Failure	A Cntmt Spray Pi	ump Sheared	d Shaft &	Cntmr	
Time	Position			Applicant	s Actions or Beh	avior			
			CS press	ure less than	n 1870 psig, greater than 1.	5 psig,		<u> </u>	
Evaluator No	ote: SRO/cro depress	ew should exe surization durir	rcise <b>FOI</b> ng perforn	DOUT PAG	e <u>event dia</u> Poas	GNOSTIC	<b>S</b> for S	G	
	Correct impleme constitu 1-4 inclu	POAs implem entation of App te complete fa usive. (Appen	DAs implemented would then result in ALL MSIVs closed, SI actuation and ation of Appendix E, Isolating AFW to Faulted S/G which does NOT complete faulted SG feedwater isolation. Complete isolation is in E-2 Step ve. (Appendix E is attached following this event guide.)						
	·		FOLDO	OUT PAGE	<u> </u>	<u> </u>			
		RCP TRIP		$\Delta = N/\Delta$					
			GNOSTI	<u>CS</u>					
		EVENT DIA     IF any S     following:	GNOSTI 6/G press	<b>CS</b> sure is drop	ping uncontro	lled, THE	N PER	FORI	
	RO/BOP	EVENT DIA     IF any S     following:     a. CLOS	GNOSTI 6/G press 6E MSIVs	CS sure is drop and MSIV b	ping uncontro ypass valves	lled, THE	N PER	FORI	
	RO/BOP	EVENT DIA     IF any S     following:     a. CLOS     b. IF any     PERF	GNOSTI GA press E MSIVs SE MSIVs SG pre	<u>CS</u> sure is drop and MSIV to ssure continue ofollowing:	ping uncontro ypass valves ues to drop und	lled, <b>THE</b>	N PER THEN	FORI	
	RO/BOP RO	EVENT DIA     IF any S     following:     a. CLOS     b. IF any     PERF     1) El	SE MSIVE SORM THE SE MSIVE SE MSIVE SE MSIVE SE MSIVE SE MSURE S	CS sure is drop and MSIV t ssure continue following: actuated.	ping uncontro ypass valves ues to drop und	lled, <b>THE</b>	N PER THEN	FORI	
	RO/BOP RO	EVENT DIA • IF any S following: a. CLOS b. IF any PERF 1) El 2) IF TI	GNOSTI GORD press SE MSIVs y S/G pre ORM the NSURE S at least of HEN ISO	<b><u>CS</u></b> sure is drop sand MSIV to ssure continue following: a contract of the second blactuated.	ping uncontro ypass valves ues to drop und tact (S/G press o faulted S/G(s	lled, <b>THE</b> controlled, sure contro	N PER THEN	FORI	
	RO/BOP RO	EVENT DIA • IF any S following: a. CLOS b. IF any PERF 1) El 2) IF TI •	GNOSTI GARDER SEMSIVE	<b><u>CS</u></b> sure is drop sand MSIV to ssure contine following: a contine one S/G is in LATE AFW to AFW level of	ping uncontro ypass valves ues to drop und tact (S/G press to faulted S/G(s	lled, <b>THE</b> controlled, sure contro	N PER THEN olled or S/G(s)	FORI	
	RO/BOP RO	EVENT DIA • IF any S following: a. CLOS b. IF any PERF 1) El 2) IF TI •	AGNOSTI S/G press SE MSIVs y S/G pre FORM the NSURE S at least of HEN ISO CLOSE IF any / THEN I	CS Sure is drop and MSIV b soure continue following: a following: a following: a following: a following: a following: a following: a following: b actuated. a following: b actuated. b actuated. a following: b actuated. a following: b actuated. b actuated. b actuated. b actuated. c a following: b actuated. b actuated. c a following: b actuated. c a following: c a following: b actuated. c a following: c a follo	ping uncontro ypass valves ues to drop und tact (S/G press of faulted S/G(s control valves f r faulted S/G ( ppendix E, Iso	lled, <b>THE</b> controlled, sure contro s): or faulted CANNOT to lating AFV	N PER THEN Diled or S/G(s) De CLO V to Fat	rising SED,	
	RO/BOP RO	EVENT DIA • IF any S following: a. CLOS b. IF any PERF 1) El 2) IF TI • • 3) El IS	GRITEIX GNOSTI GG press SE MSIVs y S/G pre ORM the NSURE S At least of HEN ISO CLOSE IF any / THEN I NSURE a OLATE /	<u>CS</u> sure is drop sand MSIV b ssure continue following: a following: a following: a following: a following: a following: a following: a following: a following: a following: a following: b actuated. a following: b actuated. a following: b actuated. a following: b actuated. b actuated. a following: b actuated. b actuated. b actuated. b actuated. c actuated. b actuated. c actuat	ping uncontro ypass valves ues to drop und tact (S/G press to faulted S/G (s control valves f r faulted S/G ( ppendix E, Iso f the following d S/G(s):	lled, THE controlled, sure contro s): or faulted CANNOT t lating AFV conditions	N PER THEN olled or S/G(s) oe CLO V to Fat met: T	rising SED, ulted S	
	RO/BOP RO	EVENT DIA • IF any S following: a. CLOS b. IF any PERF 1) El 2) IF TI • • 3) El IS •	GNOSTI GOLATE / CLOSE	<u>CS</u> sure is drop sure is drop sand MSIV to ssure continue following: a following: a following:	ping uncontro ypass valves ues to drop und tact (S/G press to faulted S/G (s control valves f r faulted S/G ( ppendix E, Iso f the following d S/G(s): er than 440 gp	lled, <b>THE</b> controlled, sure contro s): or faulted CANNOT to lating AFV conditions	N PER THEN Diled or S/G(s) De CLO V to Fat met: T	FORI rising SED, ulted S HEN	

	Appendix D	Required Operator Actions						Form ES-D-2		
C.	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	41	of	55
	Event Description:	Mai Spr	in Steam Line Bre ay Pump 1B-B D	eak Inside C isch VIv Au	Containment to Open Failu	w/ 1A Cntmt Spray Pum ure	p Sheared	d Shaft 8	k Cntm	nt

	Time	Position	Applicant's Actions or Behavior
	Evaluator No	te: Actions for	ES-0.5 are contained in attachment at back of scenario guide
		BOP	<ol> <li>PERFORM ES-0.5, Equipment Verifications WHILE continuing in this procedure.</li> </ol>
		RO	<ul> <li>6. DETERMINE if secondary heat sink available:</li> <li>a. CHECK total AFW flow greater than 440 gpm.</li> <li>b. CHECK narrow range level greater than 10% [25 ADV] in at least one S/G.</li> <li>c. CONTROL feed flow to maintain narrow range level between 10% [25% ADV] and 50% in all S/Gs.</li> </ul>
			(Heat Sink is available from AFW:>440 gpm available.)
		RO	7. CHECK if main steam lines should be isolated:
			a. CHECK if any of the following conditions have occurred:
			<ul> <li>Any S/G pressure less than 600 psig OR</li> </ul>
			<ul> <li>Any S/G pressure dropping UNCONTROLLED. OR</li> </ul>
			Phase B actuation
			b. ENSURE MSIVs and MSIV bypass valves CLOSED
			c. ENSURE applicable Foldout Page actions COMPLETED
		RO	<ul> <li>8. CHECK RCP trip criteria:</li> <li>a. CHECK the following:</li> <li>RCS pressure less than 1250 psig.</li> <li>AND</li> <li>At least one CCP OR SI pump RUNNING</li> </ul>
			b. STOP RCPs
C.			
		RO	<ul> <li>9. MONITOR RCS temperatures:</li> <li>IF any RCP running, THEN CHECK T-avg stable at or trending between 547°F and °F OR</li> </ul>

	Appendix D	Required Operator Actions Form ES-D-							3-D-2	
**.	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	42	of	5{
	Event Description:	Mai Spr	n Steam Line Bre ay Pump 1B-B Di	eak Inside isch VIv A	Containment w/ 1 uto Open Failure	A Cntmt Spray P	ump Sheare	d Shaft 8	. Cntm	nt
	Time	Position			Applicant's	Actions or Bel	navior	<u> </u>		
			• IF R( 547°	CPs stop F and 5	oped, THEN Cl 52°F	HECK T-cold	stable or tr	ending	to be	twee
		RO	10. CHECk a. Press b. Press c. Norm d. Powe e. At lea	C pressu surizer F surizer s nal spray er to at le ast one l	rizer PORVs, s PORVs CLOSE afety valves C valves CLOS east one block plock valve OP	afeties, and s D. LOSED. ED. valve AVAILA EN.	pray valve BLE.	s:	_	
		CREW	11. DETER • CHE • CHE (RNO Requ	MINE S CK all S CK all S <b>uired)</b>	/G secondary p /G pressures C /G pressures g	oressure boun ONTROLLEE reater than 14	daries are ) or RISIN 10 psig.	INTAC 3.	Т:	
		SRO	RNO: PERFORM	the follo	wina:					
	Evaluator Note	: at Step via SPD designa conditio direct th procedu	11.a, <b>MONITO</b> S. When a Ri te one of the E ns using <b>1-FR</b> e crew to trans tre(s).	<b>DR</b> statu ED or O Board op <b>-0, UNIT</b> sition to	s trees, the cre RANGE path s perators (typica <b>1 STATUS TI</b> the appropriate	w will implem tatus tree is o lly the BOP) t <b>REES</b> . Once e RED and/or	ent status bserved, t o verify sta verified, th ORANGE	tree mo ne SRC tus tree e SRO path	onitori ) will e shou	ng Id
		During E conditio	$E-0 \rightarrow E-2$ performance in this scenario, containment pressure will meet entry ns for FR-Z.1, High Containment Pressure. It follows this event quide							
-			a. MON	ITOR st	atus trees.					
			b. <b>GO T</b>	<b>O</b> E-2, F	aulted Steam	Generator Isc	lation.			
-			Crew trans	itions to	E-2, Faulted	Steam Genera	ator Isolati	on.		
										-
				·····						

	Appendix D Required Operator Actions								Form ES-D-2			
	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	43	of	55		
	Event Description:	Ma Spi	in Steam Line Bre ay Pump 1B-B D	eak Inside isch VIv Au	Containment v ito Open Failu	v/ 1A Cntmt Spray Pum re	ip Sheare	d Shaft &	k Cntmi	nt		

Time	Position	Applicant's Actions or Behavior
		E-2, Faulted Steam Generator Isolation
Evaluator I	Note: Critical Ta	ask is to Isolate the faulted SG before transition out of E-2
	[Steps 1- 4	f inclusive completes operator-directed actions to isolate the faulted SG(s)
	<b>CAUTION:</b> ປ	Inisolating a faulted S/G or secondary break should NOT be considered INLESS needed for RCS cooldown.
Critical Task	BOP	1. CHECK MSIVs and MSIV bypass valves CLOSED.
	BOP	2. CHECK ANY S/G secondary pressure boundary INTACT:
		Any S/G pressure CONTROLLED or RISING
	BOP	3. <b>IDENTIFY</b> Faulted S/G(s):
		a. CHECK S/G pressures:
		<ul> <li>Any S/G pressure DROPPING in an uncontrolled manner.</li> </ul>
		OR
		Any S/G pressure less than 140 psig.
	CAUTIONS:	<ul> <li>Secondary heat sink requires at least one S/G available.</li> </ul>
		<ul> <li>If the TD AFW pump is the only source of feed flow, isolating both steam supplies will result in loss of secondary heat sink.</li> </ul>
Evaluator N	lote: Critical Ta	sk is to Isolate the faulted SG before transition out of E-2
	[Steps 1- 4	inclusive completes operator-directed actions to isolate the faulted SG(s)]
Critical Task		4. ISOLATE Faulted S/G(s):
	BOP	a. <b>ENSURE</b> MFW isolated to faulted S/G(s) by any of the following:
		<ul> <li>feedwater isolation valve CLOSED [M-4]</li> </ul>

C

-	Appendix D		Required Operator Actions	Form ES-D-2							
	Op Test No.:	NRC	Scenario # _ 2 Event #6, 7	Page _ 44 _ of _ 55							
9 	Event Description:	Mai Spr	Steam Line Break Inside Containment w/ 1A Cntmt Spray Pump S y Pump 1B-B Disch VIv Auto Open Failure	Sheared Shaft & Cntmnt							
[	Time	Position Applicant's Actions or Behavior									
	E-2, Faulted Steam Generator Isolation										
			OR								
			<ul> <li>feedwater regulating valve and bypass valve</li> </ul>	ve CLOSED [M-3].							
		BOP	b. ENSURE AFW isolated to faulted S/G(s):								
ŀ											

		CLOSE MD AFW LCV
		CLOSE TD AFW LCV and PLACE in PULL TO LOCK.
	BOP	c. CHECK S/G #1 or #4 faulted.
		(NNO required)
$\bigcirc$		c. GO TO Substep 4.e.
	BOP	d. VERIFY S/G blowdown valves CLOSED.
	BOP	e. VERIFY atmospheric relief CLOSED.
	BOP	5. CHECK CST level greater than 5%.
	BOP	6. VERIFY secondary radiation NORMAL:
patrix y		<ul> <li>a. CHECK secondary radiation NORMAL USING Appendix A, Secondary Rad Monitors. (App. A also contained in ES-0.5)</li> </ul>
Ċ		
		b. NOTIFY Chem Lab to take S/G activity samples.

	Appendix D Required Operator Actions								Form ES-D-2		
(	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	45	of	55	
Sec. 1	Event Description:	Ma Spi	in Steam Line Bre ay Pump 1B-B Di	eak Inside sch VIv Au	Containment w/ 1 uto Open Failure	A Cntmt Spray P	ump Sheared	d Shaft &	& Cntmi	nt	
	Time	Position			Annlicant	s Actions or Poh					

	Fosition	Applicant's Actions or Behavior
		E-2, Faulted Steam Generator Isolation
	BOP	c. WHEN Chem Lab is ready to sample S/Gs, THEN PERFORM the following:
		1) ENSURE FCV-15-43 Blowdown Flow Control valve CLOSED.
		2) ENSURE Phase A signal RESET.
		3) <b>OPEN</b> blowdown isolation valves.
		d. NOTIFY RADCON to survey main steam lines and S/G blowdown.
1		e. WHEN S/G samples completed, THEN CLOSE blowdown isolation valves
	RO/ SRO	7. CHECK SI termination criteria:
		a. RCS subcooling based on core exit T/Cs greater than 40°F.
	BOP	b. Secondary heat sink:
		<ul> <li>Narrow range level in at least one Intact S/G greater than 10% [25% ADV]</li> </ul>
		OR
		Total feed flow to Intact S/Gs greater than 440 gpm.
	RO	c. RCS pressure stable or rising.
	RO	d. Pressurizer level greater than 10% [20% ADV].
	SRO	e. GO TO ES-1.1, SI Termination.

Appendix D	ppendix D Required Operator Actions								-D-2
Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	46	of	55
Event Description: Main Steam Line Break Inside Containment w/ 1A Cntmt Spray Pump Sheared Shaft & Cntmnt Spray Pump 1B-B Disch VIv Auto Open Failure							nt		
Time	Position	1		A					
		Ε-2, Faι	Ited Stea	am Generat	tor Isolation	avior			
	SRO	8. GO TC	) E-1, Los	s of Reacto	or or Secondary C	Coolant.			
					END				
Lead Examine	ead Examiner may terminate the scenario at E-2 Step 7.e, SI Termination criteria determination.								

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	Appendix D Required Operator Actions								Form ES-D-2		
(	Op Test No.:	NRC	Scenario #	2	Event #	6, 7	Page	47	of	55	
and the second sec	Event Description:	Ma Sp	in Steam Line Bre ray Pump 1B-B Di	ak Inside sch Vlv Au	Containment v uto Open Failu	v/ 1A Cntmt Spray Pum re	p Sheared	l Shaft 8	k Cntmr	nt	

	Time	Position	Applicant's Actions or Behavior
			FR-Z.1, High Containment Pressure
		NOTE: If this (Loss conct	procedure has been entered for an orange path and performance of ECA-1.1 of RHR Sump Recirculation) is required, FR-Z.1 may be performed urrently with ECA-1.1.
		RO	1. MONITOR RWST level greater than 27%.
		RO	2. VERIFY Phase B valves CLOSED
			Panel 6K PHASE B GREEN
			Panel 6L PHASE B GREEN.
		DO	
		RU	3. ENSURE RCPS STOPPED.
$\hat{\Box}$		SRO	4. <b>DETERMINE</b> if this procedure should be exited:
		BOP	a. CHECK for faulted S/G:
			Any S/G pressure DROPPING in an uncontrolled manner
			OR
			Any S/G pressure less than 140 psig.
		RO	b. <b>CHECK</b> containment pressure less than 12 psig.
	Evaluator No	te: Critical Ta cooling equ CSF	<b>sk</b> is to manually actuate at least the minimum complement of containment uipment before an extreme (red-path) challenge develops to the containment
		(ES-0.5 Ste	ep 13 directs completion by BOP during procedure performance.)
	Critical Task	RO	<ul> <li>CHECK at least one containment spray pump RUNNING and delivering flow.</li> </ul>
		BOP	d. CHECK at least one containment air return fan RUNNING. (RNO required)
		ВОР	RNO: d. WHEN 10 minutes have elapsed from Phase B actuation, THEN ENSURE air return fans RUNNING.
Car		SRO	e. <b>RETURN</b> to procedure and step in effect.

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	SQN		REACTOR		DR SAEETVI	NECTION	E-0			
Op Test No.: Event Description:		Ma	Scenario # ain Steam Line Bre oray Pump 1B-B Di	2 Event # <u>6, 7</u> Page <u>48</u> sreak Inside Containment w/ 1A Cntmt Spray Pump Sheared Shaft & Disch Vlv Auto Open Failure				8   Shaft &	of _ Cntmr	55 nt
0- T				Julieu C				For	m ES	-D-2
, ppoint	aix D		Re	nuired (	Inorator Activ	222				

Page 1 of 2

## APPENDIX E

## ISOLATING AFW TO FAULTED S/G

1.	if r Thi Pei	motor-driven AFW LCV for faulted S/G CANNOT be closed, EN RFORM the following:	
	a.	IF at least one <u>other</u> AFW pump is available, THEN	
		PLACE affected MD AFW pump in PULL TO LOCK.	
	b.	ENSURE at least one of the following:	
		<ul> <li>total AFW flow greater than 440 gpm</li> </ul>	
		OR	
		<ul> <li>narrow range level greater than 10% [25% ADV] in at least one intact S/G.</li> </ul>	
	C.	DISPATCH personnel to locally isolate MD AFW to faulted S/G USING EA-3-11, Local Isolation of MD and TD AFW.	
	d.	WHEN MD AFW flowpath to faulted S/G is locally isolated, THEN	
		ENSURE affected MD AFW pump RUNNING.	

Appendix	D	Required Operator Actions						Form ES-D-2	
Op Test No.	.: NRC	Scenario #	2	Event #	6, 7	Page	49	of	55
Event Descr	ription:	Main Steam Line Bre Spray Pump 1B-B D	əak Inside isch VIv A	Containment w/ 1 uto Open Failure	A Cntmt Spray P	ump Sheared	l Shaft &	& Cntmn	ıt
					and the second second second second				

Page 2 of 2

### APPENDIX E

## ISOLATING AFW TO FAULTED S/G

NOTE	TDAFW pump steam supply will automatically swap from S/G #1 to S/G #4 after 60 second time delay when FCV-1-17 or -18 is closed.

 IF turbine-driven AFW LCV for faulted S/G CANNOT be closed, THEN PERFORM the following:

a.	IF at least one MD AFW pump is available to supply an intact S/G, THEN	
	CLOSE FCV-1-17 or FCV-1-18 to stop TD AFW flow.	
b.	ENSURE at least one of the following:	
	<ul> <li>total AFW flow greater than 440 gpm</li> <li>OR</li> </ul>	
	<ul> <li>narrow range level greater than 10% [25% ADV] in at least one intact S/G.</li> </ul>	
C.	DISPATCH personnel to locally isolate TD AFW to faulted S/G USING EA-3-11, Local Isolation of MD and TD AFW.	
d.	WHEN TD AFW flowpath to faulted S/G is locally isolated, THEN PERFORM the following:	
	1) IF S/G #1 or 4 is faulted, THEN ENSURE steam supply from faulted S/G isolated	
	by closing FCV-1-15 (S/G #1) or FCV-1-16 (S/G #4).	
	2) ENSURE FCV-1-17 and FCV-1-18 OPEN.	
	3) ENSURE TD AFW pump RUNNING.	

END OF TEXT

Appen	ndix D	Required Operator Actions			Form ES		
Op Test Event D	t No.: Description	<u>NRC</u> Equ	Scenario # - uipment verifications	Event #	ES-0.5	Page	50 of
Tir	me	Position		Applicant	s Actions or Beh	avior	
			ES-0.5, E		CATIONS		
Evalua	ator Not	e: BOP con (includin	npletes ES-0.5 g any discrepa	including Appendic Incies and actions t	ces A & B and aken) to SRO.	reports co	mpletion
		BOP	1. VERIFY	D/Gs RUNNING.			
		BOP	2. VERIFY	D/G ERCW supply v	alves OPEN.		
		BOP	3. VERIFY a	at least four ERCW p	oumps RUNNIN	١G	
		BOP	4. VERIFY Pump Pump Pump	CCS pumps RUNNIN 1A-A (2A-A) 1B-B (2B-B) C-S.	NG		
		BOP	5. VERIFY	EGTS fans RUNNING	Э.		
		BOP	6. VERIFY g	generator breakers C	PEN.		
		Crew	7. NOTIFY a actions.	at least two AUOs to	report to MCR	to be availa	able for loca
			8. VERIFY A	AFW pumps RUNNIN	IG:		
		BOP	a. MD A b. TD AF	FW pumps -W pump.			

	Appendix D		Required Operator Actions	Form ES-D-2							
C	Op Test No.: Event Descriptic	NRC on: Equi	Scenario # _ 2 Event # _ ES-0.5 Page	∋ <u>51</u> of <u>55</u>							
	Time	Position	on Applicant's Actions or Behavior								
			ES-0.5, EQUIPMENT VERIFICATIONS								
		<b>NOTE:</b> AFW level control valves should NOT be repositioned if manual action has been taken to control S/G levels, to establish flow due to failure, or to isolate a faulted S/G.									
			<ul><li>9. CHECK AFW valve alignment:</li><li>a. VERIFY MD AFW LCVs in AUTO.</li></ul>								
		BOP	b. VERIFY TD AFW LCVs OPEN.								
			401 CLOSED.	/-3-400 and FCV-3-							
		BOP       10. VERIFY MFW Isolation:         a. MFW pumps TRIPPED         b. ENSURE the following:         • MFW regulating valves CLOSED         • MFW regulating bypass valve controller outputs ZERO         • MFW isolation valves CLOSED									
		BOP	11. MONITOR ECCS operation:								
			<ul> <li>a. VERIFY ECCS pumps RUNNING:</li> <li>CCPs:</li> <li>RHR pumps</li> <li>SI pumps</li> </ul>								
			b. VERIFY CCP flow through CCPIT.								
			c. CHECK RCS pressure less than 1500 psig.								
			d. VERIFY SI pump flow.								
			e. CHECK RCS pressure less than 300 psig.								
			f. VERIFY RHR pump flow.								
		BOP	12. VERIFY ESF systems ALIGNED:								
			<ul> <li>a. Phase A ACTUATED:</li> <li>PHASE A TRAIN A alarm LIT [M-6C, B5].</li> <li>PHASE A TRAIN B alarm LIT [M-6C, B6].</li> </ul>								

	Appendix D		Re	Required Operator Actions Fo						-D-2
	Op Test No.: Event Description:	<u>NRC</u> Equi	Scenario # pment verificati	 ions	Event #	ES-0.5	Page	_52	of _	55
	Time	Position			Applicant's	Actions or Beh	avior			
			ES-0.5	, EQUIPM		ATIONS				
			b. Cr •	ntmt Vent CNTMT CNTMT	Isolation ACT VENT ISOLA VENT ISOLA	UATED: TION TRAIN A TION TRAIN B	alarm LIT alarm LIT	[M-6C [M-6C	), C5]. ), C6].	
			c. St • •	atus moni 6C DAR 6D DAR 6E LIT C 6H DAR 6J LIT.	tor panels: K K DUTSIDE outli K	ned area				
Ċ			d. Tra	ain A statu CNTMT PHASE	us panel 6K: VENT GREEN A GREEN	1				
			e. Tra • •	ain B statu CNTMT PHASE /	is panel 6L: VENT GREEN A GREEN	1				
	Evaluator Note:	<b>Critical Ta</b> cooling equ CSF	<b>sk</b> is to man uipment befo	ually actu pre an extr	ate at least the eme (red-path	e minimum cor ı) challenge de	nplement velops to	of cont the cor	ainme	ent ient
		(ES-0.5 Ste	ep 13 directs	completion	on by BOP du	ring procedure	performa	nce)		
			a. CH OR	IECK for a Phase B Containm	any of the follo ACTUATED	wing:	8 psig	on:		
			b. <b>VE</b>	RIFY cont	tainment spray					
			1)	Containm	ent spray pum	ips RUNNING	i.			

	Required Operator Actions Form ES-							
Op Test No.: Event Description:	<u>NRC</u> Eq	NRC Scenario # 2 Event # ES-0.5 Page Equipment verifications						of
Time	Position			Applicant	s Actions or Beł	navior		
		ES-0.5	, EQUIPN		CATIONS			
		2)	Contain 72-2 OF	ment spray he EN.	ader isolation	valves FC	V-72-3	and
		4)	FCV-72-	·13 CLOSED.	ader flow grea	ter than 47	750 apr	-12-3
		5)	Panel 6	E LIT.				
		c. VE •   •	<b>ERIFY</b> Ph PHASE E PHASE E	ase B ACTUA TRAIN A ala TRAIN B ala	NTED: rm LIT [M-6C, rm LIT [M-6C,	A5]. A6].		
		d. EN	NSURE R	CPs STOPPE	Ð.			
		e. VE • F	<b>RIFY</b> Pha Panel 6K Panel 6L	ase B valves C PHASE B GR PHASE B GR	CLOSED: EEN. EEN.			
		f. WH retu	<b>1EN</b> 10 m urn fans F	inutes have e RUNNING.	lapsed, <b>THEN</b>	ENSURE	contair	nment
		14. MONIT	OR if cor	ntainment vac	uum relief isola	ation valve	s shoul	d be
		a. CH	ECK con	tainment pres	sure greater th	an 1.5 psi	g.	
		b. <b>CH</b> [Pn •	ECK cntr 6K MAN FCV-30	nnt vacuum re IUAL] -46	elief isolation va	alves CLO	SED:	

	Appendix D	D Required Operator Actions For							
	Op Test No.: Event Description:	NRC Equ	Scenario # _ 2 Event # _ ES-0.5 Page _ 54 of _ 55						
	Time	Position	Applicant's Actions or Behavior						
			ES-0.5, EQUIPMENT VERIFICATIONS						
		BOP	<ul> <li>15. CHECK secondary and containment rad monitors USING the following:</li> <li>Appendix A, Secondary Rad Monitors (attached)</li> <li>Appendix B, Containment Rad Monitors. (attached)</li> </ul>						
		BOP	<ol> <li>WHEN directed by E-0, THEN PERFORM Appendix D, Hydrogen Mitigation Actions.</li> </ol>						
			<ul> <li>17. CHECK pocket sump pumps STOPPED: [M-15, upper left corner]</li> <li>HS-77-410, Rx Bldg Aux Floor and Equipment Drain Sump pump</li> <li>HS-77-411, Rx Bldg Aux Floor and Equipment Drain Sump pump</li> </ul>						
C		BOP	18. <b>DISPATCH</b> personnel to perform EA-0-1, Equipment Checks Following ESF Actuation.						
		BOP	19. ENSURE plant announcement has been made regarding Reactor Trip and SI.						
	Evaluator Note: BOP completes ES-0.5 including Appendices A & B and reports completion (including any discrepancies and actions taken, i.e.: containment Spray operating discrepancies per ES-0.5 Step 13) to SRO.								
			END (ES-0.5, EQUIPMENT VERIFICATIONS)						

	Appendix D		Fo	rm ES	3-D-2					
$\sim$	Op Test No.:	NRC	Scenario #	2	Event #	ES-0.5	Page	55	of	55
	Event Description:	Equ	uipment verificatio	ons						

(ES-0.5, EQUIPMENT VERIFICATIONS)							
	APPENDIX A SECONDARY RAD MONITORS						
BOP	<ol> <li>CHECK following rad monitors including available trends prior to isolation:</li> </ol>						
	<ul> <li>Condenser exhaust recorder RR-90-119</li> <li>S/G blowdown recorder RR-90-120</li> <li>Main steam line rad monitors</li> <li>Post-Accident Main Steam Line rad recorder RR-90-268B points 3 (blue), 4 (violet), 5 (black), and 6 (brown). [M-31 (back of M-30)]</li> </ul>						
BOP	<ol> <li>IF secondary radiation is HIGH, THEN ENSURE Unit Supervisor notified.</li> </ol>						
	END OF TEXT						

	APPENDIX B							
		CONTAINMENT RAD MONITORS						
	BOP	<ol> <li>CHECK following rad monitors:         <ul> <li>Upper containment high range rad monitors RM-90-271 and RM-90-272 NORMAL [M-30]</li> <li>Lower containment high range rad monitors RM-90-273 and RM-90-274 NORMAL [M-30]</li> <li>Containment rad recorders RR-90-112 and RR-90-106 NORMAL [M-12] (prior to isolation).</li> </ul> </li> </ol>						
	BOP	<ul> <li>IF secondary radiation is HIGH, THEN ENSURE Unit Supervisor notified.</li> </ul>						
	<b>1</b> 2	END OF TEXT						

C

Appenaix D			Scenario Outline			Form ES-	
Facility: Examiners:	Sequoyah		Scenario No.: Operat	3 ors:	Op Test No.:	NRC	
nitial Conditi	 ons: ≈3-4	% RTP, 1A Ma	in Feedwater Pump is in s	- - service.			
Turnover:	Continue pl	ant startup.	Operations are complete	e though	n 0-GO-4.Section	5.2 Step 2	
Farget CTs:	Start at least	1 EDG prior to	placing equipment PTL i	n ECA.0-	-0		
	Start at least	1 'A' Train ER	CW Pump in an operating	g safegua	ards train		
Event No.	Malf. No.	Event Type*		Ever	nt Description		
<b>1</b> . T+0	N/A	R - RO N - Crew	Continue Power Increase to MODE 1				
<b>2</b> . T+20	NI04A	I - RO TS - SRO	Intermediate Range channel N-35 failure low (>5% RTP at initiation)				
<b>3.</b> T+30	RW01G	C - BOP TS - SRO	Q-A ERCW Pump Over current trip				
<b>4</b> . T+40	RX21	I - BOP	PT-1-33, Main Steam H	ldr Press	ure Transmitter Lo	Failure	
<b>5.</b> T+50	RC07A	C - RO TS - SRO	PORV 68-334 fails oper	n. The P	ORV can be close	d manually	
<b>6.</b> T+60	TH02B	M - All	RCS Leak				
<b>7.</b> T+65	TH02B	M - All	SBLOCA				
<b>8.</b> T+65	ED01 EG08A- EG03B- pre-insert	C - BOP	Loss of offsite power(de Shutdown Boards 1A-A EDG fails to start 1B-B EDG trips and car	elayed) re in Autom nnot be re	esulting in a loss of atic estarted	power to both 6.9	
<b>9.</b> T+65	CV35 pre-insert	C - RO	1A-A CCP fails to start i	in Autom	atic		
<b>10.</b> T+65	RP16K611A pre-insert	C - BOP	Selected 'A' Train Safet	y Injectio	n Loads fail to star	rt automatically	
* (NI)orr	nal (R)eactivity	(I)nstrument	(C)omponent (M)aior				

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#### Scenario 3 Summary

The crew will assume the shift with the unit in startup at ≈3-4% RTP, controlling SG levels with main feedwater, ready to proceed to MODE 1. Following the briefing summary, the crew will raise reactor power starting in 0-GO-4 Section 5.2 Step 3.

After the crew has entered MODE 1, and at the direction of the Lead Examiner, an Intermediate Range NI will fail requiring action to remove it from service in accordance with AOP-I.01, Section 2.2. SRO will refer to Technical Specifications 3.3.1.1 Table 3.3-1 functional unit 5 Action 3, 3.3.3.7 Table 3.3.10 instrument 17 Action 1.

At the direction of the Lead Examiner, Q-A ERCW Pump will trip. The crew will refer to alarm response procedures (ARPs) 1-AR-M27A A-1, C-2, 1-AR-M27B-A E-3, E-4 and should go to AOP-M.01, Section 2.1 that directs manually starting J-A ERCW Pump and repositioning the DG Power Selector, 0-XS-67-285 for proper safeguards actuation. SRO will refer to Technical Specifications 3.7.4.

At the direction of the Lead Examiner, PT-1-33, Main Steam Header Pressure Transmitter will fail low affecting the Steam Dumps, which will all close and Main Feed Pump Control that will cause the 1A Main Feed Pump to go to minimum speed. The crew will maintain RCS temperature on the SG atmospheric relief valves according to 1-SO-1-2, Section 7.1, Steam Dump System Shutdown and respond to annunciators for SG level deviation using 1-AR-M5-A, B-7- LS-3-42D STEAM GEN LVL HIGH-LOW DEVIATION directing implementation of AOP-S.01, Loss of Normal Feedwater Section 2.3, Loss of Main Feedwater Pump Control.

At the direction of Lead Examiner direction, a Pzr PORV will fail open causing an uncontrolled RCS Pressure drop. The crew should close the block valve, refer to ARPs 1-AR-M5A D-2, E-2 and 1-AR-M5C B-6 and SRO direct entry into AOP-I.04, section 2.1. The crew should also refer to 0-SO-68-3, section 8.3 to close the associated block valve. SRO will refer to Technical Specifications 3.2.5.b and LCO 3.4.3.2 action a (according to TS Bases for PORV operability).

The RCS leak occurs and progresses into a SBLOCA. The crew responds to alarms by referring to ARPs 1-AR-5C B-1, B-3, 1-AR-M 6E C-6 directing them to AOP-R.05 Section 2.1 for lowering Pzr level and a challenge to VCT Makeup capability. Subsequently the crew will initiate a reactor trip and enter E-0.

Shortly after the trip (~5 minutes), offsite power is lost. 1A-A EDG automatic start fails and must be manually started. 1B-B EDG trips and cannot be re-started. The crew must manually start 1A-A EDG to avoid entering ECA-0.0 [Note; ECA-0.0 MAY be entered briefly (through Step 8) prior to starting EDG].

Additionally, selected 'A' Train Safety Injection Loads: 1A-A CCP, 1A-A MD AFW Pump, Train A SI signal to TDAFW Pump and ERCW Pumps J-A, Q-A, K-A and R-A (if selected) fail to automatically start. Starting the CCP is critical to a SBLOCA with the unavailability of the 2<sup>nd</sup> CCP due to the loss of AC power. Re-starting the J-A ERCW Pump is critical for long term cooling of 1A-A EDG and 1A Header ECCS loads due to the Q-A Pump loss.

EOP flow: E-0 – E-1 – FR-Z.1 – ES-1.2

The scenario may be terminated at the direction of the Lead Examiner, when ES-1.1, Post LOCA Cooldown transition is determined.

PSA significant task: Start EDG, 1A-A CCP and J-A ERCW Pump PSA significant DAS: SBLOCA PSA significant component failure: Pzr PORV, 1A-A EDG, Q-A ERCW Pump



## NRC 1009 ESG-3 Booth Instruction File

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7-16-2010

EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH
		FEEDBACK
Simulator IC	IC-119	≈3-4% RTP, BOL ~1000 MWD/MTU
		CB 'D' Rods @ 180 steps, all others @ 228 steps;
	Perform switch check.	[B] = 1710 ppm; Ba Blender setting: 46.3%
	Allow the simulator to run	Xe ≈ -54.7 pcm; Sm ≈ equilibrium
	for at least 3 minutes before	
	starting the exercise This	Console Operator actions: Place simulator in run and
	will initialize ICS	perform the following:
		<ul> <li>Place the MODE 2 sign on 1-M-4</li> </ul>
	Load SCN:	Place Train Week 'A' sign
	1009 NRC ESG-3	<ul> <li>ENSURE IR Ch 1 selected on NR-45 Rdr</li> </ul>
		ENSURE 1-M-5 Tave-Tref Recorder re-scaled for
	Place simulator in RUN.	MODE 2 values
	Place OOS equipment in	ENSURE 1C Pzr B/U Htr Group energized
	Clear alarms	
MFs, RFs, ORs	IMF EG08A	1A-A EDG fails to start in Automatic
are active when	IMF EG03B	1B-B EDG trips and cannot be restarted
the SCN file is	IME CC09B	1B CCS fails to start in Automatic
loaded.	IME CV35A	1A-A CCP fails to start in Automatic
		Selected 'A' Train Sefety Injection Loads fail to start
		automatically
1.	N/A	Raise Power to 13-15% in preparation for Main Generator Synchronization
2.	IMF NI04A f:0 k:2	Intermediate Range channel N-35 failure low TS evaluation- if required; <u>Support staff report</u> : When contacted, respond as MSS- inform the crew that IMs will report to the MCR in ~25 minutes.
3.	IMF RW01G f:1 k:4	Q-A ERCW Pump Over current trip
		<u>Support staff report</u> : When dispatched, wait ~5 minutes and report as the AUO that the pump motor is hot the touch. If dispatched, Report as the WCC SRO from the 1A-A 6.9 kV SDBd, the breaker relay target actuated is instantaneous
		overcurrent.
Booth	IUR ZDIX 567285 f:1	ERCW Pump Select Sw XS-67-285 to Q-A Pump; (simulates BO
Uperator:	(pre-insert)	Sequence failure
verity IOR		Support staff report: none
4.	IMF RX21 f:1 k:3	PT-1-33, Mn Stm Hdr PT Lo Failure;
		<u>Support staff report</u> : When dispatched, wait ~5 minutes and respond as TB AUO; report no apparent local failure indications.

# NRC 1009 ESG-3 Booth Instruction File

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EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH FEEDBACK
5.	IMF RC07A f:1 k:5	PORV 68-334 fails open. The PORV can be closed manually
		<u>Support staff report</u> : When MSS contacted, state that MSS will generate a WO to investigate the problem.
6.	IMF TH02B f:0.01 k:6	RCS Leak- Loop #2
		Support staff report: none
7. Modify Malf. At Rx Trin	MMF TH02B f:.025 r:300 IMF ED01 f:1 d:300 e:1	SBLOCA Loop #2 w/ Loss of offsite power (delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards
		<u>Support staff report</u> : If requested, wait ~5 minutes and report the SELD is experiencing grid instabilities;
8.	IMF EG08A f:1 e:2 IMF EG03B f:1 e:2 (pre-insert)	1A-A EDG fails to start in Automatic; 1B-B EDG trips and cannot be restarted;
		<u>Support staff report</u> : If dispatched, AUO reports no reason identified for 1A-A EDG failure to start; investigating 1B-B EDG start failure- nothing identified currently;
9.	IMF CV35A f:1 e:17	1A-A CCP fails to start in Automatic (following BO)
		<u>Support staff report</u> : If dispatched, AUO reports no apparent cause for auto-start failure;
		If requested, report 1A-A CCP Lube Oil local temperature, flow and pressure indications are normal and the auxiliary oil pump is running.
10.	IMF RP16K611A f:1 e:17	1A-A MD AFW Pump, Trn A SI signal to TDAFW Pump and ERCW Pumps J-A, Q-A, K-A and R-A (if selected) fail to automatically start
11. When directed	IRF IAR01 f:1 k:11 IRF IAR02 f:1 k:11	Locally starts both A & B Control Air Compressors
by Lead Examiner, insert		Support staff report: If requested by crew; in response to EA-32-2 to re-establish Control Air
12. When directed	IRF IAR06 f:2 k:12	Opens FCV-32-110.
by Lead Examiner, insert		<u>Support staff report</u> : Utilize after ~75 psig is developed in response to EA-32-1 to restore non-essential air to containment.
13. When directed	IRF EGR13 f:100 k:13	Opens VLV-35-568 to vent generator hydrogen to the roof
by Lead Examiner, insert		Support staff report: If requested by crew; in response to AOP- P.01 Step 11
Termination Cri	teria: ES-1.1, Post LOCA	Cooldown transition is determined



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Page 1

DELTA	REACTOF	POWER	ASSUMED	INSERTED	EXPECTED	DELTA RHC	BORON	DELTA	RECOMMEN	[RECOMMEN]	IODINE
TIME	POWER	DEFECT	ROD HT	WORTH	XENON	BORON	CONC	PPM	DILUTION	BORATION	CONC
(hrs)	(%)	(pcm)	(steps)	(pcm)	(pcm)	(pcm)	(ppm)	(ppm)	(gal)	(gal)	(% eq)
0	4.0	73.1	180.0	-430.8	-54.7		1710.0				0.1
1	9.0	160.6	182.0	-401.0	-55.6	58.6	1700.6	-9.4	371	0	0.7
2	15.0	262.1	186.5	-346.5	-63.8	55.1	1691.7	-8.9	351	0	1.8
3	15.0	262.6	187.0	-341.5	-79.9	11.8	1689.8	-1.9	75	0	3.1
4	18.0	310.8	188.0	-326.4	-102.9	56.0	1680.9	-9.0	357	0	4.5
5	20.0	343.5	189.0	-312.6	-132.7	48.7	1673.0	-7.8	312	0	5.9
6	22.0	375.0	190.0	-298.9	-168.7	53.8	1664.4	-8.6	346	0	7.4
7	27.0	452.4	196.0	-233.7	-211.0	54.4	1655.7	-8.7	351	0	9.1
8	30.0	498.7	200.0	-191.5	-259.7	52.9	1647.2	-8.5	343	0	11.0
9	30.0	499.8	200.0	-190.8	-314.3	54.9	1638.4	-8.8	357	0	12.8
10	30.0	500.8	201.0	-180.8	-373.0	49.8	1630.4	-8.0	324	0	14.5
11	30.0	501.8	202.0	-170.8	-434.3	52.3	1622.0	-8.4	342	0	16.1
12	30.0	502.8	203.0	-160.8	-496.9	53.7	1613.4	-8.6	352	0	17.4
13	30.0	503.8	204.0	-150.9	-559.9	54.0	1604.7	-8.7	356	0	18.7
14	30.0	504.8	205.0	-141.3	-622.2	53.8	1596.1	-8.6	356	0	19.8
15	30.0	505.9	207.0	-122.9	-683.5	43.8	1589.1	-7.0	291	0	20.8
16	30.0	506.7	208.0	-113.5	-743.0	51.0	1580.9	-8.2	339	0	21.7
17	30.0	507.7	209.0	-104.2	-800.6	49.2	1573.0	-7.9	328	0	22.5
18	30.0	508.6	209.0	-103.8	-855.9	55.8	1564.1	-8.9	373	0	23.2
19	30.0	509.6	209.0	-103.3	-908.7	53.4	1555.5	-8.6	359	0	23.9
20	30.0	510.7	209.0	-102.9	-958.9	50.8	1547.4	-8.1	342	0	24.5
1000	MWD/MTU	J	Hold Tavg	= Tref +/- 1.	5F			Total	6628	0	
6820	BAT ppm								Small hourly	boration/dilution	
	-								volumes may	y be accumulate	d
									for larger sin	gle additions	
Reason	for Maneuv	/er	Reactor/Pla	ant restart fo	llowing forc	ed outage- 3	30% hold				
Date			Today		<u> </u>	<u>v</u> -			· · · · · · · · · · · · · · · · · · ·		
RxEng N	Name		J. Sidekick								
Comme	nts		none								

1009 ESG-3 Page 1 of 5

Part 1 -					Today
1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 - 1996 -	Completed by Off-g	oing Shift / Reviewe	d by On-comina SI	nift	
Mode 2, PSA Risk	3-4% Power MWe		NRC pl	none Authentication Co	ode
Grid Ris	: Green				
RCS Lea	kage ID .02 gpm, UNID	.01 gpm		After 0800 YYYY	
		Common Te	ch Spec Actions		
l	_CO/TRM	Equipment INOP	Time INOP	Owner	RTS
1	None	None			
		U-1 Tech	Spec Actions		
	<u>CO/TRM</u>	Equipment INOP	Time INOP	Owner	<u>RTS</u>
1	None	None			
		Protecte	d Equipment		
• Non	e				
		Shift	Priorities		
Rais	se power to 13-15%; j	prepare for Main Gei	nerator Synchroniz	ation.	
Acc     Sec	tion 5.2 Step 3 Perfo	el fallures, CPL tren	ding not required p	prior to 50%.	
ano	ther SRO/RO:				
	· · · · · · · · · · · · · · · · · · ·		nne Kon in paraller	is being prep ed/brien	ed by
	· · · · · · · · · · · · · · · · · · ·	,	ine Kon in paraner	is being prep ea/brief	ed by
	,		me Kon în paraner	is being prep ea/brief	ed by
	,		me Kon in paraller	is being prep ea/brief	ed by
Part 2 -	Performed by on-co	ming shift		is being prep ea/brien	ed by
Part 2 –	Performed by on-co Verify your current qualifi	ming shift cations (re: OPDP-1 Secti	on 7.3 F.)	is being prep ea/brien	ed by
Part 2 –	Performed by on-co Verify your current qualifi Review Operating Log si	ming shift cations (re: OPDP-1 Secti nce last held shift or 3 day	on 7.3 F.) s, whichever is less.	is being prep ea/brien	ed by
Part 2 –	<b>Performed by on-co</b> Verify your current qualifi Review Operating Log si ew the following for change	ming shift cations (re: OPDP-1 Secti nce last held shift or 3 day es since last shift turnover:	on 7.3 F.) s, whichever is less.	is being prep ea/brien	ed by
Part 2 –	Performed by on-co Verify your current qualifi Review Operating Log si ew the following for change ODMIs/Standing Orders/ Shift Orders	ming shift cations (re: OPDP-1 Sections elast held shift or 3 day es since last shift turnover:	on 7.3 F.) s, whichever is less.	PERs (applicable to unit)	ed by
Part 2	Performed by on-co Verify your current qualifi Review Operating Log si ew the following for change ODMIs/Standing Orders/ Shift Orders TACFs	ming shift cations (re: OPDP-1 Sections nce last held shift or 3 day es since last shift turnover: LCO actions Operator workar and challenges	on 7.3 F.) s, whichever is less.	PERs (applicable to unit) Immediate required reading	ed by
Part 2	Performed by on-co Verify your current qualifi Review Operating Log si ew the following for change ODMIs/Standing Orders/ Shift Orders TACFs Performed by both c	ming shift cations (re: OPDP-1 Secti nce last held shift or 3 day es since last shift turnover: LCO actions Derator workar and challenges	on 7.3 F.) s, whichever is less.	PERs (applicable to unit) Immediate required reading	ed by

SHIFT TURNOVER CHECKLIST	Page 2. of 3	Today
	MAIN CONTROL ROOM (7690)	
<ul> <li>Train A Week</li> <li>0-SI-SXX-068-127.0 Appx. E, I Sect. 1.2.1.E.</li> </ul>	RCS & Pressurizer Temperature & P	ressure Limits in progress per
None	OUTSIDE (7666) [593-5214]	
None	AUXILIARY BUILDING (7775)	
• None		
• None	JRBINE BUILDING (7771) (593-8455	

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1009 ESG-3 Page 3 of 5

# SHIFT TURNOVER CHECKLIST

## Page 3. of 3

Today

PANEL	WINDOW	ANNUNCIATOR	WO / PER Number
		-	

### Equipment Off-Normal (Pink Tags)

UNID And Noun Name	Panel	Problem Description	WO / PER Number

#### MCR WO LIST

ID And Noun Name	Panel	Problem Description	WO/PER Number
-			

# UNIT ONE REACTIVITY BRIEF

# Date: Today Time: Now

	General Information						
RCS Boron: 1710 ppm Today	BA Controller Setpoint: <b>46.3</b> %	RCS B-10 Depletion: 52 ppm					
Operable BAT: A BAT A Boron: 6850 ppm BAT C Boron: 6850 ppm RWST Boron: 2601 ppm							
Nominal Gallons per rod step from 219: 7 gallons of acid, 50 gallons of water							
* Verify boric acid flow controller is set	at Adjusted BA Controller Setting iaw 0-	SO-62-7 section 5.1					
Esti	mated values for a 1° Change in Ta	IVE **					
Gallons of acid: 26	Gallons of water: <b>136</b>	Rod Steps: 3					
Estimated ro (Assuming Xenon equilibrium and	ds/boron for emergency step power no reactivity effects due to Xenon. 2/3 total r	er reduction ** eactivity from rods, 1/3 from boron)					
Power reduction amount	Estimated Final Rod Position	Estimated boron addition					
10%	196 Steps on bank D	99 gallons					
30%	173 Steps on bank D	292 gallons					
50%	151 Steps on bank D	481 gallons					
** These values are approximations by Rx Engineering or SO-62-7 calcu power operation only. Engineering d	and not intended nor expected to be exa lated values. These values are calculated ata last updated <b>one week ago</b> . Data Va	ct. The values may be superseded d assuming 100% steady state llid until <b>one week from now</b> .					
Pr	evious Shift Reactivity Manipulatic	ons					
Number of dilutions: 1	Number of borations: 0	Rod steps in: 0					
Gallons per dilution: 12	Gallons per boration: 0	Rod steps out: 0					
Total amount diluted: 12	Total amount borated: 0	Net change: 0 IN/Out					
Curren	t Shift Estimated Reactivity Manipu	llations					
Number of dilutions: *	Number of borations: 0	Pod atono in: 0					
Gallons per dilution: *	Gallons per boration: 0	Rod steps in: 0					
Total expected dilution: *     Total expected boration: 0     Net change: 0     In/Out							
Remarks: * Per the RE Reactiv Rx Power: 3-4% Last Dilution Comple	n: -54.7 pcm, equilibrium arium: 544 pcm						

Next Unit 1 Flux Map is scheduled - three weeks from now Unit 1 M-P is 0 PPM

Unit Supervisor:

Name/Date

	Operations Chemistry Information						
	Boron Results						
	Sample Point	Units	Boron	Date / Time	Goal	Limit	
	U1 RCS	ppm	1710	Today / Now	Variable	Variable	
	U2 RCS	ppm	816	Today / Now	Variable	Variable	
	U1 RWST	ppm	2601	Today / Now	2550 - 2650	2500 - 2700	
	U2 RWST	ppm	2569	Today / Now	2550 - 2650	2500 - 2700	
	BAT A	ppm	6850	Today / Now	Variable	Variable	
	BAT B	ppm	6850	Today / Now	Variable	Variable	
	BAT C	ppm	6850	Today / Now	Variable	Variable	
	U1 CLA #1	ppm	2556	Today / Now	2470-2630	2400-2700	
	U1 CLA #2	ppm	2575	Today / Now	2470-2630	2400-2700	
	U1 CLA #3	ppm	2591	Today / Now	2470-2630	2400-2700	
	U1 CLA #4	ppm	2589	Today / Now	2470-2630	2400-2700	
	U2 CLA #1	ppm	2531	Today / Now	2470-2630	2400-2700	
	U2 CLA #2	ppm	2650	Today / Now	2470-2630	2400-2700	
	U2 CLA #3	ppm	2522	Today / Now	2470-2630	2400-2700	
	U2 CLA #4	ppm	2526	Today / Now	2470-2630	2400-2700	
	Spent Fuel Pool	ppm	2547	Today / Now	<u>&gt;</u> 2050	<u>≥</u> 2000	
ACCURATE ACC	Li	thium Res	ults		Goal	Midpoint	
	U1 RCS Lithium	ppm	1.1	Today / Now	>1	>1	
	U2 RCS Lithium	ppm	2.43	Today / Now	2.18-2.48	2.33	

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Primary to Se	condary Lo	eakrate In	formation (Total	CPM RM-90-	99/119)
Indicator	Units	U1	Date / Time	U2	Date/Time
SI 50 S/G Leakage?	Yes/No	No	Today / Now	No	Today / Now
SI 137.5 CVE Leakrate	gpd	< 0.1	Today / Now	< 0.1	Today / Now
5 gpd leak equivalent	cpm	115	Today / Now	68	Today / Now
15 gpd (30 min increase)	cpm	265	Today / Now	83	Today / Now
30 gpd leak equivalent	cpm	490	Today / Now	206	Today / Now
75 gpd leak equivalent	cpm	1165	Today / Now	455	Today / Now
150 gpd leak equivalent	cpm	2290	Today / Now	870	Today / Now
CVE Air Inleakage	cfm	10	Today / Now	12.5	Today / Now
Bkgd on 99/119	cfm	40	Today / Now	40	Today / Now
Steady state conditions	are necessary	for an accurate	e determination of leak	rate using the CVE	Rad Monitor

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	Appendix D		Required Operator Actions Form E	ES-D-2
(	Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>1</u> Page <u>1</u> of	83
	Event Descriptio	on: Rais	ise plant power to 13-15% RTP	
	Time	Position	Applicant's Actions or Behavior	
	Simulator O	perator: No a	action required for event 1	
	Indications /	Available: Nor	one Applicable	
	T = 0	Crew will per Between 13%	rform power change IAW 0-GO-4, Section 5.2 Reactor Power Ascension To ⁄⁄8 And 15% RTP	)
		SRO	Direct a load increase in accordance with 0-GO-4, Reactor Power Asc To Between 13% And 15% RTP, Section 5.2, and 0-SO-62-7 Boron Concentration Control, Section 6.1 or Section 6.2.	ension
		NOTES: 1. 2. 3.	<ul> <li>Actions effecting reactivity are directed in the following step. 0-SO-62-7 requires shall be adhered to for reactivity changes (i.e. reactivity balance, amounts of acid or water). All appropriate verifications and peer checks shall be utilized of performance.</li> <li>Recommended dilution rate is 50 to 75 gallon batches every 12 to 15 minutes steady power increase. Rod movement should be limited to 1/2 step increment approximately every 1 1/2 minutes. Dilution and rod movement rates may be adjusted depending on SG level control stability.</li> <li>Control Rod withdrawal and / or dilution requirements may be significantly imply the change in core reactivity due to changing Xenon concentration.</li> </ul>	rements boric Juring 5 for a nts pacted
$\cap$		CREW	<b>INITIATE</b> a methodical and deliberate reactor power increase by manual adjustment of the control banks or by diluting the RCS.	ual
		CREW	WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Ur Narrative Log.	nit
		CRO	<b>MAINTAIN</b> the SG levels on program by periodically adjusting the feed bypass reg controller level setpoints using Appendix B and C.	dwater
	Evaluator No	te: The followi	ving Steps are from 0-SO-62-7 Boron Concentration Control, Section 6.2	, Dilute
		CAUTION 1:	When making an RCS dilution of $\geq$ 3000 gallons, it should be done in b with an RCS boron concentration verification at the halfway point (e.g. gallons). Allow at least 15 minutes between batches.	atches , 1500
		CAUTION 2:	Returning the Boric Acid Blender to service after unplugging, cleaning, maintenance on the Boric Acid System could introduce debris, sludge, chunks of solidified boron into the CCP suction resulting in pump dama Extreme care must be exercised to properly flush the Boric Acid Blend system following an outage.	, or air or age. ler
		NOTE 1: If a hea boi	an excessive amount of dilution is required (plant startup), the pressurize aters should be energized to cause pressurizer spray operation for equa pron concentration in RCS and pressurizer	ər alizing
$\bigcirc$		NOTE 2: Dill des per	lute mode will be used anytime a long-term positive reactivity addition is ssired. The operator should use the normal dilute mode whenever condition is srmit.	ions

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	Appendix D			Required Ope	rator Actions			Form ES	S-D-2
(	Op Test No.: Event Descriptio	<u>NRC</u> n: Rai	Scenario # se plant powe	3 r to 13-15% RTP	Event #	1	Page	_2_ of	83
	Time	Position	1		A				
	Evaluator No	<b>bilipticing</b> in the second	will be perfo lotes, recor or a steady ilutions will one-quarte for 963 galle [1] ENSU reacti	ormed based on nmended dilu power increa be divided ev er of the volun ons for the firs <b>JRE</b> unit is <u>NC</u> vity additions.	Applicant's Action for the RE-provic tion rate is 50 to se. During subs enly over each ho ne over each ho st hour)]. DT in a Tech Spo [C.1]	ded Rea 75 gal sequent nour as ur's pe ec or T	activity Spread lon batches ev t power escala determined b riod (e.g.: ~24 RM action that	Isheet; base very 12 to 1 ation, large y the crew [ 10 gallons, 4 t prohibits p	ed on 5 i.e.: I times ositive
		NOTE: H RO	UT level inc [2] ENSU expect	crease of 1% i IRE sufficient	s equal to 1380 capacity availat	gallons ole in th	s (TI-28 fig. 34 he HUT selecte	). ed to receive	Ð
				HUT A		_%	INITIALS	_	
$\bigcirc$		RO	[3] ENSURE makeup system is aligned for AUTO operation in accordance with Section 5.1.					nce	
		RO	[4] RECC conce	<b>)RD</b> the quan ntration using	tity of dilution wa Appendix D. (I	ater rec N/A for	uired to achie minor power o	ve desired l changes)	ooron
		NOTE Di th th	<b>NOTE</b> Due to eyeball interpolation the verified calculation may slightly differ from the initial calculation. The following signoff indicates that any differences in the two results have been discussed and are close enough to be considered validated.						
RO [5] PERFORM Appendix I Independent Verification of Calculation of Boric Acid or Primary Water. (N/A if App. D was performed verify data from Rx Engineering)					ulation for Ai rmed by SR	mount O to			
			(Step not	required pro	ονιαθά τη κητητ	urnov	er package)		
		RO	[6] PLAC to the	E [ <u>HS-62-14(</u> STOP positio	<b>)A]</b> , Boric Acid S n.	Supply	to Blender Flo	w Control S	witch
$\bigcirc$		RO	[7] PLAC positic	<b>E [<u>HS-62-14(</u></b> m.	)B], CVCS Make	eup Se	lector Switch t	o the <b>DILU</b> I	re

Appendix D		Required Operator Actions Form ES-D-
Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>1</u> Page <u>3</u> of <u>8</u>
Event Descripti	ion: Ri	aise plant power to 13-15% RTP
Time	Position	Applicant's Actions or Behavior
	RO	[8] ENSURE [HS-62-140D], Boric Acid Valve to the Blender is CLOSED (Green light is LIT).
	RO	[9] SET [FQ-62-142], Batch Integrator for the desired quantity
	NOTE I	Primary Water Flow Controller <b>[FC-62-142]</b> receives its reference signal (70 gpm) from setpoint potentiometer (dial indicator) located on panel M-6. A setpoint of 35% corresponds to a 70 gpm primary water flow rate
	RO	[10] ADJUST [FC-62-142], Primary Makeup Water Flow Controller for the desired flow rate
	RO	[11] PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control Switch to the START position.
	RO	[12] VERIFY the following;
		[a] Inlet to top of VCT [FCV-62-128] is OPEN. [b] Primary Water flow by [FI-62-142A] OR [FO-62-142]
	NOTE	
	NOTE A S E r v	Alternate dilution in small amounts is acceptable on a regular basis, provided n ignificant changes in seal water temperature or seal leakoff are indicated. Batches of 5 to 10 gallons may be added through FCV-62-144 on a frequency not to exceed once per 30 minutes. ICS points for No. 1 seal leakoffs and seal vater temperatures on the RCPs should be monitored during and after dilution.
	RO	[13] IF primary water addition to the bottom of the VCT [FCV-62-144] is desired, THEN
	RO	[a] CLOSE [FCV-62-128] with [HS-62-128].
	RO	[b] OPEN [FCV-62-144] with [HS-62-144].
	RO	[c] VERIFY Primary Water flow by [FI-62-142A] OR [FQ-62-142].
	NOTE If	may take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity and take approximately 15 minutes before any changes to reactivity 15 minutes before any c
		[14] MONITOR nuclear instrumentation and reactor coolant temperature ensure the proper response from dilution.

<u>NRC</u>	Scenario #	3	Event#	1	Dorro		
Rai	ico plont pouror			1	Page	(	)†
	ise plant power	to 13-15% F	RTP				
Position			Applicant'	s Actions or Be	ehavior		
	[15] IF   THEN OPEN:	LI-62-129 ENSURE S to diver	2], Volume Co [LCV-62-118 t excess water	ntrol Tank Le , Volume Co to the Holdu	vel, increas ntrol Tank [ p Tanks.	ses to 63 p Divert Val	vercen ve
	[16] WH	IEN dilutio	on is complete				
-	Position	Position [15] IF THEN OPEN [16] WH [a] PL	Position       [15]       IF [LI-62-129]         THEN ENSURE       OPENS to diverte         OPENS to diverte       [16]         WHEN dilution       [a] PLACE [HS-10]	Position       Applicant's         [15]       IF [LI-62-129], Volume Contraction         THEN ENSURE [LCV-62-118]       OPENS to divert excess water         OPENS to divert excess water       [16]         WHEN dilution is complete       [a] PLACE [HS-62-140A], Bote	Position       Applicant's Actions or Be         [15]       IF [LI-62-129], Volume Control Tank Le         THEN ENSURE [LCV-62-118], Volume Co         OPENS to divert excess water to the Holdu         [16]         WHEN dilution is complete, THEN         [a]         PLACE [HS-62-140A], Boric Acid to Black	Position       Applicant's Actions or Behavior         [15]       IF [LI-62-129], Volume Control Tank Level, increased THEN ENSURE [LCV-62-118], Volume Control Tank I OPENS to divert excess water to the Holdup Tanks.         [16]       WHEN dilution is complete, THEN         [a]       PLACE [HS-62-140A], Boric Acid to Blender Flow	Position       Applicant's Actions or Behavior         [15]       IF [LI-62-129], Volume Control Tank Level, increases to 63 p         THEN ENSURE [LCV-62-118], Volume Control Tank Divert Value         OPENS to divert excess water to the Holdup Tanks.         [16]       WHEN dilution is complete, THEN         [a]       PLACE [HS-62-140A], Boric Acid to Blender Flow Control State

	[16] WHEN dilution is complete, THEN
	[a] PLACE [ <u>HS-62-140A</u> ], Boric Acid to Blender Flow Control Switch to the STOP position.
	[b] IF [FCV-62-144] was previously OPENED, THEN CLOSE [FCV-62-144] with [HS-62-144].
	[c] VERIFY no primary water flow on either [FI-62-142A] OR [FQ-62-142].
	[d] ENSURE [FCV-62-128] is CLOSED
	[17] IF power increase in progress and additional dilutions will be required, THEN use this table to re-perform steps [4] through [18] (next page)
	[19] <b>REALIGN</b> the blender controls for <b>AUTO</b> makeup to the CVCS in accordance with Section 5.1.
	[20] ENSURE dilution(s) is logged in Unit Narrative Log.
NOTE S	Sample may be obtained at normal RCS sample intervals provided the unit is at over and the unit response following the dilution is as expected.
	[21] IF RCS boron sample is required, THEN NOTIFY Chem Lab to obtain RCS boron sample.

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Appendix D	Re	equired Op	perator Actic	ons		Form E	S-D-2
Op Test No.: <u>NRC</u> Event Description:	Scenario # Raise plant power to	3 0 13-15% R <sup>-</sup>	Event # TP	1	Page _	5 of	83
lime Positio	<u>n  </u>	-D	Applicant	t's Actions or Behavio	or st	- nd	
[4] RECORD the quantity concentration using A	of dilution water rec opendix D.	uired to ac	chieve desire	d boron		2	3'"
[5] PERFORM Appendix I	, IV of Calculation for	or amount	of BA or PW.		Quantity	Quantity	Quantity
[6] PLACE [ <u>HS-62-140A]</u> , STOP position.	Boric Acid Supply	to Blender	Flow Control	Switch to the	////	/ 1 <sup>st</sup> CV	$\frac{SRO}{1^{st}CV}$
[7] PLACE [ <u>HS-62-140B]</u> ,	CVCS Makeup Se	lector Swit	ch to the <b>DIL</b>	UTE position.			
[8] ENSURE [ <u>HS-62-140</u> [	Boric Acid Valve	to Blender	is CLOSED (	Green light LIT).			
[9] SET [FQ-62-142], Bate	ch Integrator for the	desired qu	lantity.		/ /		
[10] ADJUST [FC-62-142] rate.	, Primary Makeup \	Water Flow	/ Controller fo	or the desired flow	/ 1 <sup>st</sup> CV	/ 1 <sup>st</sup> CV	/ 1 <sup>st</sup> CV
[11] PLACE [ <u>HS-62-140A</u>	], BA Supply to Ble	nder Flow	Control Switc	h to <b>START</b> .	/ 1 <sup>st</sup> CV	/	/ 1 <sup>st</sup> CV
[12] VERIFY the following: [a] Inlet to top of VCT [b] Primary Water flow	[ [FCV-62-128] is O w by [FI-62-142A] o	PEN. or [FQ-62-1	142].				
[13] IF PW addition to top bottom of the VCT [F [a] CLOSE [FCV-62- [b] OPEN [FCV-62-1]	of VCT <b>[FCV-62-12</b> CV-62-144] is desir 128]with [HS-62-12 44] with <b>[HS-62-14</b> 4]	8] is not w ed, <b>THEN</b> 8]	arranted, but	PW addition to the			
Ici VERIFY Primary V	Vater flow by [FI-62	-142 <b>Δ</b> 1 or	[FO-62-142]				
[14] MONITOR nuclear ins	strumentation and re	eactor cool	ant temperat	ure to ensure the			
[15] IF [ <u>LI-62-129</u> ], VCT le [LCV-62-118], VCT D	vel, increases to 63 Divert Valve, <b>OPEN</b>	B percent, T S to divert	THEN ENSUI	RE to the HUTs.			
[16] WHEN dilution is com [a] PLACE [HS-62-1	plete, <b>THEN</b> 40A], Boric Acid to	Blender Fl	low Control S	witch to STOP		/	/
with [HS-62-144]	rv water flow on eit	her I <b>FI-62-</b>	142Al or IEO	- <u>CV-62-144</u> ]			
[d] ENSURE IFCV-62	2-128] is CLOSED	( <u> va</u>		<u></u>	<u>├</u>		
[18] IF Step [17] will be PERFORM the follo [a] PLACE IHS-62-1	repeated, THEN wing: 40B1, CVCS Make	ID Selector	Switch to the	e AUTO position			
[b] PLACE [ <u>HS-62-1</u> [c] ENSURE dilution	<b>40A]</b> , BA to Blende	r Flow Cor	ntrol Switch to	START position.	1 <sup>st</sup> CV		]

	Appendix D		Red	quired Op	perator Act	ions			Fo	orm ES	S-D-2
$\sim$	Op Test No.:	NRC	Scenario #	3	Event #		1	Page	6	of	83
Same 2	Event Description:	Rai	se plant power to	13-15% R	TP						

Time	Position	Applicant's Actions or Behavior
	0-GO-4, Sect	ion 5.2 Reactor Power Ascension To Between 13% And 15% RTP
	NOTE: The fee	ne steam generator level operator is in control of unit startup until the main edwater reg valves are in <b>AUTO</b> . <b>[C.5]</b>
	SRO	[1] <b>REVIEW</b> plant parameters and indications, <b>AND</b>
		VERIFY stability prior to reactor power escalation.
		NOTES:
	1) Adjusting b (Close blow	lowdown flow will provide an additional method of controlling SG water inventory. vdown isolation valves only if level cannot be maintained)
	2) Prior to inc	reasing reactor power above 5%, SG blowdown should be in service.
	3) Maximum I gpm is indi equals 5 gr analysis.	plowdown rate is less than or equal to 270 gpm. Each steam generator flow, up to 60 cated on panel L-357 located in the A.B. Supply Fan Rm. Minimum blowdown rate om for each steam generator. Final blowdown rate should be determined by chemical
	4) Computer ( 1F2261A.	points require a prefix 0, 1, or 2 be placed in front of the point number; for example,
	BOP	<ul> <li>[2] IF SG blowdown is in service, THEN ADJUST FIC-15-43 as desired. (plant computer pt. F2261A)</li> </ul>
	<b>NOTES:</b> 1)	Actions effecting reactivity are directed in the following step. 0-SO-62-7 requirements shall be adhered to for reactivity changes (i.e. reactivity balance, amounts of boric acid or water). All appropriate verifications and peer checks shall be utilized during performance.
	2)	Recommended dilution rate is 50 to 75 gallon batches every 12 to 15 minutes for a steady power increase. Rod movement should be limited to 1/2 step increments approximately every 1 1/2 minutes. Dilution and rod movement rates may be adjusted depending on SG level control stability.
	3)	Control Rod withdrawal and/or dilution requirements may be significantly impacted by the change in core reactivity due to changing Xenon concentration.

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Op Test No::       NRC       Scenario #       3       Event #       1       Page       7       of         Event Description:       Raise plant power to 13-15% RTP         Time       Position       Applicant's Actions or Behavior         R0       [3] INITIATE a methodical and deliberate reactor power increase by manu adjustment of the control banks or by diluting the RCS.         R0       Initiates a control rod withdrawal according to the Reactivity Plan         Evaluator Note:       Crew will coordinate control rod withdrawal and dilutions based on the RE-provided Reactivity Spreadsheet and would coordinate rod withdrawal and dilutions observing guidance the Step 3 NOTES above.         Evaluator Note:       Mode change call is made using Loop ΔT indications on the MCB and ICS, not NIs; NI may be referred to during the MODE change determination         Refer to 0-GO-4 Section 3.1, Precaution C, specifically bullets 2 & 3 (below):       •         •       When reactor power is less than or equal to 15%, use LEFM core thermal power indicator (U2118). If LEFM is NOT available, then continue using average loop ΔT up to 400 (U2118). If LEFM is NOT available, then continue using average loop ΔT up to 400 (U1118 will be used above 40% with LEFM unavailable).         RO       [4] WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Unit Narrative Log.         RO       [4] WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Unit Narrative Log.         RO       [5] UNIT 1 ONLY:         MODE	Appendix D	·	Re	quired O	perator Actions			Fo	orm ES	3-D-2
Event Description:         Raise plant power to 13-15% RTP           Time         Position         Applicant's Actions or Behavior           RO         [3] INITIATE a methodical and deliberate reactor power increase by manu adjustment of the control banks or by diluting the RCS. RO initiates a control rod withdrawal according to the Reactivity Plan           Evaluator Note:         Crew will coordinate control rod withdrawal and dilutions based on the RE-provided Reactivity Spreadsheet and would coordinate rod withdrawal and dilutions observing guidance the Step 3 NOTES above.           Evaluator Note:         Mode change call is made using Loop ΔT indications on the MCB and ICS, not NIs; NI may be referred to during the MODE change determination Refer to 0-GO-4 Section 3.1. Precaution C, specifically bullets 2 & 3 (below):           When reactor power is less than or equal to 15%, use average loop ΔT (UO485).           When reactor power is greater than 15%, use LEFM core thermal power indication (U2118). If LEFM is NOT available, then continue using average loop ΔT up to 40° (U1118 will be used above 40% with LEFM unavailable).           RO         [4] WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Unit Narrative Log.           RO         [4] WHEN reactor normally, both MCB and ICS indications are review for MODE transition verification. Crew member replaces the MODE 1 sign on 1-M-4 unde the clock.           BOP         [5] UNIT 1 ONLY: MAINTAIN the SG levels on program by periodically adjusting the feedwater bypass reg controller level setpoints using Appendix B and C BOP refers to appendices noted (included following this event guide) and maintains SG levels an	Op Test No.:	NRC	Scenario #	3	Event #	1	Page	7	of	83
Time         Position         Applicant's Actions or Behavior           RO         [3] INITIATE a methodical and deliberate reactor power increase by manu adjustment of the control banks or by diluting the RCS. RO initiates a control rod withdrawal according to the Reactivity Plan           Evaluator Note:         Crew will coordinate control rod withdrawal and dilutions based on the RE-provided Reactivity Spreadsheet and would coordinate rod withdrawal and dilutions observing guidance the Step 3 NOTES above.           Evaluator Note:         Mode change call is made using Loop ΔT indications on the MCB and ICS, not NIs; NI may be referred to during the MODE change determination Refer to 0-GO-4 Section 3.1, Precaution C, specifically bullets 2 & 3 (below):           •         When reactor power is less than or equal to 15%, use average loop ΔT (UO485).           •         When reactor power is greater than 15%, use LEFM core thermal power indication (U2118). If LEFM is NOT available, then continue using average loop ΔT up to 40 (U1118 will be used above 40% with LEFM unavailable).           RO         [4] WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Unit Narrative Log.           RO         [4] WHEN reactor power the SRO should announce transition to MODE 1 bas on Loop ΔT indication. Normally, both MCB and ICS indications are review for MODE transition verification.           RO         [4] WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Unit Narrative Log.           RO         [4] WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Get the step onto the MODE 1 sign on 1-M-4 unde the clock. <t< td=""><td>Event Description</td><td>on: Ra</td><td>iise plant power to</td><td>13-15% R</td><td>TP</td><td></td><td></td><td></td><td></td><td></td></t<>	Event Description	on: Ra	iise plant power to	13-15% R	TP					
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Evaluator Note:         Mode change call is made using Loop ΔT indications on the MCB and ICS, not NIs; NI may be referred to during the MODE change determination           Refer to 0-GO-4 Section 3.1, Precaution C, specifically bullets 2 & 3 (below):         •           •         When reactor power is less than or equal to 15%, use average loop ΔT (UO485).           •         When reactor power is greater than 15%, use LEFM core thermal power indication (U2118). If LEFM is NOT available, then continue using average loop ΔT up to 40° (U1118 will be used above 40% with LEFM unavailable).           RO         [4] WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Unit Narrative Log.           RO         RO would be monitoring this; any crew member may make the initial identification however the SRO should announce transition to MODE 1 bas on Loop ΔT indication. Normally, both MCB and ICS indications are reviewed for MODE transition verification.           Crew member replaces the MODE 2 sign with MODE 1 sign on 1-M-4 unde the clock.         [5] UNIT 1 ONLY: MAINTAIN the SG levels on program by periodically adjusting the feedwater bypass reg controller level selpoints using Appendix B and O BOP refers to appendices noted (included following this event guide) and maintains SG levels and program setpoints during the power increase.           [6] UNIT 2 ONLY:N/A	Evaluator No	ote: Crew wil Reactivit guidance	I coordinate co y Spreadsheet the Step 3 NC	ntrol rod and wou DTES ab	withdrawal and Ild coordinate r ove.	d dilutions ba od withdraw	ased on the al and diluti	RE-pı ons ol	rovideo bservir	ว่ าg the
Evaluator Note:         Mode change call is made using Loop ΔT indications on the MCB and ICS, not NIs; NI may be referred to during the MODE change determination Refer to 0-GO-4 Section 3.1, Precaution C, specifically bullets 2 & 3 (below):           •         When reactor power is less than or equal to 15%, use average loop ΔT (UO485).           •         When reactor power is greater than 15%, use LEFM core thermal power indication (U2118). If LEFM is NOT available, then continue using average loop ΔT up to 40 (U1118 will be used above 40% with LEFM unavailable).           RO         [4] WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Unit Narrative Log.           RO         [4] WHEN reactor power the SRO should announce transition to MODE 1 bas on Loop ΔT indication. Normally, both MCB and ICS indications are review for MODE transition verification. Crew member replaces the MODE 2 sign with MODE 1 sign on 1-M-4 under the clock.           [5] UNIT 1 ONLY:         MAINTAIN the SG levels on program by periodically adjusting the feedwater bypass reg controller level setpoints using Appendix B and O BOP refers to appendices noted (included following this event guide) and maintains SG levels and program setpoints during the power increase.										
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BOP       Crew member replaces the MODE 2 sign with MODE 1 sign on 1-M-4 under the clock.         BOP       [5] UNIT 1 ONLY:         MAINTAIN the SG levels on program by periodically adjusting the feedwater bypass reg controller level setpoints using Appendix B and C BOP refers to appendices noted (included following this event guide) and maintains SG levels and program setpoints during the power increase.         [6] UNIT 2 ONLY:N/A		SRO	RO would be identification on Loop ∆T in for MODE tra	monitori however ndication ansition v	ng this; any cro the SRO shou . Normally, bot erification.	ew member Ild announce h MCB and	may make t transition t ICS indicati	he init o MO ons ar	ial DE 1 b e revie	ased awed
BOP       [5] UNIT 1 ONLY:         MAINTAIN the SG levels on program by periodically adjusting the feedwater bypass reg controller level setpoints using Appendix B and C         BOP refers to appendices noted (included following this event guide) and maintains SG levels and program setpoints during the power increase.         [6] UNIT 2 ONLY:N/A			Crew member the clock.	er replace	es the MODE 2	sign with M	ODE 1 sign	on 1-	M-4 ur	nder
BOP refers to appendices noted (included following this event guide) and maintains SG levels and program setpoints during the power increase. [6] UNIT 2 ONLY:N/A		BOP	[5] UNIT 1 O MAINTA feedwate	NLY: IN the So or bypass	G levels on pro reg controller	gram by per level setpoir	iodically adj its using Ap	usting pendi	the x B an	d C.
[6] UNIT 2 ONLY:N/A			BOP refers to maintains SG	o append 6 levels a	ices noted (inc nd program se	luded follow tpoints durin	ing this eve ig the powe	nt guio r incre	de) and ase.	t
			[6] UNIT 2	ONLY:.	<b>N/A</b>					

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Appendix D		Required Operator Actions	Form ES
Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>1</u> Pa	age <u>8</u> of
Event Description	: Ra	ise plant power to 13-15% RTP	
Time	Position	Applicant's Actions or Behavior	
Evaluator Not	e: Accordir Step 6 is	g to turnover information, the crew will not prepare for no N/A for this exam.	or perform MT roll;
	N/A	[7] IF Turbine Roll in parallel with power increase is de THEN PERFORM Section 5.3 in parallel with the re- section.	esired, emainder of this
	RO	[8] IF the intermediate range rod stop setpoint is reach energizes, THEN	ed before P-10
		[8.1] <b>STOP</b> the power escalation.	
		[8.2] <b>CONTACT</b> Reactor Engineering to evaluate calibration. <b>[C.3]</b>	power range
	BOP	[9] WHEN reactor power is greater than or equal to 10 PRMs, THEN [C.1] [C.3]	% on at least 2 ou
		[9.1] VERIFY annunciator XA-55-4A, window D-5:	
		P-10 NUCLEAR AT POWER is LIT. PERMISSIVE	
	BOb	[9.2] VERIFY annunciator XA-55-4A, window B-5:	
		BLOCK is DARK.	
	RO	[9.3] <b>COMPARE</b> the highest reading PRM with the $\Delta T$ indication to be within 5% of each other.	highest reading lo
	RO	[9.4] IF the above conditional response is <b>NOT</b> atta THEN	ined,
		<ul><li>A. STOP the power increase.</li><li>B. NOTIEY the SRO</li></ul>	

Appendix D		Re	quired C	perator Actions			Form E	ES-D
Op Test No.:	NRC	Scenario #	3	Event #	1	Page	<u>9</u> of	
Event Descript	on: Ra	ise plant power to	o 13-15% F	RTP				
Time	Position			Applicant's	Actions or Bel	havior		
	NOTE: T	he following st	ten will h	lock both ID (25	%) and PP	(25%) low	nowor road	or tri
		no ronowing of	ich will p	IUCK DUIT IN (20		(20%) IOW p	power react	OF U.

	RO	[10.1] PLACE IRM TRIP BLOCK P-10 [HS-92-5003] AND [HS-92-5004] to BLOCK.
	BOP	[10.2] VERIFY annunciator XA-55-4A, window C-2:
		INTERMED RANGE TRAINS A & B TRIP BLOCKED is LIT.
Ċ	RO	[10.3] RELEASE [HS-92-5003] AND [HS-92-5004]. [10.4] PLACE PRM LOW POWER TRIP BLOCK P-10 [HS-92-5005] AND [HS-92-5006] to BLOCK.
	BOP	[10.5] VERIFY annunciator XA-55-4A, window D-1:
		POWER RANGE LOW SETPOINT TRAINS A & B TRIP BLOCKED is LIT.
		[10.6] RELEASE [HS-92-5005] AND [HS-92-5006].
		Step 11 NOTES: U2 Applicable Only
	CREW	[11] WHEN reactor power is between 13 and 15%, THEN
		[11.1] STOP power increase.
		[11.2] STABILIZE the plant.
	SRO	[12] IF rolling of second MFWP This step N/A

Appendix D		Required Operator Actions Form ES-D-2
Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>1</u> Page <u>10</u> of <u>83</u>
Event Descriptio	on: Ra	aise plant power to 13-15% RTP
Time	Position	Applicant's Actions or Behavior
	SRO	[13] IF unit shutdown is required This step N/A
	SRO	[14] <b>ENSURE</b> steps 5.2[1] through 5.2[11] of this section complete. (applicable steps)
		NOTE If Section 5.3 has already been initiated, then performance should continue at the step in effect.
	SRO	[15] IF rolling the turbine, THEN GO TO Section 5.3.
Lead oxamin	or mov ou - 4	END OF TEXT
Leau examin	er may cue t	ne next event after CREW has entered MODE 1

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Appendix D		Red	quired O	perator Actior	าร		Form E	S-D-2
Op Test No.:	NRC	Scenario #	3	Event #	1	Page	<u>11</u> of	83
Event Description:	Rai	ise plant power to	13-15% F	RTP				

(Page 1 of 1)

# FIGURE 1 STEAM GENERATOR LEVEL SETPOINT VS REACTOR POWER

#### NOTE

This figure does <u>NOT</u> represent the automatic S/G level program. The operating band provides a guide for Operators during Unit start-up and is intended to enhance S/G level control during transition from AFW level control to Bypass Reg valve control to Main Reg Valve control.



Appendix D

	Rec	quired Op	perator Actions			Form	ES-D-
Dp Test No.: NR	C Scenario #	<u>3</u>	Event #	1	Page	<u>12</u> or	f8
STARTUP			Unit		D	ate	
		App (Pag	endix C le 1 of 5)				
N	IFW REG AND M	FW BYF	PASS VALVI	E INSTRUC	TIONS		
1.0 MFW BYP	ASS CONTROLL	ER LE	/EL SETPOI	NT ADJUS	TMENTS		
		CA	UTION				
It is VERY import	ant that adjustm	ents to	MFW Reg va	alves are m	ade SLC	OWLY wi	th
over stressed as	it is a key point f	to veri to a suc	fy the desire cessful star	ed results. tun	This poi	nt canno	ot be
		N	OTES				**************************************
1) The SG MFW	Bypass controlle	r should	be adjusted	on only <u>ON</u>	<u>E</u> SG at	a time. <sub>I</sub> a	C.5]
<ol> <li>The SG MFW</li> <li>The MFW By</li> </ol>	Bypass controller	r should ould be i	be adjusted	on only <u>ON</u> prior to adju	<u>E</u> SG at sting set	a time. <sub>I</sub> e point valu	c.sj Je to
<ol> <li>The SG MFW</li> <li>The MFW By prevent control</li> </ol>	Bypass controller pass controller sho oller gain input cha	r should ould be ange.	be adjusted	on only <u>ON</u> prior to adju	<u>E</u> SG at sting set	a time. <sub>I</sub> n point valu	c.sj Je to
<ol> <li>The SG MFW</li> <li>The MFW By prevent control</li> <li>[1] WI adj</li> </ol>	/ Bypass controller pass controller sho oller gain input cho HEN MFW Bypass justment, THEN	r should ould be ange. s control	be adjusted in MANUAL   	on only <u>ON</u> prior to adju point require	<u>E</u> SG at sting set	a time. <sub>I</sub> r point valu	c.sj ue to
<ol> <li>The SG MFW</li> <li>The MFW Byprevent control</li> <li>[1] WI adjust</li> </ol>	Bypass controller sho oller gain input cha HEN MFW Bypass justment, THEN RFORM the follow ie: [c.5] (N/A value	r should ould be ange. s control wing ste es <u>NOT</u>	be adjusted in MANUAL j ller level setp ps on one M adjusted)	on only <u>ON</u> prior to adju point require FW Bypass	<u>E</u> SG at sting set s valve at	a time. <sub>R</sub> point valu	c.sj Je to
<ol> <li>The SG MFW</li> <li>The MFW By prevent control</li> <li>[1] WI adj</li> <li>PE tim</li> <li>[1.1]</li> </ol>	Bypass controller sho oller gain input cha HEN MFW Bypass justment, THEN RFORM the follow ie: [c.5] (N/A valve REFER TO Ap	r should ould be ange. s control wing ste es <u>NOT</u> opendix	be adjusted in MANUAL   ller level setp ps on one M adjusted) B for allowat	on only <u>ON</u> prior to adju ooint require FW Bypass	<u>E</u> SG at sting set s valve at	a time. <sub>R</sub> point valu	c.sj Je to
<ol> <li>The SG MFW</li> <li>The MFW By prevent control</li> <li>[1] WI ad</li> <li>PE tim</li> <li>[1.1]</li> </ol>	Bypass controller sho oller gain input cha HEN MFW Bypass justment, THEN RFORM the follow ie: [c.5] (N/A valve REFER TO Ap	r should ould be ange. s control wing ste es <u>NOT</u> opendix	be adjusted in MANUAL   ller level setp ps on one M adjusted) B for allowat	on only <u>ON</u> prior to adju point require FW Bypass ple setpoint. <b>SG-1</b>	<u>E</u> SG at sting set s valve at <b>SG-2</b>	a time. r point valu a <b>sg-</b> 3	c.5] Je to
<ol> <li>The SG MFW</li> <li>The MFW By prevent control</li> <li>[1] WI adj</li> <li>PE tim</li> <li>[1.1]</li> </ol>	Bypass controller sho oller gain input cha HEN MFW Bypass justment, THEN RFORM the follow ie: [c.5] (N/A valve REFER TO Ap	r should ould be ange. s control wing ste es <u>NOT</u> opendix	be adjusted in MANUAL   ller level setp ps on one M adjusted) B for allowat	on only <u>ON</u> prior to adju point require FW Bypass ple setpoint. <b>SG-1</b>	E SG at sting set s valve at SG-2	a time. r point valu a <b>SG-3</b>	c.5] Je to 
<ol> <li>The SG MFW</li> <li>The MFW By prevent control</li> <li>[1] WI adj</li> <li>PE tim</li> <li>[1.1]</li> </ol>	Bypass controller sho oller gain input cha HEN MFW Bypass justment, THEN RFORM the follow ie: [c.5] (N/A valve REFER TO Ap PLACE MFW	r should ould be ange. s control wing ste es <u>NOT</u> opendix Bypass	be adjusted in MANUAL j ller level setp ps on one M adjusted) B for allowat	on only <u>ON</u> prior to adju point require FW Bypass ple setpoint. <b>SG-1</b> □ MANUAL.	E SG at sting set s valve at SG-2	a time. r point valu a sg-3	c.5] µe to 
<ol> <li>The SG MFW</li> <li>The MFW By prevent control</li> <li>[1] WI adj</li> <li>PE tim</li> <li>[1.1]</li> </ol>	Bypass controller sho oller gain input cha HEN MFW Bypass justment, THEN ERFORM the follow ie: [c.5] (N/A valve REFER TO Ap PLACE MFW	r should ould be ange. s control wing ste es <u>NOT</u> opendix Bypass	be adjusted in MANUAL j ller level setp ps on one M adjusted) B for allowat	on only <u>ON</u> prior to adju point require FW Bypass ple setpoint. SG-1 D MANUAL. SG-1	E SG at sting set s valve at SG-2 C	a time. r point valu a SG-3 D SG-3	sc.5]
<ol> <li>The SG MFW</li> <li>The MFW By prevent control</li> <li>[1] WI adj</li> <li>PE tim</li> <li>[1.1]</li> </ol>	Bypass controller sho oller gain input cha HEN MFW Bypass justment, THEN ERFORM the follow ie: [c.5] (N/A valve REFER TO Ap PLACE MFW	r should ould be ange. s control wing ste es <u>NOT</u> opendix Bypass	be adjusted in MANUAL ( ller level setp ps on one M adjusted) B for allowat controller in	on only <u>ON</u> prior to adju point require FW Bypass ple setpoint. SG-1 D MANUAL. SG-1 D	E SG at sting set s valve at SG-2 C	a time. r point valu a SG-3 D SG-3	sc.5]

Appendix D	Req	uired O	perator Actions	3		Form	ES-D-2
Op Test No.: NR(	C Scenario #	3	Event #	1	Page	<u>13</u> of	83
Event Description:	Raise plant power to	13-15% R	TP				
[1.3]	<b>STABILIZE</b> S	G level	at a desired	level.			
				SG-1	SG-2	SG-3	SG-4 □
[1.4]	ADJUST cont monitoring SG	roller s i level.	etpoint in sma	all increment	s while		
				SG-1	SG-2	SG-3	SG-4 □
[1.5]	PLACE MFW I	Bypass	controller in	AUTO.			
				SG-1 □	SG-2	SG-3	SG-4 □
[1.6]	ALLOW the pla valve setpoint.	ant to s	tabilize befor	e adjusting a	another		
				SG-1 □	SG-2	SG-3 □	SG-4 □

## 2.0 DAMPENING SG LEVEL OSCILLATIONS WITH MFW BYPASS VALVES IN SERVICE

	NOTES
1)	Perform adjustments to one SG at a time. <u>Allow Plant Parameters to Stabilize</u> between valve adjustments. [c.5]
2)	The wide range level recorders may respond to a change in level before the narrow range indicators. [C.5]
3)	Indicated flowrate on the feed flow indicators may <u>NOT</u> reflect an accurate value of flow. The flow indication is to be used as a <u>reference value only</u> . [c.5]
4)	The following step may be performed any time SG level oscillates outside the SG level setpoint operating band of $\pm 5$ percent.

[1] IF required to dampen SG level oscillations at any time during SG level control with the MFW bypass controllers in AUTO, THEN

PERFORM the following: [c.s]

	ndix D	Rec	quired Op	erator Actions			For	m E	S-D-2
Op Tes	st No.: NRC	Scenario #	3	Event #	1	Page	14	of	83
Event [	Description:	Raise plant power to	13-15% RT	P					
	[1.1]	PLACE the M	FW Byp	ass controlle	r in MANUA	\L.			
	[1.2]	CHANGE valv	/e dema	nd position L	ESS THAN	_			
		10 percent in 1	ine oppo	site direction	i of valve tra	avel.			
	[1.3]	PLACE the M	FW Byp	ass controlle	r in <b>AUTO</b> .				
3.0	POSITION	ING MFW REG	VALVES	OFF SEAT	DURING U	NIT			
			N	OTES	·····		<u></u>		
1)	After a MFW R further until pla PARAMETERS KEY TO SMOO	eg is adjusted D nt stabilizes and S TO STABILIZE DTH POWER AS	O <u>NOT</u> SG leve BETWE CENSIO	increase read al returns to p EEN REG VA DN.	tor power c rogram. Al LVE ADJU:	or open M LOWIN STMENT	IFW Re 3 PLAN 'S IS TI	эд √T HE	
2)	Anticipate level	shrink when the	• MFW F	Reg comes of	f its seat. <sub>I</sub> a	2.5]			
3)	Use main feedv seat.	water flow indica	tion to d	etermine who	en MFW Re	g valves	come	off	
	[1] PER seat	FORM the follow	ving step	os to position	MFW Reg	valves of	ff		J
	[1.1]	<b>REVIEW</b> plant							
		opening.	parame	ters and indi	cations prio	r to initia	1		
		opening.	parame	ters and indi	cations prio <b>SG-1</b> □	r to initia sg-2 □	 SG-3 □		SG-4 □
	[1.2]	OPEN the MFV maintaining the and 60 percent	parame N Reg v e MFW I t open.	ters and indi alve in small 3ypass valve	cations prio SG-1 D increments between 2	r to initia sg-2 □ while	I SG-3 □		SG-4 □
	[1.2]	OPEN the MFV maintaining the and 60 percent	parame N Reg v e MFW I t open.	ters and indi alve in small 3ypass valve	cations prio SG-1 I increments between 2 SG-1 I	r to initia SG-2 while 5 SG-2 □	SG-3		SG-4 □ SG-4 □
	[1.2] [1.3]	OPEN the MFV maintaining the and 60 percent ENSURE MFV Reg valve is op	parame V Reg v e MFW E t open. / Bypase pened.	ters and indi alve in small 3ypass valve s valve starts	cations prio	r to initia SG-2 While 5 SG-2 C en MFW	SG-3		SG-4 SG-4

Append	Appendix D Required Operator Actions							Form	ES-D-2
Op Test Event De	No.: <u>NRC</u> escription:	Scenario # Raise plant power to	3 o 13-15% R	Event # TP		1	Page	<u>15</u> o	f <u>83</u>
	[1.4]	ENSURE SG setpoint when	level ret	urns to Mf eg valve i	-W Byp s adjus	ass cor ted.	ntroller		<u></u>
						SG-1	SG-2	SG-3 □	SG-4 □
	[1.5]	ENSURE SG performing su	level and bsequen	d MFW sy it valve ad	stem sl justme	tabilizes nts.	before		
						SG-1	SG-2	SG-3	SG-4
3.0	POSITIONI STARTUP	NG MFW REG (continued)	VALVES	OFF SEA	<b>\T DUF</b>	RING UI	NIT		
							D	D	
4.0	PLACING I	MFW REG VAL	VES IN A		<b>TIC</b>				
2) [ s	Both MFW Re simultaneous	eg and MFW By ly for an extend	pass co ded peri	ntrollers s od. [C.5].	should	NOT b	e left in ,	AUTO	
	[1] WH PEF	EN desired to pl RFORM the follo	lace MFV wing:	V Reg val	ves in <i>I</i>	AUTO, <sup>-</sup>	THEN		a Lande <u>s <u>an</u>te de la composition de la composition</u>
	[1_1]	ADJUST SG	level to S	SG progra	m level	setpoir	nt,		
		ADJUST the l deviation (bet while matchin	MFW Re ween -5 g steam	g valve to percent ai and feed t	obtain nd +5 p flows.	near ze ercent)	ero		
						SG-1	SG-2	SG-3	SG-4 □
	[1.2]	WHEN contro	ller devia	ation is ne	ar zero	, THEN			
		PLACE the M	FW Reg	valve in A	UTO.				
						SG-1	SG-2	SG-3	SG-4 □
Appendi								3 1021 Re	evision 9

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	Appendix D		Re	quired O	perator Act	ions			Form F	-S-D-2
(	Op Test No.:	NRC	Scenario #	3	Event #		1	Page	<u>16</u> of	83
and the second s	Event Description:		Raise plant power to	13-15% R	TP					
		[1.3]	VERIFY the I	MFW Re	eg valve is	s contro	Illing SG I	evel.		
							SG-1	SG-2	SG-3	SG-4 □
		[1.4]	PLACE the a	associate	ed MFW E	Bypass	valve in <b>I</b>	MANUAI	-	
							SG-1	SG-2 □	SG-3 □	SG-4 □
		[1.5]	CLOSE the I AND	MFW By	pass valv	e in sm	all incren	nents,		
			ENSURE the level.	MFW F	Reg valve	respon	ids to con	trol SG		
			,				SG-1	SG-2 □	SG-3	SG-4 □
press.		[1.6]	WHEN MFW	Reg va	lve is con	trolling	SG level,	THEN		
			PROCEED T	' <b>O</b> anoth	ier SG loo	p.				
							SG-1	SG-2 □	SG-3	SG-4 □
				[End o	f Append	ix]				

Appendix D Required Operator Actions					Form E		
Op Test No.:	NRC	Scenario #	3	Event #	2	Page	17 of
Event Description	n: Inter	rmediate Range	channel N	l-35 failure low (>{	5% RTP at initiation	)	
Time	Position			Applicant's	Action or Behavio	rs	
Simulator Op	perator: at Lea	d Examiner	directio	n, insert Event	2		
Indications/A Indications	llarms s	<u></u>					
• 1-XI-92 • 1-XI-92 • 1-XR-9	2-5003A IRM % 2-5011C, IRM-S <sup></sup> 2-5001, NUCLE	POWER N-35 TARTUP RAT AR POWER I	indicator E N-35 in NR-45 Re	r fails to '0'. dicator trends d corder selected	own then stabili trace goes to '0'	zes at '0'.	
1-M-13 • 1-XI-92	-5003B NEUTR	ON FLUX INT	ERMEDI	ATE RANGE ind	icator fails to '0'		
T = 20	Crew	Respond to failure will b	MCR inc	dications; no ala	arms associated	l with this fa	ailure; N-
		AOP-I-01,	Section 2	2.0 OPERATOR	R ACTIONS	onitoring.	
		1. DIAGN	<b>OSE</b> the	e fallure:		T	
		IF				GO TO SECTION	PAGE
		Source F	Range Failu	re		2.1	4
		Intermed	liate Range	Failure		2.2	9
	-	Power R	ange Failur	e		2.3	14
	SPO	US may use	e AOP-I.(	01,Nuclear Instr	ument Malfunct	ion Sectior	12.2.
	0110	Intermediat	e Range	Failure:			
	SRO	conditions v	a new r while this	instrument mal	sheet to level p function is addre	ower/main essed.	tain MOE
	CAUTION 1	lf reactor inoperabl	power is e channe	below P-6 (10 <sup>-4</sup> I prior to raising	%), Tech Specs J power above P	require res -6.	toring
	CAUTION 2	If reactor restoring	power is inoperab	above P-6 but b le channel prior	elow 5% power, to raising powe	, Tech Spec er above 5%	s require
	NOTE 1	If Intermedi P-10 (10%) will be corre	ate Range will resulf cted whe	e channel is faile t in a reactor trip. In the channel is	d high, reducing If control power bypassed in Step	reactor pow • is available o 6.	er to less , this con
	NOTE 2	If any IR ch indication m	annel has 1ay be dis	a failed high, ther abled. (SRMs m	automatic re-en ay require manu	abling of Sc al reinstatin	ource Ran g in ES-0.
,	NOTE 3	Failure of In Channel	Itermedia	te Range Chann	el may affect ass	ociated Sou	Irce Rang

Appendix D		Required C	Operator	Actions		*****	Fo	rm ES	S-D-2
Op Test No.:	NRC	Scenario #	3	Event #	2	Page	18	of	83
Event Description:	inte	rmediate Range o	channel N	-35 failure low (>	5% RTP at initiat	tion)			
Time	Position			Applicant's	Action or Beha	viors			
	RO	1. IF unit i	s in Mo	de 2, <b>THEN S</b> 1	ABILIZE rea	ctor power	at cur	rent le	evel.
		2. EVALUA	TE the	following Tech	Specs for app	plicability:		<b></b>	
		• 3.3.1.1 (3	3.3.1), R	eactor Trip Sys	stem Instrume	entation			
	SRO	- Actions 3c 10%of RATE	& d, (Fr ED THEI	om Table 3.3-1 RMAL POWER	functional un , POWER OF	iit 5)Applio PERATION	əs – Ał may c	bove 5 :ontini	5% & ue;
		TS 3.0.3. is	N/A						
		AND							
		• 3.3.3.7, A	Accident	Monitoring Ins	trumentation				
		Action 1 (Fro	om Table instrume	e 3.3-10 Instrur ent or Ht Stby v	nent 17) Appl //i 6 hrs. & Ht	ies - within SD w/i foll	30 day owing	ys, rei 6 hrs.	turn
Evaluator Note	e: TSs 3.3.3. Source R	.5 and 3.9.2 wo	ould not	be applicable v	vith this failur	e since the	assoc	iated	
		3. CHECK	at least	one Intermedia	te Range cha	annel OPE	RABLE		
	RO	RO should inc Recorder is re	licate N3 -selecte	6 is reading accu d to an operating	urately and also channel.	o re-select c	or indica	ate NR	-45
		CAUTIONS:	Loss of trip sig	of instrument OR ( gnal.	control power w	/ill cause a s	ingle ch	iannel i	reactor
			For los Reduc	ss of control powe	er only, the read r below P-10 wil	tor trip sign I result in a i	al canno reactor 1	ot be by trip.	ypassed
		NOTE: The f N/A-	ollowing	table lists Inte	rmediate Rar	nge NIS po	wer su	pplies	i
		RO verifies I fuses not blo	nstr Pwr wn on N	and Cont Pwr 4-13 N35 drawe	indicators lit a	and Instr a	nd Cor	ıt Pwr	
	RO	4. CHECK • INSTE	Dower a RUMENT tor LIT	vailable to faile POWER ON	d Intermediat	e Range cl	nannel	: [M-1	3]
		AND							

CONTROL POWER ON indicator LIT

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Appendix D		Required Operator Actions Form ES-D-
Op Test No.: Event Description:	NRC	Scenario # <u>3</u> Event # <u>2</u> Page <u>19</u> of <u>8</u> rmediate Range channel N-35 failure low (>5% RTP at initiation)
Time	Position	Applicant's Action or Behaviors
	RO	5. <b>IF</b> required to monitor IR channel on NR-45 recorder, <b>THEN ENSURE</b> OPERABLE IR channel selected on NR-45 Recorder. [M-4]
	RO	6. PLACE Level Trip switch for failed channel in BYPASS [M-13, N35/N36
	N-4 E1	
		Isure RO performs following actions at NI Panel, M-13.
	κυ	<ul> <li>IT control power is available, THEN PREFORM the following:</li> <li>a. VERIFY NIS TRIP BYPASS annunciator LIT [M-6A, A-1].</li> <li>b. VERIFY appropriate annunciator LIT:</li> <li>1. INTERMEDIATE RANGE TRIP BYPASS CHANNEL I [M-4A, A-2)</li> </ul>
		2. INTERMEDIATE RANGE TRIP BYPASS CHANNEL II [M-4A, B-
	SRO	SRO directs as the RO performs steps 6 - 9:
	RO	8. CHECK associated Source Range Channel NOT affected
	SRO	9. GO TO appropriate plant procedure.
		END OF SECTION
Evaluator Note:	The follow	ving CREW Brief and Notification actions are not contained in the procedure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		Notifications should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		<u>Operations Management</u> - Typically Shift Manager. <u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). ( <b>Note:</b> Maintenance notification may be delegated to the Shift Manager).
Lead Examiner	may cue ne	ext event when Technical Specifications are identified.

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Appendix D		Required Operator Actions	Form ES-D-2
Op Test No.:	NRC	Scenario #3 Event #3 Page20	) of <u>83</u>
Event Description	n: Q	A ERCW Pump Over current trip w/ BO Sequencer Failure	
Time	Position	Applicant's Actions or Behavior	
Simulator Op	erator: at Lea	d Examiner direction, insert Event 3	
Indications/A Annunciat 0-M-27A 0-XA-55-27	llarms ors: /A A-1: "UNIT C-2: "PUMP	1 HEADER A PRESSURE LOW Q-A DISCH PRESS LOW	
0-M-27B : ● 0-XA-5	5-27B-A E-4:"	ERCW/CCS PUMP MOTOR TRIP"	
Indication 0-M-27A • ERCW	IS HDR 1A SUPP	LY FLOW 1-FI-67-61: shows decreasing trend (to single pump co	onditions)
<ul> <li>ERCW</li> <li>ERCW</li> <li>ERCW</li> <li>ERCW</li> <li>ERCW</li> <li>ERCW</li> </ul>	HDR 1A SUPP HDR 2A SUPP HDR 2A SUPP PUMP Q-A MO PUMP Q-A 0-H	LY PRESS, 1-PI-67-493A: shows decreasing trend (to single pum LY FLOW 2-FI-67-61: shows normal steady trend. LY PRESS, 2-PI-67-493A: shows normal steady trend. TOR AMPS, 0-EI-67-459A: shows '0' amps. S-67-460A Handswitch White and Green Indicating Lights are illu	p conditions) iminated.
T = 30	CREW	Respond in accordance with Alarm Response Procedures; Refers US to AOP-M.01 as determined in 0-AR-M27-A, C-2; (other ARPs may also apply)	
	SRO	US may use AOP-M.01, LOSS OF ESSENTIAL RAW COOL Section 2.1, ERCW Pump(s) tripped or failed	NG WATER
	BOP	1. <b>IDENTIFY</b> and <b>LOCK OUT</b> failed ERCW pump.	
	BOP	<ol> <li>START additional ERCW pumps as required to maintain pressure between 78 psig and 124 psig.</li> </ol>	supply header
	BOP	3. CHECK two Train A ERCW Pumps AVAILABLE.	

Appendix D

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Appendix D	R	equired O	perator Actio	ns			Form E	S-D-2
Op Test No.:	NRC Scenario #	3	Event #	3	Page	21	of	83
Event Description:	Q-A ERCW Pur	np Over cu	rrent trip w/ B	O Sequence	er Failure			

Time	Position	Applicant's Actions or Behavior
	BOP	4. CHECK 1A and 2A ERCW supply header pressures and flows NORMAL:
		a. Supply header pressures [between 78 psig and 124 psig]:
		<ul> <li>1-PI-67-493A</li> </ul>
		• 2-PI-67-493A
		<ul> <li>b. Supply header flows [expected value]:</li> </ul>
		• 1-FI-67-61
		• 2-F1-67-61
	BOP	5. CHECK 1B and 2B ERCW supply header pressures and flows NORMAL:
		a. Supply header pressures [between
		78 psig and 124 psig]:
		• 1-PI-67-488A
		• 2-PI-67-488A
		b. Supply header flows [expected value]:
		• 1-FI-67-62
		• 2-FI-67-62
	CREW	6. <b>DISPATCH</b> personnel to inspect failed pump(s) and determine cause for failure.
	SRO	7. NOTIFY STA to evaluate Tech Spec LCO 3.7.4, ERCW System, for both units.
		3.7.4, Essential Raw Cooling Water System
		<ul> <li>Restore inoperable pump w/i 72 hrs. or Ht Stby w/i next 6 hrs and Cld SD w/i the following 30 hrs. (Action applicable until Transfer Switch 0-XS-67- 285, ERCW PUMPS J-A &amp; Q-A DG POWER SEL is re-selected to the OPERABLE pump, in this case the J-A position.</li> </ul>

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Appendix D		Required Operator Actions	Form ES-D-2			
Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>3</u> Page				
Event Description	: Q-	A ERCW Pump Over current trip w/ BO Sequencer Failure				
Time	Position	Applicant's Actions or Behavior				
	BOP	8. CHECK ERCW pump loading amps NORMAL.				
	BOP	9. TRANSFER emergency power selector switch aw	ay from failed pump.			
Evaluator Not	e: ERCW Pu BO Seque	mp Select Sw XS-67-285 is overridden to the 'Q-A pos nce failure preventing J-A ERCW Pump automatic star	ition' which simulates t later in this scenario.			
	SRO	10. EVALUATE need to close and place clearance or valve for failed nump	n manual discharge			

	SRO	11. GO TO appropriate plant procedure.
<b>Evaluator Note:</b>	The follow	ing CREW Brief and Notification actions are not contained in the procedure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). ( <b>Note:</b> Maintenance notification may be delegated to the Shift Manager).
Lead Examiner	may cue the	e next event when US directs return to appropriate plant procedures.

Lead Examiner may cue the next event when US directs return to appropriate plant procedures.

Appendix D		Re	quired O	perator Actio	ns		F	orm ES	S-D-2	
Op Test No.:	NRC	Scenario #	3	Event #	4	Page	23	of	83	
Event Description:	P	T-1-33, Main S	team Hdr	Pressure Tran	smitter Lo	Failure				
Time	Position			Applicant	's Actions o	or Behavior				
Simulator Ope	rator: at Lea	ad Examiner	directior	i, insert Eve	nt 4					
Indications/Ala Indications 1-M-3: • 1-SI-46-2	arms 20A, MFPT 1 <i>1</i>	A Speed Indica	tion decr	easing;						
• 1-PI-3-66	6A, MFP 1A C	Outlet Pressure	indicatio	on decreasing	;					
• 1-FI-3-70	, MFP 1A Ou	tlet Flow indic	ation dec	reasing						
1-M-4: 1-XX-55- LOOPS LOOPS down; LOOPS down; 1-XI-1-33 1-PIC-1-3 Annunciator 1-M-5A 1-XA-55- Other Symptoms	4A, Steam D 1-4 SG-1,2,3,4 1-4 SG-1,2,3,4 1-4 SG-1,2,3,4 5, Steam Dur 33, Steam Dur 55 Window B 55 Window B 55 Deviations normal fee • Feedw • Level o	ump Valve Sta 4 STM Flow ind 4 FW Inlet Flow 4 LEVEL -NR in p Demand Ind mp Pressure ( 3-7, LS-3-42D s or unexpected dwater system: vater flow dropp dropping in all s	tus Panel dicators: v indicator ndicators licator go Controller STEAM G indication ing to all s team gen	: all 12 Steam 2 Channels p ors: 2 Channels : 3 Channels ing down 7 Green (dim) EN LVL HIGH s on any of the steam generate	Dump Va ber SG (8 to els per SG per SG (1) indicator I -LOW DEV e following	lives going c otal indicato (8 total indica 2 total indica Dar graph go /IATION may indicate	losed/clos rs) flow ga ators) flo tors) leve ing down	sed; oing do w going I going tion of tl	he	
T = 30	CREW	Observes in	dications	/symptoms s	necified al	hove and dia	anoses	wont.		
Evaluator Note	: The failure 1A Main F result late DEVIATIO restore/co go closed	e affects Stean Feed Pump to r (i.e.: 1-AR-M DN). Crew's p ontrol SG level . Then, the slo	n Dumps minimum I5A, B-7, rimary ef s followe ower mov	, which close a speed. The LS-3-42D ST forts will be to d by RCS ter <i>v</i> ing RCS ten	, and Maii re are no FEAM GEI o gain cor nperature nperature	n Feed Pum initiating ala NERATOR I itrol of Main control as ti change will	p Control rms; only _EVEL HI Feed Pur ne Steam be identifi	will dri alarms GH-LC np flow Dumps able by	ve s that W v and s will / the	
DEVIATION). Crew's primary efforts will be to gain control of Main Feed Pump flo restore/control SG levels followed by RCS temperature control as the Steam Dum go closed. Then, the slower moving RCS temperature change will be identifiable if SG atmospheric relief valves' operation. <b>0-SO-1-2, STEAM DUMP SYSTEM Section 7.1 Steam Dump System Shutdow</b> RCS temperature control on the SG atmospheric relief valves follows AOP-S.01 S 2.3 guide										

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Appendix D		Required Operator Actions Form ES-D-2
Op Test No.:	NRC	Scenario #3 Event #4 Page24 of83
Event Description:	F	PT-1-33, Main Steam Hdr Pressure Transmitter Lo Failure
Time	Position	Applicant's Actions or Pobovier
	000	SRO implements AOP-S 01 Loss Of Normal Feedwater Section 2.3 Loss of
	SRU	Main Feedwater Pump Control:
	SRO	SRO directs Section 2.3 Immediate Operator Actions (IOAs)
		NOTE: Step 1 is an IMMEDIATE ACTION.
	BOP	1. <b>RESTORE</b> feedwater pressure:
		a. PLACE affected MFP speed controller(s) in MANUAL:
		MFPT 1A(2A) & 1B(2B)     Speed Control
		OR
		MFPT 1A(2A) Speed Controller
		OR
		MFPT 1B(2B) Speed Controller
	BOP	<ul> <li>ADJUST speed on affected MFP(s) to restore feedwater pressure to normal (~1040 psig at full power).</li> </ul>
	BOP	2. DETERMINE IT MEP trip is needed:
		a. CHECK BOTH MFWPs in service. (RNO Required)
		RNO:
		RNO 1 <sup>st</sup> condition N/A- adequate MFW is available:
		a. IF reactor power is greater than AFW flow capability (~ 3%) AND
		adoquato recumator nom OANNOT be maintained
	BUP/	RNO 2 <sup>nd</sup> condition N/A- adequate MFW is available:
	Crew	AND S/G levels CANNOT be controlled with main feedwater
		RNO 3 <sup>rd</sup> condition implemented:
		IF only one MFWP is in service, THEN GO TO Caution prior to Step
	BOP	3. MAINTAIN steam generator level(s) on program. [with manual MEP Cor

Appendix D			Form ES-D-2						
Op Test No.:	NRC	Scenario #	3	Event #	4	Page	25	of	83

Event Description:

PT-1-33, Main Steam Hdr Pressure Transmitter Lo Failure

N	NOTE: Ap	pendix C may be used to determine program feedwater D/P for current power
		perias e may be deed to determine pregram recurrent bit for current power,
	[Ap	opendix C attached to end of this event guide]
	BOP	4. <b>MAINTAIN</b> MFP discharge pressure on program <b>USING</b> ICS or available control board indications.
C	CAUTION:	Reactor operation at low power levels for extended periods may challenge reactivity control due to xenon changes.
	RO	5. CHECK Reactor power greater than 5%.
	CREW	6. INITIATE repairs on failed equipment.
	SRO	7. GO TO appropriate plant procedure.
		END OF SECTION - AOP-S.01 Section 2.3

Appendix D	Required Operator Actions						F	orm E	S-D-2
Op Test No.:	NRC	Scenario #	3	Event #	4	Page	26	of	83
Event Description:		PT-1-33, Main S	team Hdr	Pressure Tran	smitter Lo F	ailure			

Time	I	Position	<u> </u>	Applicant's Actions or Behavior								
				0-SO-1-2, Steam Dump System Section 7.1, Steam Dump System Shutdown								
		BOP	[1]	<ol> <li>IF necessary to transition from steam dumps to S/G atmospheric relief valves for RCS temp control, THEN PERFORM the following:</li> </ol>								
		BOP		[1.1] ENSURE S/G atmospheric relief valve controllers set at 84% (1005 psig) or as required for current RCS temp and output signal approximately zero:								
		S/G		PIC	SETPOINT	OUTPUT	INITIALS					
	#1			PIC-1-6A	84% (1005 pisg) or as required	~ 0						
				PIC-1-13A	84% (1005 pisg) or as required	~ 0						
		#3		PIC-1-24A	84% (1005 pisg) or as required	~ 0						
		#4		PIC-1-31A	84% (1005 pisg) or as required	~ 0						
		BOP	[1.2] SLOWLY RAISE [PIC-1-33] Steam Dump Pressure Control setpoint.									
			Step is N/A due to PT-1-33 failure									
Evaluator No	te:	SRO direc to maintai	rts <u>O</u> in un	<u>R</u> BOP operator adju it in MODE 1.	ists SG Atmospheric	Relief Valves	as necessary					
		BOP	[1.3] <b>ADJUST</b> S/G atmospheric relief valve setpoints to maintain desired RCS temperature.									
		BOP	]	1.4] WHEN steam du valves are controll	mp valves fully closed ing RCS temperature,	AND atmosphe THEN	eric relief					
				[1.4.1] <b>PLACE [H</b>	S-1-103A] Steam Dum	np Control in Ol	FF position.					

Appendix D		Required Operator Actions Form ES-D-2							
Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>4</u> Page <u>27</u> of <u>83</u>							
Event Description:	P	T-1-33, Main Steam Hdr Pressure Transmitter Lo Failure							
Time	Position	Applicant's Actions or Behavior							
		0-SO-1-2, Steam Dump System Section 7.1, Steam Dump System Shutdown							
		[1.4.2] PLACE [HS-1-103B] Steam Dump Control in OFF position.							
		[2] IF RHR cooling is established							
		Step is N/A (including NOTE preceding step and following substeps)							
		END OF TEXT							
Evaluator Note:	The follow	ving CREW Brief and Notification actions are not contained in the procedure.							
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.							
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.							
		Operations Management - Typically Shift Manager.							
		Namenance Personnel – Typically Maintenance Shift Supervisor (MSS).							

are stabilized in manual control.

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Appendix D	Re	quired C	perator Actions	;		For	m ES	-D-2
Op Test No.: N	RC Scenario #	3	Event #	5	Page	29	of	83
Event Description:	PORV 68-334 fails o	ppen (can	be closed manuall	y)				
Simulator Operator:	at Lead Examiner	directio	Applicant's	Actions or Beha	ivior			
Indications/Alarms: Indications 1-M-4: • 1-XX-68-363A, noise; • 1-TI-68-331: 68	PZR PORV ACOUST 3-340.334, XE-340.33	IC MONI <sup>*</sup> 4 TAILPII	FORS: XI-68-33 PE TEMPS	4A indicates e	elevated acc	oustic (1	flow)	
<ol> <li>1-M-5</li> <li>RCS PR PRESS</li> <li>PRT LEVEL, 1- open)</li> <li>PRT PRESSUR remained open</li> <li>PRT TEMPERA remained open</li> <li>RCS PZR PRES PORV remained</li> <li>RCS LOOP 1 H proportional to</li> </ol>	S (Chs 1-4), 1-PI-68-3 LI-68-300 shows an i E, 1-PI-68-301 shows ) TURE, 1-TI-68-309 s ) S Recorder 1-PR-68 d open L WIDE RANGE PRE time PORV remaine	40A, 334 increasin s an incre hows an -340 sho SS Reco d open	, 323, 322: shov g trend (magnit easing trend (m increasing tren ws a decreasing rder 1-PR-68-69	ving RCS (Pzr ude proportio agnitude prop d (magnitude g pressure tre shows a dec	) pressure g mal to time portional to proportiona and proporti reasing pre	going d PORV r time PC al to tim ional to	own; remair DRV ne POF time rend	ned RV
1-M-6 • RCS WR HL PR • RCS HL PRESS • RCS HL PRESS Annunciators: 1-M-5 • 1-XA-55-5A D- • E- • 1-XA-55-5C B-	ESSURE LOOP 3 1- WIDE RANGE 1-PI- WIDE RANGE 1-PI- WIDE RANGE 1-PI- '4: "PS-68-340G/F PF 2: "TS-68-331 PRES 6: "XS-68-363 PRES	PI-68-664 68-62, sh 68-69, sh RESSURI SURIZEI SURIZEI	A, shows a decr ows a decreasi ows a decreasi ZER PRESSUR R POWER RELI R RELIEF VALV	easing pressung ng pressure v ng pressure v E LOW BACKI EF LINE TEMF E OPEN"	ire value; alue; alue; UP HTRS O P HIGH"	N"		
T = 40 CRE	EW Respond in EW Refers US C, B-6; (otl	accorda to AOP-I her ARPs	nce with Alarm .04 as determir s may also app	Response P led in 1-AR-M ly)	rocedures; 15-A, D-4, I	∃-2 and	1-AR	R-M5-
SR	O US may use Section 2.1 1-3	e AOP-I. , Uncont	04, Pressurizer rolled RCS pres	Instrument A ssure drop du	nd Control le to open I	Malfun PORV i	ctions n Mod	s les
							-	

Appendix D

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Appendix D		Rec	quired Op	erator Actions	j		Forr	n ES-[
Op Test No.: Event Description:	NRC PC	Scenario # DRV 68-334 fails op	3 pen (can b	Event #	5 V)	Page	30	of
Time	Position			Applicant's	Actions or Behavi	ior		
		NOTE: If sp Sec	oray valv	e is open due s the appropri	to pressure ins ate entry point	strument	failure, th	nen
		1. DIAGNO	SE the f	ailure:				
		IF					GO TO SECTION	PAG
		Uncontrolled R in Modes 1-3	CS pressu	ire drop due to	open PORV		2.1	4
		Uncontrolled R( stuck open spra	CS pressu ly valve	re drop due to			2.2	7
		Pressurizer Pre	ssure Inst	rument OR Cor	ntroller Malfunct	ion	2.3	11
		Pressurizer Lev	el Instrum	ent Malfunctior	ł		2.4	20
	RO	CAUTION NOTE Step 1. CHECK • valve	Partia 1 is an II Pzr POR position	Ily open POR MMEDIATE A Vs CLOSED: indication	V may display CTION.	y no lig	ht indicat	ions.
		(RNO Real	sac monii <b>(ired)</b>	ors.				
	RO	RNO: CLOSE affe pressure dro Expected RO • PORV • Assoc	cted POF op. O actions /, (w/ 1-H tiated Blo	RV and/or bloc are to close/a S-68-334A), <b>A</b> ck Valve (w/ 1	k valve as nec ttempt to close <b>ND</b> -HS-68-333A)	essary f e BOTH	o stop RC	cs
	RO	2. MONITO	<b>R</b> RCS p	pressure STAE	BLE or RISING	•		
	RO	3. CHECK	SI signal	NOT actuated				
				ST ZI NGALGIS			ssaiy	

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Appendix D		Rec	uired O	perator Action	S	•	Fo	rm ES	3-D-		
Op Test No.:	NRC	Scenario #	3	Event #	5	Page	31	of	8		
Event Description	n: POF	₹V 68-334 fails op	oen (can	be closed manual	lly)						
Time	Position			Applicant	's Actions or Beha	ivior					
	CAUTIO	N RCS pr differer	essure c ices betv	hanges and ch ween pzr and R	anges in RCS b CS boron) may	oron conce	ntratio e reacti	n (due vity.	to		
	RO	5. MONITO	<b>DR</b> reac	tor power:		*		~# 			
		a. CH	ECK rea	ictor in Mode 1	or 2.						
		b. <b>MO</b> for	NITOR ( unexpec	core thermal po ted changes.	ower						
		EVALU		IP-1 Emergen	ICV Plan Class	ification Ma	atrix				
				, i, zinorgon				·····			
		7. EVALUA • 3.2.5, DN 3.2.5 LCO s	ATE the IB Para states:	following Tech meters The following I maintained wit a. Reactor C b. Pressurize c. RCS Total	h Specs for ap DNB related p hin the limits s oolant System or Pressure Flow Rate	oplicability: arameters shown on T n (RCS)Tav	shall b able 3 ⁄g	e .2-1:			
		• 3.4.3.2, F 3.4.3.2 LCO TS 3.4.3.2 A	<ul> <li>3.4.3.2, PORVs</li> <li>3.4.3.2 LCO states: Two power relief valves (PORVs) and their associated block valves shall be OPERABLE.</li> <li>TS 3.4.3.2 Action a.: With one or more PORV(s) inoperable, but capable of RCS pressure control, within 1 hour either restore the PORV to OPERABLE status or close the associated block valve(s); otherwise, be in at least HOT STANDBY within the next 6</li> </ul>								
		TS 3.4.3.2 A	Action b	.: With one PC pressure control	ORV inoperable , within 1 hour e	and incapal either restore	ble of F e the P	RCS ORV to	c		

pressure control, within 1 hour either restore the PORV to OPERABLE status or close the associated block valve and remove power from the block valve; restore the PORV to OPERABLE status within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

Appendix D		Red	quired C	Operator Action	IS		Fo	rm ES	6-D-2		
Op Test No.:	NRC	Scenario #	3	Event #	5	Page	32	of	83		
Event Description:	PC	PRV 68-334 fails o	pen (can	be closed manua	lly)	_		•			
Time	Position			Applicant	's Actions or Behavi	ior					
Evaluator Note:	3.2.5 DN ≥2220 <b>n</b>	B related para	meter o	n Table 3.2-1.t	. Pressurizer P	ressure is	stated	das			
	Tech Spe	ec Bases for 3.	4.3.2, P	ORV OPEABI	LITY follows this	s event gu	uide; P	ORV	uon)		
		• 32.5 h F	3.2.5.b DNB Parameters:								
		The following DNB related parameters shall be maintained within limits shown on Table 3.2-1:									
		a. F	Reactor	Coolant Syste	m (RCS) Tavg:	≤583°F					
		b. F	Pressuri	zer Pressure:		≥2220 p	osia*				
		c. F	RCS Tot	tal Flow Rate:		Figure 3	3.2-1				
		d. 1	fotal Flo	W:	_	[Figure	3.2-1]				
		Applies – re to ≤5% RTF	store th w/i the	e parameter (I next 4 hrs.	Pressurizer Pres	ssure) w/i	2 hrs.	or red	uce		
		AND									
		• 3.4.3.2.a	Relief	Valves – Oper	ating						
		Applies - re	store the	e PORV to OP	ERABLE status	w/i 1 hr	or clos	a tha			
		associated hours.	block va	alve or HT STB	SY w/i next 6 hou	urs, HT S	D w/i fo	ollowir	ng 6		
		8. IF POR block va	/ block lve to c	valve must be omply with LC	closed <b>OR</b> powe O 3.4.3.2,	er must b	e remo	oved fr	om		
		THEN RI	EFER T	<b>O</b> 0-SO-68-3,	Pressurizer Pres	ssure Cor	ntrol S	ystem.			
		(Include)	d follow	ving this even	t guide)						
		9. CHECK	the follo	owing NORMA	L:						
		10. ENSUR	E WO ir	nitiated on faile	d equipment.						
		11. <b>GO TO</b> a	appropr	iate plant proc	edure.						
Evaluator Note: procedure.	The fo	bllowing CREW	/ Brief a	nd Notification	actions are not	containe	d in the	Ð			
		CREW Brie allows prior	<b>f</b> would to the n	typically be co ext event.	nducted for this	event as	time				
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief									

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Appendix D		Re	quired O	perator Actions	;		Fo	rm E\$	3-[
Op Test No.:	NRC	Scenario #	3	Event #	5	Page	33	of	<u> </u>
Event Description:	PC	0RV 68-334 fails c	pen (can b	e closed manuali	y)				
Time	Position			Applicant's	Actions or Beha	avior			
		<u>Operations</u> <u>Maintenand</u> (MSS). ( <b>N</b> Shift Mana	<u>Manage</u> ce Persor ote: Main ger).	<u>ment</u> - Typicall <u>nnel</u> – Typically Itenance notific	y Shift Manag / Maintenanc ation may be	ger. e Shift Sup e delegated	ervisor to the		
Lead Examiner to appropriate	r may cue t plant proce	he next event edures.	when U	S completes T	ech Spec ev	valuation o	or direc	xts re	tı
Time	Position			Applicant's	Actions or Beha	avior			
0-SO-6	68-3, Secti	on 8.3 Isolat	ion of a	Leaking or I	noperable l	Pressurizo	er POI	RV	
	<ol> <li>This OR</li> <li>Step if Port Port Port Port Port Port Port Port</li></ol>	section may be used to isolate a PORV which is leaking or inoperable to remove power from PORV and/or block valve to comply with LCO 3.4.3.2. DS 8.3[5] and/or 8.3[6] may be performed prior to Steps 8.3[1] - 8.3[4] DRV must be isolated promptly due to leakage OR if necessary to meet h Spec action time limits. CS is or has been water solid, water in the bonnet of PORVs will significantly slow valve stroke time due to hydraulic locking. Several valve strokes may be required ear the water from valve bonnet following solid water operations.							
	SRO	[1.] <b>IF</b> unit basis s	is in Mod ection to	es 1-3, <b>THEN</b> evaluate impa	REFER TO T ct on PORV a	Fech Spec and block v	LCO 3. ⁄alve op	4.3.2 berab	a
		[2.] IF unit [3.] NOTIF and/or	is in Mod Y Work V closed bl	e 4 or 5,N/A Veek Manager ock valve on o	to evaluate ii verall plant ri	mpact of in	operab	le PC	)F
				CAUTIC	NI				
	Closure for AB e one POF assumed the cred	of PORV block I. 714 General RV is credited I to remain op ited PORV ma	k valve m Area and with NO p en withou y NOT be	ay conflict with 6.9KV Shutdo bower available ut power). If 1- available.	h App. R fire wn Board Rn to block val FCV-68-333 (	safe shutd n A or B. Ir ve (i.e. bloc or 2-FCV-68	own an 1 these ck valv 3-332 is	alysis areas e is clos	5 5, e(

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	Appendix D			Form ES-D-2							
	Op Test No.: Event Description:	Op Test No.:       NRC       Scenario #       3       Event #       5       Page         Event Description:       PORV 68-334 fails open (can be closed manually)									
	Time	Position		Appl	icant's Actions or Beha	vior					
		1) If ap Con wato eval 2) Una wou valve	plicable, the following tinuous or hourly fire w th may be terminated of uated by the Fire Prote vailability of credited P Id NOT be expected to a is NOT expected to b	N step directs atch should or marked N ection Progr ORV during significantly be immediat	IOTES establishing fire wa be used consistent /A if acceptable alte am Owner (Enginee fire may delay esta degrade plant safe elv reportable under	tch in affected with FOR 3.7. mate comp me ering) are imple blishing RHR ety. Therefore	areas. 12. Fire easures mented. conditions , closing b	s but lock			
<u> </u>			[4.] IF unit is in Mo [4.1] ENSURE S App. R fire [4.2] Unit 1 Only IF 1-FCV-6 THEN ESTABLIS • AB el • 6.9KV [4.3] Unit 2 Only	<ul> <li>[4.] IF unit is in Mode 1-4, THEN PERFORM the following:</li> <li>[4.1] ENSURE SR initiated to document condition and evaluate impact on App. R fire safe shutdown.</li> <li>[4.2] Unit 1 Only:</li> <li>[4.2] Unit 1 Only:</li> <li>IF 1-FCV-68-333 will remain closed in Mode 1-4, THEN</li> <li>ESTABLISH fire watch in the following areas: <ul> <li>AB el. 714 General Area (Unit 1 side).</li> <li>6.9KV Shutdown Board Room A.</li> </ul> </li> </ul>							
			[5.] IF block valve with LCO 3.4.3 [5.1] CLOSE aff	must be clo 8.2 action, 1 ected valve	sed to isolate leak THEN PERFORM to (N/A valve not cl	ting PORV <b>OF</b> the following: osed)	R to comp	bly			
			Block Valve for PORV (FCV-68-332)	/ 340A	HS-68-332A	INITIALS					
			Block Valve for PORV (FCV-68-333)	/ 334A	HS-68-333A						
			[5.2] <b>IF</b> PORV b Spec LCO others).	lock valve r 3.4.3.2, <b>TH</b>	nust be de-energiz EN PLACE affecte	zed to comply ed breaker to	with Tec OFF (N/A	h A the			

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		Red	quired Ope	erator Actions	3	Fc	orm ES-I
Op Test No.: Event Description:	NRC PORV	Scenario # ′ 68-334 fails o	 pen (can be	Event #	5 y)	Page <u>35</u>	_ of
Time	Position			Applicant's	s Actions or Behavior	ſ	
	UNIT	v	ALVE	BRE	AKER UNID	INITIALS	cv
	4	1-FC	V-68-332	1-BCTD-6 480V Rx Compt 12	58-332-B MOV Bd 1B1-B E		
	3	1-FC	V-68-333	1-BCTD-6 480V Rx I Compt 9E	68-333-A MOV Bd 1A1-A		
	2	2-FC	V-68-332	2-BCTD-6 480V Rx I Compt 12	68-332-B MOV Bd 2B1-B E		
		2-FC	V-68-333	2-BCTD-6 480V Rx I Compt 9D	i8-333-A Mov Bd 2A1-A		
	To comply stored in a	with OPDP-7 n approved s	' (Fuse Co torage loca	NOTI ntrol), fuses re ation.	E emoved must be b	agged, labeled	d, and
		[6.] IF POR Spec Lo others)	V solenoid CO 3.4.3.2	d valve must 2, <b>THEN REN</b>	be de-energized <b>IOVE</b> fuses for a	to comply wit affected valve:	h Tech : (N/A the
		[7.] ENSUR valve or	E caution	order or off-r andswitch. (N	normal tag is plac /A if handswitch	ced on affecte will be dange	ed block r-tagged
		[8.] ENSUR	RE SR initi	ated. SR #		_·	
		[9.] PLACE restore	this proce block valv	edure in activ /e/PORV to n	e procedures bo ormal.	ok UNTIL rea	dy to
			End of S	ection 8.3,			

Appendix D		Red		Form ES-D-2					
Op Test No.:	NRC	Scenario #	3	Event #	5	Page	36	of	83
Event Description:	PC	DRV 68-334 fails o	pen (can	be closed manuall	y)				

#### 3/4.4.3 SAFETY AND RELIEF VALVES - OPERATING

The power operated relief valves (PORVs) and steam bubble function to relieve RCS pressure during all design transients up to and including the design step load decrease with steam dump. Operation of the PORVs minimizes the undesirable opening of the spring-loaded pressurizer code safety valves. Each PORV has a remotely operated block valve to provide positive shutoff capability should a relief valve become inoperable. The PORVs also function to remove non-condensable or steam from the pressurizer.

The OPERABILITY of the power-operated relief valves (PORVs) and block valves is determined on the basis of their being capable of performing the following functions:

- a. Manual control of PORVs to control reactor coolant system pressure. This is a function that is used for a steam generator tube rupture accident.
- b. Maintaining the integrity of the reactor coolant pressure boundary. This is a function that is related to controlling identified leakage and ensuring the ability to detect unidentified reactor coolant pressure boundary leakage.
- c. Manual control of the block valve to: (1) unblock an isolated PORV to allow it to be used for manual control of reactor coolant system pressure (Item A), and (2) isolate a PORV with excessive seat leakage (Item B)
- d. Manual control of a block valve to isolate a stuck-open PORV.

Surveillance requirements (SR) provide assurance that the PORVs and block valves can perform their functions. The block valves are exempt from the SR to cycle the valves when they have been closed to comply with the ACTION requirements. This precludes the need to cycle the valves with full system differential pressure or when maintenance is being performed to restore an inoperable PORV to operable status.

Testing of PORVs with a steam bubble in the pressurizer is considered to be a representative test for assessing PORV performance under normal operating conditions.

From: SEQUOYAH - UNIT 1, Amendment No. 12, 133, 157, 308, June 16, 2006, Page B 3/4 4-2

Appendix D	·	Re	quired O	perator Actions	5		Foi	rm ES	6-D-2
Op Test No.:	NRC	Scenario #	3	Event #	6	Page	37	of	83
Event Description:	RC	S Leak							
Time	Position			Applicant's	Actions or Behav	ior			
Simulator Opera	ator: at Le	ad Examiner (	direction	, insert Event	6				
Indications/Alar Indications 1-M-4: • RCS PZR • RCS PZR • RCS PZR • 1-XI-94-10 trending d	ms: LVL, 1-LI-6 LVL, 1-LI-6 LVL, 1-LI-6 1/102, Core	8-339A, shows 8-335A, shows 8-320, shows a 9 Exit Temp Ma	a decrea a decrea decreasi rgin to Sa	sing level valu sing level valu ng level value aturation (exo s	e e sensors Trn A 8	k B) press	ure ind	licatio	ns
<ul> <li>1-M-5:</li> <li>RCS PR PRESS (Chs 1-4), 1-PI-68-340A, 334, 323, 322: showing RCS (Pzr) pressure going down;</li> <li>RCS PZR PRESS Recorder 1-PR-68-340 shows a decreasing pressure trend;</li> <li>RCS LOOP 1 HL WIDE RANGE PRESS Recorder 1-PR-68-69 shows a decreasing pressure trend.</li> <li>1-M-6:</li> </ul>									
RCS WR H     RCS HL PI     RCS HL PI     Annunciators     1-M-5:     1-XA-55-56	IL PRESSU RESS WIDI RESS WIDI	IRE LOOP 3 1-F E RANGE 1-PI-6 E RANGE 1-PI-6 B-1: "TS-30-31	21-68-66A 58-62, sho 58-69, sho	, shows a decr ows a decreasi ows a decreasi	easing pressure ng pressure val ng pressure val	e value; lue; lue;			
•		B-3: "TS-30-24	1 LOWER		TURF HI"				
•		B-4: "TS-30-24	0 LOWER		TURE HI"				
1-M-6: ● 1-XA-55-6E	E Window (	C-6: "ZS-61-186		IDENSER LOW	ER INLET DOO	R OPEN"			
T = 50		Respond in	accordar	nce with Alarm	Response Pro	cedures			
Evaluator Note:	ne RCS procedure Containm capability MAINTAII event dep	leak occurs an e, AOP-R.05 S ent pressure; t . MONITOR si N step 5, VCT pending on crev	d progres ection 2. his situas teps 2, P Make-up w pace a	sses into a SB 1 for lowering tion could also zr Level, 3, Cc capability are nd actions.	LOCA. The cro Pzr level/RCS present a chal ntainment Pres all potential Ry	ew respon pressure llenge to V ssure, 4, 1 < Trip initi	nds usi and inc VCT Ma RCS P ators fo	ng thi reasi ake-u ressu or this	is ng p re c
Evaluator Note:	At the <b>Lea</b> reactor tri	<b>d Examiner d</b> p and enter E-	irection, 0.	leak size will	ncrease requir	ing the cr	ew to i	nitiate	a
	Reactor T SRO/Crev	rip criteria con v should deter	tained in mine/stat	MONITOR ste	eps 2, 3, 4 and/	or MAIN	FAIN st	tep 5.	

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	Appendix D		Re	quired O	perator Actio	ns		Form ES-D-2		
(	Op Test No.:	NRC	Scenario #	3	Event #	6	Page	38	of	83
	Event Description	n: RCS	Eeak	······						
	Time	Position			Applica	nt's Actions or Behav	/ior			
		SRO	SRO uses Section 2.1	AOP-R.0 , RCS Le	5, RCS LEA eak in Mode	K AND LEAK SO 1-3	DURCE ID	ENTIF	ICAT	ION
	T = 50	CREW	Respond in	accorda	nce with Ala	rm Response Pr	ocedures			
		RO	1. CONTR	ROL char	ging flow usi	ng one CCP:				
			ADJ     level	on progr	/-62-93 and am.	FCV-62-89 as n	ecessary I	o mair:	ntain p	zr
			• MAII	NTAIN se	al injection f	low at least 6 gp	om to each	RCP.		
		RO	2. MONIT	OR press / <i>ired</i> )	surizer level	STABLE or RISI	NG.			
	SRO <b>RNO: IF</b> sufficient time is available, <b>THEN ISOLATE</b> normal and excess									
$\sim$		RO	a. ENSUR	E FCV-62	2-72, 73, and	d 74 CLOSED.				
			b. CLOSE c. ENSUR	FCV-62- <b>E</b> FCV-62	69 and 70. 2-54 and 55	CLOSED.				
	Evaluator Not	te: Since this developing therefore i develops,	is a " <b>MONIT</b> g a Pzr/RCS p nitiate the rea the crew may	OR" step pressure actor trip / decide t	, the crew m trend. If so, and E-0 imp o trip the rea	ay continue in the steps 3 or 4 coulementation. If a actor and transiti	ne procedu Ild be the I loss of R on to E-0	ure whi decisic CS pre based	ile on poir ossure on thi	nt and
		SRO	IF loss of pr psig) is imm	ressurize ninent, <b>Ti</b>	r level is imn HEN PERFO	ninent <b>OR</b> low p <b>RM</b> the following	ressure re g:	actor t	rip (19	070
			b. INITIATE	e reactor. E Safetv I	Iniection.					
			с. GO ТО Е	E-0, Read	ctor Trip or S	afety Injection.	·····			
		RO	3. MONIT	OR conta <i>ired</i> )	inment pres	sure STABLE or	DROPPII	NG.		
			RNO:							
			IF containm following:	ent pres	sure is appro	baching 1.5 psig,	THEN PE	ERFOF	RM the	)
			a. TRIP the	e reactor.						
			b. INITIATE	Safety I	njection.					
New york and the second second			C. GU TO	E-0, Rea	ctor I rip or \$	Safety Injection.				

	Appendix D		Re	equired Op	perator Act	ions		For	rm ES	3-D-2
C.	Op Test No.:	NRC	Scenario #	3	Event #	6	Page	39	of	83
	Event Description:	F	CS Leak							

Time	Position	Applicant's Actions or Behavior
	CAUTION:	Unit is in Mode 3 with low pressurizer pressure SI NOT blocked, SI should
	<u> </u>	IOT be manually blocked to prevent safety injection.
	RO	4. <b>MONITOR</b> RCS pressure STABLE or RISING.
		(RNO required)
		(dropping), <b>THEN TRIP</b> the reactor and <b>GO TO</b> E-0, Reactor Trip or Safety Injection.
		IF Unit is in Mode 3 N/A
Evaluator N	ote: RCS lea Section 2 challeng trip and	k will progress into a SBLOCA. As the crew responds using AOP-R.05 2.1, the lowering Pzr level and increased charging flow may result in a e to VCT Make-up capability. Subsequently the crew may initiate a reactor enter E-0 based on this step.
	RO	<ol> <li>MAINTAIN VCT level greater than 13% USING automatic or manual makeup.</li> </ol>
		RNO:
		ir leak is on charging header in Aux Bidg N/A.
		IF VCT level CANNOT be maintained, THEN PERFORM the following:
		a. <b>LINSORE</b> CCP suction aligned to RWST:
		$(1)  \mathbf{C} = \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C} \mathbf{C}$
		2) ULUSE LUV-02-152 dilu 155. b IE in MODE 1 or 2 THEN TOID the resister and $CO$ TO E 0. Due to T to
*****		or Safety Injection.
	RO/BOP	RO and/or BOP operator should monitor pocket sump level (1-M-15, indicators 1-LI-77-410 & 77-411).
	RO/BOP	RO and/or BOP operator should containment radiation levels (on (0-M-12, recorders and modules 1-RR-90-105 and 1-RR-90-112 for lower and upper containment, resp.)

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Appendix D		Re		Fo	rm ES	S-D-2			
Op Test No.:	NRC	Scenario #	3	Event #	6	Page	40	of	83
Event Description:	RCS Leak								

Time	Position	Applicant's Actions or Behavior
	880	Expected to direct [BOP operator] to perform Appendices I and/or J;
	SRU	(Included at end of this event guide)
	BOP	Perform Appendices I and/or J, as directed.
	NOTE 1: Ap	pendix I or J may be used to estimate RCS leak rate.
	NOTE 2: If le	etdown was isolated in Step 2, the leak rate may have exceeded capacity of
	one	e CCP in the normal charging alignment (EAL 1.2.2P).
	SRO	6. EVALUATE EPIP-1, Emergency Plan Classification Matrix.
	SRO	7. EVALUATE Tech Spec/TRM LCOs USING Appendix K, Evaluating Tech Specs and TRM.
	BOP	8. CHECK secondary side radiation NORMAL:
		S/G blowdown rad monitor
		Condenser vacuum exhaust rad monitor
	! 	Main steam line rad monitors.
	BOP	9. STOP containment purging and venting:
		<ul> <li>a. IF containment purge in progress, THEN ENSURE containment purge fans STOPPED.</li> </ul>
		b. ENSURE containment purge and vent dampers CLOSED.
	BOP	10. CHECK containment airborne activity RISING. (RM-90-106 or 112)
Evaluator No	te: RCS leal crew will ultimately unidentif according	k source is not determinable using this procedure's diagnostics. Therefore the continue with the following isolation measures and leakage monitoring y arriving at the conclusion that RCS leakage exceeds the Tech Spec ied leakage limit (or until the Lead Examiner directs leak size change g to the scenario guide).
	CREW	11. CHECK leakage source UNKNOWN.
	RO	12. CHECK pressurizer PORVs NORMAL:
		Tailpipe temperature
		Acoustic monitors

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Appendix D		Re	equired Op	perator Act	ions		Fo	rm ES	S-D-2
Op Test No.:	NRC	Scenario #	3	Event #	6	Page	41	of	83
Event Description:	RC	S Leak							

Time	Position	Applicant's Actions or Behavior
A		13. ISOLATE letdown:
	RO	a. ENSURE the following letdown orifice valves CLOSED:
		• FCV-62-72
		• FCV-62-73
		• FCV-62-74
	RO	b. ENSURE the following letdown isolation valves CLOSED:
		• FCV-62-69
		• FCV-62-70
•		• FCV-62-77
·····	RO/	c. CHECK leak ISOLATED based upon the following
		<ul> <li>containment parameters</li> </ul>
	BOP	<ul> <li>estimated leak rate USING Appendix I or J.</li> </ul>
		(RNO required)
	SRO	RNO:
		c. IF leak is NOT isolated, THEN GO TO Step 14.
	RO	14. ISOLATE charging:
		a. ENSURE letdown orifice valves CLOSED:
		• FCV-62-72
		• FCV-62-73
		• FCV-62-74
		b. <b>ENSURE</b> the following charging header isolation valves CLOSED:
	DO	• FCV-62-90
	RU	• FCV-62-91
		• FCV-62-85
		• FCV-62-86.
	RO/	c. CHECK leak ISOLATED based upon the following
		containment parameters
	BOP	<ul> <li>estimated leak rate USING Appendix I or J.</li> </ul>
		(RNO required)
	SPO	RNO:
	JORU	c. IF leak is NOT isolated, THEN PERFORM the following:

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Appendix D		Required Operator Actions Form ES-D-								
Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>6</u> Page <u>42</u> of <u>8</u>								
Appendix D       Required Operator Actions         Op Test No::       NRC       Scenario #3 Event #6 Page         Event Description:       RCS Leak         Time       Position       Applicant's Actions or Behavior         RO/       1)       IF normal charging is required to maintain Pzr BOP         RESTORE normal charging USING EA-62-5.       SRO       2)         SRO       2)       IF running CCP must be stopped N/A         SRO       3)       GO TO Step 15.         RO       15. CHECK Pzr safety valves NORMAL:         RO       16. CHECK PRT conditions NORMAL:         RO       16. CHECK PRT conditions NORMAL:         RO       16. CHECK PRT conditions NORMAL:         Exerct       Temperature         BOP       17. NOTIFY Chemistry to ensure all primary side sample [Hot Sample Room]         BOP       18. CHECK CCS parameters NORMAL:         CCS surge tank level STABLE.       CCS surge tank level STABLE.         RO       19. CHECK all CLA levels NORMAL.         RO       20. CHECK excess letdown heat exchanger NORMAL (if Temperature         RO       20. CHECK miss settown heat exchanger NORMAL (if Temperature										
Time	Position	Applicant's Actions or Behavior								
	RO/ BOP	<ol> <li>IF normal charging is required to maintain Pzr level, THEN RESTORE normal charging USING EA-62-5.</li> </ol>								
	SRO	2) IF running CCP must be stopped N/A								
	SRO	3) <b>GO TO</b> Step 15.								
	RO	15. CHECK Pzr safety valves NORMAL:								
		<ul> <li>Tailpipe temperature</li> <li>Acoustic monitors</li> </ul>								
	RO	16. CHECK PRT conditions NORMAL:								
		<ul> <li>Level</li> <li>Pressure</li> </ul>								
		Temperature								
	BOP	17. <b>NOTIFY</b> Chemistry to ensure all primary side sample valves CLOSED. [Hot Sample Room]								
	BOP	18. CHECK CCS parameters NORMAL:								
		<ul> <li>CCS radiation monitors NORMAL</li> <li>CCS surge tank level STABLE.</li> </ul>								
	RO	19. CHECK all CLA levels NORMAL.								
	RO	<ul> <li>20. CHECK excess letdown heat exchanger NORMAL (if applicable):</li> <li>Temperature</li> <li>Pressure</li> </ul>								
	RO	21. CHECK TI-68-398, Reactor Vessel Head Vent Temperature NORMAL								

Appendix D

Appendix D		Re	equired O	perator Act	Form ES-D-2					
Op Test No.:	NRC	Scenario #	3	Event #	6	Page	43	of	83	
Op Test No.: NRC Event Description:		S Leak								

Time	Position	Applicant's Actions or Behavior
	RO	<ol> <li>CHECK TI-68-21, reactor vessel flange leakoff temperature NORMAL. [M-5]</li> </ol>
	BOP	23. MONITOR auxiliary building radiation and HELB recorders NORMAL.
Evaluator No	te: RCS leal	k is ≈90 gpm and <b>NOT</b> isolated
		PO and/or BOD aparator should manite a solution to 1/4 M 45
	RO/BOP	indicators 1-LI-77-410 & 77-411).
	RO/BOP	RO and/or BOP operator should containment radiation levels (on (0-M-12, recorders and modules 1-RR-90-106 and 1-RR-90-112 for lower and upper containment, resp.)
	SRO	Expected to direct [BOP operator] to perform Appendices I and/or J; (Included at end of this event guide)
	BOP	Perform Appendices I and/or J, as directed
	SRO	24. CHECK leak IDENTIFIED and ISOLATED USING available methods:
	BOP	Appendix I or J (Estimating Leak Rate)
		<ul> <li>containment parameters (radiation, pressure, humidity)</li> </ul>
		<ul> <li>pocket sump level rate of rise on ICS (instantaneous point U0964 or U0965, 15 min avg. point U0967 or U0968)</li> </ul>
		Rx Bldg (raceway) sump rate of rise (ICS point U0966)
		<ul> <li>local observation (if applicable)</li> </ul>
		(RNO Required)
		RNO:
		IF leak is NOT isolated. THEN PERFORM the following:
		a. <b>IF</b> additional cooling is required, <b>THEN PERFORM</b> Appendix H, Additional Containment Cooling.
Evaluator No	te: SRO/RO m trends follo	nay choose to not start additional cooling fans based on containment pressure wing the initial pressure increase. Evaluation, however, is expected.
		RO is expected to maintain saturated conditions in the Pzr by verifying adequate heater operation to maintain Pzr Vapor/Liquid temps equivalent (1-M-4: Pzr TEMP indicators 1-TI-68-324 & 1-TI-68-319)
	RO	<ul> <li>b. IF pressurizer level is above program AND rising, THEN PERFORM the following:</li> </ul>
		<ol> <li>RESTORE CVCS charging and letdown USING EA-62-5, Establishing Normal Charging and Letdown.</li> </ol>

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Appendix D		Re	equired O	perator Acti	ons		Fo	rm ES	S-D-2
Op Test No.:	NRC	Scenario #	3	Event #	6	Page	44	of	83
Event Description:	RC	S Leak							

Time	Position	Applicant's Actions or Behavior
		2) ENSURE pressurizer heaters in service as required.
Evoluctor N		
Evaluator N	ote: RCSI	eak is ≈90 gpm and NOT isolated.
		c. ATTEMPT to estimate RCS leak rate USING one of the following:
		<ul> <li>Appendix I (if leak requires rise in charging flow greater than ~10 gpm)</li> <li>OR</li> </ul>
		Appendix J (requires NO VCT makeup, dilution, or boration flow)
		<ul> <li>d. IF conditions permit, THEN DETERMINE RCS leak rate USING 0-SI- OPS-068-137.0, Reactor Coolant System Water Inventory.</li> <li>This step N/A</li> </ul>
		e. IF leak rate exceeds Tech Spec limit AND leak CANNOT be isolated, THEN INITIATE plant shutdown USING one of the following:
		AOP-C.03, Rapid Shutdown or Load Reduction
		OR
		0-GO-5, Normal Power Operation.
		OR
		<ul> <li>0-GO-6, Power Reduction from 30% to Hot Standby.</li> </ul>
	RO	f. <b>IF</b> containment purging or venting is desired, <b>THEN PERFORM</b> the following:
		<ol> <li>NOTIFY Chem Lab to evaluate off-site dose USING 0-SI-CEM- 030- 410.1 or 410.2, as applicable.</li> </ol>
		<ol> <li>EVALUATE resuming containment purging or venting USING 0- SO-30-3 or 0-SO-30-8, as applicable.</li> </ol>
		This step N/A
	SRO	g. <b>IF</b> leak source has NOT been determined, <b>THEN GO TO</b> Section 2.3, RCS Leak Source Identification.
	RO	25. MONITOR if charging and letdown should be restored:
		a. CHECK letdown ISOLATED.
		b. CHECK Pzr level:

 $\left( \begin{array}{c} \\ \end{array} \right)$ 

Appendix D		Required Operator Actions	Form ES-D-									
Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>6</u> Page	e 45 of 8:									
Event Description	: RC	S Leak										
Time	Position	Applicant's Actions or Behavior										
		<ul> <li>level greater than or equal to program level</li> </ul>										
		level RISING.										
		c. CHECK charging and normal letdown AVAILABL	E:									
		piping INTACT										
		<ul> <li>valves OPERABLE</li> </ul>										
		Train A CCS in service.										
		<ul> <li>RESTORE CVCS charging and letdown USING E Establishing Normal Charging and Letdown.</li> </ul>	<ul> <li>RESTORE CVCS charging and letdown USING EA-62-5, Establishing Normal Charging and Letdown.</li> </ul>									
	RO	26 MONITOR if pressurizer besters should be restored:										
		a. CHECK pressurizer level greater than 20% and rising.										
		b. ENSURE pressurizer heaters in service as requir	b. <b>ENSURE</b> pressurizer heaters in service as required.									
	SRO	27. IF containment purging or venting is needed, THEN I	27. IF containment purging or venting is needed, THEN PERFORM the									
		a. IF leak was inside containment, THEN NOTIFY C evaluate off-site dose USING 0-SI-CEM-030-410 applicable	Chem Lab to 0.1 or 410.2, as									
		<ul> <li>b. EVALUATE resuming containment purging or ver 30-3 or 0-SO-30-8, as applicable.</li> </ul>	nting <b>USING</b> 0-SC									
	SRO	28. INITIATE leak repairs.										
	SRO	29. GO TO appropriate plant procedure.										
		END OF SECTION										
			<del></del>									
Evaluator Not	e: The follow	CREW Brief and Notification actions are not contained CREW Brief would typically be conducted for this event	ing CREW Brief and Notification actions are not contained in the procedure. CREW Brief would typically be conducted for this event as time									
		Notifications should be addressed as analysis if it										
		specifically addressed by the procedure or in the CREW	brief									
		Operations Management - Typically Shift Manager										
		Maintenance Personnel – Typically Maintenance Shift Su	Inonvisor									

Maintenance Personnel – Typically Maintenance Shift Supervisor (MSS). (**Note:** Maintenance notification may be delegated to the Shift Manager).

Lead Examiner may cue the next event as desired.

-	Appendix D	ndix D Required Operator Actions						Form ES-D-2				
	Op Test No.:	NRC	Scenario #	3	Event #	6	Page	46	of	83		
	Event Description:	RC	S Leak									

Time	Position	Applicant's Actions or Behavior							
		EA-62-5,							
		Establishing Normal Charging and Letdown							
		4.0 OPERATOR ACTIONS							
		4.1 Section Applicability							
		1. IF normal charging flow is to be established, THEN GO TO Section 4.2.							
		2. IF normal letdown flow is to be established, THEN GO TO Section 4.3.							
		4.2 Establishing Normal Charging Flow							
		1. VERIFY at least one CCP RUNNING.							
		2. CLOSE seal water flow control valve [FCV-62-89].							
		3. <b>OPEN</b> charging header isolation valves:							
		• [FCV-62-90]							
		• [FCV-62-91]							
		4. OPEN one of the following charging isolation valves:							
		CHARGING ISOLATION VALVES ONE OPEN							
		FCV-62-86 (normal charging)							
		FCV-62-85 (alternate charging)							
		<ol> <li>ESTABLISH at least 55 gpm charging flow USING seal water and charging flow control valves IFCV-62-891 and IFCV-62-931.</li> </ol>							
		6. ADJUST seal injection flow to each RCP to between 6 gpm and 13 gpm.							
	CAUTION	If emergency boration is in progress, the automatic control of FCV-62-93 may result in reduced boration flow							
		7. <b>IF</b> automatic level control desired <b>AND</b> pressurizer level greater than 25% <b>THEN PLACE</b> charging flow control valve <b>[FCV-62-93]</b> in AUTO.							

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	Appendix D		Required Operator Actions							Form ES-D-2			
	Op Test No.: Event Descriptic	NRC	RCS L	Scenar .eak	io #	3	Event #	6	Page	47	of	83	
	Time	Positic	on	· · · · · · · · · · · · · · · · · · ·			Applie	cant's Actions or Be	havior				
								EA-62-5,					
						Esta	blishing l	Normal Charging	g and Letdo	wn			
				B. <b>GC</b>	<b>) TO</b> S	ection 4	4.1, step i	n effect.					
					<u></u>	4.	3 Establis	shing Normal Le	tdown Flow			••••••••••••••••••••••••••••••••••••••	
		NOTE	NOTE EA-62-3, Establishing Excess Letdown, may be utilized if Normal Letdown cannot										
			be established.										
				<u>1. IF</u>	chargi	ng now	NOT esta	Diisnea, IHEN P	ERFORM Se	ection 4	1.		
				2. <b>VE</b>	RIFY	pressur	izer level	greater than 17%					
				3. ENSURE letdown orifice isolation valves CLOSED:									
					LETDO	WN OR	IFICE ISO	LATION VALVES	CLOSED √				
							FCV-62-7	2					
							FCV-62-7	3					
							FCV-62-7	4					
				4. OF	PEN let	down is	solation va	lves:					
					LI	ETDOW	N ISOLATI	ON VALVES	OPEN √				
							FCV-62-6	;9					
							FCV-62-7	0					
1							FCV-62-7	7					
		NOTE	Placin flow sl	g cool nould i	ing wa preven	ter on tl t TIS-62	ne Letdow 2-79B/A fr	n Heat Exchange	er prior to res	storing	letdov -70-1	wn 92	
advices.				5. PL		HIC-62-	78] in MA	NUAL, AND OPI	EN [TCV-70	- <b>192</b> ] to	o ~50	%.	

Appendix D		Required Operator Actions	Form ES							
Op Test No.:	NRC	Scenario # <u>3</u> Event # <u>6</u> P	age <u>48</u> of							
Event Description	on: RC	S Leak								
Time	Position	Applicant's Actions of Babaular								
		EA-62-5.								
		Establishing Normal Charging and L	etdown							
		<ol> <li>PLACE letdown pressure controller [PCV-62-81] in MANUAL and ADJUST output between 40% and 50%, (50%-60% open).</li> <li>ADJUST charging flow as necessary to prevent flashing in the letd line.</li> </ol>								
		8. OPEN letdown orifice isolation valves as needed:	······································							
		LETDOWN ORIFICE ISOLATION VALVES	EN '							
		FCV-62-72	]							
		FCV-62-73	]							
		FCV-62-74	]							
	NOTE: Nor	mal letdown pressure is 325 psig at normal operating ten	nperature.							
		9. ADJUST letdown pressure controller [PCV-62-81] desired pressure.	output to obtain							
		10. ADJUST letdown pressure controller [PCV-62-81] existing pressure.	setpoint to match							
		11. PLACE letdown pressure controller [PCV-62-81] in	AUTO.							
	NOTE: Nor	nal letdown temperature is ~100°F.								
		12. ADJUST [HIC-62-78A] to obtain desired letdown te	emperature, as							

13. PLACE [HIC-62-78A] in AUTO.

	Appendix D		Red	quired Op	perator Act	ions		Fo	rm ES	3-D-2
<i>(</i>	Op Test No.:	NRC	Scenario #	3	Event #	6	Page	49	of	83
	Event Description:	RC	S Leak							

Time	Position			Applicant's Actions or Behavi	or					
				EA-62-5,						
			Establis	hing Normal Charging an	d Letdown	······				
	NOTE: Letdo	own temp ses letdow	erature may swi /n temperature (	ng due to repeated actuation of the second sec	on of TIS-62-` o fully open.	79B/A, which				
		14. <b>IF</b> ne follow	ecessary to stab	ilize letdown temperature,	THEN PERFO	ORM the				
		a. F	PLACE [HIC-62- DPEN direction.	78A] in MANUAL and ADJ	UST controll	er output in				
		b. V	VHEN letdown h pproximately 10	neat exchanger outlet temp 00°F, <b>THEN PLACE [HIC-6</b>	erature is sta 2 <b>-78A]</b> in AU	bilized at TO.				
		15. <b>ENS</b>	URE high temp	erature divert valve [HS-62	- <b>79A]</b> in DEN	IIN position.				
		16. ADJUST charging and letdown as necessary to maintain RCP seal								
		injec	tion flow and pro	essurizer level.						
		17. IF Co VCT	CP suction is ali is desired, <b>THE</b>	gned to the RWST and rea <b>N ENSURE</b> VCT aligned for	ligning CCP s or normal ope	suction to ration:				
		а. <b>Е</b>		CT level greater than 20%	6.					
		U. <b>L</b>	NOURE VOI	Sullet valves ALIGINED.						
			COMPONENT	POSITION √						
			LCV-62-132	OPEN						
			HS-62-132	PULL A-P AUTO						
			LCV-62-133	OPEN						
			HS-62-133	PULL A-P AUTO		•				
					<u> </u>					
		c. <b>E</b>	NSURE RWST peration:	supply to CCP suction valv	es ALIGNED	for normal				

	Appendix D		Form ES-D-2							
1	Op Test No.:	NRC	Scenario #	3	Event #	6	Page	50	of	83
	Event Description:	RC	S Leak							

Time	Position		Applicant's Actions or Behavior									
				EA-62-5,								
			Establis	hing Normal Charging a	nd Letdown							
			COMPONENT	POSITION √								
			LCV-62-135	CLOSED								
			HS-62-135	PULL A-P AUTO								
			LCV-62-136	CLOSED								
			HS-62-136	PULL A-P AUTO								
		d.	<b>ENSURE</b> VCT m with current boro	akeup control system set n concentration.	for automatic	operation						
		е.	ENSURE Prima	ary Water system in serv	vice.							
		18. <b>GO</b>	TO Section 4 1	sten in effect								
				END OF TEXT								
				- <u>1. 8 </u>	·····							

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Appendix D		Required Operator Actions							
Op Test No.:	NRC	Scenario #	3	Event #	6	Page	_51	of	83
Event Description:	RCS	Leak							

SQN	RCS LEAK AND LEAK SOURCE IDENTIFICATION	AOP-R.05 Rev. 14
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Page 1 of 1

### APPENDIX K

# **EVALUATING TECH SPECS AND TRM**

- 1. **EVALUATE** the following Tech Spec/TRM LCOs for applicability:
  - 3.2.5, DNB parameters
  - 3.4.3.1, Safety and Relief Valves-Operating
  - 3.4.3.2, Relief Valves-Operating
  - 3.4.6.2, RCS Leakage
  - 3.4.6.3, RCS Pressure Isolation Valve Leakage
  - TRM 3.4.11, Reactor Coolant System Head Vents
  - 3.4.12, Low Temperature Over Pressure Protection Systems
  - 3.6.1.4, Containment Pressure
  - 3.6.1.5, Containment Air Temperature

### END

Op Test No.: <u>NRC</u> Scenario # <u>3</u> Event # <u>6</u> Page <u>52</u> of <u>83</u> Event Description: RCS Leak	Appendix D		Re		Form ES-D-2					
Event Description: RCS Leak	Op Test No.:	NRC	Scenario #	3	Event #	6	Page	52	of	83
	Event Description:	RC	CS Leak							

SQN	RCS LEAK AND LEAK SOURCE IDENTIFICATION	AOP-R.05 Rev. 14	

Page 1 of 1

#### APPENDIX I

## ESTIMATING RCS LEAK RATE USING CVCS FLOW BALANCE

NOTE 1 This method is recommended when leak requires rise in charging flow greater than ~10 gpm. Appendix J is more accurate for smaller leak rates.

NOTE 2 This appendix assumes RCS temperature and charging flow are approximately constant.

Т

	INITIAL	FINAL	CHANGE
PZR Level			[1] (negative for level decrease)
Time			[2]
Charging Flow		[3]	
Letdown Flow		[4]	
Total RCP Seal Return Flow		[5]	

# **Pressurizer Level Conversion**

Pressurizer le change	vel	с	onversion factor		Time Change		Pzr Level (positiw	Rate e for lev	of Change el rising)
	%	X e	52 gal / %	-	I	mîn	=		gpm
step [1] abov	e				step [2] above			[6]	
				Leak Rate	e Calculation				
Charging Flow	l	Letdown Flow	Seal R Flo	leturn w	Pzr Level Rate of Change		Instrument error correction factor		RCS Leak Rate
÷				***		+	3 gpm	= _	gpm
step [3] above	5	step [4] above	step abo	[5] we	step [6] above				

Page 73 of 80

Appendix D		Required Operator Actions								
Op Test No.:	NRC	Scenario #	3	Event #	6	Page	53	of	83	
Event Description:	RC	S Leak								

SQN	RCS LEAK AND LEAK SOURCE IDENTIFICATION	AOP-R.05 Rev. 14
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Page 1 of 1

#### APPENDIX J

# ESTIMATING RCS LEAK RATE USING VCT AND PZR LEVEL

CAUTION This appendix CANNOT be used during VCT makeup, boration, or dilution.

NOTE This appendix assumes RCS temperature is approximately constant.

	VCT LEVEL (%)	PZR LEVEL (%)	TIME (min)
INITIAL			
FINAL			
CHANGE	[1]	[2]	[3]
	(positive for level decrease)	(positive for level decrease)	

### VCT Level Conversion

VCT level change		conversion factor		Time Change		VCT Level Rate of Change
						(positive for level lowering)
%	х	20 gal / %	+	mi	n =	e gpm
step [1] above				step [3] above		[4]
		Pressu	rizer L	evel Conversior	1	
Pressurizer level change		conversion factor		Time Change		Pzr Level Rate of Change (positive for level lowering)
%	X	62 gal / %	÷	min	=	gpm
step [2] above				step [3] above	-	[5]
			Lea	k Rate Calculat	<u>ion</u>	
VC	T Lev	el	Pz	r Level		RCS Leak Rate
Rate of	of Cha	ange	Rate of	of Change		
		+				gpm
step	[ <b>4]</b> ab	iove	step [	5] above		
			Page	74 of 80		

	Appendix D		Re	quired Op	erator Actior	าร		Form	n ES-	D-2
$\bigcirc$	Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	54	of	83
	Event Description	n: SBLC	DCA/Loss of off	site power(d	lelayed) resultir	ng in a loss of power	r to both 6.9 k	(V Shutd	own B	oards
	Time	Position			Applicant'	s Actions or Beha	viors			
	Simulator Op	erator: at Lead	d Examiner	direction	, insert Ever	nt 7				
	Indications av 1-M-4: • 1-XI-94 trendin • 1-LI-68	vailable: -101/102, Core I g to SI actuatio -339A, 335A, 32	Exit Temp Ma n pressure v 0A, RCS PZF	argin to Sa alue. ₹ LEVEL in	turation (exo	sensors Trn A &	& B) pressu	re indic	ation	S
	1-M-5: • 1-PI-68 to Rx T • 1-PR-68 value. • 1-PR-68	-340A, 1-PI-68-3 rip/SI actuation 3-69, RCS LOOF 3-340, RCS PZR	34, 1-PI-68-3 pressure va ? 1 HL WIDE PRESS Rec	23, 1-PI-68 lues. RANGE PI order tren	3-322, RCS P2 RESS indicat ding down;	ZR PRESS narrow	w range ind c Trip/SI act	licators tuation	trenc	ding sure
~	<ul> <li>1-PR-68-69, RCS LOOP 1 HL WIDE RANGE PRESS Recorder trending down;</li> <li>1-LR-68-339, RCS PZR LEVEL Recorder trending down;</li> <li>1-FI-68-93A, CHARGING HDR FLOW Indicator indicating 115-120 gpm (1 CCP at maximum flowrate);</li> <li>1-M-6:</li> <li>1-LL 62 420, VCT LEVEL believe to the second se</li></ul>									
Ċ	<ul> <li>1-FI-62-</li> <li>1-FI-62-</li> <li>1-FI-62-</li> <li>1-PI-68-</li> <li>1-PI-68-</li> <li>1-PI-68-</li> <li>1-PI-68-</li> <li>1-PDI-3</li> </ul>	129, VCT LEVE 139A, BORIC A 142A, PRIMAR` 66A, HL Pressu 62, RCS HL Pre 69, RCS HL Pre 0-42, 43, 44, 45,	CINDICATOR TO CID TO BLEI Y WATER TO ure LOOP 3 in ess WR indic ess WR indic CNTMT PRE	NDER India BLENDEF Indicator tra ator trendi ator trendi SSURE W	own w/ VCT N cator stable a R Indicator st ending to act ing to actuati ing to actuati /IDE RANGE	1-U in progress; at ~20-25 gpm; able at ~70 gpm; cuation pressure on pressure valu on pressure valu Indicators trendi	; value. ue. ue. ng up (1.5 p	psi-SI A	ctuat	ion)
		CREW	Identifies Reactor Trip criteria contained in <b>MONITOR</b> ste <b>MAINTAIN</b> step 5.						and/o	or
			SRO/Crew	should de	etermine/stat	e trip criteria.				
		SRO	Directs RO	to manua	ally trip the re	actor and manu	ally actuate	ə SI.		
		SRO	Directs ent Operator A	ry to E-0, ctions (IO	Reactor Trip As)	or Safety Injecti	ion and per	form In	nmed	liate
		RO	Manually tr directions.	ips reacto	r, verifies rea	actor tripped and	l actuates s	SI per S	SRO	
	Evaluator Not	e: Following IC MCBs for an may take ma EPM-4, Pruc	A performand by expected a anual action(s dent Operator	ce, prior to utomatic sy to align p Actions)	Steps 1-4 imn /stem respons lant systems a	nediate action ver se that failed to oc as expected for th	ification, RO cur. Upon c e event in pi	)/BOP s discover rogress	urveys y, the . (Ref.	s y

Appendix D		R		Form ES-I					
Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	55	of	
Event Descript	ion: SE	LOCA/Loss of o	ffsite power	(delayed) resultir	ng in a loss of powe	er to both 6.9	9 kV Shu	tdown	Bo
Time	Position			Applicant's	s Actions or Beha	iviors			
		E-0, <i>F</i>	Reactor T	rip or Safety	Injection				
Evaluator N	l <b>ote:</b> High Con should ide (attached	tainment Press entify the ORAI following this e	ure is exp NGE PATH event guide	ected (2.8 psig) I condition and ə).	during the cours enter FR-Z.1, Hi	e of EOP ogh Gh Contain	conduct; ment Pr	the c essur	rev
Note 1	Steps 1 thro	ugh 4 are imn	nediate a	ction steps					
Note 2	This procedu	ure has a fold	out page						
	RO	1. VERIF • Re • Re • Ne • Ro • Ro	Y reactor eactor trip eactor trip eutron flux ed bottom d positior	TRIPPED: breakers OPE bypass break DROPPING lights LIT indicators les	EN ers DISCONNE ss than or equal	ECTED or I to 12 ste	OPEN ps.		
	BOP	2. <b>VERIF</b> • Tu	Y turbine	TRIPPED: valves CLOS	SED.				
CRITICAL TASK		5 Minutes re-enter o only). Start at le	after SI r perforn ast 1 ED	actuation, los n a second pa G prior to pla	ss of offsite po ass through E- cing equipmer	wer occu 0 IOAs (H nt PTL in	ırs; Cre Ii-level ECA.0-	w sh step -0	101 S
		1A-A EDG	i started,	supplying 1/	A-A 6.9 kV Shu	tdown Be	oard vo	oltage	э.
	BOP	<ul> <li>3. VERIF</li> <li>Atta</li> <li>Pla</li> <li>Ver</li> </ul>	Y at least empt to re i <b>ce DG 1</b> /	one train of s estore power tr <b>A-A control s</b> A Shutdown B	hutdown boards o at least ONE <b>witch in STAR</b> oards ENERGI	s ENERG train of sh T ZED	IZED. utdowr	ı boaı	rds
	BOP	Dispatch A	UO to loc	ally reset 1B-	BEDG		···· breat		

Appendix D		Required Operator Actions Form ES-D-2
Op Test No.: Event Description	NRC : SBL	Scenario #       3       Event #       7,8,9,10       Page       56       of       83         OCA/Loss of offsite power(delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards
Time	Position	Applicant's Actions or Behaviors
	RO	<ul> <li>4. DETERMINE if SI actuated:</li> <li>ECCS pumps RUNNING.</li> <li>Any SI alarm LIT [M-4D] (SI will be actuated)</li> </ul>
	BOP	<ol> <li>PERFORM ES-0.5, Equipment Verifications WHILE continuing in this procedure (attached following EOPs).</li> </ol>
	RO	<ul> <li>6. DETERMINE if secondary heat sink available: <ul> <li>a. CHECK total AFW flow greater than 440 gpm.</li> <li>b. CHECK narrow range level greater than 10% [25 ADV] in at least one S/G.</li> <li>c. CONTROL feed flow to maintain narrow range level between 10% [25% ADV] and 50% in all S/Gs.</li> <li>(Heat Sink is available from Train A and TDAFW)</li> </ul> </li> </ul>
	RO	<ul> <li>7. CHECK if main steam lines should be isolated:</li> <li>a. CHECK if any of the following conditions have occurred:</li> <li>Any S/G pressure less than 600 psig AND STEAMLINE PRESS ISOL SI BLOCK RATE ISOL ENABLE permissive DARK [M-4A, A4]</li> <li>OR</li> <li>Any S/G pressure dropping UNCONTROLLED. OR</li> </ul>
	SRO	<ul> <li>Phase B actuation</li> <li>b. ENSURE MSIVs and MSIV bypass valves CLOSED.</li> <li>[Main Steam lines will isolate on Phase B (actuation setpoint- 2.8 psig)]</li> <li>c. ENSURE applicable Foldout Page actions COMPLETED.</li> </ul>
Evaluator Note	e: ØB actuat	ion time:

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	Appendix D		Re	quired O	perator Act	ions		Fo	rm ES	3-D-2
	Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	57	of	83
	Event Description:	SB	LOCA/Loss of off	site power	delayed) resu	Ilting in a loss of power	r to both 6.9	kV Shu	utdown	Boards

Time	Position	Applicant's Actions or Behaviors
	NOTE: L	oss of seal injection flow could adversely affect RCP seals.
CRITICAL		Start 1A-A CCP (following loss of offsite power)
TASK		1A-A CCP started delivering hi-head injection via the CCPIT to RCS.
		[(ES-0.5 actions are contained in attachment at back of scenario guide)]
CRITICAL TASK	RO	<ul> <li>8. CHECK RCP trip criteria:</li> <li>a. CHECK the following:</li> <li>RCS pressure less than 1250 psig. AND</li> <li>At least one CCP OR SI pump RUNNING</li> <li>b. STOP RCPs</li> </ul>
	RO	<ul> <li>9. MONITOR RCS temperatures:</li> <li>IF any RCP running, THEN CHECK T-avg stable at or trending between 547°F and 552°F</li> <li>OR</li> <li>IF RCPs stopped, THEN CHECK T-cold stable or trending to between 547°F and 552°F.</li> </ul>
	RO	<ul> <li>10. CHECK pressurizer PORVs, safeties, and spray valves:</li> <li>a. Pressurizer PORVs CLOSED.</li> <li>b. Pressurizer safety valves CLOSED.</li> <li>c. Normal spray valves CLOSED.</li> <li>d. Power to at least one block valve AVAILABLE.</li> <li>e. At least one block valve OPEN.</li> </ul>
	BOP (BO if BOP	11. : DETERMINE if S/G secondary pressure boundaries are INTACT:
	is performing ES-0.5)	<ul> <li>CHECK all S/G pressures CONTROLLED or RISING.</li> <li>CHECK all S/G pressures greater than 140 psig.</li> </ul>

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	Appendix D		Re	quired O	perator Actio	ns		Fo	rm ES	6-D-2
	Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	58	of	83
2	Event Description:	SBI	_OCA/Loss of off	site power(	delayed) resulti	ng in a loss of power	to both 6.9	⊧kV Shu	ıtdown	Boards

Time	Position	Applicant's Actions or Behaviors
	BOP (RO if BOP is performing ES-0.5)	<ul> <li>12. DETERMINE if S/G tubes are INTACT:</li> <li>All S/G narrow range levels CONTROLLED or DROPPING</li> <li>Secondary radiation NORMAL USING Appendix A, Secondary Rad Monitors. (App. A performed in ES-0.5).</li> </ul>
	RO BOP	<ul> <li>13. DETERMINE if RCS is INTACT:</li> <li>Containment pressure NORMAL</li> <li>Containment sump level NORMAL</li> <li>LOWER COMPT TEMP HIGH alarm DARK. [M-5C, B1]</li> <li>Containment radiation NORMAL USING Appendix B, Containment Rad Monitors. (App. B performed in ES-0.5)</li> </ul>
	CREW	<ul> <li>RNO:</li> <li>PERFORM the following:</li> <li>a. INITIATE ES-0.5 Appendix D, Hydrogen Mitigation Actions.</li> <li>b. MONITOR status trees.</li> <li>c. GO TO E-1, Loss of Reactor or Secondary Coolant.</li> </ul>
Evaluator No	te: at Step 1 via SPDS designate condition direct the procedure During th FR-Z.1, H included	<ul> <li>1.a, MONITOR status trees, the crew will implement status tree monitoring</li> <li>When a RED or ORANGE path status tree is observed, the SRO will</li> <li>one of the Board operators (typically the BOP) to verify status tree</li> <li>s using 1-FR-0, UNIT 1 STATUS TREES. Once verified, the SRO should</li> <li>crew to transition to the appropriate RED and/or ORANGE path</li> <li>e(s).</li> <li>e progress of the LOCA, containment pressure will reach entry conditions for</li> <li>digh Containment Pressure (&gt;2.8 psig). Expected FR-Z-1 actions are</li> <li>following E-1 event guide.</li> </ul>
	US	Directs entry to E-1, Loss of Reactor or Secondary Coolant
Evaluator Not	te: Following S manually st A, 2A-A, 1E pushbutton	actuation, both EDGs will fail to start. BOP Operator is expected to tart 1A-A EDG from either 1-M-1 using 1-HS-82-15, DG EMERG START 1A- B-B, 2B-B handswitch or back panel 0-M-26A using emergency start 0-HS-82-16A and start at least 1 'A' Train ERCW Pump (J-A ERCW Pump

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Appendix D		Re	quired O	perator Act	ions		Fo	rm ES	3-D-2
Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	59	of	83
Event Description:	SB	LOCA/Loss of off	site power(	delayed) resu	ulting in a loss of power to	o both 6.9	kV Shu	ıtdown	Boards

Time	Position	Applicantia Astiens en Debeuieus
	should be	Applicant's Actions or Benaviors
		Start at least 1 EDG prior to placing equipment PTL in ECA.0-0.
IASK		1A-A EDG started, supplying 1A-A 6.9 kV Shutdown Board voltage.
		(AOP-P.01, Loss of Offsite Power contains IOAs that should be performed during E-0 re-entry following loss of offsite power. AOP-P.01 actions are following this event guide.)
CRITICAL		Start 1A-A CCP (following loss of offsite power)
TASK		1A-A CCP started delivering hi-head injection via the CCPIT to RCS.
		[(ES-0.5 actions are contained in attachment at back of scenario guide)]
CRITICAL TASK		Start at least 1 'A' Train ERCW Pump in an operating safeguards train (following loss of offsite power)
		[(ES-0.5 actions are contained in attachment at back of scenario guide)]
	E-1,	LOSS OF REACTOR OR SECONDARY COOLANT
NOTE	This procedure	e has a foldout page.
	RO	1. CHECK RCP trip criteria:
		a. CHECK the following:
		At least one CCP OR SI pump RUNNING
		AND
		RCS pressure
		less than 1250 psig.
		b. STOP RCPs.
	ВОР	d. CHECK containment hydrogen concentration less than 6%.
	BOP	e. WHEN ice condenser AHU breakers have been opened, THEN ENERGIZE hydrogen igniters USING Appendix D.

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	Appendix D		Required		Form ES-D-2				
$\bigcirc$	Op Test No.: Event Description:	<u>NRC</u> SBL	Scenario #3	Event #	<b>7,8,9,10</b> g in a loss of powe	Page r to both 6.	<u>60</u> 9 kV Shu	of	83 Boards
	Time	Position		Applicant's	s Actions or Beha	viors			·
		BOP	f. CHECK concent	C containment hyd tration less than 0	Irogen 1.5%. [M-10]				
		BOP	<ul> <li>2. CHECK S/G</li> <li>S/G presor RISIN</li> <li>S/G presore greater t</li> </ul>	secondary press ssures CONTROL IG ssures than 140 psig.	ure boundaries LED	INTACT			
C		BOP	3. MAINTAIN Ir a. Greater t b. Between	ntact S/G narrow han 10% [25% A 10% [25% [ADV]	range levels: DV]. and 50%				
		BOP	4. VERIFY seco a. CHECK s USING A Monitors.	ondary radiation N econdary radiation opendix A, Seconda	NORMAL: NORMAL ary Rad				
			b. NOTIFY C samples. c. WHEN Ch to sample	hem Lab to take S/ em Lab is ready S/Gs.	/G activity				
			THEN PERFORM 1) ENSUI Contro 2) ENSUI	I the following: RE FCV-15-43 Blow I valve CLOSED. RE Phase A RESE	vdown Flow F.			••••••	
$ \sim $			3) UPEN	biowdown isolation	valves.				

	Appendix D		Red	quired O	perator Actio	ons		Foi	rm ES	3-D-2
6	Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	61	of .	83
	Event Description:	SB	LOCA/Loss of offs	site power(	delaved) resul	ting in a loss of power	to both 6.9	kV Shu	itdown	Boards

SBLOCA/Loss of offsite power(delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards

Time	Position	Applicant's Actions or Behaviors
		d. NOTIFY RADCON to survey main steam
		lines and S/G blowdown.
		e. WHEN S/G samples completed,
		CLOSE blowdown isolation valves.
	CAUTION	Any time a pressurizer PORV opens, there is a possibility that it may stick open.
	RO	5. MONITOR pressurizer PORVs and block valves:
		a. Power to block valves AVAILABLE.
		b. Pressurizer PORVs CLOSED.
		c. At least one block valve OPEN.
	RO	6. MONITOR SI termination criteria:
		a. RCS subcooling based on core exit T/Cs greater than 40°F.
	BOP	b. Secondary heat sink:
		Narrow range level     in at least one letest S/G
		greater than 10% [25% ADV].
		OR
		Total food flow to latest S/Co
		greater than 440 gpm.
	RO	C RCS pressure STABLE or RISING

Appendix D		Re	quired Op	perator Act	ions		Fo	rm E	S-D-2
Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	62	of	83

Event Description: SBLOCA/Loss of offsite power(delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards

Time	Position	Applicant's Actions or Behaviors
	RO	d. Pressurizer level greater than 10% [20% ADV].
	SRO	e. GO TO ES-1.1, SI Termination.
	RO	7. <b>MONITOR</b> if containment spray should be stopped:
		a. CHECK any containment spray pump RUNNING.
		b. CHECK containment pressure less than 2.0 psig.
		c. CHECK containment spray suction aligned to RWST.
		d. RESET containment spray signals.
		e. STOP containment spray pumps and PLACE in A-AUTO.
		f. CLOSE containment spray discharge
		valves:     FCV-72-39. Train A
		• FCV-72-2, Train B.
	BOP	8. MONITOR shutdown boards continuously energized.
	RO	9. DETERMINE if RHR pumps should be stopped:
		a. CHECK RCS pressure:
		1) Greater than 300 psig
		2) STABLE or RISING.
		b. CHECK RHR pump suction aligned from RWST.

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	Appendix D		Re	equired Op	perator Act	ions		Fo	rm ES	3-D-2
6	Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	63	of	83
Sec. 1										

Event Description:

SBLOCA/Loss of offsite power(delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards

Time	Position	Applicant's Actions or Behaviors
		c. ENSURE SI signal RESET.
		d. STOP RHR pumps and PLACE in A-AUTO.
		e. MONITOR RCS pressure greater than 300 psig.
	NOTE 1	S/G pressures dropping slowly during a LOCA with no faulted S/G should be considered "stable" in the following step.
	NOTE 2	RCS pressure rising slightly during a LOCA which is NOT isolated should be considered "stable" in the following step.
	SRO	10. <b>DETERMINE</b> if SI termination criteria should be checked again:
		a. CHECK pressure in all S/Gs STABLE or RISING.
		b. CHECK RCS pressure STABLE or DROPPING.
	SRO	11. DETERMINE if \ generators should be stopped:
		a. VERIFY shutdown boards ENERGIZED from start busses.
		b. ENSURE SI signal RESET.
		<ul> <li>STOP any unloaded diesel generators and PLACE in standby USING EA-82-1, Placing D/Gs in Standby.</li> </ul>
	BOP	12. MONITOR if hydrogen igniters and recombiners should be turned on:

	Appendix D		Rec	quired O	perator Actio	ons		For	rm ES	-D-2
1 A	Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	64	of	83
C. C.	Event Description	00								_

SBLOCA/Loss of offsite power(delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards

Time	Position	Applicant's Actions or Behaviors
		a. ENSURE ice condenser AHU breakers
		opened USING EA-201-1, 480 V Board
		Room Breaker Alignments.
		b. CHECK hydrogen concentration
		measurement AVAILABLE:
		Hydrogen analyzers have been
		in ANALYZE for at least
		5 minutes.
		c. CHECK containment hydrogen
		concentration less than 6%.
-		<ul> <li>WHEN ICE CONDENSER ANU Dreakers</li> <li>have been opened</li> </ul>
		THEN
		ENSURE hydrogen igniters
		ENERGIZED USING Appendix D.
		e. CHECK containment hydrogen
		concentration less than 0.5%. [M-10]
	RO	13. MONITOR if containment vacuum control should be returned to normal:
		a. CHECK containment pressure
		less than 1.0 psig.
		b. VERIFY containment vacuum relief
		isolation valves OPEN: [Panel 6K]
		• FCV-30-46
		ECV 20 47
		• FCV-30-47
		• FCV-30-48.
	SRO	14. INITIATE evaluation of plant status:
		a. ENSURE cold leg recirculation
		capability:
		1) Power to at least one RHR pump
		AVAILABLE.

Event Description:

	Appendix D		Rec	quired O	perator Action	าร		For	rm ES	3-D-2
Con a	Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	65	of	83
	Event Description:	SB	LOCA/Loss of offe	site power	(delaved) resultir	ng in a loss of powe	r to both 6 9	tkV Shu	itdown	Boarde

SBLOCA/Loss of offsite power(delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards

Time	Position	Applicant's Actions or Behaviors							
		2) Capability to operate the following valves AVAILABLE:							
		<ul> <li>FCV-63-72 and FCV-74-3 (for RHR Pump A-A).</li> </ul>							
		OR							
		<ul> <li>FCV-63-73 and FCV-74-21 (for RHR Pump B-B).</li> </ul>							
		b. CHECK Auxiliary Building radiation:							
		1) Area Radiation Monitors RR–90–1A and RR–90–1B NORMAL							
		2) Aux Bldg Vent monitor recorder 0-RR-90-101 NORMAL (prior to isolation).							
		c. MONITOR containment sump level less than 68%.							
		d. NOTIFY TSC to initiate post-accident sampling as necessary.							
		e. EVALUATE plant equipment status USING EA-0-4, Evaluation of Equipment Status.							
	SRO	15. DETERMINE if RCS cooldown and depressurization is required:							
	RO	a. CHECK RCS pressure greater than 300 psig.							
	SRO	b. GO TO ES-1.2, Post LOCA Cooldown and Depressurization.							
Appendix D		Re	quired O	perator Actio	ons		Fo	rm ES	3-D-2
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Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	66	of	83
Event Description:	SB	LOCA/Loss of off	site power(	delayed) resuli	ing in a loss of powe	er to both 6.9	) kV Shi	utdown	Boards

Time Position **Applicant's Actions or Behaviors** SRO 16. DETERMINE if transfer to cold leg recirculation is required: RO CHECK RWST level less than 27%. b. IF ES-1.3 has NOT been performed, THEN SRO GO TO ES-1.3, Transfer to RHR Containment Sump. RO 17. MONITOR if RHR spray should be placed in service: a. CHECK the following conditions met: Containment pressure . greater than 9.5 psig AND At least 1 hour has elapsed since beginning of accident AND RHR suction aligned to containment sump AND At least one CCP AND one SI pump RUNNING. RO b. CHECK both RHR pumps RUNNING. c. ESTABLISH Train B RHR spray: 1) CHECK Train B RHR pump RUNNING. 2) ENSURE RHR crosstie FCV-74-35 CLOSED. 3) CLOSE RHR injection FCV-63-94. 4) OPEN RHR spray FCV-72-41. d. MONITOR containment pressure RO greater than 4 psig.

Appendix D		Re	quired C	Operator Action	ns	Form ES-D-				
Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	67	of	83	
Event Description:	SE	BLOCA/Loss of off	site power	r(delaved) resulti	ng in a loss of powe	er to both 6.9	kV Shi	ıtdown	Boarde	

SBLOCA/Loss of offsite power(delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards

Time	Position	Applicant's Actions or Behaviors
	RO	18. MONITOR if CLAs should be isolated:
		a. CHECK RCS pressure less than 100 psig.
		b. CHECK power to CLA isolation valves AVAILABLE.
		c. ENSURE SI signal RESET.
		d. CLOSE CLA isolation valves.
	SRO	19. INITIATE evaluation of plant status:
	RO	a. ENSURE cold leg recirculation capability:
		<ol> <li>Power to at least one RHR pump AVAILABLE.</li> <li>Capability to operate the following values AVAILABLE:</li> </ol>
		<ul> <li>FCV-63-72 and FCV-74-3 (for RHR Pump A-A).</li> </ul>
		OR
		FCV-63-73 and FCV-74-21     (for RHR Pump B-B).
		b. CHECK Auxiliary Building radiation:
	BOP	1) Area Radiation Monitors RR–90–1A and RR–90–1B NORMAL.
		2) Aux Bldg Vent monitor recorder 0-RR-90-101 NORMAL (prior to isolation).
	SRO	c. CONSULT TSC to determine dose projection for steaming S/Gs.
	SRO	d. CHECK dose projection for each S/G acceptable.

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Appendix D	Form ES-D-2								
Op Test No.:	NRC	Scenario #	3	Event #	7,8,9,10	Page	68	of	83

Event Description:

SBLOCA/Loss of offsite power(delayed) resulting in a loss of power to both 6.9 kV Shutdown Boards

Time	Position	Applicant's Actions or Behaviors
		e. DUMP steam to condenser from Intact S/Gs UNTIL S/G pressure less than RCS pressure.
	SRO	20. DETERMINE if reactor vessel head should be vented:
		CONSULT TSC for evaluation of vessel     head venting.
	SRO	21. WHEN 4 hours have elapsed since event initiation, THEN PREPARE for hot leg recirculation:
		DISPATCH personnel to restore power to FCV-63-22 USING EA-201-1, 480V Board Room Breaker Alignments.
	SRO	<ol> <li>WHEN 5 hours have elapsed since event initiation, THEN GO TO ES- 1.4, Transfer to Hot Leg Recirculation.</li> </ol>
	SRO	23. EVALUATE long term plant status:
		CONSULT TSC.
		END
Scenario may	v be terminate	d upon transition to ES-1.2 at Step 15.b.

	Appendix D		Required Operator Actions Fo						m ES-D-2		
C.	Op Test No.:	NRC	Scenario #	3	Event #	FR-Z.1	Page	69	of	83	
Anna de la	Event Description:	Hig	High Containment Pressure Function Restoration (Orange Path)								

Time	Position	Applicant's Actions or Behavior						
		FR-Z-1, High Containment Pressure						
	NOTE: If th 1.1 cor	his procedure has been entered for an orange path and performance of ECA- (Loss of RHR Sump Recirculation) is required, FR-Z.1 may be performed ncurrently with ECA-1.1.						
	RO	1. MONITOR RWST level greater than 27%.						
	RO	<ul> <li>2. VERIFY Phase B valves CLOSED:</li> <li>Panel 6K PHASE B GREEN</li> <li>Panel 6L PHASE B GREEN.</li> </ul>						
	RO	3. ENSURE RCPs STOPPED						
	BOP	4. DETERMINE IT This procedure should be exited:						
		Any S/G pressure DROPPING     in an uncontrolled manner						
		OR						
		Any S/G pressure less than 140 psig.						
		RNO Required)						
		RNO:						
		a. GO TO Step 5.						
		b. CHECK containment pressure less than 12 psig.						
		<ul> <li>c. CHECK at least one containment spray pump RUNNING and delivering flow.</li> </ul>						
		d. CHECK at least one containment air return fan RUNNING.						
		e. <b>RETURN</b> to procedure and step in effect.						

		Required Operator Actions	Form ES
Op Test No.: Event Description:	NRC	Scenario # <u>3</u> Event # FR-Z.1	Page <u>70</u> of
Time	Position	Applicant's Actions or Be	havior
		FR-Z-1, High Containment Pressure	
	RO	5. VERIFY containment spray operation:	
		a. CHECK RHR sump recirculation capa	bility AVAILABLE.
		b. VERIFY containment spray pumps RL	INNING.
		c. CHECK RWST level greater than 27%	).
		d. VERIFY containment spray suction AL	IGNED to RWST:
		FCV-72-22 OPEN	
		<ul> <li>FCV-72-21 OPEN.</li> </ul>	
		e. VERIFY containment spray discharge	valves OPEN:
		• FCV-72-39	
		• FCV-72-2.	
		f. VERIFY containment spray recirc valve	es CLOSED
		• FCV-72-34	
		• FCV-72-13.	
		g. <b>VERIFY</b> containment spray flow greate train.	ər than 4750 gpm on each
	BOP	6. <b>MONITOR</b> containment air return fans:	
		WHEN at least 10 minutes     have elansed from Phase B	
		THEN	
		ENSURE containment air return fans	
	·		
	RO	7. VERIFY containment ventilation dampers	CLOSED:
		Panel 6K CNTMT VENT GREEN	••••••••••••••••••••••••••••••••••••••
		Panel 6L CNTMT VENT OREEN	

	Appendix D		Required Operator Actions Form ES-D-2									
	Op Test No.:	NRC	Scenario # <u>3</u> Event # FR-Z.1 Page <u>71</u> of <u>83</u>									
	Event Description:	High	Containment Pressure Function Restoration (Orange Path)									
	Time	Position	Applicant's Actions or Behavior									
			FR-Z-1, High Containment Pressure									
		RO	8. VERIFY Phase A valves CLOSED:									
			Panel 6K PHASE A GREEN									
			Panel 6L PHASE A GREEN.									
		RO	<ol> <li>VERIFY cntmnt vacuum relief isolation valves CLOSED: [Pnl 6K MANUAL]</li> </ol>									
			• FCV-30-46									
			• FCV-30-47									
			• FCV-30-48.									
		BOP	10. VERIFY MSIVs and MSIV bypass valves CLOSED.									
1 International												
		BOP	11. DETERMINE if any S/G Intact:									
			a. CHECK at least one S/G pressure:									
			CONTROLLED or RISING									
			AND									
			Greater than 1/0 psin									
	C	AUTION: Is	solating all S/Gs will result in a loss of secondary heat sink.									
		BOP	12. DETERMINE if any S/G Faulted:									
	L		a. CHECK S/G pressures:									

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	Appendix D		Re	quired Op	perator Acti	ons	Form ES-D-				
6	Op Test No.:	NRC	Scenario #	3	Event #	FR-Z.1	Page	72	of	83	
	Event Description:	Higl	High Containment Pressure Function Restoration (Orange Path)								

Time	Position	Applicant's Actions or Behavior
		FR-Z-1, High Containment Pressure
		<ul> <li>Any S/G pressure DROPPING in an uncontrolled manner</li> <li>OR</li> <li>Any S/G pressure</li> </ul>
		less than 140 psig
	BOP	b. <b>ISOLATE</b> feed flow to affected S/G:
		MFW     AFW
	BOP	13. MONITOR if hydrogen igniters and recombiners should be turned on:
		<ul> <li>a. DISPATCH personnel to open ice condenser AHU breakers USING EA-201-1, 480 V Board Room Breaker Alignments.</li> </ul>
		b. CHECK hydrogen concentration measurement AVAILABLE:
		Hydrogen analyzers     have been in ANALYZE     for at least 5 minutes.
		c. CHECK containment hydrogen concentration less than 6%.
		<ul> <li>d. WHEN ice condenser AHU breakers have been opened, THEN ENERGIZE hydrogen igniters USING Appendix D, Placing Hydrogen Analyzers and Igniters In Service.</li> </ul>
		e. CHECK containment hydrogen concentration less than 0.5%.
	RO	14. <b>MONITOR</b> if RHR spray should be placed in service:
		a. CHECK the following:

	Appendix D		Re	quired O	perator Actio	ons	Form ES			
10	Op Test No.:	NRC	Scenario #	3	Event #	FR-Z.1	Page	73	of	83
	Event Description:	Hig	h Containment P	ressure Fu	nction Restora	tion (Orange Path)				
	Time	Position	1		A					

Time	Position	Applicant's Actions or Behavior
		FR-Z-1, High Containment Pressure
		Containment pressure     greater than 9.5 psig
		AND
		At least 1 hour has elapsed     since beginning of accident
		AND
		RHR suction ALIGNED     to containment sump
		AND
		At least one CCP AND one SI     pump RUNNING.
	RO	b. CHECK both RHR pumps RUNNING.
	RO	c. ESTABLISH Train B RHR spray:
		1) CHECK Train B RHR pump RUNNING.
		2) ENSURE RHR crosstie FCV-74-35 CLOSED.
		3) CLOSE RHR injection FCV-63-94.
		4) <b>OPEN</b> RHR spray FCV-72-41.
	RO	d. MONITOR containment pressure greater than 4 psig.
	RO	15. MONITOR if containment spray should be stopped:
		a. CHECK any containment spray pump RUNNING.
		b. CHECK containment pressure less than 2.0 psig.
·····		c. CHECK containment spray suction aligned to RWST.
		d. RESET Containment Spray.
		e. <b>STOP</b> containment spray pumps and <b>PLACE</b> in A-AUTO.

Appendix D

NUREG 1021 Revision 9

	Appendix D	andix D Required Operator Actions						Form ES-D				
ere.	Op Test No.:	NRC	Scenario #	3	Event #	FR-Z.1	Page	74	of	83		
	Event Description:	High	n Containment Pr	essure Fu	nction Restorat	tion (Orange Path)						
	Time	Position			Applica	nt's Actions or Behavi	or					

	FR-Z-1, High Containment Pressure								
	f. CLOSE containment spray discharge valves:								
	• FCV-72-39, Train A								
	• FCV-72-2, Train B.								
SRO	16. RETURN TO procedure and step in effect.								
	END								

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Appendix D		Required Operator Actions Form							
Op Test No.:	NRC	Scenario # 3 Event # ES-0.5 Page 75	of 92						
Event Descriptio	n: ES	-0.5, Equipment Verifications							
Time	Position	Applicant's Actions or Behavior							
		ES-0.5, Equipment Verification							
CRITICAL TASK	BOP	Start at least 1 EDG prior to placing equipment PTL in ECA.( 1A-A EDG started, supplying 1A-A 6.9 kV Shutdown Board y	)-0 voltage						
CRITICAL TASK	RO	Start at least 1 CCP (high-head injection pump)	<u>onugo</u>						
		1A-A CCP started delivering hi-head injection via the CCPIT	to RCS.						
TASK	BOP	Start at least 1 'A' Train ERCW Pump in an operating safegu	ards train						
Evaluator No	te: Following manually A, 2A-A, pushbutt should be	SI actuation, both EDGs will fail to start. BOP Operator is expected start 1A-A EDG from either 1-M-1 using 1-HS-82-15, DG EMERG S 1B-B, 2B-B handswitch or back panel 0-M-26A using emergency sta on 0-HS-82-16A and start at least 1 'A' Train ERCW Pump (J-A ERC e the U1 A Train pump started).	d to START 1A- art SW Pump						
CRITICAL TASK	BOP	1. VERIFY D/Gs RUNNING. (RNO Required)							
		RNO:							
		EMERGENCY START D/Gs.							
	BOP	2. VERIFY D/G ERCW supply valves OPEN.							
CRITICAL TASK	BOP	3. VERIFY at least four ERCW pumps RUNNING. (RNO Required)							
		RNO: START ERCW pumps as necessary (one on each shutdown board preferred).							
	ROP								
		<ul> <li>Pump 1A-A (2A-A) Must Manually Start</li> <li>Pump 1B-B (2B-B)</li> <li>Pump C-S</li> </ul>							
	BOP	5. VERIFY EGTS fans RUNNING							
	BOP	6. VERIEY generator breakers OPEN							

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Appendix D		Required Operator Actions Form ES-D-2
Op Test No.:	NRC	Scenario # 3 Event # ES-0.5 Page 76 of83
Event Description	on: ES-	0.5, Equipment Verifications
Time	Position	Applicant's Actions or Behavior
		ES-0.5. Equipment Verification
	BOP	<ol> <li>NOTIFY at least two AUOs to report to MCR to be available for local actions.</li> </ol>
	BOP	8. VERIFY AFW pumps RUNNING:
		MD AFW pumps
		TD AFW pump.
AFW level co levels, to esta	ntrol valves sh ablish flow due	ould NOT be repositioned if manual action has been taken to control S/G to failure, or to isolate a faulted S/G.
	BOP	9. CHECK AFW valve alignment:
		<ul> <li>a. VERIFY MD AFW LCVs in AUTO.</li> <li>b. VERIFY TD AFW LCVs OPEN.</li> <li>c. VERIFY MD AFW pump recirculation valves FCV-3-400 and FCV-3 401 CLOSED.</li> </ul>
	BOP	10. VERIFY MFW Isolation:
		a. CHECK MFW pumps TRIPPED
		b. ENSURE the following:
		<ul> <li>MFW regulating valves CLOSED</li> <li>MFW regulating bypass valve controller outputs ZERO</li> <li>MFW isolation valves CLOSED</li> </ul>
	BOP	11 MONITOR ECCS operation:
		a. VERIEY FCCS pumps RUNNING
CRITICAL TASK	RO	Start at least 1 CCP (high-head injection pump) 1A-A CCP started delivering hi-head injection via the CCPIT to RCS.
CRITICAL TASK	RO/ BOP	<ul> <li>CCPs - MANUALLY START 1A-A CCP</li> <li>RHR pumps</li> <li>SI pumps</li> </ul>
		b. VERIFY CCP flow through CCPIT
		c. CHECK RCS pressure less than 1500 psig.

Appendix D		Required Operator Actions		Foi	m ES	-D
Op Test No.:	NRC	Scenario # Event # ES-0.5 F	Page _	77	of _	{
Event Description:	ES-	D.5, Equipment Verifications				
Time	Position	Applicant's Actions or Behavior	······································			
		ES-0.5, Equipment Verification				
		d. VERIFY SI pump flow.				
		e. CHECK RCS pressure less than 300 psig.				
		f. VERIFY RHR pump flow.				
		12 VERIEV ESE systems ALICNED:				
		a Phase & ACTUATED:				
		PHASE A TRAIN A alarm LIT     [M-6C, B5].				
		PHASE A TRAIN B alarm LIT [M-6C, B6].				
		b. Cntmt Vent Isolation ACTUATED:				
		CNTMT VENT ISOLATION     TRAIN A alarm LIT [M-6C, C5].	<u> </u>			
		CNTMT VENT ISOLATION     TRAIN B alarm LIT [M-6C, C6].				
		c. Status monitor panels:				
		• 6C DARK				
		• 6D DARK				
		be LTLOUISIDE outlined area				
		OJLII.				
		CNTMT VENT OPEEN				
		PHASE A GREEN				
		e. Train B status panel 61				
		CNTMT VENT GREEN				
		PHASE A GREEN				
			19			
		13. MONITOR containment spray NOT required:				
		a. CHECK for any of the following:				
		OR     OR				

Appendix D		Re		For	m ES	3-0			
Op Test No.: Event Description:	NRC ES	Scenario # -0.5, Equipment	<u>3</u> Verificatio	Event #	ES-0.5	Page	78	of	
Time	Position			Applica	nt's Actions or Beha	vior			
		ES-	).5. Equi	ipment Verif	ication				
		•	Contair	iment pressu	re greater than 2	2.8 psig			
		b CH	ECK for	any of the	following				
		1)	Containn RUNNIN	nent spray pu G.	mps				<u></u>
		2)	Containn isolation and FCV	nent spray he valves FCV-7 -72-2 OPEN.	ader 2-39				
		3)	Containn valves to and FCV	nent spray rec RWST FCV- -72-13 CLOS	irculation 72-34 ED.				
		4)	Containn greater tl	nent spray hei han 4750 gpm	ader flow per train.				
		5)	Panel 6E	LIT.					
		c. <b>VE</b>	RIFY Pha	ase B ACTUA	ATED:				
		•	PHASE E [M-6C, A	3 TRAIN A ala 5].	rm LIT				
		•	PHASE E [M-6C, AI	3 TRAIN B ala 6].	rm LIT				
		d. ENS	SURE RO	CPs STOPPE	ED.				
		e. VEF	RIFY Pha	ase B valves	CLOSED:				
		• [	Panel 6K	PHASE B GR	EEN.				
		•	Panel 6L	PHASE B GR	EEN.				
		f. WH retu	<b>EN</b> 10 m rn fans F	inutes have RUNNING.	elapsed, <b>THEN</b>	ENSURE c	ontainr	ment	ai
		14. <b>MONIT</b>	OR if co	ntainment va	cuum relief isola	ation valves	shoul	d be	
		closed:							
		a. CHE	ECK con	tainment pre	ssure greater that	an 1.5 psig.	•	_	
		b. CHE MAN	ECK cntr NUAL]	nt vacuum re	lief isolation valv	ves CLOSE	D: [Pn	l 6K	

Appendix D Required Operator Actions								Form ES-D-2		
Op Test No.:	NRC	Scenario #	3	Event #	ES-0.5	Page	79	of	83	
Event Description:	It Description: ES-0.5, Equipment Verifications									
Time	Position			Appli	cant's Actions or Behav	vior				
		ES-	0.5, Equi	pment Vei	rification					
		15. CHEC	<b>K</b> second	lary and co . Secondar	ontainment rad mo rv Rad Monitors	nitors <b>US</b>	NG the	e follo	wing:	
		• Ap	pendix B,	, Containm	ent Rad Monitors.	RHR pun	nps			
		16. WHEN Mitiga	I directed tion Action	by E-0, <b>TI</b> ns.	HEN PERFORM A	ppendix E	), Hydr	ogen		
		17. CHEC • HS • HS	K pocket -77-410, I -77-411, I	sump pum Rx Bldg Au Rx Bldg Au	ips STOPPED: [M ix Floor and Equip ix Floor and Equip	-15, upper ment Drai ment Drai	r left co n Sum n Sum	prner] p pum	ip A B.	
		18. <b>DISPA</b> ESF A	<b>TCH</b> pers	sonnel to p	perform EA-0-1, Ec	quipment (	Checks	; Follo	wing	
		19. ENSU and SI	<b>RE</b> plant a	announcer	nent has been ma	de regard	ing Rea	actor 7	Ггір	
			- <u></u>		END					

Appendix D		Required Operator Actions	Form	IES-D-
Op Test No.: Event Descriptio	NRC	Scenario # <u>3</u> Event # <u>AOP-P.01</u> Pagess of Off Site Power	e <u>80</u>	of <u>8</u>
Time	Position	Applicant's Actions or Behavior		
		AOP-P.01, Loss of Off Site Power		
Evaluator No	ote: During A actions ir important outside th	OP-P.01 implementation, the crew performs through step 9 nportant to support current operating strategies; further acti t, are administrative or are delegated to Unit 2 MCR or othe ne MCR.	, which con ivities, while er plant pers	tains connel
		2.0 OPERATOR ACTIONS		
	CREW	1. <b>DIAGNOSE</b> the failure:		
		IF.,.	GO TO SECTION	PAGE
		Complete loss of off-site power	2.1	4
		<ul> <li>Partial Loss of Offsite Power:</li> <li>A or B start busses de-energized OR</li> </ul>	2.2	29
		<ul> <li>loss of normal supply to individual shutdown board (shutdown board energized from D/G)</li> </ul>		
		2.1 Complete Loss of Offsite Power		
		NOTE: Steps 1 and 2 are immediate actions.		
		Start at least 1 EDG prior to placing equipment PTL is	n ECA.0-0.	
		1A-A EDG started, supplying 1A-A 6.9 kV Shutdown I	Board volta	age.
	BOP	1. <b>CHECK</b> Diesel Generators RUNNING and supplying ( <i>RNO Required</i> )	shutdown t	oards.
		RNO:		
	BOP	EMERGENCY START available D/Gs. (From 1-M-1 Han Emergency Start PB)	dswitch or (	)-M26-/
	BOP	2. CHECK ERCW supply valves to D/Gs OPEN.		
Evaluator No	te: AOP-P.0 <sup>°</sup> these pro procedure actions to	as well as E-0, ECA-0.0 and ES-0.5 all verify 6.9 kV Shut cedures implement actions to restore shutdown board volta s provide these instructions giving the operators multiple p restore voltage to at least one 6.9 kV Shutdown Board.	down Board age. Severa prompts to c	l voltag al continue

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Appendix D Required Operator Actions For								orm ES	6-D-2
Op Test No.:	NRC	Scenario #	3	Event #	AOP-P.01	Page	81	of	83
Time	Position			Applica	nt's Actions or Behavi	or			
		AOP-I	P.01, Lo	oss of Off Si	te Power				
	BOP	3. MONITO (RNO Requ	<b>red)</b>	H 6900V shu	tdown boards on	this unit	ENER	SIZED	).
	BOP	RNO: IF NO 6900 the following	/ shutdo	own board is	ENERGIZED on	this unit,	THEN	PERF	ORI
		a. <b>IF</b> un Powe	iit is in N er has b	lode 1-4, <b>TH</b> een entered.	EN ENSURE EC	A-0.0, Lo	ss of A	AL AC	
		b. IF un	it is in N	lodes 5 or 6.	this Step is N/A				
		c. IF an	y D/G is	s available	1A-A EDG should	d be starte	əd		
	BOP	d. WHE	N off-sit	te power is a	vailablewill not	be restor	ed this	scena	ario
		e. DO N is EN	<b>IOT CO</b> IERGIZI	NTINUE Sec	tion 2.1 UNTIL a	t least on	e shuto	down t	ooar
	BOP	IF one 6900 PERFORM 1	OV shut the foll	down boai Iowing:	rd is ENERGIZED	) on this	unit,	THEN	1
CRITICAL	PO	Start at leas	t 1 CCF	? (high-head	injection pump	)			
TASK		1A-A CCP s	tarted c	lelivering hi	-head injection	via the C	CPIT t	o RCS	5.
		a. ENSI	JRE ava	ailable CCP I	RUNNING.				
	RO	b IE NC		available		viac. atom			
	BOP	<u> </u>			TA-A COP III Sel	Nce- step	IN/A	•••	
		c. IF ar	iy D/G a	ivailable1	A-A EDG in serv	vice- ste	p N/A		
	BOP	d. PERF	F <b>ORM</b> a s:	pplicable AC	P for loss of shut	down boa	ard as	time	
		• AC	)P-P.05 (l	Unit 1 Shutdow	n Boards)				
	·	• AC	)P-P.06 (I	Unit 2 Shutdown	n Boards)		·····		

Appendix D Required Operator Actions Fo								rm ES	S-D-
Op Test No.: Event Descriptior	NRCNR	Scenario #	3 wer	Event #	AOP-P.01	_ Page	82	of	8
Time	Position			Applicar	nt's Actions or Behavi	or			
		AOP-	P.01, Lo	ss of Off Sit	e Power				
	BOP	e. IF of	f-site pov	ver is availat	oleN/A for rema	ainder of s	scenar	io	
		4. NOTIFY	SM to p	erform the fo	llowing:	sification	Motrix		
				_1117-1, L1116		sincation	Matrix		
		b. INIT Syst	IATE sta em.	ffing of TSC	and OSC <b>USING</b>	Emerger	ncy Pa	ging	
		5. RECOR	<b>D</b> time of	loss of off-s	ite power				
		6. MONITO	<b>)R</b> diesel	generator lo	bading:				
		7. CHECK	charging	system ope	ration:				
	CAUTION	<ol> <li>Failure to to contair uncontrol</li> <li>Opening greater th</li> </ol>	promptly ment wil led press <u>Frain A</u> E an 82.3°	/ restart air c l delay restor surizer level r RCW supply - makes <u>Trai</u> t	ompressors and ration of letdown. rise and PORV op to Station Air Cou n A MCR Chiller a	restore no This ma ening. mpressor ind EBR (	on-ess y resul s with Chiller	ential t in ERCW inope	air ter rab
		due to ina	idequate	ERCW flow.	This would place	e both uni	ts in L(	CO 3.0	).5.
	NUIE		DI AIF COM	ipressors wil	i add about 0.1 N	IW to D/G	i 1A-A	and 1	B-B
		8. RESTOR	RE contro	l air: handswitche	es in CLOSE pos	ition.			

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	Appendix D		Required Operator Actions Form ES-D-2								
	Op Test No.: Event Description:	Test No.:       NRC       Scenario #       3       Event #       AOP-P.01       Page         ent Description:       Loss of Off Site Power									
	Time	Position	Applicant's Actions or Behavior								
			AOP-P.01. Loss of Off Site Power								
			b. ESTABLISH cooling water to station air compressors:								
			1) VERIFY Train B ERCW available.								
			2) ENSURE FCV-67-208 Train B ERCW to air compressors OPEN. [0-M-27A]								
			c. WHEN ERCW established to station air compressors, THEN DISPATCH an operator to start Station Air Compressors A and B USING EA-32-2, Establishing Control and Service Air.								
			d. <b>ENSURE</b> auxiliary air compressors RUNNING. [M-15 or AB el 734] (powered from Unit 2 Shutdown Bds)								
C			e. CHECK Phase B NOT actuated.								
			<ul> <li>f. WHEN control air pressure restored, THEN RESTORE air to containment USING EA-32-1, Establishing Control Air to Containment.</li> </ul>								
			<ol> <li>DISPATCH operator to D/G Building to monitor diesel generators USING 0-SO-82-1, 2, 3, 4 App. C.</li> </ol>								
	Evaluator Note:	During AO actions im important, outside the	P-P.01 implementation, the crew performs through step 9, which contains portant to support current operating strategies; further activities, while are administrative or are delegated to Unit 2 MCR or other plant personnel e MCR.								

_	Appendix	Form ES-D-1					
F							
	Facility: Sequoyah Examiners:		h	Scenario No.: 4 Op Test No Operators:	.: NRC		
	Initial Cond	ditions: <u>10</u>	0% Power BOL;	TD AFW Pp OOS for maintenance			
	Turnover:	Maintain Cu	irrent Plant cond	tions			
	Target CTs	wn initiation. essurization					
		Terminate F	RCS depressuriz	ation prior to losing RCS Subcooling			
	Event #	Malf. No.	Event Type*	Event Description			
-	<b>1.</b> T+0	ED16A	C – BOP TS – SRO	125 DC Vital Battery Charger I failure			
	<b>2.</b> T+10	RW01E	C – BOP TS – SRO	ERCW Pump N-B trips			
	<b>3.</b> T+20	RX11B	I – RO TS – SRO	1-PT-1-73, Main Turbine Impulse Pressure Transmitter fails low			
	<b>4.</b> T+30	TH05A	C – All TS – SRO	SGTL			
	<b>5.</b> T+50	N/A	R – RO N – SRO/BOP	Rapid plant shutdown			
	<b>6.</b> T+50	ZDIHS62138A	C – RO C – SRO	Rapid Boration Valve fails to open; RWST use for rapid shutdown			
	<b>7.</b> T+50	TH05A	M – All	SGTL increases to SGTR requiring Rx Trip and Safety Injection			
	<b>8.</b> T+50	MS04A	C – BOP	#1 SG MSIV Auto/Manual close failure			
	<b>9.</b> T+60	RC06A RC06B	C – RO	Both Pzr Spray Valves fail full open during RC	S depressurization in E-3		
	* (N)	ormal, (R)eacti	vity, (I)nstrume	nt, (C)omponent, (M)ajor			

 $( \$ 

Appendix D

#### **Scenario 4 Summary**

The crew will assume the shift with the unit at 100% Power BOL and the TD AFW Pump OOS for maintenance with the directions to maintain 100% RTP per 0-GO-5 Section 5.2.

At the direction of the Lead Examiner, 125 Volt DC Vital Battery Charger I fails. Crew will respond to 1-AR-M1C, A-4, diagnose the failure and initiate 0-SO-250-1, Section 8.1.1 to transfer Vital Battery I to the spare charger. SRO will refer to Technical Specifications 3.8.2.3 Action b.

After the charger failure, at the direction of the Lead Examiner, Essential Raw Cooling Water Pump N-B will trip. The crew will refer to alarm response procedures (ARPs) 0-AR-M27A A-4, C-4, 0-AR-M27B-A E-3, E-4 and should go to AOP-M.01, Section 2.1. Section 2.1 directs manually starting L-B ERCW Pump and repositioning the DG Power Selector, 0-XS-67-286 for proper safeguards actuation. SRO will refer to Tech Specs: 3.7.4; the LCO is applicable until selector switch 0-XS-67-286 is re-selected to the OPERABLE pump.

Following the ERCW pump trip, at the direction of the Lead Examiner, Turbine Impulse Transmitter PT-1-73 will fail low. This will result in inadvertent rod insertion. The crew will respond using alarm response procedure (ARPs) 1-AR-M5A A-6 and abnormal procedure AOP-C.01, Rod Control Malfunctions Section 2.1, Uncontrolled Rod Bank Movement to place Rod Control in Manual. AOP-C.01 Section 2.1 transitions the crew to AOP-I.08 Section 2.1, Failure of 1-PI-1-73, to evaluate actual S/G levels vs. level program, Feedwater Control and direct transfer steam dump control system to steam pressure mode. SRO will refer to Tech Specs: 3.3.1.1 Functional Unit 22E, Action 8.b.

Following the impulse pressure failure, at the direction of the Lead Examiner, a Steam Generator Tube Leak (SGTL) approximately 15 gpm, occurs in #1 Steam Generator (SG). The crew will respond using ARPs 0-AR-M12A B-5, C-1 and go to AOP-R.01, SG Tube Leak Section 2.1 initially. SRO will refer to Tech Specs: 3.4.6.2.c Action a.

Since this leak is within normal charging capacity, AOP-R.01 directs the crew to perform a rapid shutdown according to AOP-C.03, Rapid Shutdown or Load Reduction. During initiation of the rapid load reduction, 1-FCV-62-138, Emergency Boration Flow Control Valve fails to open (from the MCR and locally) resulting in the crew using either normal makeup boration or boration from the RWST. From Event 3, Rod Control remains in MANIUAL.

After the rapid shutdown is initiated, at the direction of the Lead Examiner, the SGTL will propagate to a significant rupture (~400 gpm). This leak size will require Reactor Trip/Safety Injection initiation.

After the crew initiates the Reactor Trip/SI, the ruptured S/G MSIV will not close. E-3, SGTR requires closing nonruptured MSIVs and other steam paths both from the MCR and locally to isolate the ruptured S/G. #1 S/G MSIV will close when EA-1-1, Closing MSIVs Locally, E-3 alternate path actions, is implemented.

As the crew progresses through E-3, they will cool down and depressurize the RCS to the identified target values. During depressurization, both Pressurizer Spray Valves will fail open requiring the crew to stop at least #1 and #2 RCPs to control the RCS depressurization.

The scenario may be terminated when crew has completed RCS depressurization and CCPIT isolation in E-3 Step 24.



## NRC 1009 ESG-4 Booth Instruction File

7-16-2010

EVENT		IC/MF/RF/OR # DESCRIPTION/EXPECTED ACTIONS/E			
6	Cimeral Action 10		FEEDBACK		
	Simulator IC	IC-16 Perform switch check. Allow the simulator to run for at least 3 minutes before loading SCEN file or starting the exercise. This will initialize ICS.	100%, BOL ~150 MWD/MTU CB 'D' Rods @ 216 steps, all others @ 228 steps; [B] = 1120 ppm; Ba Blender setting: 27.5% Xe/Sm @ equilibrium <u>Console Operator actions: Place simulator in run</u> <u>and perform the following:</u>		
		Load SCENS: <u>1009 NRC ESG-4</u> Place simulator in RUN. Place OOS equipment in required position with tags. Clear alarms	<ul> <li>Allow the simulator to run before loading SCEN file.</li> <li>Place the MODE 1 sign on 1-M-4</li> <li>Place Train Week A sign</li> </ul>		
	MFs, RFs, ORs are	IMF FW07C f:1	TDAFW PUMP IS INOPERABLE.		
	SCN file is loaded.	IOR ZLOHS117A_GREEN f:0 IOR ZLOHS118A_GREEN f:0	<u>Close</u> FCV-1-17 & 18 & <u>place Hold Notice</u> on HS-1-17&18 and FCV-1-51.		
		IOR ZLOHS3136AA_GREEN1 f:0 IOR ZLOHS3136AA_GREEN2	Also <u>place Hold Order</u> on TDAFW Pump ERCW supply valves.		
$\bigcirc$		f:0 IOR ZLOHS3136AA_RED1 f:0 IOR ZLOHS3136AA_RED2 f:0 IOR ZDIHS3136AA f:0	Place Protected Equipment tags on both MD AFW Pumps, 1-M-4 and both EDGs, 0-M-26		
		IOR ZLOHS3179AA_GREEN1 f:0 IOR ZLOHS3179AA_GREEN2 f:0 IOR ZLOHS3179AA_RED1 f:0 IOR ZLOHS3179AA_RED2 f:0 IOR ZDIHS3179AA f:0			
	Event 1.: insert using	IMF ED16A f:1 k:1	125 DC Vital Battery Charger I failure		
			<u>Support staff report</u> : When dispatched, wait ≈ 2 minutes then report that the battery charger was smoking but no flames, and that the AUO opened AC input and DC output breakers. [Role-play as Fire OPS if needed.]		
	If requested align the	IRF EDR65A f:1 k:11	Place Spare Charger 1-S on Vital battery Bd I.		
	Bat Bd I, insert KEY-11		<u>Support staff report</u> : When dispatched, wait ~20 min to insert the remote function and then report the transfer complete.		
	Event 2.: insert using	IMF RW01E f:1 k:2	ERCW Pump N-B trips on overcurrent.		
	<u>INEY 2</u>		<u>Support staff report</u> : When dispatched to check the breaker, wait $\approx 3$ minutes then report that there is an instantaneous overcurrent relay on the pump breaker.		
Ċ			<u>Support staff report</u> : When dispatched to check Motor wait ~5 min and report motor is hot to the touch. Role play as AUO to close tripped pump discharge valve as needed, no console actions are needed.		

### NRC 1009 ESG-4 Booth Instruction File

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EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH FEEDBACK
Event 3.: insert using	IMF RX11B f:0 k:3	Impulse Pressure Transmitter 1-PT-1-73 Fails Low
		<u>Support staff report</u> : When IMs or MSS contacted to trip bistables, inform the crew that the IMs will report to the MCR in ~ 45 minutes.
Event 4.: insert using Key 4	IMF TH05A f:0.3 k:4	#1 SGTL ~15 gpm & Rapid Plant Shutdown
·····		<u>Support staff report</u> : When Chem Lab contacted for RM- 90-119 limit, inform the crew of the limit on the Ops chemistry information report (turnover information). Report that other Chemistry actions will take ~45 minutes to complete.
		<u>Support staff report</u> : When RADCON/Chem Lab are requested to survey/sample S/Gs, wait ~10 min then report as RADCON that #1 S/G has slightly higher background than the others.
		<u>Support staff report</u> : Wait 45 minutes and report as Chem Lab that ruptured S/G is #1 S/G.
Event 5.	- none -	AOP-C.03 Rapid Plant Shutdown
		<u>Support staff report</u> : as necessary to support plant power reduction.
Event 6.	IOR ZDIHS62138A f:0	Emergency Boration Flow Control Valve (FCV-62-138) Will Not Open.
	[pre-insert]	<u>Support staff report</u> : If Dispatched to check locally wait~ 3 min and report valve closed but you cannot determine why it won't open. If requested to operate the valve locally, report that it will not open locally either.
Event 7. Modify Malfunction	MMF TH05A f:8.6 r:300	Lp 1 SGTL Increasing To SGTR (~400 Gpm) Over 5 Min. (Rx Trip/Safety Injection required)
		Support staff report: - none -
Event 8.	IMF MS04A f:1 [pre-insert]	#1 SG MSIV Auto/Manual close failure
<u>KEY-18</u>	IOR AN_OV_610 f:2 k:18 IOR AN_OV_617 f:2 d:5 k:18 IRF MSR04A f:1 d:10 k:18 AND	<u>Support staff report</u> : When directed to perform EA-1-1, wait 1 minute and report #1 SG MSIV transfer switch in the AUX position.
	DMF MS04A w/ k:18	THEN, Insert KEY 18
Event 9.: Insert during E-3 RCS Depress <u>Key 9</u>	IMF RC06A f:100 k:9 IMF RC06B f:100 k:9	BOTH Pzr Spray Valves PCV-68-340B & 68-340D Fail Open
		Support staff report: -none-
Termination Criteria:	completion of E-3 Step 24,	CCPIT Isolation



1009 ESG-4 Page 1 of 5

Unit 1 MCR CHECKLIST	Page 1. c	of 3		Todav
Part 1 - Completed by Off-going	Shift / Reviewed by	y On-coming Shi	ift	
Mode 1, 100% Power		NRC	phone Authenticat	ion Code
Grid Risk: Green				
		Until 0800 XXXX	κ	
RCS Leakage ID .02 gpm, UNID .02 gp	m		After 0800 YYYY	/
	0	0.0.0		
a Nono	Common Teci	Spec Actions		
• None				
	U-1 Tech S	pec Actions		
LCO/TRM	Equipment INOP		Time INOP	Owner
TS LCO 3.7.1.2.a TD	AFW T&T valve repair		2 hours ago	MMG
TS 3.3.3.7.18b action 1 TD	AFWP ERCW - AFW	Valve Position	2 hours ago	MMG
			-	
	Protected	Equipment		
<ul> <li>Equipment/spaces for TDAFW</li> </ul>	Pump per 0-GO-16 /	\ррх J		
1000/ DTD :	Shift Pi	riorities		
• 100% RTP in accordance with (	)-GO-5 Section 5.2,	power Operation		
Daily and Shiftly Sis per work so	chedule			
Ĩ				
Part 2 – Performed by on-coming	shift			
Verify your current qualification	2		rating Log aines las	t hold shift ar 2
			rating Log since las	t neid snift or 3
X Standing Orders / Shift Orders		Q	ays, whichever is i	
				quired reading
LCO Actions				
Part 3 - Performed by both off-go	ing and on-coming	ı shift		
	undia			
	ras			

1009 ESG-4 Page 2 of 5

SHIFT TURNOVER CHECKLIST	Page 2. of 3	Today
	MAIN CONTROL ROOM (7690)	
<ul> <li>Train <u>A</u> Week</li> <li>Protected Equipment:</li> <li>MDAFW Pump A 1-HS-3-118A</li> <li>MDAFW Pump B 1-HS-3-128A</li> <li>D/G 1A-A 1-HS-57-46A</li> <li>D/G 1B-B 1-HS-57-73A</li> </ul>		
	OUTSIDE (7666) [593-5214]	
<ul> <li>All Equipment normal</li> <li>Equipment/spaces for TDAFWP p</li> </ul>	protected per 0-GO-16 Appx J	
TDAEW pump was tagged 2 hours	AUXILIARY BUILDING (7775)	
excessively. Expected Return to	service is 8 hours. (WO 10-08)	ve. The packing was blowing 0025-000)
TUF	RBINE BUILDING (7771) (593-84	(55)
• All Equipment normal		

1009 ESG-4 Page 3 of 5

### SHIFT TURNOVER CHECKLIST

### Page 3. of 3

Today

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### Equipment Off-Normal (Pink Tags)

UNID And Noun Name	Panel	Problem Description	WO / PER Number
[			

#### MCR WO LIST

ID And Noun Name	Panel	Problem Description	WO/PER Number
			····
	-		

### UNIT ONE REACTIVITY BRIEF Date: Today Time: Now

General Information

RCS Boron: <b>1120</b> ppm	Today	BA Con	troller Setpoint: 27.5% *	RCS B-10 Depletion: 2 ppm	
Operable BAT: A	BAT A Boron: 6	<b>850</b> ppm	BAT C Boron: 6850ppm	RWST Boron: 2601 ppm	
Nominal	Gallons per rod s	tep from 18	39: 17 gallons of acid, 75	gallons of water	

Verify boric acid flow controller is set at Adjusted BA Controller Setting iaw 0-SO-62-7 section 5.1

Estimated values for a 1° Change in Tave \*\*

Gallons of acid: 22

Gallons of water: 94

Rod Steps: 1

Estimated rods/boron for emergency step power reduction \*\* (Assuming Xenon equilibrium and no reactivity effects due to Xenon. 2/3 total reactivity from rods, 1/3 from boron)

Power reduction amount	Estimated Final Rod Position	Estimated boron addition	
10%	181 Steps on bank D	93 gallons	
30%	161 Steps on bank D	291 gallons	
50%	n/a	n/a	

\*\* These values are approximations and not intended nor expected to be exact. The values may be superseded by Rx Engineering or SO-62-7 calculated values. These values are calculated assuming 100% steady state power operation only. Engineering data last updated <u>TODAY</u>. Data Valid up to three weeks from now.

#### Previous Shift Reactivity Manipulations

Number of dilutions: 1	Number of borations:	Rod steps in:	
Gallons per dilution: 12	Gallons per boration:	Rod steps out:	
Total amount diluted: 12	Total amount borated:	Net change:	IN/Out

#### Current Shift Estimated Reactivity Manipulations

**Remarks:** Rx Power – 100% MWD/MTU – 1000 Xenon & Samarium at Equilibrium \*\*\*The boron letdown curve is flat for the next 25 EFPD.

Last Dilution Complete ~1 hour ago.

Next Unit 1 Flux Map is scheduled: <u>three weeks from now</u>

Unit Supervisor: \_

Name/Date

1009 ESG-4 Page 5 of 5

# **Operations Chemistry Information**

Boron Results						
Sample Point	Units	Boron	Date / Time	Goal	Limit	
U1 RCS	ppm	1120	Today / Now	Variable	Variable	
U2 RCS	ppm	816	Today / Now	Variable	Variable	
U1 RWST	ppm	2601	Today / Now	2550 - 2650	2500 - 2700	
U2 RWST	ppm	2569	Today / Now	2550 - 2650	2500 - 2700	
BAT A	ppm	6850	Today / Now	Variable	Variable	
BAT B	ppm	6850	Today / Now	Variable	Variable	
BAT C	ppm	6850	Today / Now	Variable	Variable	
U1 CLA #1	ppm	2556	Today / Now	2470-2630	2400-2700	
U1 CLA #2	ppm	2575	Today / Now	2470-2630	2400-2700	
U1 CLA #3	ppm	2591	Today / Now	2470-2630	2400-2700	
U1 CLA #4	ppm	2589	Today / Now	2470-2630	2400-2700	
U2 CLA #1	ppm	2531	Today / Now	2470-2630	2400-2700	
U2 CLA #2	ppm	2650	Today / Now	2470-2630	2400-2700	
U2 CLA #3	ppm	2522	Today / Now	2470-2630	2400-2700	
U2 CLA #4	ppm	2526	Today / Now	2470-2630	2400-2700	
Spent Fuel Pool	ppm	2547	Today / Now	<u>&gt;</u> 2050	<u>&gt;</u> 2000	
	ithium Res	ults		Goal	Midpoint	
U1 RCS	ppm	1.1	Today / Now	>1	>1	
U2 RCS	ppm	2.43	Today / Now	2.18-2.48	2.33	

Primary to Se	econdary L	eakrate In	formation (Total (	CPM RM-90-9	9/119)
Indicator	Units	U1	Date / Time	U2	Date/Time
SI 50 S/G Leakage?	Yes/No	No	Today / Now	No	Today / Now
SI 137.5 CVE Leakrate	gpd	< 0.1	Today / Now	< 0.1	Today / Now
5 gpd leak equivalent	cpm	115	Today / Now	68	Today / Now
15 gpd (30 min increase)	cpm	265	Today / Now	83	Today / Now
30 gpd leak equivalent	cpm	490	Today / Now	206	Today / Now
75 gpd leak equivalent	cpm	1165	Today / Now	455	Today / Now
150 gpd leak equivalent	cpm	2290	Today / Now	870	Today / Now
CVE Air Inleakage	cfm	10	Today / Now	12.5	Today / Now
Bkgd on 99/119	cfm	40	Today / Now	40	Today / Now
Steady state conditions	s are necessary	for an accurat	e determination of leak r	ate using the CVE	Rad Monitor



Appendix D		Required Operator Actions Form ES-D
Op Test No	.: <u>NRC</u>	Scenario #4 Event #1 Page 1 of 4
Event Descripti	on: 125	5 Volt DC Vital Battery Charger I
Time	Position	
Simulator		Applicant's Actions or Benavior
Indications/ Annuncia 1-M-1C	Alarms ator:	
Indication	ns	DC VITAL CHGR I FAILURE OR VITAL BAT I DISCHARGE"
1-M-1 • 1-EI-5	57-92, 125V VITA	L BATT BD 1 AMPS indicates increasing amps
·····	BOP	Refer to alarm response procedure 1-AR-M1-C, window A4
	BOP	[1] SELECT channel I on [1-XS-57-96] 125V Vital Battery voltage, AND CHECK battery bd voltage.
		[2] IF failure of 125V DC Vital Battery Bd, THEN GO TO AOP-P.02, Loss
	SRO	(Step is N/A Board Voltage is normal; decision to return to ARP)
	NOTE: Dow norm 92 in	nscale (zero or below) deflection of EI-57-92 indicates current flow from nal power supply (charger). <b>Upscale (greater than zero) deflection of EI-57</b> ndicates current flow from the battery.
	BOP	[3] CHECK [1-EI-57-92] Vital Battery Bd I amps.
		(Ammeter shows upscale deflection indicating battery discharge)
	BOP	[4] DISPATCH personnel to INSPECT AND CHECK for local alarms on the 125V DC Vital Charger I and 125V DC Vital Battery Bd I.
	BOP	[5] IF battery bd. voltage is less N/A
	BOP	[6] IF overvoltage condition N/A
	CREW	<ul> <li>[7] IF 125V Battery System is supplying Board, THEN ENSURE 125V DC Vital Battery Bd is ALIGNED in accordance with 0-SO-250-1, 125 Volt L Vital Power System.</li> </ul>
		(Crew should initiate placing spare charger in service to Vital Batt Bd I. Crew could also decide to place the 5 <sup>th</sup> Battery in service.)

Appendix D

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NUREG 1021 Revision 9

Appendix D		Req	uired Op	perator Action	IS		F	Form I	ES-D-2
Op Test No.:	NRC	Scenario #	4	Event #	1	Page	2	of	41
Event Description:	12	5 Volt DC Vital Bat	tery Char	ger l					

Time	Position	Applicant's Actions or Behavior
	SRO	[8] IF AC undervoltage or DC Breaker trip on charger, THEN ENSURE 125V Vital Charger is ALIGNED in accordance with 0-SO-250-1, 125 Volt DC Vital Power System.
	SRO/ CREW/	[9] IF charger failure, THEN EVALUATE need to place spare charger in service in accordance with 0-SO-250-1, 125 Volt DC Vital Power System.
		(If not previously initiated SRO should direct placing spare charger in service to Vital Batt Bd I. Crew could also decide to use the 5 <sup>th</sup> Battery)
	CREW	[10] EVALUATE EPIP-1 Emergency Plan Classification Matrix.
	SRO	<ul> <li>[11] EVALUATE TS LCOs 3.8.2.3. (2 Hr Action b. Applies)</li> <li>3.8.2.3, D.C. Distribution - Operating <u>ACTION b</u>: w/ 1 125-volt D.C. battery bank and/or its charger inoperable, restore inoperable bank and/or charger w/i 2 hrs or HT STDBY w/i next 6 hrs &amp; CLD SHTDWN w/i following 30 hrs. Tech Spec LCO applies until Spare Charger is placed in censize.</li></ul>
		rech opec 200 applies until opare charger is placed in service.
<b>Evaluator No</b>	te: The followi	ng CREW Brief and Notification actions are not contained in the procedure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).
Lead Examin	er may cue ne	xt event when the replacement battery charger in service and Tech
Specs are ide	entified.	

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		Require	Form ES-D-					
Op Test No.:	NRC	Scenario #	4 Event #	2	Page	3	of	41
Event Description	n: ER	CW Pump N-B trips.						
Time	Position		Applicant's	Actions or Bob	wior			
Simulator Op	erator: When	n directed, initiate	Event 2	Actions of Den				
Indications/A Annunicato 0-XA-53 0 0-XA-55 1 0-XA-55 0 0-XA-55 0 0-XA-55 0 0-XA-55 0 0-XA-55 0 0-XA-55 0 0-XA-55 0 0-XA-55 0 0-XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 0 -XA-55 -XA-55 0 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -XA-55 -	Iarms ors: 5-27A A-4, "UN C-4, "PL 5-27B-A E-3, "I E-4, "I 5: 7-452A, ERCW -488A, ERCW I -62, ERCW ID -451A, ERCW I	NIT 1 HEADER B PR JMP N-B DISCH PR ERCW PUMP MOTO ERCW/CCS PUMP N N-B Handswitch N HDR 1B SUPPLY PI R 1B SUPPLY FLON PUMP N-B MOTOR	RESSURE LOW" ESS LOW" DR OVERLOAD" MOTOR TRIP" -B White & Green L RESS decreasing p W decreasing AMPS decreasing	ights on ressure at '0' indicated	amns			
• 0-PI-67	BOP	PUMP N-B DISCH P Respond to bac (P-T-L), and per	RESS decreasing, k panel alarm, pos form Annunciator F	at '0' indicated ition pump har Response Pro	l pressure ndswitch in cedure (AF	ı Pull to RP).	) Lock	
• 0-PI-67	-453A, ERCW I BOP SRO	PUMP N-B DISCH P Respond to bac (P-T-L), and per Enter and direct <i>Failure</i> .	RESS decreasing, k panel alarm, posi form Annunciator F	at ' <b>0' indicated</b> ition pump har Response Pro OP-M.01, Sect	I pressure ndswitch in cedure (AF tion 2.1 <i>EF</i>	n Pull to RP). RCW Pa	) Lock ump	
• 0-PI-67	BOP	PUMP N-B DISCH P Respond to bac (P-T-L), and per Enter and direct <i>Failure</i> .	RESS decreasing, k panel alarm, posi form Annunciator F performance of AC AOP-M.01, Section 2.1, J	at '0' indicated ition pump har Response Pro DP-M.01, Sect LOSS Of ER	I pressure ndswitch in cedure (AF tion 2.1 <i>EF</i> <b>CCW</b> Failure	n Pull to RP). RCW Pt	) Lock	
• 0-PI-67	BOP SRO BOP	PUMP N-B DISCH P Respond to bac (P-T-L), and per Enter and direct <i>Failure</i> . 1. IDENTIFY a	RESS decreasing, k panel alarm, posi- form Annunciator F performance of AC AOP-M.01, Section 2.1, <i>I</i> nd LOCK OUT faile	at ' <b>0</b> ' indicated ition pump har Response Pro DP-M.01, Sect LOSS Of ER ERCW Pump ed ERCW pun	I pressure ndswitch in cedure (AF tion 2.1 <i>EF</i> <b>RCW</b> <i>Failure</i> np.	RCW Pt	) Lock	
• 0-PI-67	BOP BOP BOP	PUMP N-B DISCH P Respond to bac (P-T-L), and per Enter and direct <i>Failure</i> . 1. IDENTIFY a 2. START addi pressure bet (Pressure may may start stand were initially ru	RESS decreasing, k panel alarm, posi- form Annunciator F performance of AC AOP-M.01, Section 2.1, I nd LOCK OUT faile tional ERCW pump ween 78 psig and be in the specifie dby pump to provi	at '0' indicated ition pump har Response Pro DP-M.01, Sect DP-M.01, Sect <b>LOSS OF ER</b> ERCW Pump ed ERCW pum os as required 124 psig. d band (~80-4 ide additiona	I pressure Indswitch in cedure (AF tion 2.1 <i>EF</i> <b>RCW</b> <i>Failure</i> np. to maintai 82 psig); h I margin s	n supp	ly hea	idei ew os

Appendix D		Red	quired Ope	erator Acti	ons		F	orm E	S-D-2
Op Test No.:	NRC	Scenario #	4	Event #	2	Page	4	of	41
Event Description:	ER	CW Pump N-B tr	rips.						

Time	Position	Applicant's Actions or Behavior
	BOP	<ol> <li>CHECK 1A and 2A ERCW supply header pressures and flows NORMAL:</li> </ol>
		a. Supply header pressures [between 78 psig and 124 psig]:
		• 1-PI-67-493A
		• 2-PI-67-493A
		b. Supply booder flows formerted web-1
		b. Supply header hows [expected value]:
		• $2-FI-67-61$ (~2700 gpm acceptable) • $2-FI-67-61$ (~13 500 gpm acceptable)
	BOP	5. CHECK 1B and 2B ERCW supply header pressures and flows NORMAL:
		a. Supply header pressures [hetween
		78 psig and 124 psig]:
		• 1-PI-67-488A
		• 2-PI-67-488A
		b. Supply header flows [expected value]:
		• 1-FI-67-62 (~1500 gpm acceptable)
		• 2-FI-67-62 (~11,500 gpm acceptable
	Crew	6. <b>DISPATCH</b> personnel to INSPECT failed pump(s) and determine cause for failure.
Evaluator Note	: Tech Spe selected	ecs: 3.7.4; the LCO is applicable until selector switch 0-XS-67-286 is re- to the OPERABLE pump, L-B ERCW Pp
		7. NOTIFY STA to evaluate Tech Spec LCO 3.7.4, ERCW System, for both
	SRO	units.
		<ul> <li>3.7.4, Essential Raw Cooling Water System</li> </ul>
		ACTION : w/ only 1 ERCW loop OPERABLE, restore at least 2 loops to
		OPERABLE w/i 72 hrs or HT STBY w/i next 6 hrs & CLD SHDN w/i following
		4.7.4 At least 2 ERCW loops shall be demonstrated OPERABLE:
		Injection test signal
L		injourier toot ognan

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	Appendix D		Req	uired O	perator Actio	ons		F	orm E	ES-D-2
6	Op Test No.:	NRC	Scenario #	4	Event #	2	Page	5	of	41
	Event Description:	EF	CW Pump N-B trip	os.						

Time	Position	Applicant's Actions or Behavior
	RO	8 CHECK ERCW numn loading amps NORMAL
Evaluator Not	te: Tech Spe selected	ecs: 3.7.4; the LCO is applicable until selector switch 0-XS-67-286 is re- to the OPERABLE pump, L-B ERCW Pp
	RO	9. <b>TRANSFER</b> emergency power selector switch away from failed pump.
	Crew	<ol> <li>EVALUATE need to close and place clearance on manual discharge valve for failed pump.</li> </ol>
	SRO	GO TO appropriate plant procedure.
		END OF SECTION
<b>Evaluator Not</b>	e: The followi	ng CREW Brief and Notification actions are not contained in the procedure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager)
Lead Examine been identified	er may cue ne d.	xt event when the spare ERCW Pump in service and Tech Specs have

		Required Operator Actions Form ES-										
Op Test No.:	NRC	Scenario # _ 4 Event # 3 Page 6 of										
Event Descriptior	1: 1-PT	Γ-1-73, Main Turbine Impulse pressure transmitter fails low										
Timo	Desition											
Simulator On	Position	Applicant's Actions or Behavior										
Alarms/Indica Annunciato 1-M-5 • 1-XA-5	itions >r: 5-5A C-6, "TS-6	8-2P/Q REAC COOL LOOPS T REF T AUCT HIGH-LOW"										
Indications 1-M-4 • Automa 1-M-5 • 1-TR-68	atic Control Roc 3-2B, RCS/TURI	d insertion BINE TEMP										
	Crew	Respond to alarms in accordance with ARPs										
	RO	Identifies automatic control rod motion with no runback in progress, positions Rod Control Handswitch 1-HS-85-5110 to MANUAL										
	SRO	Direct entry to: AOP-C.01, Rod Control System Malfunctions, Sect 2.1, Uncontrolled Ro Bank Movement <b>OR</b> AOP-L08, Turbing Impulse Pressure Instrument Malfunction										
		AOP-C.01, Rod Control System Malfunctions Sect 2.1, Uncontrolled Rod Bank Movement										
	NOTE: S	tep 1 is an immediate action step.										
	RO	<ol> <li>STOP uncontrolled rod motion:</li> <li>a. PLACE rod control in MAN.</li> <li>b. CHECK rod motion STOPPED.</li> </ol>										
	CAUTION:	Control Rods should NOT be manually withdrawn during a plant transien										
	CAUTION: RO/BOP	Control Rods should NOT be manually withdrawn during a plant transien 2. CHECK for plant transient:										
	CAUTION: RO/BOP RO	Control Rods should NOT be manually withdrawn during a plant transien         2.       CHECK for plant transient:         a.       CHECK reactor power and T-avg STABLE.										
	Appendix D	x D Required Operator Actions						Form ES				
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ŧ	Op Test No.:	NRC	Scenario #	4	Event #	3	Page	7	of	41		
	Event Description:	1-1	⊃T-1-73, Main Turl	oine Impul	se pressure tra	ansmitter fails low						

Time	Position	Applicant's Actions or Behavior
	Crew	3. CHECK for instrumentation malfunction:
	RO	a. CHECK nuclear instrumentation OPERABLE.
	RO	b. CHECK RCS RTDs OPERABLE
	BOP	c. CHECK turbine impulse pressure channels OPERABLE. (RNO required)
	SRO	RNO: c. GO TO AOP-I.08, Turbine Impulse
		AOP-I.08, Turbine Impulse Pressure Instrument Malfunction
		Section 2.1 Unit 1: Failure of Turbine Impulse Pressure Instrument 1-P-1-73
	RO/SRO	1. ENSURE control rods in MANUAL.
	NOTE: Los bel	s of Instrument Power to S/G level setpoint program input will drive setpoint ow 33%.
	BOP	<ol> <li>EVALUATE placing main feedwater reg valves in MANUAL to maintain S/G levels on program</li> </ol>
		Based on NOTE and secondary plant evaluation, FRVs remain in AUTO
		3. ENSURE steam dumps in steam pressure mode:
		a. PLACE steam dump FSV handswitches in OFF.
		b. PLACE steam dump mode selector in STEAM PRESS mode.
		c. ENSURE zero output (demand).
		d. PLACE steam dump FSV handswitches in ON.
		e. ENSURE steam dump controller setpoint at 1005 psig.
	SRO	4. EVALUATE the following Tech Spec for applicability
		3.3.1.1, Reactor Trip System Instrumentation
		Functional Unit 22.E: Reactor Trip System Interlocks, Turbine Impulse Chamber Pressure, P-13 - ACTION 8.b: Reactor Trip- Turbine Trip;
		w/ less than Minimum Number of Channels OPERABLE, declare the interlock inoperable and verify that all affected channels of the functions listed below are OPERABLE or apply the appropriate ACTION statement(s) for those functions.

Appendix D	Required Operator Actions						F	Form ES-D-		
Op Test No.:	NRC	Scenario #	4	Event #	3	Page	8	of	41	
Event Description:	1-	PT-1-73, Main Turb	oine Impu	lse pressure trans	mitter fails low					

Time	Position	Applicant's Actions or Behavior				
	RO	<ol> <li>DETERMINE Program T-avg for current reactor power USING TI-28 Figure 3 or ICS (NSSS / BOP, Program Reactor Average Temperature).</li> </ol>				
	RO	<ol> <li>RESTORE T-avg to within 1°F of program value USING one of the following:</li> </ol>				
		POSITION control rods     OR				
		ADJUST turbine load     OR				
		ADJUST RCS boron concentration.				
	NOTE: If p SR	performing this AOP in conjunction with AOP-I.11 for Eagle LCP failure,				
	Crew	<ol> <li>NOTIFY I&amp;C to perform Appendix A, Removing Unit 1 Turbine Impulse Pressure Loop 1-P-1-73 from Service.</li> </ol>				
	Crew	8. INITIATE Maintenance on 1-P-1-73.				
	SRO	9. GO TO appropriate plant procedure.				
		END OF SECTION				
Evaluator Not	e: The following	g CREW Brief and Notification actions are not contained in the procedure.				
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.				
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.				
		Operations Management - Typically Shift Manager.				
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).				
Lead Examine	er may cue next	event when Tech Specs are identified.				

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		Required Operator Actions Form ES-D
Op Test No.	NRC	Scenario #4 Event #4 Page9 of41
Event Descriptio	n: Ste	eam Generator Tube Leak
Time	Position	Applicant's Actions or Behavior
Simulator O	perator: When	n directed, initiate Event 4
Indications/A Annunciat 0-M-12 • 0-XA-5 •	Alarms :or: :5-12-AC-1, "CM B-5, "S1	NDS VAC PMP LO RNG AIR EXH MON HIGH RAD" IM GEN BLDN LIQ SAMP MON HI RAD (~10-12 min delay)"
Indication 0-M-12 • 1-RR-9 • 1-RR-9 Significant Re 1-M-5 Indication	s 90-119, CONDR 90-120, SG BLD sultant Alarms s	VAC PUMP EXH RADMON increasing count rate N LIQ SAMP RADMON increasing counts /Indications:
• 1-LR-6	8-339, RCS PZ	R LEVEL recorder showing actual level deviating (low) from program level
	Crew	Respond to alarms in accordance with ARPs
	BOP	[1] CHECK 1-RM-90-119 rate meter and 1-RR-90-119 on 0-M-12 for indication of increased radiation.
	NOTE: Ala ala suo blo	arm validity may be determined based on absence of instrument malfunction rm, indicated response of the rad monitor, and, if possible, other indications ch as blowdown monitor (recognizing the difference in response time due to wdown transport time).
	NOTE: Ala ala suc blo BOP	<ul> <li>arm validity may be determined based on absence of instrument malfunction rm, indicated response of the rad monitor, and, if possible, other indications ch as blowdown monitor (recognizing the difference in response time due to wdown transport time).</li> <li>[2] IF alarm is valid, THEN NOTIFY RCL to perform 1-SI-CEM-068-137.5 Primary to Secondary Leakage via Steam Generators.</li> </ul>
Evaluator No	NOTE: Ala ala suc blo BOP te: SRO/crew package.	<ul> <li>arm validity may be determined based on absence of instrument malfunction rm, indicated response of the rad monitor, and, if possible, other indications ch as blowdown monitor (recognizing the difference in response time due to wdown transport time).</li> <li>[2] IF alarm is valid, THEN NOTIFY RCL to perform 1-SI-CEM-068-137.5 Primary to Secondary Leakage via Steam Generators.</li> <li>SRO/BOP determines to continue procedure- valid alarm.</li> <li>member may refer to Operations Chemistry Information Sheet in turnover</li> </ul>
Evaluator No	NOTE: Ala ala suc blo BOP te: SRO/crew package. BOP	<ul> <li>arm validity may be determined based on absence of instrument malfunction rm, indicated response of the rad monitor, and, if possible, other indications ch as blowdown monitor (recognizing the difference in response time due to wdown transport time).</li> <li>[2] IF alarm is valid, THEN NOTIFY RCL to perform 1-SI-CEM-068-137.5 Primary to Secondary Leakage via Steam Generators.</li> <li>SRO/BOP determines to continue procedure- valid alarm.</li> <li>member may refer to Operations Chemistry Information Sheet in turnover</li> <li>[3] IF alarm is valid, THEN GO TO AOP-R.01, Steam Generator Tube Leak.</li> </ul>
Evaluator No	NOTE: Ala ala suc blo BOP te: SRO/crew package. BOP	<ul> <li>arm validity may be determined based on absence of instrument malfunction rm, indicated response of the rad monitor, and, if possible, other indications ch as blowdown monitor (recognizing the difference in response time due to wdown transport time).</li> <li>[2] IF alarm is valid, THEN NOTIFY RCL to perform 1-SI-CEM-068-137.5 Primary to Secondary Leakage via Steam Generators.</li> <li>SRO/BOP determines to continue procedure- valid alarm.</li> <li>member may refer to Operations Chemistry Information Sheet in turnover</li> <li>[3] IF alarm is valid, THEN GO TO AOP-R.01, Steam Generator Tube Leak.</li> <li>[4] IF rad monitor is inoperable STEP N/A</li> </ul>

_	Appendix D	ndix D Required Operator Actions						Form ES-D-2					
	Op Test No.:	NRC	Scenario #	4	Event #	4	Page	10	of	41			
	Event Description: Steam Generator Tube Leak												

Time	Position	Applicant's Actions or Behavior
		AOP-R.01, Steam Generator Tube Leak
		Section 2.1, S/G Tube Leak Requiring Rapid Shutdown
		1. <b>MONITOR</b> if Pressurizer level can be maintained:
		a. CONTROL charging flow USING FCV-62-93 and FCV-62-89 as
		necessary to maintain Pzr level on program.
		b. MONITOR pressurizer level STABLE or RISING.
		(RNO may be implemented later)
		RNO:
		b. PERFORM the following:
		1) ENSURE letdown isolated:
		FCV-62-72 CLOSED
		FCV-62-73 CLOSED
		FCV-62-74 CLOSED
		<ol> <li>IF Pzr level continues to drop, THEN START additional CCP as necessary.</li> </ol>
		<b>IF</b> Pzr level CANNOT be maintained greater than 5% <b>OR</b> loss of Pzr level is imminent, <b>THEN PERFORM</b> the following:
		1) <b>TRIP</b> the reactor.
		2) WHEN reactor is tripped, THEN INITIATE Safety Injection.
		<ol> <li>GO TO E-0, Reactor Trip or Safety Injection.</li> </ol>
	NOTE 1:	Appendix F or G can be used to estimate leak rate.
Evaluator No	te: Appendix I	F and G are at the end of this event guide.
	NOTE 2:	If letdown was isolated in Step 1, the leak rate may have exceeded the capacity of one CCP in the normal charging alignment (EAL 1.2.2.P).
		2. EVALUATE EPIP-1, Emergency Plan Classification Matrix.
		NO Classification: RCS Identified leakage (Primary to Secondary
		leakage) is less than 25 gpm.
	RO	3. MONITOR VCT level:
		MAINTAIN VCT level greater than 13% USING auto or manual makeup
		CHECK VCT makeup capability adequate to maintain level.
		(RNO required when VCT make-up is required)

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Appendix D	Required Operator Actions						Form ES-D-2					
Op Test No.:	NRC	Scenario #	4	Event #	4	Page	11	of	41			
Event Description:	Steam Generator Tube Leak											

Time	Position	Applicant's Actions or Behavior
	PO	RNO:
		IF VCT level CANNOT be maintained, THEN PERFORM the following:
		a. ENSURE CCP suction aligned to RWST:
		1) <b>OPEN</b> LCV-62-135 and -136.
		2) CLOSE LCV-62-132 and 133.
		b. IF in Mode 1 or 2, THEN PERFORM the following:
		1) <b>TRIP</b> the reactor and <b>GO TO</b> E-0, Reactor Trip or Safety Injection.
		2) WHEN ES-0.1, Reactor Trip Response, is entered, THEN CONTINUE with Step 4 of this AOP
		4. MONITOR indications of leaking S/G:
		<ul> <li>a. NOTIFY Chem Lab to evaluate Primary to Secondary Leakage USING 1(2)-SI-CEM-068-137.5:</li> </ul>
		<ul> <li>Method 1, Rapid Identification of Leaking Steam Generators</li> </ul>
		<ul> <li>Method 3, Condenser Vacuum Exhaust (CVE) Sampling for Determination of Primary-to-Secondary (P/S) Leakage.</li> </ul>
		b. <b>NOTIFY</b> RADCON to monitor Turbine Building and site environment:
		Steam lines
		S/G blowdown
		c. <b>IDENTIFY</b> leaking S/G(s) <b>USING</b> any of the following:
		<ul> <li>Unexpected rise in any S/G narrow range level</li> <li>OR</li> </ul>
		<ul> <li>S/G sample results</li> <li>OR</li> </ul>
		<ul> <li>RADCON survey of main steamlines and S/G blowdown lines</li> <li>OR</li> </ul>
		High radiation on any main steamline radiation monitor.

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Appendix D	andix D Required Operator Actions						Form ES-D-2					
Op Test No.:	NRC	Scenario #	4	Event #	4	Page	12	of	41			
Event Description:	Ste	eam Generator Tul	be Leak									

Time	Position	Applicant's Actions or Behavior
		5. EVALUATE the following Tech Specs for applicability:
		3.4.6.2, Operational Leakage: Action c
		Reactor Coolant System leakage shall be limited to: c. 150 gallons per day of
		primary-to-secondary leakage through any one steam generator;
		SHDN w/i following 30 hrs.
	NOTE: I	nitiating shutdown required by Tech Specs requires 4 hour NRC notification per SPP-3.5, Regulatory Reporting Requirements.
Evaluator No d	ote: AOP-R.01	should be continued in parallel with AOP-C.03, Rapid Shutdown, and D. Refer to the next event guide for rapid shutdown
	SRO	6. <b>INITIATE</b> rapid shutdown by performing the following:
		a. ANNOUNCE S/G tube leak on PA system.
		<ul> <li>PERFORM rapid shutdown USING AOP-C.03 WHILE continuing in this section.</li> </ul>
		c. ENSURE power reduced to less than 50% within one hour.
		d. <b>ENSURE</b> unit in Mode 3 within the following 2 hours.
		Implements unit shutdown to meet the 1-hour and 2 hour limits
	SRO	(SRO may handoff AOP-R.01 to BOP to perform single-performer while directing rapid shutdown)
	SRO	7. MINIMIZE Spread of contamination:
	BOP	<ul> <li>a. IF tube leak identified on S/G #1 AND S/G #4 is intact, THEN PERFORM the following:</li> </ul>
	SRO	1) <b>EVALUATE</b> LCO 3.7.1.2.
		3.7.1.2, Auxiliary Feedwater (AFW) System
		ACTION: a. w/ 1 AFW train inoperable in MODE 1, 2, or 3, restore w/i 72 hrs or HT STBY w/i next 6 hrs & HT SHDN w/i following 12 hrs.
		-Surveillance Requirement: 4.7.1.2.1 At least once per 31 days, verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.
	BOP	2) CLOSE FCV-1-15 TDAFWP steam supply from S/G #1.
	BOP	3) <b>ENSURE</b> FCV-1-16 TDAFWP steam supply from S/G #4 <b>OPEN</b> .

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Appendix D	ndix D Required Operator Actions						Form ES-D-2					
Op Test No.:	NRC	Scenario #	4	Event #	4	Page	13	of	41			
Event Description:	St	eam Generator Tul	oe Leak									

Time	Position	Applicant's Actions or Behavior	
	SRO	b. <b>PERFORM</b> EA-0-3, Minimizing Secondary Plant Contamination.	
	BOP	c. <b>IF</b> S/G blowdown is aligned to the river, <b>THEN TERMINATE</b> S/G Blowdown to river:	
		1) ENSURE S/G blowdown flow control FCV-15-43 CLOSED.	
		<ol> <li>DISPATCH operator to perform EA-15-1, Realigning S/G Blowdown to Cond DI.</li> </ol>	
		<ol> <li>WHEN EA-15-1 completed, THEN ADJUST FCV-15-43 to establish desired blowdown flow.</li> </ol>	
	BOP	d. NOTIFY Chem Lab to determine release rate for condenser vacuum exhaust USING 0-SI-CEM-030-415.0 and 0-SI-CEM-030-407.2.	
	BOP	e. <b>NOTIFY</b> Chem Lab to evaluate rerouting steam generator sample drain lines to FDCT <b>USING</b> 0-TI-CEM-000-016.4.	
	BOP	<ul> <li>f. WHEN notified by Chemistry to bypass Condensate DI, THEN DISPATCH AUO to bypass polishers on affected unit:</li> </ul>	
		<ul> <li><u>Unit 1 Only:</u></li> <li>PLACE 1-HS-14-3, Condensate Polisher Bypass Valve to OPEN.</li> <li>[Cond DI Bldg]</li> </ul>	
		<u>Unit 2 Only:</u> Step N/A	
	SRO	g. EVALUATE Appendix C, Contingency Plan for Control and Processing of Large Volumes of Contaminated Water [C.5].	
	RO	8. CHECK reactor trip breakers OPEN. (RNO required)	
	SRO <b>RNO:</b> DO NOT CONTINUE this section UNTIL E-0 immediate actions completed.		
	SRO	IF a reactor trip is directed, THEN GO TO E-0, <i>Reactor Trip or Safety Injection.</i>	

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Appendix D		Req		F	orm E	S-D-2			
Op Test No.:	NRC	Scenario #	4	Event #	4	Page	14	of	41
Event Description:	Ste	eam Generator Tub	be Leak						

Time	Position	Applicant's Actions or Behavior								
	SRO Direct Manual Rx Trip									
	SRO	SRO Enter and Direct E-0 Immediate Operator Actions (IOAs)								
Lead Examine AOP-R.01 will	Lead Examiner may cue next event when AOP-C.03 Shutdown is in progress; the remainder of AOP-R.01 will not be completed due to the implementation of E-0, E-3.									

Appendix D	)	Req	Required Operator Actions F						
Op Test N	lo.: NRC	Scenario #	4	Event #4			Page 15		41
Event Descrip	otion: S	team Generator Tu	be Leak						
	SQN	STE	AM GENE	RATOR TUBE L	EAK	AOP-F Rev. 2	R.01 26		
			AI	PPENDIX F				Pag	e 1 o
NOTE 1	This method is r Appendix G is m	ESTIMATING RC ecommended when lore accurate for sm	S LEAK R. leak requir aller leak r	ATE USING CVCS res rise in charging ates.	FLOW BAL	ANCE than ~10 gpm.			
NOTE 2	This appendix a	ssumes RCS tempe	rature and	charging flow are	approximatel	y constant.			
			INITIAL	FIN/	NL	CHAN	GE		
	PZR Level					(negative for leve	l decrease	[ <b>1</b> ]	
	Time							[2]	
	Charging F	low			[3]				
	Letdown Fl	ow			[4]				
								1. C. C. C.	

#### Pressurizer Level Conversion

	Pressuri cha	zer leve nge	əl		conversion factor		Time Change		Pzr Level F (positive)	Rate of for level	Change rising)
			%	Х	62 gal / %	÷		min	=		gpm
	step [1]	above					step [2] above			[6]	
					Ĺ	eak Ra	ate Calculation				
Charging I	Flow	Letdo	wn	Flow	Seal Retu Flow	m	Pzr Level Rate of Change		Instrument error correction factor		RCS Leak Rate
								+	3 gpm	=	gpm
step [3] at	ove	step [	4] a	bove	step [5] abo	we	step [6] above	-		•	
						P	age 64 of 68				

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Appendix	D		Form ES-D-2							
Op Test	t No.:	NRC	Scenario #	4	Event #	4	Page	16	of	41
Event Desc	ription:	Ste	eam Generator Tu	be Leak						

SQN	<b>STEAM GENERATOR TUBE LEAK</b>	AOP-R.01 Rev. 26

Page 1 of 1

#### APPENDIX G

### ESTIMATING RCS LEAK RATE USING VCT AND PZR LEVEL

CAUTION This appendix CANNOT be used during VCT makeup, boration, or dilution.

NOTE This appendix assumes RCS temperature is approximately constant.

	VCT LEVEL (%)	PZR LEVEL (%)	TIME (min)
INITIAL			
FINAL			
CHANGE	[1]	[2]	[3]
	(positive for level decrease)	(positive for level decrease)	

#### VCT Level Conversion

VCT level change		conversion factor		Time Change		VCT Level Rate of Change (positive for level lowering)
%	х.	20 gal / %	÷ _	min	_ =	gpm
step [1] above				step [3] above		[4]
		Pressu	rizer l	<u>evel Conversion</u>		
Pressurizer level change		conversion factor		Time Change		Pzr Level Rate of Change (positive for level lowering)
%	X	62 gal / %	÷ .	min	=	gpm
step [2] above				step [3] above		[5]
		Lea	ik Ra	te Calculation		
VCT Level Rate of Change	e	Pzr Rate o	Leve Cha	I RC nge	S Le	eak Rate
		+				gpm
step [4] above		step [	5] abo	lve		

-

	Appendix D		Req	uired Operator Action	S		Form ES-D-2		
	Op Test No.:	NRC	Scenario #	4 Event #	5, 6	Page	17	of _	41
1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -	Event Description:	Raj	oid plant shutdow	n, Rapid Boration Valve fai	ls to open; RWST	use for rapid	shutdo	wn	
	Time	Position		Applicant's	Actions or Beha	avior			
	Simulator Ope Annunicators/ • Rapid S	erator: No ac Indications hutdown: N/A	<u>xtion required</u>	for Event 5; Verify E	vent 6 actuat	es as expe	ected		
	1-M-6 • 1-HS-62 with har	-138A, EMER( Indswitch in th	GENCY BORAT e 'OPEN' positi	ION FLOW CONTROL	VALVE indicate	es closed ((	GREEN	l light	lit)
	• 1-62-1	SDO	Enter and Di	OW indicator indicates rect performance of A	s <b>'0'</b> .OP-C.03. Rap	id Shutdow	n or L	oad	
		5KU	Reduction.	•					
		SRO	1. ENSURE USING A	crew has been briefe oppendix E.	ed on reactivity	managem	ent ex	pecta	tions
		Crew	<ul> <li>2. NOTIFY following personnel of rapid shutdown or load reduction:</li> <li>Load Coordinator</li> <li>Chemistry</li> <li>RADCON</li> <li>Plant Management</li> </ul>						
		BOP/RO	3. MONITO and Turb	<b>R</b> reactor/turbine trip ine Trip Criteria.	NOT required I	USING App	pendix	A, Re	actor
		BOP/RO	4. CHECK	VALVE POSITION LI	MIT light DARK	on EHC p	anel. [	<u>M-2]</u>	
	N	IOTE: BAT	is preferred bo	pration source. Boration	on volume and	flowrates in	n the f	ollowi	ng
		RO/SRO	5. IF boratir	ng from BAT, THEN P	ERFORM the 1	following:			
			a. DETERM	INE recommended bo	ration volume:				
			• ~800	gal to reduce power f	rom 100% to 2	0%			
			• 10 ga	l for each 1% power r	eduction				
			volum	ne recommended by F	Reactor Engine	ering			
- 95°									

	Appendix D	Required Operator Actions						F	orm E	S-D-2
Correct :	Op Test No.:	NRC	Scenario #	4	Event #	5, 6	Page	18	of	41
	Event Description:	Ra	pid plant shutdow	n, Rapid E	Boration Valve fai	ils to open; RWST u	ise for rapid	l shutdo	wn	

Time	Position	Арр	licant's Actions or Behavio	ſ
	SRO	b. DETERMINE recommend Reactor Engineering: (SRO discretion may be u	ded boration flowrate fro sed to determine reduc	m table below or from ction rate)
		TURBINE LOAD REDUCTION RATE (%/min)	BORATION FLOWRATE	
		1%	~15 gpm	
		2%	~30 gpm	
		3%	~45 gpm	
		4%	~70 gpm	
	RO	c. ENSURE concurrence of and flowrate.	otained from US and ST	A for boration volume
	RO	d. PLACE boric acid transf	er pump aligned to blen	der in FAST speed.
	RO	e. ADJUST FCV-62-138 to	establish desired flow r	ate.
		(RNO required)		
		INITIATE normal boration U	SING Appendix D (follo	wina).
		L	APPENDIX D	
		[1] PLACE [HS-62-140A	] Makeup Control to S	TOP position.
		[2] PLACE [HS-62-140B position.	] Makeup mode selec	tor switch in BORATE
	NOTE: Bor Acid	ic Acid controller setting is tw I flow is ~45 gpm.	vice the desired flow r	ate. Maximum Boric
		[3] ADJUST [FC-62-139] rate.	BA flow controller se	tpoint for desired flow
		[4] ADJUST [FQ-62-139 boric acid volume.	BA integrator (batch	counter) to desired

Appendix D		Required Operator Actions					Form ES-D-2			
Op Test No.:	NRC	Scenario #	4	Event #	5, 6	Page	19	of	41	

Event Description:

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Rapid plant shutdown, Rapid Boration Valve fails to open; RWST use for rapid shutdown

Time	Position	Applicant's Actions or Behavior
		[5] PLACE [HS-62-140A] Makeup Control Switch mode selector switch to START.
		[6] IF desired boric acid flow rate NOT obtained, THEN ADJUST one or both of the following as necessary:
		[FC-62-139] BA flow controller
		<ul> <li>recirculation valve for BAT aligned to blender.</li> </ul>
		[7] ENSURE desired boric acid flow indicated on FI-62-139.
		[8] WHEN required boric acid volume has been added, THEN PERFORM the following:
		[a] PLACE [HS-62-140A], Makeup Control to STOP position.
		[b] ENSURE [FC-62-142], Primary Water to Blender Flow Controller in AUTO with dial indicator set at 35%.
		[c] ADJUST [FC-62-139], Boric Acid Flow Controller to desired blend solution USING TI-44 Boron Tables.
		[d] PLACE [HS-62-140B], Makeup Mode Selector Switch in AUTO position.
		[e] PLACE [HS-62-140A], Makeup Control to START.
		AOP-C.03 Step 5.f continued
	RO	f. <b>CONTROL</b> boration flow as required to inject desired boric acid volume

	Appendix D	Required Operator Actions						Form ES-D-2				
<u> </u>	Op Test No.:	NRC	Scenario #	4	Event #	5, 6	Page	20	of	41		
A Contraction of the second se	Event Description:	Ra	pid plant shutdow	n, Rapid E	Boration Valve fail	s to open; RWS1	ruse for rapic	l shutdc	wn			

Time	Position		Арр	licant's Actions or Bel	navior					
	SRO	g. <b>GC</b>	D TO Step 7.							
	RO	6. IF	borating from RWST,	THEN INITIATE bor	ation to maintain control rods					
		abo	ove low-low insertion l	imit:						
		<u>a.</u>	OPEN LCV-62-135 c	or -136.						
		<u>b.</u>	<b>CLOSE</b> LCV-62-132	or -133.						
	SRO	7. INI	7. INITIATE load reduction as follows:							
	RO	a.	ADJUST load rate to	desired value:						
		(SRO/	RO chooses Normal	Boration rates)						
			• between 1% and 4	4% per minute if bo	rating via FCV-62-138					
			<ul> <li>between 1% and boration</li> </ul>	3% per minute if b	orating via normal					
			(App. D)							
		b. ADJUST setter for desired power level:								
			DESIRED RX POWER LEVEL	RECOMMENDED SETTER VALUE						
			90%	76						
			80%	56						
			70%	46						
			60%	40						
			50%	35						
			40%	30						
			30%	25						
			20% or less	15						
	BOP	C. 1	INITIATE turbine load	reduction by depre	ssing GO pushbutton.					
					<u> </u>					

Appendix D			Form ES-D-2						
Op Test No.:	NRC	Scenario #	4	Event #	5, 6	Page	21	of	41
Event Description:	Ra	apid plant shutdow	n. Rapid P	oration Valve fail	ls to open: RWST	· use for rank	t ebutde		

**Applicant's Actions or Behavior** 

10. STOP secondary plant equipment USING Appendix B, Secondary Plant

d. CONTROL turbine load reduction as necessary to reduce power to desired level. RO 8. **MONITOR** T-avg/T-ref mismatch: a. CHECK T-ref indication AVAILABLE. RO (RNO required due to previous failure –PT-1-73, MANUAL Rod Control) b. MONITOR automatic rod control maintaining T-avg/T-ref mismatch RO/ less than 3°F. SRO (RNO required; however b. part 1 is not applicable since AUTO Rod Control is not available.) RNO: b. Part 1: IF auto rod control is functional ... N/A RO b. Part 2: IF any of the following conditions met: auto rod control NOT functional OR • turbine load rate adjustment is NOT effective in reducing mismatch OR • situation does NOT allow slowing down load reduction, RO/ THEN RESTORE T-avg to within 3°F of T-ref USING manual rod control SRO as necessary. RO/ b. Part 3: IF T-avg/T-ref mismatch CANNOT be maintained less than 5°F, THEN TRIP the reactor and GO TO E-0, Reactor Trip or Safety Injection. SRO BOP 9. MONITOR automatic control of MFW pump speed AVAILABLE.

BOP

Equipment.

Time

Position

Appendix D		Form ES-D-2							
Op Test No.:	NRC	Scenario #	4	Event #	5, 6	Page	22	of	41
Event Description:	Ra	pid plant shutdow	n, Rapid B	oration Valve	fails to open; RWST	use for rapid	l shutdo	own	

Time	Position	Applicantia Actions on Palanting							
	1 Ostaon	Applicant's Actions of Benavior							
	NOTE: If LE raise autor	FM thermal power (U2118) is inoperable, rod insertion limit curve must be d by 3 steps. Rod insertion limit alarms and ICS display are NOT matically adjusted when LEFM is inoperable.							
	RO	11. <b>MONITOR</b> control rods above low-low insertion limit <b>USING</b> ICS or COLR.							
		RNO (if required):							
		ENSURE boration flow greater than applicable value:							
		35 gpm from BAT							
		OR							
		90 gpm from RWST.							
		REDUCE turbine load rate as necessary.							
Evaluator Note: Additional AOP-C.03 Steps not included as required power reduction should be complete at or around this step									
When desire	d, the Lead Exa	aminer may cue the next event.							

Appendix D	Appendix D Required Operator Actions							Form ES-D-2			
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	23	of	41		
Event Description	: SG #1 Bo	TL increases to S SG MSIV Auto/Ma th Pzr Spray Valve	GTR requi anual clos es fail full c	iring Rx Trip and se failure; open during RCS	I Safety Injection; 6 depressurization	in E-3					
Time	Position			Applicant's	s Actions or Beha	ivior					
Simulator Ope	erator: Event Event Event	t 7- Increase S t 8- Verify expe t 9- Insert Pres	GTR to ected ac surizer	8.6 severity ctuation; DEI Spray Valve	(400 gpm) witl LETE as direct failures- BOT	n 300 sec ed; H full ope	ond ra en afte	mp; r they	/ are		

Indications:

1-M-4

- 1-LI-68-339A, 335A, 320A, RCS PZR LEVEL indicators decreasing 1-M-5
- 1-PR-68-340, RCS PZR PRESS recorder trending down
- 1-LR-68-339 RCS PZR LEVEL recorder trending down
- 1-PI-68-340A, 334, 323, 322 RCS PZR PRESS indicators decreasing
- 1-FI-68-93A, CHARGING HDR FLOW indicator increasing

1-M-30

1-RI-90-421, MAIN STEAM RAD MONITOR increasing counts

		V ·····
		AOP-R.01 Step 1 RNO:
		IF Pzr level CANNOT be maintained greater than 5% <b>OR</b> loss of Pzr level is imminent, <b>THEN PERFORM</b> the following:
		1) <b>TRIP</b> the reactor.
		2) WHEN reactor is tripped, THEN INITIATE Safety Injection.
		3) GO TO E-0, Reactor Trip or Safety Injection.
	SRO	Direct Manual Reactor Trip and Safety Injection based on pressurizer level loss imminent from AOP-R.01 Step 1 RNO.
	RO	Manually Trip Reactor and initiate SI.
	SRO	Enter and direct performance of E-0, Reactor Trip Or Safety Injection.
Evaluator Note:	Followin surveys discover event in	g IOA performance, prior to Steps 1-4 immediate action verification, RO/BOP MCBs for any expected automatic system response that failed to occur. Upon ry, they may take manual action(s) to align plant systems as expected for the progress. (Ref. EPM-4, Prudent Operator Actions)

	Appendix D		Req	erator Actions Form ES-I								
(	Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	24	of	41		
	Event Description:	tion: SGTL increases to SGTR requiring Rx Trip and Safety Injection; #1 SG MSIV Auto/Manual close failure; Both Pzr Spray Valves fail full open during RCS depressurization in E-3										

Time	Position	Applicant's Actions or Behavior
		E-0, Reactor Trip or Safety Injection
	Note 1 Step	s 1 through 4 are immediate action steps
	Note 2 This	procedure has a foldout page
	RO	<ol> <li>VERIFY reactor TRIPPED:         <ul> <li>Reactor trip breakers OPEN</li> <li>Reactor trip bypass breakers DISCONNECTED or OPEN</li> <li>Neutron flux DROPPING</li> <li>Rod bottom lights LIT</li> <li>Rod position indicators less than or equal to 12 steps.</li> </ul> </li> </ol>
	BOP	<ul> <li>2. VERIFY turbine TRIPPED:</li> <li>Turbine stop valves CLOSED.</li> </ul>
	BOP	<ul> <li>3. VERIFY at least one train of shutdown boards ENERGIZED.</li> <li>Attempt to restore power to at least ONE train of shutdown boards</li> <li>Place DG 1A-A control switch in START</li> <li>Verify Train A Shutdown Boards ENERGIZED</li> </ul>
	RO	<ul> <li>4. DETERMINE if SI actuated:</li> <li>ECCS pumps RUNNING.</li> <li>Any SI alarm LIT [M-4D] (SI will be actuated)</li> </ul>
Evaluator Not	e: ES-0.5 incl	uding appendices are contained in attachment at back of scenario guide
	BOP	<ol> <li>PERFORM ES-0.5, Equipment Verifications WHILE continuing in this procedure.</li> </ol>
	RO/BOP	<ol> <li>DETERMINE if secondary heat sink available:</li> <li>a. CHECK total AFW flow greater than 440 gpm.</li> </ol>

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Appendix D

# **Required Operator Actions**

Form ES-D-2

Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	25	of	41
Event Description:	SGT #1 Bot/	IL increases to S SG MSIV Auto/M h Pzr Spray Valve	GTR requi anual clos is fail full (	iring Rx Trip a se failure; open during R(	nd Safety Injection; CS depressurization ir	n E-3			

Time	Position	Applicant's Actions or Behavior
		<ul> <li>b. CHECK narrow range level greater than 10% [25 ADV] in at least one S/G.</li> </ul>
		<ul> <li>CONTROL feed flow to maintain narrow range level between 10% [25% ADV] and 50% in all S/Gs.</li> </ul>
		(Heat Sink is available from AFW: if >440 gpm available.)
	RO	7. CHECK if main steam lines should be isolated:
		a. CHECK if any of the following conditions have occurred:
		<ul> <li>Any S/G pressure less than 600 psig OR</li> </ul>
		<ul> <li>Any S/G pressure dropping UNCONTROLLED. OR</li> </ul>
		Phase B actuation
		b. ENSURE MSIVs and MSIV bypass valves CLOSED
		c. ENSURE applicable Foldout Page actions COMPLETED
	RO	8. CHECK RCP trip criteria:
		RCS pressure less than 1250 psig.
		AND     At least one CCP OR SI pump RUNNING     (RNO required)
		a. GO TO Step 9.
	RO	<ul> <li>9. MONITOR RCS temperatures:</li> <li>IF any RCP running, THEN CHECK T-avg stable at or trending between 547°F and 552°F.</li> <li>OR</li> <li>IF RCPs stopped N/A</li> <li>(RNO required)</li> </ul>
		<b>RNO:</b> RCPs are running <b>IF</b> temperature less than 547°F and dropping, <b>THEN PERFORM</b> the following:

Appendix D		Req	uired O	perator Actior	าร		F	orm E	ES-D-2
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	26	of	41
Event Description:	vent Description: #1 SG MSIV Auto/Manual close failure; Both Pzr Spray Valves fail full open during RCS depressurization in E-3								

Time	Position	Applicant's Actions or Behavior
		a. ENSURE steam dumps and atmospheric reliefs CLOSED.
		<ul> <li>b. IF cooldown continues, THEN CONTROL total feed flow:</li> <li>1) ENSURE total AFW flow less than or equal to 600 gpm.</li> <li>2) MAINTAIN total AFW flow greater than 440 gpm UNTIL narrow range level is greater than 10% [25% ADV] in at least one S/G.</li> </ul>
		<ul> <li>IF cooldown continues after AFW flow is controlled, THEN CLOSE MSIVs and MSIV bypass valves.</li> </ul>
		d. IF temperature greater than 552°F N/A
	RO	<ul> <li>10. CHECK pressurizer PORVs, safeties, and spray valves:</li> <li>a. Pressurizer PORVs CLOSED.</li> <li>b. Pressurizer safety valves CLOSED.</li> <li>c. Normal spray valves CLOSED.</li> <li>d. Power to at least one block valve AVAILABLE.</li> <li>e. At least one block valve OPEN.</li> </ul>
	CREW	<ul> <li>11. DETERMINE S/G secondary pressure boundaries are INTACT:</li> <li>CHECK all S/G pressures CONTROLLED or RISING.</li> <li>CHECK all S/G pressures greater than 140 psig.</li> </ul>
	CREW	12. DETERMINE if S/G tubes are INTACT:
		<ul> <li>All S/G narrow range levels CONTROLLED or DROPPING.</li> </ul>
		<ul> <li>Secondary radiation NORMAL USING Appendix A, Secondary Rad Monitors. (App. A performed in ES-0.5).</li> </ul>
		(RNO required)
		RNO: IF any S/G has level rising in an uncontrolled manner OR has high radiation, THEN PERFORM the following:
Evaluator Not	e: at Step 1: When a F Board op STATUS RED and	2.a, <b>MONITOR</b> status trees, the crew will implement status tree monitoring via SPDS. RED or ORANGE path status tree is observed, the SRO will designate one of the erators (typically the BOP) to verify status tree conditions using <b>1-FR-0, UNIT 1</b> <b>TREES</b> . Once verified, the SRO should direct the crew to transition to the appropriate /or ORANGE path procedure(s).

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Appendix D	Required Operator Actions						Form ES-D-2		
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	27	of	41
Event Description	: SG #1 Bot	TL increases to S SG MSIV Auto/M h Pzr Spray Valve	GTR requ anual closes fail full	uiring Rx Trip and se failure; open during RCS	Safety Injection; depressurization	in E-3			
Time	Position			Applicant's	Actions or Beha	avior			

	a. MONITOR status trees.
	b. GO TO E-3, Steam Generator Tube Rupture.
 	Crew transitions to E-3, Steam Generator Tube Rupture.
 SRO	Enter and direct performance of E-3 Steam Generator Tube rupture.

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	Appendix D		Req	uired O	perator Action	S		F	orm E	S-D-2
and the second se	Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	28	of	41
	Event Description:	iption: SGTL increases to SGTR requiring Rx Trip and Safety Injection; #1 SG MSIV Auto/Manual close failure; Both Pzr Spray Valves fail full open during RCS depressurization in E-3								

Time	Position	Applicant's Actions or Behavior
		E-3, Steam Generator Tube Rupture
		1. MONITOR at least one RCP RUNNING.
		RCS pressure less than 1250 psig
		AND At least one CCP OP St nume DUNNING
		(RNO required)
		RNO:
		. GO TO Step 3
		· · · · · · · · · · · · · · · · · · ·
		3. MONITOR RCP trip criteria:
		a. <b>IDENTIFY</b> Ruptured S/G(s) as indicated by any of the following:
		<ul> <li>Unexpected rise in any S/G narrow range level.</li> </ul>
		OR
		<ul> <li>High radiation from any S/G sample.</li> </ul>
		OR
		<ul> <li>RADCON survey of main steam lines and S/G blowdown lines.</li> </ul>
		OR
		High radiation on any main steamline radiation monitor.
	CAUTION:	Isolating both steam supplies to the TD AFW pump when it is the only source of feed flow will result in loss of secondary heat sink
Evaluator Not	te: Critical Ta Cooldown i	ask is to Isolate Steam flow and Feedwater flow to ruptured S/G prior to RCS nitiation.
	E-3 Steps SG and, th	4 & 5 inclusive completes operator-directed actions to isolate the Ruptured nus to complete this Critical Task.
Critical Task		4. <b>ISOLATE</b> flow from Ruptured S/G(s):
		<ul> <li>ADJUST Ruptured S/G(s) atmospheric relief controller setpoint to 87% in AUTO. (1040 psig)</li> </ul>

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	Append	lix D
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## **Required Operator Actions**

Form ES-D-2

Op Test No.:	NRC	NRC Scenario # _ 4 Event # _ 7, 8, 9 Page _ 29 of _ 41							
Event Description:	SC # Bc	SGTL increases to SGTR requiring Rx Trip and Safety Injection; #1 SG MSIV Auto/Manual close failure; Both Pzr Spray Valves fail full open during RCS depressurization in E-3							

Time	Position	Applicant's Actions or Behavior						
		E-3, Steam Generator Tube Rupture						
		<ul> <li>b. CHECK Ruptured S/G(s) atmospheric relief hand switch in P-AUTO and valve(s) CLOSED.</li> </ul>						
Evaluator Not	e: Realigning	TDAFW to S/G #4 not required since TDAFW pump is Tagged out of service.						
	BOP	<ul> <li>c. CLOSE TD AFW pump steam supply from Ruptured S/G FCV-1-15 (S/G #1) or FCV-1-16 (S/G #4).</li> </ul>						
	BOP	d. VERIFY Ruptured S/G(s) blowdown isolation valves CLOSED.						
Evaluator Not	e: #1 SG MS ruptured M close when The crew v	IV, the ruptured S/G MSIV, will not close requiring isolation of the non- ISIVs, other steam paths both from the MCR and locally. #1 S/G MSIV will n EA-1-1, Closing MSIVs Locally, E-3 alternate path actions, is implemented. will complete the cooldown on the intact SG atmospheric relief valves.						
	#1 SG MS	V should be closed prior to RCS Cooldown initiation in Step 8						
	BOP	e. CLOSE Ruptured S/G(s) MSIV and MSIV bypass valve.						
		(NNO required)						
		. <b>PERFORM</b> the following:						
	BOP	1) CLOSE Intact S/G MSIVs and MSIV bypass valves.						
	BOP	<ol> <li>DISPATCH operator to perform EA-1-1, Closing MSIVs Locally, for any MSIV or MSIV bypass valve which fails to close.</li> </ol>						
	BOP	3) <b>ISOLATE</b> steam header:						
		PLACE condenser steam dumps in OFF. [M-4]						
		ENSURE steam dump valves CLOSED. [M-4]						
		CLOSE FCV-47-180, HP Steam Seal Supply Isolation. [M-2]						
		<ul> <li>ENSURE FCV-47-181 HP Steam Seal Supply Bypass CLOSED. [M-2]</li> </ul>						
		CLOSE MSR HP steam supply isolation valves. [M-2]						
		<ul> <li>DISPATCH operator to locally isolate steam header USING EA-1-4, Local Isolation of Steam Header in Turb Bldg.</li> </ul>						

Appendix D		Req	uired O	perator Action	ns		F	orm E	S-D-2
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	30	of	41
Event Description:	S0 # B0	GTL increases to S 1 SG MSIV Auto/M oth Pzr Spray Valve	GTR requision of the second se	iiring Rx Trip an se failure; open during RC	d Safety Injection; S depressurization	in E-3			

Time	Position	Applicant's Actions or Behavior					
		E-3, Steam Generator Tube Rupture					
	ВОР	4) <b>USE</b> Intact S/G(s) atmospheric relief for steam dump.					
Critical Task	BOP	5. MONITOR Ruptured S/G(s) level:					
		a. CHECK narrow range level greater than 10% [25% ADV].					
		<ul> <li>b. WHEN ruptured S/G level is greater than 10% [25% ADV], THEN PERFORM the following:</li> </ul>					
		1) <b>STOP</b> feed flow to ruptured S/G.					
		2) ENSURE Turbine Driven AFW LCV for ruptured S/G in CLOSE PULL TO LOCK					
	BOP	6. VERIFY Ruptured S/G ISOLATED from Intact S/G(s):					
		a. CHECK narrow range level greater than 10% [25% ADV].					
		<ul> <li>Ruptured S/G MSIVs and MSIV bypass valves CLOSED OR</li> </ul>					
		<ul> <li>MSIV(s) and MSIV bypass valve(s) CLOSED on Intact S/G(s) to be used for RCS cooldown.</li> </ul>					
	BOP	b. CHECK S/G #1 or S/G #4 ruptured.					
	BOP	c. CHECK TDAFW pump steam supply from ruptured S/G ISOLATED:					
		• FCV-1-15 (S/G #1) or FCV-1-16 (S/G #4) CLOSED					
	BOP	<ol> <li>CHECK Ruptured S/G pressure greater than 550 psig (Unit 1) or 425 psig (Unit 2).</li> </ol>					
	NOTE • B th c	locking low steamline pressure SI as soon as pressurizer pressure is less nan 1960 psig will prevent an inadvertent MSIV closure and keep the ondenser available for steam dump.					
	• A w • T	Iter the low steamline pressure SI signal is blocked, main steamline isolation will occur if the high steam pressure rate setpoint is exceeded. The 1250 psig RCP trip criterion is NOT applicable after RCS cooldown					
	is	initiated in the following step.					

Appendix D		Form ES-D-2							
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	31	of	41
Event Description:	SC #' Bc	3TL increases to S 1 SG MSIV Auto/M oth Pzr Spray Valve	GTR requi anual clos es fail full (	iring Rx Trip and se failure; open during RCS	Safety Injection; depressurization	in E-3			

Time	Position	Applicant's Ac	tions or Behavior
		E-3, Steam Generator Tube Ru	pture
		8. INITIATE RCS cooldown:	
	BOP/ SRO	a. <b>DETERMINE</b> target core exit S/G pressure:	T/C temperature based on Ruptured
		Lowest Ruptured S/G pressure (psig)	Target Core Exit T/C Temp (°F)
		1100 or greater	497
		1050 - 1099	492
		1000 - 1049	486
		950 - 999	480
		900 - 949	473
		850 - 899	467
		800 - 849	460
		750 - 799	453
		700 - 749	445
		650 - 699	437
		600 - 649	428
		550 - 599	419
		500 - 549	410
		450 - 499	399
		425 - 449	393
	BOP/ RO	<li>b. WHEN RCS pressure less that following:</li>	an 1960 psig, <b>THEN PERFORM</b> the
		1) BLOCK low steamline pre-	ssure SI.
		2) CHECK STEAMLINE PRE ENABLE permissive LIT.	SS ISOL/SI BLOCK RATE ISOL [M-4A, A4]
	BOP/ Crew	c. DUMP steam to condenser fro achievable rate: (RNO required MSIVs closed)	m Intact S/G(s) at maximum
	BOP	<ul> <li>c IF steam dumps NOT available, TH Intact S/G(s)</li> <li>RAISE AFW flow to intact S/Gs as IF local control of atmospheric relied</li> </ul>	HEN OPEN atmospheric relief valves or necessary to support cooldown.
		IF NO Intact S/G available N/A	

Appendix D	Required Operator Actions							Form ES-D-2			
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	32	of	41		
Event Description:	SC # BC	3TL increases to Se 1 SG MSIV Auto/M oth Pzr Spray Valve	GTR requi anual clos is fail full (	iring Rx Trip and se failure; open during RCS	Safety Injection;	in E-3					

<u> </u>	Applicant's Actions or Benavior
	E-3, Steam Generator Tube Rupture
SRO	d. WHEN core exit T/Cs less than target temperature determined in Substep 8.a,
	IHEN PERFORM the following:
BOP	<ol> <li>CLOSE steam dumps or S/G atmospheric reliefs to stop cooldown.</li> </ol>
BOP	<ol> <li>REDUCE AFW flow as necessary to stop cooldown.</li> <li>MAINTAIN total feed flow greater than 440 gpm UNTIL level greater than 10% [25% ADV] in at least one Intact S/G.</li> </ol>
e: Critical depressu	<b>Task</b> is to Cooldown RCS to less than or equal to target temperature prior to RCS rization
BOP	<ol> <li>MAINTAIN core exit T/Cs less than target temperature USING steam dumps or atmospheric reliefs.</li> </ol>
BOP	9. MAINTAIN Intact S/G narrow range levels:
	a. Greater than 10% [25% ADV]
	b. Between 20% [25% ADV] and 50%.
CAUTION:	Any time a pressurizer PORV opens, there is a possibility that it may
RO	10. MONITOR pressurizer PORVs and block valves:
	a. Power to block valves AVAILABLE
	b. Pressurizer PORVs CLOSED
	c. At least one block valve OPEN.
RO	11. RESET SI signal.
	SRO BOP BOP SOP BOP BOP BOP BOP BOP BOP BOP

Appendix D	Required Operator Actions						Form ES-D-2			
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	33	of	41	
Event Description:	S0 # B0	3TL increases to S 1 SG MSIV Auto/M oth Pzr Spray Valve	GTR requ anual clo s fail full	uiring Rx Trip and se failure; open during RCS	l Safety Injection; 6 depressurization	in E-3				

Time	Position	Applicant's Actions or Behavior
		E-3, Steam Generator Tube Rupture
	Crew	12. MONITOR AC busses energized from start busses.
	RO	13. ENSURE Phase A and Phase B RESET.
	RO	14. CHECK control air established to containment: [Panel 6K and 6L]
		<ul> <li>1-FCV-32-80 (2-FCV-32-81) Train A essential air OPEN</li> </ul>
		<ul> <li>1-FCV-32-102 (2-FCV-32-103) Train B essential air OPEN</li> </ul>
		<ul> <li>1-FCV-32-110 (2-FCV-32-111) non-essential air OPEN.</li> </ul>
		15. DETERMINE if RHR pumps should be stopped:
		a. CHECK RHR pump suction aligned from RWST
		b. CHECK RCS pressure greater than 300 psig.
		c. STOP RHR pumps and PLACE in A-AUTO.
		d. <b>MONITOR</b> RCS pressure greater than 300 psig.
		(RNO for reference)
		RNO:
		IF RCS pressure dropping uncontrolled, THEN START RHR pumps.
Evaluator Note:	Critical <sup>-</sup> depressur	<b>Fask</b> is to Cooldown RCS to less than or equal to target temperature prior to RCS rization
		16. CHECK if RCS cooldown should be stopped:
		<ul> <li>CHECK core exit T/Cs less than target temperature determined in Substep 8.a.</li> </ul>
		b. CLOSE steam dumps or atmospheric reliefs to stop cooldown.
		c. <b>REDUCE</b> AFW flow as necessary to stop cooldown.
		<b>MAINTAIN</b> total feed flow greater than 440 gpm UNTIL level greater than 10% [25% ADV] in at least one Intact S/G.
Critical Task		d. <b>MAINTAIN</b> core exit T/Cs less than target temperature <b>USING</b> steam dumps or atmospheric reliefs.
		17. CHECK Ruptured S/G(s) pressure STABLE or RISING.
		18. CHECK RCS subcooling based on core exit T/Cs greater than 60°F.

 $( \ )$ 

	Appendix D	D Required Operator Actions						Form ES-D-2				
<u> </u>	Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	34	of	41		
	Event Description:	SG #1 Bo	TL increases to S SG MSIV Auto/N th Pzr Spray Valv	GTR requ fanual clos es fail full d	iring Rx Trip and e failure; open during RCS	Safety Injection; depressurization i	n E-3					

Time	Position	Applicant's Actions or Behavior
		E-3, Steam Generator Tube Rupture
		19. DEPRESSURIZE RCS to minimize break flow and to refill pressurizer:
		a. CHECK normal pressurizer spray AVAILABLE.
		b. <b>INITIATE</b> maximum available pressurizer spray.
		c. CHECK depressurization rate ADEQUATE.
		<ul> <li>d. CONTINUE depressurization UNTIL any of the following conditions SATISFIED:</li> </ul>
		Both of the following:
		<ol> <li>RCS pressure less than Ruptured S/G(s) pressure AND</li> </ol>
		2) Pressurizer level greater than 10% [20% ADV]. OR
		<ul> <li>Pressurizer level greater than 65%.</li> <li>OR</li> </ul>
		<ul> <li>RCS subcooling based on core exit T/Cs less than 40°F.</li> </ul>
Console Opera	ator Note: V L	Vhen spray valve is completely open in next step, insert malfunction to fail . .oop 2 spray valve full open <b>(Key 6)</b> .
Evaluator Note	e: BOTH P Crew im adequate	zr Spray Valves are failed open following operator-demanded positioning; plements RNO to stop RCPs as necessary; 2 RCPs, #s 1 & 2 should be e to stop the pressure decay.
		e. CLOSE spray valve(s):
	RO	1) Normal spray valves (RNO required)
	RO	<ul> <li>RNO:</li> <li>1) STOP RCPs #1 and 2.</li> <li>IF RCS pressure continues to drop, THEN STOP additional RCP as necessary.</li> </ul>
	RO	2) Auxiliary spray valves.
	RO	f. GO TO Caution prior to Step 22

Appendix D		Required Operator Actions							
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	35	of	41
Event Description:	S0 # B0	SGTL increases to SGTR requiring Rx Trip and Safety Injection; #1 SG MSIV Auto/Manual close failure; Both Pzr Spray Valves fail full open during RCS depressurization in E-3							

Time	Position	Applicant's Actions or Behavior
		E-3, Steam Generator Tube Rupture
Evaluator No	te: The follo on their inadequa	wing PORV depressurization steps are included as the crew may decide, based procedural pace to this point, that Pzr Spray Flow depressurization rate is ate and, therefore use the Pzr PORVs to complete the RCS depressurization.
	CAUTION:	<ul> <li>Depressurizing the RCS using a pressurizer PORV may cause PRT rupture with resulting abnormal containment conditions.</li> </ul>
		<ul> <li>Excessive cycling of a pressurizer PORV increases the potential for PORV failure.</li> </ul>
	NOTE: Up rur	per head voiding may occur during RCS depressurization if no RCPs are ning. This may result in rapidly rising pressurizer level
Critical Task		20. <b>DEPRESSURIZE</b> RCS <b>USING</b> one pressurizer PORV to minimize break flow and to refill pressurizer:
		a. CHECK at least one pressurizer PORV AVAILABLE
		<ul> <li>b. OPEN one pressurizer PORV UNTIL any of the following conditions SATISFIED:</li> </ul>
		<ul> <li>Both of the following:</li> <li>1) RCS pressure less than Ruptured S/G(s) pressure</li> <li>AND</li> </ul>
		<ol> <li>Pressurizer level greater than 10% [20% ADV].</li> <li>OR</li> </ol>
		<ul> <li>Pressurizer level greater than 65%.</li> <li>OR</li> </ul>
		<ul> <li>RCS subcooling based on core exit T/Cs less than 40□F.</li> </ul>
		c. CLOSE pressurizer PORV.
Evolutor Not		
	accomplis	shed by stopping RCPs as procedurally directed in the following step.
	RO	1) Normal spray valves
		(RNO required)
Critical Task	RO	RNO: 1) STOP RCPs #1 and 2.
		IF RCS pressure continues to drop, THEN STOP additional RCP as necessary.

Appendix D		Req		F	orm [	ES-D-2			
Op Test No.:	NRC	Scenario #	4	Event #	7, 8, 9	Page	36	of	41
Event Description:	S0 #* Bc	3TL increases to S0 1 SG MSIV Auto/Ma oth Pzr Spray Valve	GTR requ anual clo: is fail full	uiring Rx Trip and se failure; open during RC	d Safety Injection; S depressurization ir	n E-3			

Time	Position	Applicant's Actions or Behavior
		E-3, Steam Generator Tube Rupture
	RO	2) Auxiliary spray valves.
		21. CHECK RCS pressure RISING
	CAUTION	
	CAUTION:	any delay in terminating SI after termination criteria are met may cause Ruptured S/G(s) overfill.
		22. CHECK if ECCS flow should be terminated:
		<ul> <li>RCS subcooling based on core exit T/Cs greater than 40°F.</li> </ul>
		Secondary heat sink:
		<ul> <li>Narrow range level in at least one Intact S/G greater than 10% [25% ADV]</li> <li>OR</li> </ul>
		Total feed flow to S/Gs greater than 440 gpm AVAILABLE
		RCS pressure STABLE or RISING.
		<ul> <li>Pressurizer level greater than 10% [20% ADV].</li> </ul>
		23. STOP the following ECCS pumps:
		a. <b>STOP</b> SI pumps and <b>PLACE</b> in A-AUTO.
		b. CHECK offsite power supplying shutdown boards
		c. <b>STOP</b> all BUT one CCP and <b>PLACE</b> in A-AUTO.
		24. ISOLATE CCPIT:
		a. CLOSE inlet isolation valves FCV-63-39 and FCV-63-40
		b. CLOSE outlet isolation valves FCV-63-26 and FCV-63-25
Scenario mag	y be terminate	d at E-3 Step 24, RCS depressurization and CCPIT isolation

On Toot No :		
Event Description:	Ec	Scenario # Event #ES-0.5 Page37 of
Time	Position	Applicant's Actions or Behavior
	<u></u>	ES-0.5, EQUIPMENT VERIFICATIONS
Evaluator Note:	BOP con (includin	npletes ES-0.5 including Appendices A & B and reports completion is any discrepancies and actions taken) to SRO.
	BOP	1. VERIFY D/Gs RUNNING.
	BOP	2. VERIFY at least four ERCW pumps RUNNING
	BOP	3. VERIFY CCS pumps RUNNING
		<ol> <li>Pump 1A-A (2A-A) Must Manually Start</li> <li>Pump 1B-B (2B-B)</li> </ol>
		3. Pump C-S.
	BOP	4. VERIFY EGTS fans RUNNING.
	BOP	5. VERIFY generator breakers OPEN.
		6. VERIFY AFW pumps RUNNING:
	BOP	<ul><li>MD AFW pumps</li><li>TD AFW pump.</li></ul>
AFW level control		NOTE

Appendix D		Req	uired Op	perator Action	าร		F	orm E	ES-D-2
Op Test No.:	NRC	Scenario #	4	Event #	ES-0.5	Page	38	of	41
Event Description:	Eq	uipment Verificatic	n						

Time	Position	Applicant's Actions or Behavior
	* BOP	<ul> <li>7. CHECK AFW valve alignment:</li> <li>a. VERIFY MD AFW LCVs in AUTO.</li> <li>b. VERIFY TD AFW LCVs OPEN.</li> <li>c. VERIFY MD AFW pump recirculation valves FCV-3-400 and FCV-3-401 CLOSED.</li> </ul>
	BOP	<ul> <li>8. VERIFY MFW Isolation:</li> <li>a. MFW pumps TRIPPED</li> <li>MFW regulating valves CLOSED</li> <li>MFW regulating bypass valve controller outputs ZERO</li> <li>MFW isolation valves CLOSED</li> </ul>
	BOP	9. MONITOR ECCS operation:
		<ul> <li>a. VERIFY ECCS pumps RUNNING:</li> <li>CCPs:</li> <li>RHR pumps</li> <li>SI pumps</li> </ul>
		b. VERIFY CCP flow through CCPIT.
	L	c. CHECK RCS pressure less than 1500 psig.
		d. VERIFY SI pump flow.
		e. CHECK RCS pressure less than 300 psig.
		f. VERIFY RHR pump flow.
	BOP	10. VERIFY ESF systems ALIGNED:
		<ul> <li>a. Phase A ACTUATED:</li> <li>PHASE A TRAIN A alarm LIT [M-6C, B5].</li> <li>PHASE A TRAIN B alarm LIT [M-6C, B6].</li> </ul>
		<ul> <li>b. Cntmt Vent Isolation ACTUATED:</li> <li>CNTMT VENT ISOLATION TRAIN A alarm LIT [M-6C, C5].</li> <li>CNTMT VENT ISOLATION TRAIN B alarm LIT [M-6C, C6].</li> </ul>

		Required Operator Actions Form ES-
Op Test No.: Event Descriptior	NRC	Scenario # _ 4 Event # ES-0.5 Page _ 39 of
Time Position		Applicant's Actions or Behavior
		<ul> <li>c. Status monitor panels:</li> <li>6C DARK</li> <li>6D DARK</li> <li>6E LIT OUTSIDE outlined area</li> <li>6H DARK</li> <li>6J LIT.</li> </ul>
		<ul> <li>d. Train A status panel 6K:</li> <li>• CNTMT VENT GREEN</li> <li>• PHASE A GREEN</li> </ul>
		<ul> <li>e. Train B status panel 6L:</li> <li>CNTMT VENT GREEN</li> <li>PHASE A GREEN</li> </ul>
	BOP	11. <b>MONITOR</b> for containment spray and Phase B actuation:
		a. CHECK for any of the following:
		Phase B ACTUATED     OR
		Containment pressure greater than 2.8 psig.
		b. VERIFY containment spray INITIATED:
		<ol> <li>Containment spray pumps RUNNING.</li> <li>Containment spray header isolation valves FCV-72-39 and FC 72-2 OPEN.</li> </ol>
		<ol> <li>Containment spray recirculation valves to RWST FCV-72-34 at FCV-72-13 CLOSED.</li> </ol>
		4) Containment spray header flow greater than 4750 gpm per trai

		Required Operator Actions Form ES				
Op Test No. Event Descriptic	: <u>NRC</u>	Scenario # <u>4</u> Event # ES-0.5 Page <u>40</u> of uipment Verification	<sup>2</sup> _ 4 <sup>2</sup>			
Time	Position	Applicant's Actions or Pehavior				
		<ul> <li>PHASE B TRAIN A alarm LIT [M-6C, A5].</li> <li>PHASE B TRAIN B alarm LIT [M-6C, A6].</li> </ul>				
		d. ENSURE RCPs STOPPED.				
		e. VERIFY Phase B valves CLOSED:				
		<ul> <li>Panel 6K PHASE B GREEN.</li> <li>Panel 6L PHASE B GREEN.</li> </ul>				
		<ul> <li>f. CHECK cntmnt vacuum relief isolation valves CLOSED: [Pnl 6K MANUAL]</li> <li>FCV-30-46</li> <li>FCV-30-47</li> <li>FCV-30-48.</li> </ul>				
		WHEN 10 minutes have elapsed, THEN ENSURE containment air re fans RUNNING.	turn			
	BOP	<ul> <li>12. CHECK secondary and containment rad monitors USING the fol</li> <li>Appendix A, Secondary Rad Monitors (attached)</li> <li>Appendix B, Containment Rad Monitors. (attached)</li> </ul>	lowing			
	BOP	<ul> <li>13. CHECK pocket sump pumps STOPPED: [M-15, upper left corner]</li> <li>HS-77-410, Rx Bldg Aux Floor and Equipment Drain Sump p</li> <li>HS-77-411, Rx Bldg Aux Floor and Equipment Drain Sump p</li> </ul>	ump A ump E			
	BOP	14. <b>DISPATCH</b> personnel to perform EA-0-1, Equipment Checks Fol	lowing			

Appendix D		Req	uired O	perator Actior	าร		F	orm E	S-D-2
Op Test No.:	NRC	Scenario #	4	Event #	ES-0.5	Page	41	of	41
Event Description	i: Equ	ipment Verificatio	n						
Time	Position	1		Applicant	's Actions or Beha	avior			
	BOP	15. ENSUR and SI.	E plant	announceme	ent has been ma	de regard	ing Re	eactor	Trip

Evaluator Note:	BOP completes ES-0.5 including Appendices A & B and reports completion (including any discrepancies and actions taken, i.e.: manual Feedwater Isolation per ES-0.5 Step 8) to SRO.
	END (ES-0.5, EQUIPMENT VERIFICATIONS)

			Scenario Outline	Form ES-D-1		
Facility: Examine	Sequo rs:	yah	Scenario No.: 5 Operators:	Op Test No.:	NRC	
Initial Cor Turnover	nditions: ~ : Continue	2% Reactor Pow Plant Startup. C	er, A Main Feedwater Pump I/S urrently at 0-GO-4, Section 5.2 Step	o 3.		
Target C	Is: Re-align	CCP suction to R	WST and Discharge through the CC	CPIT.		
	Establish Manually to Degrad	at least one train align one train of led Core Cooling	or containment spray prior to comp RHR for Containment Sump Recirc Conditions.	leting FR-Z.1. culation and establis	sh ECCS flow price	
Event No.	No. Malf. No. Event Type*			Description		
<b>1.</b> T+0	N/A	R – RO N – SRO/BOP	Continue Power Increase from ~2%.			
<b>2.</b> T+10	ZAOLIC335A _YOKO	I – BOP	#1 SG Yokogawa Level Indicating	Controller fail low		
<b>3.</b> T+20	RX07A	I – RO TS – SRO	Pressurizer Pressure Controlling Channel (PT 68-340) Fails High			
<b>4.</b> T+30	RX02A2	I – RO TS – SRO	RTD Cold Leg 1 Sensor #2 fails high			
<b>5.</b> T+40	TH01B	C – All TS – SRO	Small RCS Leak ~21 gpm in Loop	2 Hot leg.		
<b>6.</b> T+60	CN02A	C – BOP	1A CBP Trip			
<b>7.</b> T+70	TH01B RP16K604A RP16K604B	M – All	RCS Leak increase to RCS Break requires Rx trip and Safety Inject CCP suction fails to automatically swap to RWST CCP discharge fails to automatically swap to CCPIT			
		C = RO	Containment Spray Pump discharge valves fail to Auto open Cntmt Spray Hdr Train B valve will not manually open			
<b>8.</b> T+70	RP16K644A RP16K644B ZDIHS722A	0-110	Cntmt Spray Hdr Train B valve will	not manually open	io open	
#### Appendix D

#### Scenario 5 Summary

The crew will assume the shift with the unit in startup at  $\approx$ 2-3% RTP controlling SG levels using one Main Feedwater Pump, ready to continue power escalation to MODE 1. Following the briefing summary, the crew will raise reactor power starting in 0-GO-4 Section 5.2 Step 3.

After an adequate power increase, at the direction of the Lead Examiner, #1 SG Yokogawa Level-Indicating Controller fails low. The crew will respond to alarm response procedures (ARPs) 1-AR-M5-A, B-7 that directs implementation of AOP-S.01, Loss of Normal Feedwater; the crew enters Section 2.1 to mitigate the failure and return SG level(s) to normal. The #1 SG controls will remain in manual for the remainder of the scenario.

After the SG LIC failure, at the direction of the Lead Examiner, the Pressurizer Pressure controlling channel will fail high resulting in pressurizer spray valves opening; immediate operator action (IOAs) should be taken to close them and stop the RCS depressurization. The crew will respond to ARPs 1-AR-M5A B-3, 1-AR-M6-A, C-5. The SRO will direct performance of AOP-I.04, Pressurizer Instrument Malfunction, Section 2.3 to implement mitigating actions and select another controlling channel, return spray control to automatic. SRO will identify Tech Specs: 3.2.5.b; 3.3.1.1. Functional Units 7, 9, 10, Action 6; 3.3.2.1 Functional Units 1.d- Action 17, 8.a- Actions 22a

When pressurizer pressure control is restored, at the direction of the Lead Examiner, a RCS Cold Leg Loop 1 RTD, TE-68-14B will fail high; this will cause the Loop #1 Tavg channel to be high and Delta T channel to be low. The crew will respond to 1-AR-M5-A A-6, D-6 and 1-AR-M6A, A-2 and C-2 directing entry into AOP-I.02, RCS Loop RTD Instrument Malfunction, Section 2.0 and Appendix A for the Loop 1 temperature instrument failure. The crew may enter AOP-C.01, Section 2.1, Uncontrolled Rod Bank Movement for the unexpected rod motion. Tavg and Delta T control inputs will be defeated by AOP performance restoring automatic rod control capability. The SRO will identify Tech Spec actions: 3.3.1.1 Table 3.3-1, Functional Units 7, 8- Action 6, 14c- Action 10; 3.3.2.1, Functional Units 6.c.i.c and 6.c.ii.c both Action 37.

Following the RCS temperature instrument failure, at the direction of the Lead Examiner, a small unisolable RCS leak (~20-25 gpm) will occur. The crew will respond to ARPs 1-AR-M5C B-1, B-3, 1-AR-M6-E S-6 and 0-AR-M12A A-1, A-4, which will direct them to implement AOP-R.05, RCS Leak and Leak Source Identification to attempt actions to isolate leak. SRO will identify Tech Specs: 3.4.6.2.b.

Following determination that the leak is not isolated, at the direction of the Lead Examiner, 1A Condensate Booster Pump trip occurs. The crew will respond to ARPs 1-AR-M3-A A-4 (possibly E-1) that directs performance of AOP-S.04, Condensate or Heater Drains Malfunction, Section 2.5 to implement mitigating actions.

At the direction of the Lead Examiner, the RCS leak will be increased to a Large Break LOCA requiring Reactor Trip and Safety Injection. The crew will implement E-0, Reactor Trip/SI. During E-0 response, the crew should identify CCP suction valves from the RWST and CCP discharge valves to the CCPIT failed to open automatically; MCR manual action is appropriate to correct the alignment. Subsequently, transition to E-1 and status tree monitoring occur. The crew should identify entry conditions for and implement FR-Z.1 for High Containment Pressure and potentially FR-P.1 for Pressurized Thermal Shock RED Path.

Sometime during the FR procedures' performance, RWST lo-lo level will occur requiring the crew to implement ES-1.3, Containment Sump Swapover. During sump re-alignment, one of the containment sump supply valves fails to open automatically or manually which requires the crew to stop the affected RHR pump and realign only one train of RHR suction to containment sump. If containment spray realignment to containment sump is required, only one train of containment spray can be aligned to the containment sump; however, the discharge valve on that train will not open which results in no containment spray capability.

The scenario may be terminated at the direction of the Lead Examiner, following completion of FR-Z.1 and FR-P-1 if applicable, when ECCS is aligned for RHR sump recirculation using one train of RHR.

EOP flow: E-0 - E-1 - FR-Z.1 - FR-P.1 - ES-1.3





# NRC 1009 ESG-5 Booth Instruction File

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gan e j	EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH FEEDBACK
	Sim. Setup	Reset IC- 9 Perform switch check. Allow the simulator to run for at least 3 minutes before loading SCEN file or	~2% RTP BOL ~150 MWD/MTU CB 'D' Rods @ 173 steps, all others @ 228 steps; [B] = 1711 ppm; Ba Blender setting: 45% Xe/Sm @ equilibrium
		starting the exercise. This will initialize ICS.	<u>Console Operator actions: Place simulator in run and perform</u> <u>the following:</u>
		Load SCENS: <u>1009 NRC ESG-5</u> Place simulator in RUN. Place OOS equipment in required position with tags. Clear alarms and Return to FREEZE.	<ul> <li>Place Mode_2_placard on panels.</li> <li>Place_A_Train Week sign on the simulator.</li> <li>Ensure 1 PRNI and 1 IRNI are selected for display on 1-M-4 NIS Recorder NR-45.</li> </ul>
	1.	N/A	~2% Power Continue Plant Startup
		IOR ZAOLIC335A_YOKO f:0 k:2	#1 SG Yokogawa LIC fail lo
			<u>Support staff:</u> When dispatched, wait ~2 minutes, report no local indications of any abnormality.
	2.	IMF RX07A f:1 k:3	Controlling Pzr Pressure Transmitter PT 68-340 Fails High
erran y E Anna de la companya d			<u>Support staff:</u> When MSS is contacted, inform the crew that the IMs will report to the MCR in ~25 minutes.
	3.	IMF RX02A2 f:630 k:4	RTD Failure Cold Leg 1 Sensor 2 (TE-68-14B)
			<u>Support staff:</u> When MSS is contacted, inform the crew that the IMs will report to the MCR in ~45 minutes.
	4.	IMF TH01B f:0.0025 k:5	RCS Loop 2 Hot Leg Leak ~21 Gpm.
			<u>Support staff:</u> none
	5.	IMF CN02A f:1 k:6	1A CBP Trip
			<u>Support staff:</u> none
	At Lead Examine	<b>r direction</b> , when crew has det	ermined if leak is/is not isolated, <b>Modify</b> this Malfunction
	6.	MMF TH01B f:5 r:300	Lp #2 LOCA-To Require Rx Trip and Safety Injection.
			<u>Support staff:</u> none
-	7.	MMF TH01B f:35	Increase Loop 2 RCS Hot Leg Break To Large Break.
			<u>Support staff:</u> none
er al	8.	IMF RP13C f:1	Failure Of The Auto Feedwater Isolation Signal – Both Trains.
ang t		[Pre-insert]	<u>Support staff:</u> none

	<u>NRC 1009 ES</u>	G-5 Booth Instruction File	7-16-2010
~n_1	EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH FEEDBACK
	9.	IMF RP16K644A f:1	FCV-72-39, 1A-A Cntmt Spray Valve Auto Open Fails (Manually Open)
		IMF RP16K644B f:1	FCV-72-2, 1B-B Cntmt Spray Valve, Auto Open Fails (Manually Open)
			Support staff: none
		IOR ZDIHS722A f:0	Train B Containment Spray Valve Will Not Open Manually.
			Support staff: none
	10.	IOR ZDIHS6372A f:0	FCV-63-72 Train A RHR Sump Swapover Valve Fails Closed.
			Support staff: none
		IRF RHR14 f:1 k:9	RWST To RHR Pp Flow Control VIv Power, FCV-63-1.
			<u>Support staff</u> : if dispatched w/ EA-201-1 requested, as AUO, wait 2 minutes respond that electric power is restored to FCV-63-1.
	Termination C	riteria: Completion of FR-2 ES-1.3.	Z.1 and Containment Sump Recirculation implemented per

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Page 1

TIME         POWER         DEFECT         ROD HT         WORTH         XENON         BORON         CONC         PPM         DILUTION         BORATION         CONC           (hrs)         (%)         (pcm)         (p	DELTA	REACTOF	POWER	ASSUMED	INSERTED	EXPECTED	DELTA RHC	BORON	DELTA	RECOMMEN	IRECOMMENT	IODINE
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	TIME	POWER	DEFECT	ROD HT	WORTH	XENON	BORON	CONC	PPM	DILUTION	BORATION	CONC
0         2.0         37.5         173.0         -496.0         -54.7          171.0           0.1           1         6.0         111.5         176.0         -460.9         -53.9         38.1         170.4.9         -6.1         240         0         0.5           2         10.0         182.8         179.0         -426.5         -58.2         41.1         1988.3         -6.6         260         0         1.2           3         14.0         251.9         182.0         -390.9         -69.1         44.5         1691.2         -7.1         282         0         2.3           4         18.0         318.8         185.0         -356.3         -87.8         50.0         1683.2         -80.0         318         0         3.6           5         22.0         383.7         188.0         -320.4         -114.9         57.2         167.4         -9.1         365         0         7.1           7         30.0         511.4         200.0         -194.1         -247.0         14.9         1652.8         -2.4         96         0         11.2           9         30.0         513.2         206.0 </td <td>(hrs)</td> <td>(%)</td> <td>(pcm)</td> <td>(steps)</td> <td>(pcm)</td> <td>(pcm)</td> <td>(pcm)</td> <td>(ppm)</td> <td>(ppm)</td> <td>(gal)</td> <td>(gal)</td> <td>(% ea)</td>	(hrs)	(%)	(pcm)	(steps)	(pcm)	(pcm)	(pcm)	(ppm)	(ppm)	(gal)	(gal)	(% ea)
1       6.0       111.5       176.0       -460.9       -53.9       38.1       1704.9       -6.1       240       0       0.5         2       10.0       182.8       179.0       -426.5       -58.2       41.1       1698.3       -6.6       260       0       1.2         3       14.0       251.9       182.0       -390.9       -69.1       44.5       1691.2       -7.1       282.0       0       2.3         4       18.0       318.8       185.0       -355.3       -87.8       50.0       1683.2       -8.0       318       0       3.6         5       22.0       383.7       188.0       -320.4       -114.9       57.2       1674.1       -9.1       365       0       5.3         6       26.0       447.3       191.0       -284.9       -150.7       63.8       1663.9       -10.2       409       0       7.1         7       30.0       511.4       200.0       -194.1       -247.0       14.9       1652.8       -2.4       96       0       11.2         9       30.0       511.7       202.0       -174.8       -304.5       38.4       164.6       6.1       124.8	0	2.0	37.5	173.0	-496.0	-54.7		1711.0	, <u></u>			0.1
2       10.0       182.8       179.0       -426.5       -58.2       41.1       1698.3       -6.6       260       0       1.2         3       14.0       251.9       182.0       -390.9       -69.1       44.5       1691.2       -7.1       282       0       2.3         4       18.0       318.8       185.0       -355.3       -87.8       50.0       1683.2       -8.0       318       0       3.6         5       22.0       383.7       188.0       -320.4       -114.9       57.2       1674.1       -9.1       365       0       5.3         6       26.0       447.3       191.0       -284.9       -150.7       63.8       1663.9       -10.2       409       0       7.1         7       30.0       511.4       200.0       -194.1       -247.0       14.9       1652.8       -2.4       96       0       11.2         9       30.0       511.4       202.0       -174.8       -304.5       38.4       1646.6       -6.1       248       0       13.1         10       30.0       512.4       204.0       -155.5       -365.6       42.6       1639.8       -6.8       276 <t< td=""><td>1</td><td>6.0</td><td>111.5</td><td>176.0</td><td>-460.9</td><td>-53.9</td><td>38.1</td><td>1704.9</td><td>-6.1</td><td>240</td><td>0</td><td>0.5</td></t<>	1	6.0	111.5	176.0	-460.9	-53.9	38.1	1704.9	-6.1	240	0	0.5
3       14.0       251.9       182.0       -390.9       -69.1       44.5       1691.2       -7.1       282       0       2.3         4       18.0       318.8       185.0       -355.3       -87.8       50.0       1683.2       -8.0       318       0       3.6         5       22.0       383.7       188.0       -320.4       -114.9       57.2       1674.1       -9.1       365       0       5.3         6       26.0       447.3       191.0       -284.9       -150.7       63.8       1663.9       -10.2       409       0       7.1         7       30.0       510.3       196.0       -232.2       -195.1       54.7       1655.1       -8.7       352       0       9.2         9       30.0       511.7       202.0       -174.8       -304.5       38.4       1666.6       -6.1       248       0       13.1         10       30.0       512.4       204.0       -155.5       -365.6       42.6       1632.6       -7.2       294       0       162.2         12       30.0       514.1       206.0       -117.9       -493.2       46.4       1625.2       -7.4       302	2	10.0	182.8	179.0	-426.5	-58.2	41.1	1698.3	-6.6	260	0	1.2
4       18.0       318.8       185.0       -355.3       -87.8       50.0       1683.2       -8.0       318       0       3.6         5       22.0       383.7       188.0       -320.4       -114.9       57.2       1674.1       -9.1       365       0       5.3         6       26.0       447.3       191.0       -284.9       -150.7       63.8       1663.9       -10.2       409       0       7.1         7       30.0       510.3       196.0       -232.2       -195.1       54.7       1655.1       -8.7       352       0       9.2         8       30.0       511.4       200.0       -194.1       -247.0       14.9       1652.8       -2.4       96       0       11.2         9       30.0       511.7       202.0       -174.8       -304.5       38.4       1646.6       -6.1       248       0       13.1         10       30.0       513.2       206.0       -136.7       -428.9       45.2       1632.6       -7.2       294       0       16.2         11       30.0       515.0       210.0       -99.3       -557.4       46.5       1617.7       -7.4       304	3	14.0	251.9	182.0	-390.9	-69.1	44.5	1691.2	-7.1	282	0	2.3
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	4	18.0	318.8	185.0	-355.3	-87.8	50.0	1683.2	-8.0	318	0	3.6
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	5	22.0	383.7	188.0	-320.4	-114.9	57.2	1674.1	-9.1	365	0	5.3
7 $30.0$ $510.3$ $196.0$ $-232.2$ $-195.1$ $54.7$ $1655.1$ $-8.7$ $352$ $0$ $9.2$ 8 $30.0$ $511.4$ $200.0$ $-194.1$ $-247.0$ $14.9$ $1652.8$ $-2.4$ $96$ $0$ $11.2$ 9 $30.0$ $511.7$ $202.0$ $-174.8$ $-304.5$ $38.4$ $1646.6$ $-6.1$ $248$ $0$ $13.1$ 10 $30.0$ $512.4$ $204.0$ $-155.5$ $-365.6$ $42.6$ $1639.8$ $-6.8$ $276$ $0$ $14.7$ 11 $30.0$ $513.2$ $206.0$ $-136.7$ $-428.9$ $45.2$ $1632.6$ $-7.2$ $294$ $0$ $16.2$ 12 $30.0$ $514.1$ $208.0$ $-117.9$ $-493.2$ $46.4$ $1625.2$ $-7.4$ $302$ $0$ $17.6$ 13 $30.0$ $515.0$ $210.0$ $-99.3$ $-557.4$ $46.5$ $1617.7$ $-7.4$ $304$ $0$ $18.8$ 14 $30.0$ $515.9$ $212.0$ $-80.8$ $-620.9$ $45.9$ $161.4$ $-7.3$ $301$ $0$ $20.9$ 15 $30.0$ $516.8$ $214.0$ $-65.0$ $-683.0$ $47.2$ $1602.9$ $-7.5$ $310$ $0$ $20.9$ 16 $30.0$ $517.7$ $216.0$ $-49.4$ $-743.3$ $45.6$ $1595.6$ $-7.3$ $300$ $0$ $21.8$ 17 $30.0$ $518.5$ $216.0$ $-49.2$ $-801.4$ $58.8$ $1566.2$ $-9.4$ $389$ <	6	26.0	447.3	191.0	-284.9	-150.7	63.8	1663.9	-10.2	409	0	7.1
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	7	30.0	510.3	196.0	-232.2	-195.1	54.7	1655.1	-8.7	352	0	9.2
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	8	30.0	511.4	200.0	-194.1	-247.0	14.9	1652.8	-2.4	96	0	11.2
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	9	30.0	511.7	202.0	-174.8	-304.5	38.4	1646.6	-6.1	248	0	13.1
11       30.0       513.2       206.0       -136.7       -428.9       45.2       1632.6       -7.2       294       0       16.2         12       30.0       514.1       208.0       -117.9       -493.2       46.4       1625.2       -7.4       302       0       17.6         13       30.0       515.0       210.0       -99.3       -557.4       46.5       1617.7       -7.4       304       0       18.8         14       30.0       515.9       212.0       -80.8       -620.9       45.9       1610.4       -7.3       301       0       19.9         15       30.0       516.8       214.0       -65.0       -683.0       47.2       1602.9       -7.5       310       0       20.9         16       30.0       517.7       216.0       -49.4       -743.3       45.6       1595.6       -7.3       300       0       21.8         17       30.0       518.5       216.0       -49.2       -801.4       58.8       1586.2       -9.4       389       0       22.6         18       30.0       520.7       216.0       -48.8       -910.2       54.0       1568.5       -8.6       360	10	30.0	512.4	204.0	-155.5	-365.6	42.6	1639.8	-6.8	276	0	14.7
12       30.0       514.1       208.0       -117.9       -493.2       46.4       1625.2       -7.4       302       0       17.6         13       30.0       515.0       210.0       -99.3       -557.4       46.5       1617.7       -7.4       304       0       18.8         14       30.0       515.9       212.0       -80.8       -620.9       45.9       1610.4       -7.3       301       0       19.9         15       30.0       517.7       216.0       -49.4       -743.3       45.6       1595.6       -7.3       300       0       21.8         17       30.0       518.5       216.0       -49.2       -801.4       58.8       1586.2       -9.4       389       0       22.6         18       30.0       519.7       216.0       -49.0       -857.1       56.6       1577.2       -9.0       376       0       23.3         19       30.0       520.7       216.0       -48.8       -910.2       54.0       1568.5       -8.6       360       0       24.0         20       30.0       521.8       216.0       -48.7       -960.6       51.3       1560.3       -8.2       34.3	11	30.0	513.2	206.0	-136.7	-428.9	45.2	1632.6	-7.2	294	0	16.2
13       30.0       515.0       210.0       -99.3       -557.4       46.5       1617.7       -7.4       304       0       18.8         14       30.0       515.9       212.0       -80.8       -620.9       45.9       1610.4       -7.3       301       0       19.9         15       30.0       516.8       214.0       -65.0       -683.0       47.2       1602.9       -7.5       310       0       20.9         16       30.0       517.7       216.0       -49.4       -743.3       45.6       1595.6       -7.3       300       0       21.8         17       30.0       518.5       216.0       -49.2       -801.4       58.8       1586.2       -9.4       389       0       22.6         18       30.0       519.7       216.0       -49.0       -857.1       56.6       1577.2       -9.0       376       0       23.3         19       30.0       520.7       216.0       -48.7       -960.6       51.3       1560.3       -8.2       343       0       24.6         150       MWD/MTU       Hold Tavg = Tref +/- 1.5F       Total       6121       0       Small hourly boration/dilution volumes may be accumula	12	30.0	514.1	208.0	-117.9	-493.2	46.4	1625.2	-7.4	302	0	17.6
14       30.0       515.9       212.0       -80.8       -620.9       45.9       1610.4       -7.3       301       0       19.9         15       30.0       516.8       214.0       -65.0       -683.0       47.2       1602.9       -7.5       310       0       20.9         16       30.0       517.7       216.0       -49.4       -743.3       45.6       1595.6       -7.3       300       0       21.8         17       30.0       518.5       216.0       -49.2       -801.4       58.8       1586.2       -9.4       389       0       22.6         18       30.0       519.7       216.0       -49.0       -857.1       56.6       1577.2       -9.0       376       0       23.3         19       30.0       520.7       216.0       -48.8       -910.2       54.0       1568.5       -8.6       360       0       24.0         20       30.0       521.8       216.0       -48.7       -960.6       51.3       1560.3       -8.2       343       0       24.6         150       MWD/MTU       Hold Tavg = Tref +/- 1.5F       Total       6121       0       Small hourly boration/dilution volumes may be accumula	13	30.0	515.0	210.0	-99.3	-557.4	46.5	1617.7	-7.4	304	0	18.8
15       30.0       516.8       214.0       -65.0       -683.0       47.2       1602.9       -7.5       310       0       20.9         16       30.0       517.7       216.0       -49.4       -743.3       45.6       1595.6       -7.3       300       0       21.8         17       30.0       518.5       216.0       -49.2       -801.4       58.8       1586.2       -9.4       389       0       22.6         18       30.0       519.7       216.0       -49.0       -857.1       56.6       1577.2       -9.0       376       0       23.3         19       30.0       520.7       216.0       -48.8       -910.2       54.0       1568.5       -8.6       360       0       24.0         20       30.0       521.8       216.0       -48.7       -960.6       51.3       1560.3       -8.2       343       0       24.6         Total       6121       0         Small hourly boration/dilution volumes may be accumulated for larger single additions         6820       BAT ppm       Hold Tavg = Tref +/- 1.5F       Total       6121       0       Small hourly boration/dilution volumes may be accumulated for larger single additions	14	30.0	515.9	212.0	-80.8	-620.9	45.9	1610.4	-7.3	301	0	19.9
16       30.0       517.7       216.0       -49.4       -743.3       45.6       1595.6       -7.3       300       0       21.8         17       30.0       518.5       216.0       -49.2       -801.4       58.8       1586.2       -9.4       389       0       22.6         18       30.0       519.7       216.0       -49.0       -857.1       56.6       1577.2       -9.0       376       0       23.3         19       30.0       520.7       216.0       -48.8       -910.2       54.0       1568.5       -8.6       360       0       24.0         20       30.0       521.8       216.0       -48.7       -960.6       51.3       1560.3       -8.2       343       0       24.6         150       MWD/MTU       Hold Tavg = Tref +/- 1.5F       Total       6121       0       Small hourly boration/dilution volumes may be accumulated for larger single additions         Reason for Maneuver       Reactor/Plant restart following forced outage- 30% hold	15	30.0	516.8	214.0	-65.0	-683.0	47.2	1602.9	-7.5	310	0	20.9
17       30.0       518.5       216.0       -49.2       -801.4       58.8       1586.2       -9.4       389       0       22.6         18       30.0       519.7       216.0       -49.0       -857.1       56.6       1577.2       -9.0       376       0       23.3         19       30.0       520.7       216.0       -48.8       -910.2       54.0       1568.5       -8.6       360       0       24.0         20       30.0       521.8       216.0       -48.7       -960.6       51.3       1560.3       -8.2       343       0       24.6         150       MWD/MTU       Hold Tavg = Tref +/- 1.5F       Total       6121       0       Small hourly boration/dilution volumes may be accumulated for larger single additions         6820       BAT ppm       Hold Tavg = Tref +/- 1.5F       Total       6121       0         Small hourly boration/dilution       volumes may be accumulated for larger single additions       10       Small hourly boration/dilution         Reason for Maneuver       Reactor/Plant restart following forced outage- 30% hold	16	30.0	517.7	216.0	-49.4	-743.3	45.6	1595.6	-7.3	300	0	21.8
18       30.0       519.7       216.0       -49.0       -857.1       56.6       1577.2       -9.0       376       0       23.3         19       30.0       520.7       216.0       -48.8       -910.2       54.0       1568.5       -8.6       360       0       24.0         20       30.0       521.8       216.0       -48.7       -960.6       51.3       1560.3       -8.2       343       0       24.6         150       MWD/MTU       Hold Tavg = Tref +/- 1.5F       Total       6121       0       0       Small hourly boration/dilution volumes may be accumulated for larger single additions         6820       BAT ppm       Reactor/Plant restart following forced outage- 30% hold       0       20       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%       20%	17	30.0	518.5	216.0	-49.2	-801.4	58.8	1586.2	-9.4	389	0	22.6
19       30.0       520.7       216.0       -48.8       -910.2       54.0       1568.5       -8.6       360       0       24.0         20       30.0       521.8       216.0       -48.7       -960.6       51.3       1560.3       -8.2       343       0       24.6         150       MWD/MTU       Hold Tavg = Tref +/- 1.5F       Total       6121       0         6820       BAT ppm       Free +/- 1.5F       Total       6121       0         Small hourly boration/dilution volumes may be accumulated for larger single additions       Small hourly boration/dilution       volumes may be accumulated for larger single additions         Reason for Maneuver Date RxEng Name Comments       RxEng Name       J. Sidekick none       J. Sidekick	18	30.0	519.7	216.0	-49.0	-857.1	56.6	1577.2	-9.0	376	0	23.3
20       30.0       521.8       216.0       -48.7       -960.6       51.3       1560.3       -8.2       343       0       24.6         150       MWD/MTU       Hold Tavg = Tref +/- 1.5F       Total       6121       0         6820       BAT ppm       Fref +/- 1.5F       Total       6121       0         Reason for Maneuver       Reactor/Plant restart following forced outage- 30% hold       Small hourly boration/dilution         Date       Today       J. Sidekick       J. Sidekick         RxEng Name       J. Sidekick       none	19	30.0	520.7	216.0	-48.8	-910.2	54.0	1568.5	-8.6	360	0	24.0
150       MWD/MTU       Hold Tavg = Tref +/- 1.5F       Total       6121       0         6820       BAT ppm       Small hourly boration/dilution volumes may be accumulated for larger single additions         Reason for Maneuver Date       Reactor/Plant restart following forced outage- 30% hold         RxEng Name Comments       J. Sidekick none	20	30.0	521.8	216.0	-48.7	-960.6	51.3	1560.3	-8.2	343	0	24.6
6820       BAT ppm       Small hourly boration/dilution volumes may be accumulated for larger single additions         Reason for Maneuver       Reactor/Plant restart following forced outage- 30% hold         Date       Today         RxEng Name       J. Sidekick         Comments       none	150	MWD/MTL	J	Hold Tavg	= Tref +/- 1.	5F			Total	6121	0	
Reason for Maneuver       Reactor/Plant restart following forced outage- 30% hold         Date       Today         RxEng Name       J. Sidekick         Comments       none	6820	BAT ppm							=	Small hourly	boration/dilution	
Reason for Maneuver       Reactor/Plant restart following forced outage- 30% hold         Date       Today         RxEng Name       J. Sidekick         Comments       none										volumes may	be accumulated	1
Reason for ManeuverReactor/Plant restart following forced outage- 30% holdDateTodayRxEng NameJ. SidekickCommentsnone	for larger single additions											
Date     Today       RxEng Name     J. Sidekick       Comments     none	Reason	for Maneu	/er	Reactor/Pla	int restart fo	llowing force	ed outage- 3	0% hold				
RxEng Name     J. Sidekick       Comments     none	Date			Today								
Comments none	RxEng N	lame	•	J. Sidekick								
	Comme	nts	•	none								

1009 ESG-5 Page 1 of 5

Unit 1 MCR CHECKLIST Page 1. c	f 3 Today
Part 1 - Completed by Off-going Shift / Reviewed by	/ On-coming Shift
Mode 2, ~2% Power	NRC phone Authentication Code
Grid Risk: Green	
	Until 0800 XXXX
RCS Leakage ID .02 gpm, UNID .02 gpm	After 0800 YYYY
Common Tect	Spec Actions
None	opec Actions
U-1 Tech Sj	bec Actions
Equipment INOP	Time INOP Owner
• None	
Protected	Equipment
None	
Shift Pr	iorities
<ul> <li>Continue Plant Startup. Currently at 0-GO-4, Section 5.2</li> </ul>	Step 3.
Part 2 - Performed by on coming chift	
Tart 2 Terrormed by on-coming smit	
☑ Verify your current qualifications	Review Operating Log since last held shift or 3
M Standing Orders / Obit Out	days, whichever is less
	☑ Immediate required reading
LCO Actions	
Part 3 - Performed by both off-going and on-coming	shift
Walk down of MCR Control Boards	

1009	ESG-5
Page	2 of 5

SHIFT TURNOVER CHECKLIST	Page 2. of 3	Today
	MAIN CONTROL ROOM (7690)	
Train <u>A</u> Week		
	OUTSIDE (7666) [593-5214]	
All Equipment normal		
All Equipment normal	AUXILIARY BUILDING (7775)	
Т	URBINE BUILDING (7771) (593-845	i)
All Equipment normal		

1009 ESG-5 Page 3 of 5

## SHIFT TURNOVER CHECKLIST

### Page 3. of 3

Today

	Disabled Annunciators								
PANEL	WINDOW	ANNUNCIATOR	WO / PER Number						

### Equipment Off-Normal (Pink Tags)

UNID And Noun Name	Panel	Problem Description	WO / PER Number

#### MCR WO LIST

ID And Noun Name	Devel		
	Panel	Problem Description	WO/PER Number

### UNIT ONE REACTIVITY BRIEF Date: Today Time: Now

RCS Boron: 1711 ppm	Today	BA Cor	ntroller Setpoint: <b>45%</b> *	RCS B-10 Depletion: 2 ppm
Operable BAT: A	BAT A Boron: 685	<b>0</b> ppm	BAT C Boron: 6850ppm	RWST Boron: 2601 ppm
Nominal	Gallons per rod ste	p from 18	9: 17 gallons of acid, 75	gallons of water

General Information

\* Verify boric acid flow controller is set at Adjusted BA Controller Setting iaw 0-SO-62-7 section 5.1

Estimated values for a 1° Change in Tave \*\*

Gallons of acid: 22

Gallons of water: 94

Rod Steps: 1

Estimated rods/boron for emergency step power reduction \*\* (Assuming Xenon equilibrium and no reactivity effects due to Xenon. 2/3 total reactivity from rods, 1/3 from boron)

Power reduction amount	Estimated Final Rod Position	Estimated boron addition	
10%	181 Steps on bank D	93 gallons	
30%	161 Steps on bank D	291 gallons	
50%	n/a	n/a	

\*\* These values are approximations and not intended nor expected to be exact. The values may be superseded by Rx Engineering or SO-62-7 calculated values. These values are calculated assuming 100% steady state power operation only. Engineering data last updated <u>TODAY</u>. Data Valid up to three weeks from now.

Previous Shift Reactivity Manipulations

Number of dilutions: 1	Number of borations:	Rod steps in:	
Gallons per dilution: 12	Gallons per boration:	Rod steps out:	
Total amount diluted: 12	Total amount borated:	Net change:	IN/Out

**Current Shift Estimated Reactivity Manipulations** Charles Statistics

**Remarks:** Rx Power – ~2% MWD/MTU - 150 Xenon & Samarium at Equilibrium \*\*\* As Required by Reactor Engineering startup spreadsheet.

Next Unit 1 Flux Map is scheduled: three weeks from now

Unit Supervisor:

Name/Date

1009 ESG-5 Page 5 of 5

Limit
Limit
L
Variable
Variable
2500 - 2700
2500 - 2700
Variable
Variable
Variable
2400-2700
2400-2700
2400-2700
2400-2700
2400-2700
2400-2700
2400-2700
2400-2700
<u>≥</u> 2000
Midpoint
>1
2.33

## **Operations Chemistry Information**

Primary to Se	econdary L	eakrate In	formation (Total (	CPM RM-90-9	9/119)
Indicator	Units	U1	Date / Time	U2	Date/Time
SI 50 S/G Leakage?	Yes/No	No	Today / Now	No	Today / Now
SI 137.5 CVE Leakrate	gpd	< 0.1	Today / Now	< 0.1	Today / Now
5 gpd leak equivalent	cpm	115	Today / Now	68	Today / Now
15 gpd (30 min increase)	cpm	265	Today / Now	83	Today / Now
30 gpd leak equivalent	cpm	490	Today / Now	206	Today / Now
75 gpd leak equivalent	cpm	1165	Today / Now	455	Today / Now
150 gpd leak equivalent	cpm	2290	Today / Now	870	Today / Now
CVE Air Inleakage	cfm	10	Today / Now	12.5	Today / Now
Bkgd on 99/119	cfm	40	Today / Now	40	Today / Now
Steady state conditions	are necessary	for an accurat	e determination of leak r	ate using the CVE	Rad Monitor



	Appendix D		Red	quired Ope	erator Acti	ons		Fo	rm ES	S-D-2
21	Op Test No.:	NRC	Scenario #	5	Event #	1	Page	1	of	57
	Event Description:	Po	wer increase							

Time	Position	Applicant's Actions or Behavior
Simulator Op	erator: No ac	tion required for event 1
Indications A	vailable: Non	e Applicable
	SRO	Direct a load increase in accordance with 0-GO-4, Reactor Power Ascension To Between 13% And 15% RTP, Section 5.2, and 0-SO-62-7 Boron Concentration Control, Section 6.1 or Section 6.2.
	NOTES: 1. 2. 3.	Actions effecting reactivity are directed in the following step. 0-SO-62-7 requirements shall be adhered to for reactivity changes (i.e. reactivity balance, amounts of boric acid or water). All appropriate verifications and peer checks shall be utilized during performance. Recommended dilution rate is 50 to 75 gallon batches every 12 to 15 minutes for a steady power increase. Rod movement should be limited to 1/2 step increments approximately every 1 1/2 minutes. Dilution and rod movement rates may be adjusted depending on SG level control stability. Control Rod withdrawal and / or dilution requirements may be significantly impacted by the change in core reactivity due to changing Xenon concentration.
	CREW	<b>INITIATE</b> a methodical and deliberate reactor power increase by manual adjustment of the control banks or by diluting the RCS.
	CREW	WHEN reactor power is above 5%, THEN LOG Mode 1 entry in the Unit Narrative Log.
	CRO	<b>MAINTAIN</b> the SG levels on program by periodically adjusting the feedwater bypass reg controller level setpoints using Appendix B and C.
Evaluator Not	te: The followi	ng Steps are from 0-SO-62-7 Boron Concentration Control, Section 6.2, Dilute
	CAUTION 1:	When making an RCS dilution of $\geq$ 3000 gallons, it should be done in batches with an RCS boron concentration verification at the halfway point (e.g., 1500 gallons). Allow at least 15 minutes between batches.
	CAUTION 2:	Returning the Boric Acid Blender to service after unplugging, cleaning, or maintenance on the Boric Acid System could introduce debris, sludge, air or chunks of solidified boron into the CCP suction resulting in pump damage. Extreme care must be exercised to properly flush the Boric Acid Blender system following an outage.
	NOTE 1: If a he bo	an excessive amount of dilution is required (plant startup), the pressurizer aters should be energized to cause pressurizer spray operation for equalizing ron concentration in RCS and pressurizer
	NOTE 2: Dil de pe	ute mode will be used anytime a long-term positive reactivity addition is sired. The operator should use the normal dilute mode whenever conditions rmit.
Evaluator Not	e: Dilutions wi 0-GO-4 No minutes for volume dilu one-third, o per hour fo	Il be performed based on the RE-provided Reactivity Spreadsheet; based on otes, recommended dilution rate is 50 to 75 gallon batches every 12 to 15 r a steady power increase. During subsequent power escalation, large utions will be divided evenly over each hour as determined by the crew [i.e.: one-quarter of the volume over each hour's period (e.g.: ~240 gallons, 4 times or 963 gallons for the first hour)].

		Required Operator Actions						
Op Test No	.: NRC	Scenario #	5	Event #	1	Page	_2	of
Event Descriptio	on: Po	ower increase						
Time	Position			Applicant's Ac	tions or Be	havior		
	RO	[1] ENSU positiv	<b>RE</b> unit is NO	DT in a Tech S dditions.	pec or TR	M action that	at proh	ibits
	NOTE: H	HUT level inc	rease of 1%	is equal to 138	0 gallons	(TI-28 fig. 3	4).	
		[2] ENSU expec	<b>RE</b> sufficient ted amounts	capacity availa	able in the wn: ( <b>N/A</b> i	HUT select	ted to	receive
			HUT	LEVEL		INITIALS		
			Α		%		_	
			В		_%		_	
	RO	[3] ENSU with S	RE makeup section 5.1.	system is aligne	ed for <b>AU</b>	<b>TO</b> operatio	n in ac	corda
	RO	[4] RECO	<b>RD</b> the quan	tity of dilution v Appendix D. (	vater requ N/A for m	lired to achie	eve de	sired b
	RO	[4] RECO conce	<b>RD</b> the quan ntration using	tity of dilution v Appendix D. (	vater requ <b>N/A</b> for m	ired to achie inor power o	eve de change	sired b es)

NOTE:	Due to eyeball interpolation the verified calculation may slightly differ from the initial calculation. The following signoff indicates that any differences in the two results have been discussed and are close enough to be considered validated
SRO	[5] PERFORM Appendix I Independent Verification of Calculation for Amount of Boric Acid or Primary Water. (N/A if App. D was performed by SRO to verify data from Rx Engineering)
	(Step not required provided in shift turnover package)
 RO	[6] PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control Switch to the STOP position.
RO	[7] PLACE [HS-62-140B], CVCS Makeup Selector Switch to the DILUTE position.
 RO	[8] ENSURE [HS-62-140D], Boric Acid Valve to the Blender is CLOSED (Green light is LIT).
 RO	[9] SET [FQ-62-142], Batch Integrator for the desired quantity.

Appendix D		Red	quired Op	erator Actio	ons		Fc	orm E	S-D-2
Op Test No.:	NRC	Scenario #	5	Event #	1	Page	3	of	57
Event Description:	Pov	wer increase						_	

Time	Position	Applicant's Actions or Behavior
	NOTE P	rimary Water Flow Controller [FC-62-142] receives its reference signal (70
	g	pm) from setpoint potentiometer (dial indicator) located on panel M-6. A
······································		etpoint of 35% corresponds to a 70 gpm primary water flow rate
	RO	[10] ADJUST [FC-62-142], Primary Makeup Water Flow Controller for the
		desired flow rate.
	PO	[11] PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control
		Switch to the START position.
	RO	[12] VERIFY the following:
		[a] Inlet to top of VCT [FCV-62-128] is OPEN
		[b] Primary Water flow by [FI-62-142A] OR [FO-62-142]
		[2] • • • • • • • • • • • • • • • • • • •
		Utorpata dilution in amall amaunta in annu ta tu
		on significant chapters in soci water temperature on a regular basis, provided
	F	Batches of 5 to 10 gallons may be added through ECV 62 144 er a framerica.
	n	not to exceed once per 30 minutes ICS points for No. 4 and lock for the
	1	ater temperatures on the RCPs should be monitored during and offer dilution
		[13] IF primary water addition to the better of the VOT (FOV on 444)
	RO	desired THEN
	NOTE: It	may take approximately 15 minutos hoforo any changes to reactivity
	in in	dicated on nuclear instrumontation or PCS temporature indication
		In a second design of the seco
	RO	to oncure the proper response from dilution
		to ensure the proper response from dilution.
	-	[15] IF [LI-62-129], Volume Control Tank Level, increases to 63 percent,
	RO	THEN ENSURE [LCV-62-118], Volume Control Tank Divert Valve
		<b>OPENS</b> to divert excess water to the Holdup Tanks.
		[16] WHEN dilution is complete, THEN
		[a] PLACE [HS-62-140A], Boric Acid to Blender Flow Control Switch to
		the STOP position.
		[b] IF [FCV-62-144] was previously OPENED. THEN CLOSE
		[FCV-62-144] with [HS-62-144].
		[c] VERIFY no primary water flow on either [FI-62-142A] OR
		[FQ-62-142].
		Idl ENSURE (ECV-62-128) is CLOSED
	1	

Appendix D		Required Operator Actions	Form ES-D-2
Op Test No.: Event Descriptio	n: Pov	Scenario # <u>5</u> Event # <u>1</u> Page wer increase	4 of <u>57</u>
Time	Decition	1	
	Position	[17] IF power increase in progress and additional dilutions required, THEN use this table to re-perform steps [4] thro page)	s will be ough <b>[18]</b> (next
		[19] <b>REALIGN</b> the blender controls for <b>AUTO</b> makeup to accordance with Section 5.1.	the CVCS in
		[20] ENSURE dilution(s) is logged in Unit Narrative Log.	
	NOTE Sa	ample may be obtained at normal RCS sample intervals provid ower and the unit response following the dilution is as expected	ded the unit is at
		[21] IF RCS boron sample is required, THEN NOTIFY Ch RCS boron sample.	em Lab to obtain
		End of Section 6.2	
Evaluator No	te: SRO/BOP required to	determines CCS Surge Tank manual make-up is adequate an maintain tank level (for the remainder of the scenario).	nd will be
Evaluator No	te: The fo proced	llowing CREW Brief and Notification actions are not contained lure.	in the
		<b>CREW Brief</b> would typically be conducted for this event as to the next event.	ime allows prior
		<b>Notifications</b> should be addressed as applicable if not special addressed by the procedure or in the CREW brief.	ifically
		<u>Operations Management</u> - Typically Shift Manager. <u>Maintenance Personnel</u> – Typically Maintenance Shift Super (Note: Maintenance notification may be delegated to the Shi	visor (MSS). ft Manager).
Lead Examin	er Note: may page perfo	direct initiation of the next event at his discretion. Steps on th s are associated with performance of repetitive dilutions or ma rmed until all dilutions are complete.	e next two ay not be

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Appendix D		Red	quired Op	erator Actio	ons		Fo	rm E	S-D-2
Op Test No.:	NRC	Scenario #	5	Event #	1	Page	5	of	57
Event Description:	Po	wer increase							

STEP	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
[4] RECORD the quantity of dilution water required to achieve desired boron			
concentration using Appendix D.	Quantity	Quantity	Quantity
[5] PERFORM Appendix I, IV of Calculation for amount of BA or PW.			
	SRO	SRO	SRO
[6] PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control Switch to the STOP position.	/ 1 <sup>st</sup> CV	$\frac{1}{1^{st}CV}$	/ 1 <sup>st</sup> CV
[7] PLACE [HS-62-140B], CVCS Makeup Selector Switch to the DILUTE position.			
[8] ENSURE [HS-62-140D] Boric Acid Valve to Blender is CLOSED (Green light LIT).			
[9] SET [FQ-62-142], Batch Integrator for the desired quantity.	/ 1 <sup>st</sup> CV	/	
[10] ADJUST [FC-62-142], Primary Makeup Water Flow Controller for the desired flow rate.	/	_/	/
[11] PLACE [HS-62-140A], BA Supply to Blender Flow Control Switch to START.	,	,	
		$\frac{1^{st}}{1^{st}}CV$	
[12] VERIFY the following: [a] Inlet to top of VCT [ECV-62-128] is OPEN			
[b] Primary Water flow by [FI-62-142A] or [FQ-62-142].			
[13] IF PW addition to top of VCT [FCV-62-128] is not warranted, but PW addition to the	<u>_</u>	<u> </u>	
bottom of the VCT [FCV-62-144] is desired, THEN [a] CLOSE [FCV-62-128]with [HS-62-128]			
[b] OPEN [FCV-62-144] with [HS-62-144].			
[c] VERIFY Primary Water flow by [FI-62-142A] or [FQ-62-142].			
[14] MONITOR nuclear instrumentation and reactor coolant temperature to ensure the proper response from dilution.			
[15] IF [LI-62-129], VCT level, increases to 63 percent, THEN ENSURE [LCV-62-118], VCT Divert Valve, OPENS to divert excess water to the HUTs.		Π	
[16] WHEN dilution is complete, THEN		/	1
[a] PLACE [HS-62-140A], Boric Acid to Blender Flow Control Switch to STOP	1 <sup>st</sup> CV	1 <sup>st</sup> CV	1 <sup>st</sup> CV
[b] IF [FCV-62-144] was previously OPENED, THEN CLOSE [FCV-62-144] with [HS-62-144].			
[c] VERIFY no primary water flow on either [FI-62-142A] or [FQ-62-142].			
[d] ENSURE [FCV-62-128] is CLOSED.			
[18] IF Step [17] will be repeated, THEN PERFORM the following:			
[a] PLACE [HS-62-140B], CVCS Makeup Selector Switch to the AUTO position.	/		
[b] PLACE [HS-62-140A], BA to Blender Flow Control Switch to START position.	1 <sup>st</sup> CV	Γ	]
[c] ENSURE dilution is logged in Unit Narrative Log.			]

Appendix D		Rec	luired Op	erator Actions			Fo	rm ES	-D-2
Op Test No.:	NRC	Scenario #	5	Event #	2	Page	6	of	57
Event Description	: #1 \$	SG Yokogawa Le	evel Indicat	ing Controller fail l	w				
Time	Position			Applicant's	Actions or Beha	avior			
Simulator Op	erator: When	directed, ini	tiate Eve	ent 2					
Indications/Al Annunciato 1-M-5 • 1-XA-55 Indications 1-M-3	larms pr: 5-5A B-7, "LS D-2, "UN S	-3-42D STEAM IT 1 CCS CUR	GEN LV GE TK LV	l High-low de /l lo auto ma	VIATION" KEUP INITIA	TED"			
<ul> <li>1-LIC-3- position</li> <li>1-LR-3- 1-M-4</li> <li>1-LI-3-3</li> <li>1-FI-3-3</li> </ul>	-35, SG-1 REG n. 43A, SG LOOP 8, 39, 42, SG-1 5A, 35B, SG-1	BYPASS FLON 1&2 WR LEVE NR LEVEL ind FW INLET FLC	W CONTF EL increa licators i DW CH-1,	ROL indicates a sing actual leve ncreasing levels 2 increasing fe	lowering leve I (Red Pen). S. edwater flow	el and incre	asing	valve	
T = 10	RO	Identifies 1 DEVIATIO	-XX-55-5 N" ackno	5A A-3, "LS-3-4 wledges alarm	2D STEAM ( and, notifies	GEN LVL H SRO:	ligh-l	.OW	
	BOP	Diagnoses Step 1, imr	#1 SG L nediate o	evel instrument	t failure, perf (IOAs)	orms AOP-	S.01 S	Section	n 2.1
	RO	Refers to a Causes: 1. Malfund 2. identifie	nd imple ction of s	ments SG Leve team generator 5.01, Main Feed	l Deviation a level control lwater Malfu	llarm ARP, ls. Step 1; nctions Sec	Proba	ıble	
	SRO	Directs ent Malfunctior	ry into ar is Sectio	nd implementati n 2.1	on of AOP-S	5.01, Main I	-eedw	ater	
		Se	Ac ection 2.	OP-S.01 Main F 1 Unit 1 Failure	eedwater Ma of Automatio	alfunctions c S/G Leve	I Conti	rol	
	NOTE: S	tep 1 is an IM	MEDIAT	E ACTION.					
	BOP	1. <b>RESTO</b>	RE stea	m generator lev	vel(s):	<b>4</b> 0.8	<u> </u>	·····	
Evaluator Note	e: BOP will portion o	be using 1-Ll f 1-M-3 vs. no	C-3-35, S ormal leve	SG-1 REG BYP el controls on th	ASS FLOW ne desk portio	CONTROL on of 1-M-3	. (on th 3.	າe upri	ight
	Since it is increasin	s a controller a g feedwater fl	as well a ow and #	s an indicator, t #1 SG increasir	he low level Ig level.	indicated w	/ill cau	ISE	

<u>ppondix D</u>		Required Operator Actions	Form ES-D-
Op Test No.:	NRC	Scenario # <u>5</u> Event # <u>2</u>	Page <u>7</u> of <u>5</u>
Event Description:	#1 S	G Yokogawa Level Indicating Controller fail low	
Time	Position	Applicant's Actions or Behavior	
		a. PLACE affected feedwater reg valve control	ller(s) in MANUAL.
		b. <b>CONTROL</b> feedwater flow on affected S/G(s program.	s) to restore level to
		2. CHECK S/G pressure instruments NORMAL	
		3. CHECK Steam Flow Channels NORMAL. [M-4]	
		4. CHECK Feed Flow Channels NORMAL. [M-4]	

5. MAINTAIN steam generator level(s) on program.

6. CHECK the following:

8. INITIATE repairs on failed equipment.
 9. GO TO appropriate plant procedure.

(RNO required)

GO TO Step 8.

•

• RNO:

ICS point U1118 (Megawatt thermal indication) may be impacted by feed flow instrument failure. U2118 (LEFM calorimetric power) should remain reliable.

failure is due to steam flow or feed flow instrument malfunction

automatic control of affected MFW reg valve(s) is available.

NOTE:

BOP

	Appendix D		Required Operator Actions						Form ES-D-2				
<u> </u>	Op Test No.:	NRC	Scenario #	5	Event #	2	Page	8	of _	57			
	Event Description:	#1	SG Yokogawa Le										

Time	Position	Applicant's Actions or Behavior				
Evaluator Note	e: The follo procedu	owing CREW Brief and Notification actions are not contained in the re.				
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.				
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.				
		Operations Management - Typically Shift Manager.				
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).				
Lead Examine	r may cue nex	t event when #1 SG level is being controlled manually.				

Appendix D		Required Operator Actions	Form ES-D-2
Op Test No.:	NRC	Scenario # _ 5 Event # _ 3	Page 9 of 57
Event Description	: Pres	surizer Pressure Controlling Channel Fails High	
Time	Position	Applicant's Actions or Behr	avior
Simulator Op Indications/A Annunciato 1-M-5 • 1-XA-55 1-M-6	erator: When larms or: 5-5A Window B-	directed, initiate Event 3 3, "PS-68-340F/G PRESSURIZER PRESS ABOVE R	EF SET POINT"
<ul> <li>1-XA-58</li> <li>Indications</li> <li>1-M-5</li> <li>1-PI-68-</li> <li>Significant Re</li> <li>1-M-4</li> </ul>	-6A Window C- -340A, 334, 323, esultant Alarm	5, "PS-68-340A PRESSURIZER HIGH PRESSURE" 322 RCS PZR PRESS indicators decreasing s/Indications:	
• 1-XI-68-	-340B & 340D R	D indicating lights illuminated indicating Pzr Spra	ay Valves open
	RO	AOP-I.04 Section 2.3 Step 1, immediate operation	/instrument failure, performs tor actions (IOAs)
	BOP	Identifies 1-XX-55-5A B-3, "PS-68-340F/G PRE REF SET POINT" acknowledges alarms and, n	ESSURIZER PRESS ABOVE notifies SRO:
	BOP	Refers to and implements Pzr Pressure Contro Causes: 1. Pressurizer pressure controls malfunctionin 2. Identifies AOP-I.01, Pressurizer Instrument	I alarm ARP, Probable g. Step 1; Malfunction.
	SRO	Directs entry into and implementation of AOP-S Malfunction Section 2.3, Pressurizer Pressure Malfunction	5.01, Pressurizer Instrument Instrument OR Controller
	NOTE: S	AOP-I.01 Pressurizer Instrument And Section 2.3 Pressurizer Pressure Instrument ep 1 is an IMMEDIATE ACTION.	Control Malfunctions OR Controller Malfunction
	RO	1. CHECK normal spray valves CLOSED. (RNO required)	
	RO	RNO: IF RCS pressure is less than 2260 psig, THEN	

Appendix D			Form ES-D-2						
Op Test No.:	NRC	Scenario #	5	Event #	3	Page	10	of	57
Event Description:	Pre	essurizer Pressur	e Controllir	ng Channel Fa	ils High				

Time	Position	Applicant's Actions or Behavior
		CLOSE affected spray valve(s) USING the following:
		<ul> <li>PIC-68-340A, Master Pressure Controller.</li> <li>OR</li> </ul>
		<ul> <li>PZR Spray controllers PIC-68-340D (Loop 1) and/or PIC-68-340B (Loop 2).</li> </ul>
	RO	2. <b>MONITOR</b> pressurizer pressure stable or trending to desired pressure.
	NOTE: Ap	ppendix L shows layout of PZR pressure control for operator reference.
	RO	3. CHECK PI-68-340A NORMAL. (RNO)
		PERFORM the following: a. ENSURE PRESS CONTROL SELECTOR switch XS-68-340D in PT- 68-334 & 323.
	RO	<ul> <li>b. ENSURE LOOP TAVG T REC/SEL selector switch XS-68-2B in LOOP 2, 3, or 4.</li> <li>c. ENSURE PRESS REC CHANNEL SELECTOR XS-68-340B in PT-68-334, PT-68-323, or PT-68-322.</li> </ul>
		d. GO TO Caution prior to Step 8.
		· · · · · · · · · · · · · · · · · · ·
	CAUTION:	RCS pressure changes and changes in RCS boron concentration (due to differences between Pzr and RCS boron) may cause small change in core reactivity.
		8. MONITOR reactor power:
	RO	a. CHECK reactor in Mode 1 or 2.
		b. <b>MONITOR</b> core thermal power for unexpected changes.
		<ul> <li>9. EVALUATE the following Tech Specs for applicability:</li> <li>3.2.5 DNB Parameters - (N/A unless RCS press decreased below 2205 psig)</li> <li>3.3.1.1 (3.3.1), Reactor Trip System Instrumentation - (Action 6 applies)</li> </ul>
	SRO	<ul> <li>3.3.2.1 (3.3.2), ESF Actuation System Instrumentation - (Action 17 applies)</li> <li>3.3.3.5 Remote Shutdown Instrumentation - (N/A)</li> <li>3.4.4 Pressurizer Heaters (may be applicable while heaters are unavailable</li> </ul>
		due to instrument failure) – (N/A)

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	Appendix D	Required Operator Actions							Form ES-D-2			
	Op Test No.:	NRC	Scenario #	5	Event #	3	Page	11	of	57		
1	Event Description:	Pressurizer Pressure Controlling Channel Fails High										

Time	Position		Applicant's Actions or Behavior							
	RO		(PZR PRESS and PZR S	SPRAY control	llers in AUTO.					
		RNO requ	irea)							
	RO	WHEN mal PERFORM a. ENSUR Meter is b. ENSUR HTRS it	function has been identifie the following: E Master Pzr Pressure C less than 40%. E PZR PRESS Controller n AUTO.	ed <b>AND</b> isolat controller PIC- r, PZR SPRA	ed or correcte 68–340A Outţ ⁄ controller, ar	d, <b>THEN</b> out Percent nd PZR				
	NOTE: If p	2011 21 21 21 21 21 21 21 21 21 21 21 21 2	OP in conjunction with AC	<u>DP-I.11 for an</u>	Eagle LCP fai	lure <b>N/A</b>				
	RO	a. CHE	ECK any pressurizer pres	sure channel	INOPERABLE	•				
	RO	b. <b>CHECK</b> OTΔT setpoint on affected channel NORMAL.(RNO) <b>(</b> <b>TO</b> Substep 11.d.								
	SRO	c. IF a • t (	ny of the following conditi ransmitter signal failed (e ΟΤΔΤ pressure input) <b>OR</b> ΟΤΔΤ pressure input pote determined,	ons exists: entire instrume entially affecte	nt loop affecte d or status CA	ed including NNOT be				
		THEN PER	FORM applicable append	lix:						
			PZR PRESSURE INSTRUMENT	CHANNEL	APPENDIX					
			P-68-340 (P-455)	ł	А					
	SRO		P-68-334 (P-456)	11	В					
			P-68-323 (P-457)		С	-				
			P-68-322 (P-458)	IV	D					

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Appendix D			For	m ES	3-D-2				
Op Test No.:	NRC	Scenario #	5	Event #	3	Page	12	of	57
Event Description:	Pre	ssurizer Pressure	e Controllin	g Channel Fa	ils High				

Timo	Desition	
	Position	Applicant's Actions or Behavior
	SRO	12. GO TO appropriate plant procedure.
		· · · · · · · · · · · · · · · · · · ·
Evaluator Note	: The followin	g CREW Brief and Notification actions are not contained in the procedure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).
Lead Examiner identified	may cue nex	t event when Pzr Pressure control is in AUTO and Tech Specs are

Appendix D		Required Operator Actions Form E	S-D-						
Op Test No	.: NRC	Scenario # _ 5 Event # _ 4 Page _ 13 of	5						
Event Descripti	on: RTE	D failure Cold Leg Loop 1 Sensor #2 Fail High.							
Time	Position	Applicant's Actions or Behavior							
Simulator O Indications/ Annuncia 1-M-5 • 1-XA- 1-M-6 • 1-XA-	perator: When Alarms tor: 55-5A D-6, "NAR	directed, initiate Event 4							
Indicatior 1-M-5 • 1-TI-6	8-2E, LOOP 1 TA	VG indicating high							
T = 30	RO	Identifies 1-XA-55-5A, D-6, "Narrow Range RTD failure Loop 1", 1-XA-55- 6A Window A-2, "TS-68-2D Reac Cool Loops Overtemp ΔT Trip Alert" acknowledges alarms and, notifies SRO:							
	RO	Diagnoses Loop 1 RCS temperature instrument failure							
	RO	<ul> <li>Refers to and implements RCS RTD alarm ARP, Probable Causes:</li> <li>1. CHECK 1-XX-55-5, Trip status, AND EVALUATE Rx trip criteria.</li> <li>1;</li> <li>2 identifies AOP-L02, RCS Loop RTD Instrument Molfunction</li> </ul>	Ste						
	SRO	Directs entry into and implementation of AOP-I.02, RCS Loop RTD Instrument Malfunction							
		AOP-I.02, RCS Loop RTD Instrument Malfunction Section 2.0 Operator Actions							
	RO	<ol> <li>Enter and direct Actions of AOP-I.02</li> <li>PLACE rod control in MANUAL. (N/A Rods already in Manual at 2% Power)</li> </ol>							
	CAUTION:	Control rods should NOT be manually withdrawn during a plant tran	nsien						
	NOTE: Ta	<ul> <li>avg must be within 1°F of Tref when restoring automatic rod control.</li> <li>2. RESTORE Tavg as necessary USING one of the following:         <ul> <li>manual rod control</li> <li>OR</li> </ul> </li> </ul>							

	Appendix D		Rec	Required Operator Actions					Form ES-D-2				
Com	Op Test No.:	NRC	Scenario #	5	Event #	4	Page	14	of	57			
	Event Description:	RTI			-								

Time Position Applicant's Actions or Behavior											
		OR	OR								
			ne load re	duction							
	RO	3. CHECK (RNO)	<ol> <li>CHECK loop 1 temperature channel OPERABLE.</li> <li>(RNO)</li> </ol>								
	RO	PERFORM a. PUL b. PUL c. PLA d. GO	<ul> <li>a. PULL-TO-DEFEAT TAVG CHANNEL DEFEAT switch to LOOP 1</li> <li>b. PULL-TO-DEFEAT ΔT CHANNEL DEFEAT switch to LOOP 1</li> <li>c. PLACE LOOP TAVG ΔT REC/SEL switch in LOOP 2, 3, or 4</li> <li>d. GO TO Step 7.</li> </ul>								
	SRO	<ul> <li>7. EVALUA</li> <li>3.3.1.1</li> <li>OT∆T Action</li> <li>3.3.2.1</li> <li>Instrum</li> <li>Action 37 for</li> </ul>	ATE the fo (3.3.1), R on 6 alrea (3.3.2), E entation or S/G Le	ollowing Tech Sp eactor Trip Syste dy in effect, S/G ngineered Safety vel AFW start a	ecs for app em Instrum <b>5 Level ΔΤ</b> / Feature A nolies	blicability: entation <b>Action 10 als</b> Actuation Syste	o applie: m				
	NOTE: If perfo		conjunct		1 for on Eq	alo I CD foilura					
	RO	<ol> <li>NOTIFY IM to remove failed TAVG ΔT instrument loop from service USING appropriate Appendix:</li> </ol>									
			RC <b>S</b> LOOP	INSTRUMENT LOOP NUMBER	PROT CH	APPENDIX					
			1	T-68-2 (T-411/412)	1	Α					
			2	T-68-25 (T-421/422)		В					
			3	T-68-44 (T-431/432)	[]]	С					
			4	T-68-67 (T-441/442)	IV	D					
		9. IF autom	atic rod c	ontrol is available	e, THEN	5-1 Ν/Δ					

,	Appendix D		Rec	uired Op	erator Action	ns	<u> </u>	Fo	rm ES	S-D-2
	Op Test No.:	NRC	Scenario #	5	Event #	4	Page	15	of	57
	Event Description:	RT	D failure Cold Leo	g Loop 1 Se	∍nsor #2 Fail H	igh.				

Time	Position	Applicant's Actions or Behavior					
		10. GO TO appropriate plant procedure.					
Evaluator Note: The following CREW Brief and Notification actions are not contained in the procedure.							
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.					
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.					
		Operations Management - Typically Shift Manager.					
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).					
When Tech Sp	pec Evaluation	is complete proceed to the next event at lead examiner's discretion					

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Appendix D		Required Operator Actions Form ES-D							
Op Test No.	: NRC	Scenario #	5	Event #	5	Page	16	of _	57
Event Description	on: Sma	all RCS Leak insid	de contair	nment (Hot Leg Lo	op 2)				
Time	Position			Applicant's	Actions or Beh	avior			
Simulator O Indications// Indication 1-M-5 • 1-PR-( • 1-LR-6 • 1-FI-6 • 1-FI-6 • 1-FI-6 • 1-FI-6 • 1-FI-6 • 1-FI-6 • 1-FI-6 • 1-RR-1 • 1-RR-1 • 1-RR-1 • 1-RR-1 • 1-RR-1 • 1-RR-1	Indications/Alarms Indications 1-M-5 1-PR-68-340, RCS PZR PRESS trending down 1-LR-68-339, RCS PZR LEVEL actual level deviating low from program level indication 1-FI-62-93A, CHARGING HDR FLOW increasing flow 1-M-6 1-LI-62-129, VCT LEVEL decreasing 1-PDIR-30-133, CNTMT ANN increasing trend 0-M-12 1-RR-90-106, CNTMT LOWER COMPT RADMON recorder shows increasing trend 1-RR-90-112, CNTMT UPPER COMPT RADMON recorder shows increasing trend 1-RR-90-106A, CNTMT LOWER COMPT RADMON PART & GAS increasing counts 1-RM-90-112A, CNTMT UPPER COMPT RADMON-PART increasing counts 1-RM-90-112B, CNTMT UPPER COMPT RADMON-PART increasing counts 1-RM-90-112B, CNTMT UPPER COMPT RADMON-PART increasing counts								
Significant F Annuncia 1-M-5 • 1-XA-4 0-M-12 • 0-XA-4	Resultant Alarn tor: 55-5A C-5, "LS-7 55-12A A-1, "1-R A-4, "1-R	ns/Indications 7-410A REACT 2A-90-112A CN 2A-90-106A CN	S: TOR BLC TMT BL TMT BL	DG AUX FL & EC DG UP COMPT DG LWR COMP	) DRAIN SUN AIR MON HIC T AIR MON H	IP HI" (1 <sup>st</sup> o GH RAD" IIGH RAD"	ne aftei	r ~12	min)
Evaluator No	ote: VCT level of 0.5%	el to volume co	onversio equals t	on is approxima the 10 gal/min F	tely 20 gal/% PIP-1 criter	. A change	in indie	cated	level
T = 30	RO	Identifies Pz	r below	program, Char	ing flow incre	asing w/ VC	T level (	decrea	asing.
	BOP	Checks rad	monitor	s, determines ir	ncreasing tre	nd on cont	ainmen	t mor	nitors
	SRO	Directs entry Source Iden	into an tificatior	id implementati า	on of AOP-F	₹.05, RCS I	_eak an	d Lea	ak
	SPO	Enter and di	AOP-R.	05, RCS Leak a Section 2.1 R	and Leak So CS Leak in N	urce Identif <i>I</i> ode 1-3	ication		
	IUNS ULAUF-R.	0.5							

	Appendix D		Req	uired Op	erator Actio	ns		Forn	n ES-	-D-2
for a	Op Test No.:	NRC	Scenario #	5	Event #	5	Page	17	of	57
	Event Description:	Sm	nall RCS Leak insid	de contain	ment (Hot Leg	Loop 2)				

Time	Position	Applicant's Actions or Behavior							
	CREW	DIAGNOSE the failure, determine Section 2.1 ap	plicable:						
	IF		GO TO SECTION	PAGE					
	ANY of t	the following indications in Modes 1-3:							
	Pres	surizer level dropping unexpectedly							
	Char	ging flow rising unexpectedly with stable pzr level	2.1	4					
	VCT     radia	level dropping with Aux Bldg or Containment tion rising	RCS Leak in Mode 1-3						
	High     incre	Energy Line Break recorder indicating unexpected ase in temperature							
	other	r indications of RCS leak (local or MCR)							
	RO	1. <b>CONTROL</b> charging flow using one CCP:							
		<ul> <li>ADJUST FCV-62-93 and FCV-62-89 as necessary to maintain pzr level on program.</li> </ul>							
		MAINTAIN seal injection flow at least 6 gr	om to each R	CP					
Evaluator No	ote: Crew ma Crew ma	y implement RNO at this time to isolate letdown; y return to perform RNO for Trip Rx and initiate SI	later when Le	ak increa	ases				
	Evaluator Not	te: Since this is a "MONITOR" step, the crew may while developing a Pzr/RCS level trend. If so, decision point and therefore initiate the reactor implementation. If a loss of Pzr level is immine trip the reactor and transition to E-0 based on the sector.	y continue in steps 3, 4 or trip and E-0 ent, the crew this step.	the proce 5 could b may deci	edure be the ide to				
	RO	2. MONITOR pressurizer level STABLE or RISIN (RNO)	NG						
		RNO: IF sufficient time is available, THEN ISOLATE no	rmal and exc	ess letdo	wn:				
		a. ENSURE FCV-62-72, 73, and 74 CLOSED.							
	b. CLOSE FCV-62-69 and 70.								
		c. ENSURE FCV-62-54 and 55 CLOSED.							
	<b>RNO:</b> IF loss of pressurizer level is imminent OR low pressure reactor trip (197 psig) is imminent, THEN PERFORM the following:								
		a. TRIP the reactor.							

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Appendix D		Req	Form ES-D-2						
Op Test No.:	NRC	Scenario #	5	Event #	5	Page	18	of	57
Event Description:	Sma	all RCS Leak insi	de contain	ment (Hot Leg L	oop 2)				
Time	Desition	1		A		•			

Time	Position	Applicant's Actions or Behavior							
		b. INITIATE Safety Injection.							
		c. GO TO E-0, Reactor Trip or Safety Injection.							
	Evaluator Not	te: Since this is a "MONITOR" step, the crew may continue in the procedure while developing a containment pressure trend. If so, steps 2, 4 or 5 could be the decision point and therefore initiate the reactor trip and E-0 implementation. If containment pressure increases, the crew may decide to trip the reactor and transition to E-0 based on this step.							
	RO	<ol> <li>MONITOR containment pressure STABLE or DROPPING.</li> <li>(RNO required)</li> </ol>							
		<ul> <li>RNO:</li> <li>IF containment pressure is approaching 1.5 psig, THEN PERFORM the following:</li> <li>a. TRIP the reactor.</li> <li>b. INITIATE Safety Injection.</li> <li>c. GO TO E-0, Reactor Trip or Safety Injection.</li> </ul>							
	CAUTION: If	<ul> <li>Since this is a "MONITOR" step, the crew may continue in the procedure while developing a containment pressure trend. If so, steps 2, 3 or 5 could be the decision point and therefore initiate the reactor trip and E-0 implementation. If containment pressure increases, the crew may decide to trip the reactor and transition to E-0 based on this step.</li> <li>Unit is in Mode 3 with low pressurizer pressure SI NOT blocked, SI should OT he manually blocked to prevent another initiation.</li> </ul>							
	RO	4. MONITOR RCS pressure STABLE or RISING.							
		(KNO required)							
		IF Unit is in Mode 1 or 2 AND RCS pressure is approaching 1970 psig (dropping), THEN TRIP the reactor and GO TO E-0, Reactor Trip or Safety Injection.							
		IF Unit is in Mode 3 N/A							
Evaluator N	ote: RCS leak Section 2 challenge trip and e	will progress into a SBLOCA. As the crew responds using AOP-R.05 2.1, the lowering Pzr level and increased charging flow may result in a to VCT Make-up capability. Subsequently the crew may initiate a reactor enter E-0 based on this step.							
	RO	<ol> <li>MAINTAIN VCT level greater than 13% USING automatic or manual makeup.</li> </ol>							
		RNO: IF leak is on charging header in Aux Bldg N/A.							

Appendix D		Required Operator Actions	Form ES-D-2
Op Test No.:	NRC	Scenario # _ 5 Event # _ 5 Pag	e <u>19</u> of <u>57</u>
Event Description	: Sn	nall RCS Leak inside containment (Hot Leg Loop 2)	
Time	Position	Applicant's Actions or Behavior	
		IF VCT level CANNOT be maintained. THEN PERFORI	<b>M</b> the following:
		a. <b>ENSURE</b> CCP suction aligned to RWST:	
		1) <b>OPEN</b> LCV-62-135 and -136.	
		2) <b>CLOSE</b> LCV-62-132 and 133.	
		b IF in MODE 1 or 2 THEN TRIP the reactor and GO	CO E-0 Peactor Tri

		b. IF in MODE 1 or 2, THEN TRIP the reactor and GO TO E-0, Reactor Trip or Safety Injection.
RO/BC	)P	RO and/or BOP operator should monitor pocket sump level (1-M-15, indicators 1-LI-77-410 & 77-411).
RO/BC	P	RO and/or BOP operator should containment radiation levels (on (0-M-12, recorders and modules 1-RR-90-105 and 1-RR-90-112 for lower and upper containment, resp.)
SRO		Expected to direct [BOP operator] to perform Appendices I and/or J; (Included at end of this event guide)
BOP		Perform Appendices I and/or J, as directed.
NOTE 1:	Арр	endix I or J may be used to estimate RCS leak rate.
NOTE 2:	If let one	down was isolated in Step 2, the leak rate may have exceeded capacity of CCP in the normal charging alignment (EAL 1.2.2P).
SRO		6. EVALUATE EPIP-1, Emergency Plan Classification Matrix.
SRO		<ol> <li>EVALUATE Tech Spec/TRM LCOs USING Appendix K, Evaluating Tech Specs and TRM (attached at the end of this event guide).</li> </ol>
		8. CHECK secondary side radiation NORMAL:
BOP		S/G blowdown rad monitor
		Condenser vacuum exhaust rad monitor
		Main steam line rad monitors.
BOP		9. STOP containment purging and venting:
		<ul> <li>a. IF containment purge in progress, THEN ENSURE containment purge fans STOPPED.</li> </ul>
		b. <b>ENSURE</b> containment purge and vent dampers CLOSED.
CREV	V	10. CHECK containment airborne activity RISING. (RM-90-106 or 112)

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	Appendix D		Req	uired Op	erator Actic	ons		Form	n ES-	-D-2
pres.	Op Test No.:	NRC	Scenario #	5	Event #	5	Page	20	of	57
	Event Description:	Sm	all RCS Leak insi	de contain	ment (Hot Leg	Loop 2)				

Time	Position	Applicant's Actions or Behavior
Evaluator Not	e: RCS leal crew will ultimately unidentifi	c source is not determinable using this procedure's diagnostics. Therefore the continue with the following isolation measures and leakage monitoring / arriving at the conclusion that RCS leakage exceeds the Tech Spec ed leakage limit (or until the Lead Examiner directs leak size change
	according	g to the scenario guide).
	CREW	11. CHECK leakage source UNKNOWN.
	RO	12. CHECK pressurizer PORVs NORMAL
		Tailpipe temperature
		Acoustic monitors
		13. ISOLATE letdown:
	RO	<ul> <li>a. ENSURE the following letdown orifice valves CLOSED:</li> </ul>
		• FCV-62-72
		• FCV-62-73
		• FCV-62-74
	RO	<ul> <li>ENSURE the following letdown isolation values CLOSED:</li> </ul>
		• FCV-62-69
		• FCV-62-70
		• FCV-62-77
		c. CHECK leak ISOLATED based upon the following
	RO/	containment parameters
	BOP	<ul> <li>estimated leak rate USING Appendix I or J.</li> </ul>
		(RNO required)
	SRO	RNO:
	0100	c. IF leak is NOT isolated, THEN GO TO Step 14.
	RO	14. ISOLATE charging:
		a. ENSURE letdown orifice valves CLOSED:
		• FCV-62-72
		• FCV-62-73
		• FCV-62-74
		b. <b>ENSURE</b> the following charging header isolation valves CLOSED:
		• FCV-62-90

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Appendix D	······································	Required Operator Actions Form ES-D-2
Op Test No.: Event Description	NRC	Scenario # <u>5</u> Event # <u>5</u> Page <u>21</u> of <u>5</u> nall RCS Leak inside containment (Hot Leg Loop 2)
Time	Position	Applicant's Actions or Robavier
	roonon	<ul> <li>FCV-62-91</li> <li>FCV-62-85</li> <li>FCV-62-86</li> </ul>
	RO/	<ul> <li>c. CHECK leak ISOLATED based upon the following</li> <li>containment parameters</li> </ul>
	BOP	<ul> <li>estimated leak rate USING Appendix I or J.</li> <li>(RNO required)</li> </ul>
	SRO	RNO: c. IF leak is NOT isolated, THEN PERFORM the following:
	RO/BOP	<ol> <li>IF normal charging is required to maintain Pzr level, THEN RESTORE normal charging USING EA-62-5.</li> </ol>
	SRO	2) IF running CCP must be stopped N/A
	SRO	3) GO TO Step 15.
	RO	15. CHECK Pzr safety valves NORMAL:
		<ul> <li>Tailpipe temperature</li> <li>Acoustic monitors</li> </ul>
	RO	16. CHECK PRT conditions NORMAL:
		<ul> <li>Level</li> <li>Pressure</li> <li>Temperature</li> </ul>
	BOP	17. <b>NOTIFY</b> Chemistry to ensure all primary side sample valves CLOSED [Hot Sample Room]
	BOP	18. CHECK CCS parameters NORMAL:
		<ul> <li>CCS radiation monitors NORMAL</li> <li>CCS surge tank level STABLE.</li> </ul>
	RO	19. CHECK all CLA levels NORMAL.
	RO	20. CHECK excess letdown heat exchanger NORMAL (if applicable):

	Appendix D Op Test No.: <u>NRC</u> Event Description: Sma		Required Operator Actions Form ES-D-2					
			Scenario # <u>5</u> Event # <u>5</u> Page <u>22</u> of <u>57</u> all RCS Leak inside containment (Hot Leg Loop 2)					
	Time	Position	Applicant's Actions or Behavior					
_			Temperature     Pressure					
		RO	21. <b>CHECK</b> TI-68-398, Reactor Vessel Head Vent Temperature NORMAL. [M-4]					
		RO	22. <b>CHECK</b> TI-68-21, reactor vessel flange leakoff temperature NORMAL. [M-5]					
		BOP	23. MONITOR auxiliary building radiation and HELB recorders NORMAL.					
	Evaluator Note: RCS leak is ≈21 gpm and NOT isolated							
$\bigcirc$		RO/BOP	RO and/or BOP operator should monitor pocket sump level (1-M-15, indicators 1-LI-77-410 & 77-411).					
		RO/BOP	RO and/or BOP operator should containment radiation levels (on (0-M-12, recorders and modules 1-RR-90-106 and 1-RR-90-112 for lower and upper containment, resp.)					
		SRO	Expected to direct [BOP operator] to perform Appendices I and/or J;					
		BOP	(Included at end of this event guide)					
		SRO	24. CHECK leak IDENTIFIED and ISOLATED USING available methods:					
		BOP	<ul> <li>Appendix I or J (Estimating Leak Rate)</li> <li>containment parameters (radiation, pressure, humidity)</li> <li>pocket sump level rate of rise on ICS (instantaneous point U0964 or U0965, 15 min avg. point U0967 or U0968)</li> <li>Rx Bldg (raceway) sump rate of rise (ICS point U0966)</li> <li>local observation (if applicable)</li> <li>(RNO Required)</li> </ul>					
	Evaluator Note	e: SRO/RO r trends follo	ay choose to not start additional cooling fans based on containment pressure wing the initial pressure increase. Evaluation, however, is expected.					
			RNO: IF leak is NOT isolated, THEN PERFORM the following:					

Appendix D	······	Required Operator Actions					Form ES-D-2			
Op Test No.: Event Description:	NRCSm	Scenario # all RCS Leak insi	5 de contair	Event #	5 op 2)	Page	23	of _	57	
Time	Position Applicant's Actions or Behavior									
		<ul> <li>a. IF additional cooling is required, THEN PERFORM Appendix H, Additional Containment Cooling.</li> </ul>								

			RO is expected to maintain saturated conditions in the Pzr by verifying						
		:	adequate heater operation to maintain Pzr Vapor/Liquid temps equivalent						
			(1-M-4: PZr TEMP Indicators 1-11-68-324 & 1-11-68-319)						
		RO	the following:						
			<ol> <li>RESTORE CVCS charging and letdown USING EA-62-5, Establishing Normal Charging and Letdown</li> </ol>						
			2) <b>ENSURE</b> pressurizer heaters in service as required.						
	Evaluator Not	te: RCS lea	ak is ≈21 gpm and NOT isolated.						
			c. <b>ATTEMPT</b> to estimate RCS leak rate <b>USING</b> one of the following:						
C			<ul> <li>Appendix I (if leak requires rise in charging flow greater than ~10 gpm)</li> </ul>						
			OR						
			<ul> <li>Appendix J (requires NO VCT makeup, dilution, or boration flow)</li> </ul>						
			<ul> <li>IF conditions permit, THEN DETERMINE RCS leak rate USING 0-SI- OPS-068-137.0. Reactor Coolant System Water Inventory</li> </ul>						
			This step N/A						
			<ul> <li>IF leak rate exceeds Tech Spec limit AND leak CANNOT be isolated, THEN INITIATE plant shutdown USING one of the following:</li> </ul>						
			<ul> <li>AOP-C.03, Rapid Shutdown or Load Reduction OR</li> </ul>						
			<ul> <li>0-GO-5. Normal Power Operation.</li> </ul>						
			OR						
			<ul> <li>0-GO-6, Power Reduction from 30% to Hot Standby.</li> </ul>						
		RO	f. IF containment purging or venting is desired, N/A						
C		SRO	<ul> <li>g. IF leak source has NOT been determined, THEN GO TO Section 2.3, RCS Leak Source Identification.</li> </ul>						
NRC	Scenario # _ 5 Event # _ 5 Page _ 24 of _ 5								
---------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--	--	--	--	--	--
1: Sr	nall RCS Leak inside containment (Hot Leg Loop 2)								
Position	Applicant's Actions or Behavior								
RO	25. <b>MONITOR</b> if charging and letdown should be restored:								
	a. CHECK letdown ISOLATED.								
	b. CHECK Pzr level:								
	level greater than or equal to program level								
	level RISING.								
	c. CHECK charging and normal letdown AVAILABLE:								
	piping INTACT								
	valves OPERABLE								
	Train A CCS in service.								
	d. <b>RESTORE</b> CVCS charging and letdown <b>USING</b> EA-62-5.								
	Establishing Normal Charging and Letdown.								
	<ul> <li>a. CHECK pressurizer level greater than 20% and rising.</li> <li>b. ENSURE pressurizer heaters in service as required.</li> </ul>								
SRO	27. IF containment purging or venting is needed, N/A								
SRO	28. INITIATE leak repairs.								
SRO	29. GO TO appropriate plant procedure.								
	END OF SECTION								
e: The follow	ving CREW Brief and Notification actions are not contained in the procedure.								
	<b>CREW Brief</b> would typically be conducted for this event as time allows prito the next event.								
	<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.								
	Operations Management - Typically Shift Manager.								
	<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). ( <b>Note:</b> Maintenance potification may be delegated to the Shift Manager)								
	NRC Sr Position RO RO SRO SRO SRO SRO SRO								

Appendix D		Req	Form ES-D-2						
Op Test No.:	NRC	Scenario #	5	Event #	5	Page	25	of	57
Event Description:	Sn	nall RCS Leak insi	de contair	ment (Hot Leg Lo	op 2)				

SQN RCS LEAK AND LEAK SOURCE IDENTIFICATION AOP-1	t.05 14	
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#### APPENDIX I

Page 1 of 1

## ESTIMATING RCS LEAK RATE USING CVCS FLOW BALANCE

NOTE 1 This method is recommended when leak requires rise in charging flow greater than ~10 gpm. Appendix J is more accurate for smaller leak rates.

NOTE 2 This appendix assumes RCS temperature and charging flow are approximately constant.

	INITIAL	FINAL	CHANGE
PZR Level			[1] (negative for level decrease)
Time			[2]
Charging Flow		[3]	
Letdown Flow		[4]	
Total RCP Seal Return Flow		[5]	

# Pressurizer Level Conversion

	Pressurizer level change			conversion Time Change factor		Time Change		Pzr Level ( positive)	Rate of for leve	of Change el rising)
		%	X	62 gal / %	÷		min	-		gpm
step [1] above			step [2] above		[6]					
				Leak	Rate	a Calculation				
Charging F	low	Letdowi	n Flow	Seal Return Flow	ł	Pzr Level Rate of Change	_	Instrument error correction factor		RCS Leak Rate
step [3] ab	ove s	step [4]	above			step [6] above	. +	э урт	-	gpm

Page 73 of 80

Appendix D		Form ES-D-2							
Op Test No.:	NRC	Scenario #	5	Event #	5	Page	26	of	57
Event Description:	Sm	all RCS Leak insid	de contain	ment (Hot Leg Lo	op 2)				

Page 1 of 1

Rev. 14

#### APPENDIX J

# ESTIMATING RCS LEAK RATE USING VCT AND PZR LEVEL

CAUTION This appendix CANNOT be used during VCT makeup, boration, or dilution.

NOTE This appendix assumes RCS temperature is approximately constant.

	VCT LEVEL (%)	PZR LEVEL (%)	TIME (min)
INITIAL			
FINAL			
CHANGE	[1]	[2]	[3]
	(positive for level decrease)	(positive for level decrease)	

#### VCT Level Conversion

VCT level change	conversion factor	Ti	me Change		VCT Level Rate of Change (positive for level lowering)
% X	20 gal / %	÷	min	=	gpm
step [1] above		ste	p [3] above		[4]
	Pressuri	zer Level	Conversion		
Pressurizer level change	conversion factor	Tin	e Change		Pzr Level Rate of Change (positive for level lowering)
<u> </u>	62 gal / %	÷	min	=	gpm
step [2] above		stej	o [3] above		[5]
	Leal	k Rate Ca	culation		
VCT Level Rate of Change	Pzr Rate o	Level f Change	R	CS Le	eak Rate
	÷				gpm
step [4] above	step [{	5] above	****		

Appendix D			Form ES-D-2						
Op Test No.:	NRC	Scenario #	5	Event #	5	Page	27	of	57
Event Description:	Sm	iall RCS Leak insid	de contair	iment (Hot Leg Lo	op 2)				
					AN 2 .				

SQN RCS LEAK AND LEAK SOURCE IDENTIFICATION AOP-R.05 Rev. 14

Page 1 of 1

#### APPENDIX K

### **EVALUATING TECH SPECS AND TRM**

- EVALUATE the following Tech Spec/TRM LCOs for applicability:
- 3.2.5, DNB parameters may be applicable depending on Letdown isolation: 3.2.5.b. Pressurizer Pressure would be applicable ACTION: w/ any of the above parameters exceeding its limit, restore w/i its limit w/i 2 hrs or reduce THERMAL POWER <5% of RTP w/i next 4 hrs.
- 3.4.3.1, Safety and Relief Valves-Operating N/A
- 3.4.3.2, Relief Valves-Operating- N/A

3.4.6.2.a, RCS Leakage – PRESSURE BOUNDARY LEAKAGE: <u>ACTION a.</u>: w/ any PRESSURE BOUNDARY LEAKAGE not w/i limits, be in HOT STANDBY w/i 6 hrs & CLD SHDN w/i following 30 hrs.

- 3.4.6.3, RCS Pressure Isolation Valve Leakage N/A
- TRM 3.4.11, Reactor Coolant System Head Vents N/A
- 3.4.12, Low Temperature Overpressure Protection Systems N/A
- 3.6.1.4, Containment Pressure depending on leak size
- 3.6.1.5, Containment Air Temperature depending on leak size

### END

Appendix D		Req	Required Operator Actions						
Op Test No. Event Descriptic	: <u>NRC</u> on: 1A (	Scenario # CBP Trip	5	Event #	6	Page	_28	of .	57
T:		П							
Simulator O	Position			Applicant's	Actions or Beha	avior			
Indications/A Annunciat 1-M-3 • 1-XA-5	Alarms tor: 55-3A A-4, "CON	DENSATE BO	OSTER P	UMP 1A FAIL <sup>-</sup>	ΓΟ START"				
Indication 1-M-3 • 1-EI-2- • Indicat Significant R Annunciat	s Annunciator: 97, CBP-A AMP tor 1-PI-2 129 Mi cosultant Alarm	S decrease to FP INLET PRE ns/Indications	ʻ0' SS indica s:	ites a lowering	pressure				
1-M-3 ● 1-XA-5	5-3A E-1, "PS-2	-129 LOW NPS	H AT MF	P'S"					
	BOP	Identifies 1 acknowledge	-XA-55-3A ges alarn	A A-4, "Condens n and, notifies	ate Booster Pu SRO:	ump 1A Fai	l To Sta	art",	
	BOP	Refers to an Causes: 1. Dispatc 2. CHECK 3. Identifie	nd impler hes an A is suction as AOP-S	nents Condens UO locally; 1 valve FCV-2- 5.04, Condensa	sate Booster Po 94 FULLY OI ate or Heater	ump alarm PEN Drains Ma	ARP,	Proba on.	ble
	SRO	Directs entr Drains Malf	y into an unction S	d implementat Section 2.5, Co	ion of AOP-S ondensate Bo	6.04, Cond poster Pum	ensate ıp Trip	or He	eater
			AOP-S.0 Sect	4, Condensate	e or Heater D ensate Booste	rains Malfe er Pump T	unction		
Evaluator No	te: From 0-0 Power S	O-4, Power A ection 5.5 Ste	Ascensior	n From Less T	han 5% Read	tor Power	To 30	% Rea	actor
		[30] IF run amps, T START [30.1] T	ning cond <b>HEN</b> the follow hird HW (	densate boost ving pumps in pump (if availa	er pump reac accordance v ible).	hes appro with 1,2-S	ximate O-2/3-1	ly 140	)

Appendix D	pendix D Required Operator Actions							Form ES-D-2				
 Op Test No.:	NRC	Scenario #	5	Event #	6	Page	29	of	57			
Event Description:	1A	CBP Trip						-				

Time	Desition	
nine	Position	Applicant's Actions or Behavior
		Return to AOP-S.04, Section 2.5:
		<ol> <li>VERIFY two condensate booster pumps RUNNING.</li> </ol>
		2. MONITOR Steam generator levels returning to program. [M-4]
		3. MONITOR reactor power:
		a. CHECK ICS thermal power indication AVAILABLE
		h <b>REDUCE</b> turbine load as necessary to maintain 10 minute evenes
		power less than applicable limit (3455 or 3411 MW/t)
		4 DISPATCH operator to investigate serves of Operators to Durity D
		trip
	CALITION	Peducing turbing load too repidly could recult in further due to a too too
	CAUTION.	pressure due to reduction in bester drain flow. Becommended lead rate is
		1% per minute if turbine load reduction is needed
	NOTE: Sev	vere MFW pump cavitation is likely if inlet pressure is less than 250 psig
		5 MONITOR Feedwater nump inlet pressure greater than 320 psig.
		PI-2-129]
		(RNO)
		RNO:
		EVALUATE starting additional available condensate system numps
		(Hotwell, Cond, Booster, Cond, DI Booster)
		<b>REDUCE</b> turbine load until MFW pump inlet pressure greater than 320
		psig.
		IF severe cavitation of MFW pumps is indicated, THEN TRIP reactor and
		GO TO E-0, Reactor Trip or Safety Injection.
		6. MONITOR Condensate Booster pump suction pressure greater than
···		100 psig. [M-3, PI-2-77]
		7. NOTIFY Maintenance to investigate and repair pump malfunction as
		necessary.

Appendix D		Red	quired Op	erator Acti	ons	•	For	m ES	-D-2
Op Test No.:	NRC	Scenario #	5	Event #	6	Page	30	of	57
Event Description:	1A	CBP Trip							

Time	Position	Applicant's Actions or Behavior
		8. CHECK reactor power greater than 85%.
		<ol> <li>IF condensate booster pump CANNOT be restored within 24 hours, THEN EVALUATE power reduction to less than 85% USING 0-GO-5, Normal Power Operation.</li> </ol>
		10. GO TO appropriate plant procedure
Evaluator Note	: The follow	ing CREW Brief and Notification actions are not contained in the procedure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).
flow capabilitie	r may cue the es by starting	next event when the crew has restored condensate system pressure/ the standby Condensate Booster Pump.

	Appendix D			Required C	Operator Action	าร		Fo	rm ES	6-D-2
рана корологија 1990 - Селонија 1990 - Селонија	Op Test No.	: <u>NRC</u>	Scenari	io # <u>5</u>	_ Event #	7, 8, & 9	Page	31	of	57
		on:	Large Break L	.OCA, Cntmt Sp	oray VIvs Auto op	en fail, A Train RHR	sump suc	tion vlv fa	ails clos	sed.
	Time	Position	n		Applican	t's Actions or Behavi	or			
	Simulator O	perator: W	hen directe	d, initiate Ev	vent 7					
	1-M-4:	ivaliable:								
	<ul> <li>1-XI-94-101/102, Core Exit Temp Margin to Saturation (exo sensors Trn A &amp; B) press trending to SI actuation pressure value.</li> <li>1-LI-68-339A, 335A, 320A, RCS PZR LEVEL indicators trending down (&lt;5%)</li> </ul>							ure ind	licatio	ns
	4 TE -									
	1-M-5:	8-340A 1-DI	69 224 4 01	60 202 4 DL						
	to Rx	Trip/SI actua	ation pressur	·00-323, 1-P1- e values.	08-322, RGS PA	LR PRESS narrow	v range in	ndicato	rs trer	nding
	• 1-PR-6	68-69, RCS L	.00P 1 HL W	IDE RANGE	PRESS indicat	or trending to Rx	Trip/SI a	ctuatio	n pres	sure
	• 1-PR-6	8-340, RCS	PZR PRESS	Recorder tre	ndina down:					
	• 1-PR-6	8-69, RCS L	OOP 1 HL W	IDE RANGE	PRESS Record	ler trending dowr	ı;			
	• 1-LR-6 • 1-FI-68	8-339, RCS 8-93A. CHAF	PZR LEVEL I RGING HDR F	Recorder trei	nding down; or indicating 1	15-120 apm /1 CC	P of mos		flering	4-1-
	<ul> <li>1-FI-68-93A, CHARGING HDR FLOW Indicator indicating 115-120 gpm (1 CCP at maximum 1-M-6:</li> <li>1-LI-62-129, VCT LEVEL Indicator trending down w/ VCT M-U in progress;</li> </ul>							anum	nowra	ite);
	1-IVI-6: ● 1-I I-62	-129 VCT I	EVEL Indicat	tor tranding						
interna Sa T	• 1-FI-62	-139A, BOR		BLENDER Ind	dicator stable a	at ~20-25 gpm;				
un di	<ul> <li>1-FI-62</li> <li>1-PI-69</li> </ul>	-142A, PRIN		R TO BLEND	ER Indicator st	able at ~70 gpm;				
	• 1-PI-68	-62, RCS HI	L Press WR in	ndicator tren	trending to actuati	uation pressure v on pressure value	value. e.			
	• 1-PI-68	-69, RCS HI	Press WR in	ndicator tren	ding to actuati	on pressure valu	e.			
-	• 1-PDI-3	50-42, 43, 44	Direct	Manual Rea	wide RANGE	Indicators trendin	ig up (1.5	5 psi-Sl	Actua	tion)
		SRO	monito	r steps in AC	DP-R.05 for eit	her Pressurizer l	ased on evel. Co	one of ntainm	sever: ent	al
			Pressu	ire or RCS P	ressure.					
ŀ		RO	Manua	Ily Trip the F	Reactor and In	tiate SI.				
ŀ	Evaluator No	SRU	Enter a	and Direct pe	erformance of	E-0, Reactor Trip	Or Safe	ty Injec	ction.	
		conta	inment Hi H	wing imme li pressure d	diate actions	performance (IC	DAs) for	Rx Tri	p and	SI, a
		failure	es may be id	dentified an	d corrected a	t this time. The	se actio	ns may	y be	
		perfo	rmed as pru	Ident action	s prior to rea	ching the applic	able pro	ocedur	e ster	ps.
	ES-0.5, initiated at Step 5 of E-0, procedurally address each of these will be performed by the BOP operator.						ese fail	ures	and	
			E-0	, Reactor T	rip or Safety I	njection				
-		Note 1 S	teps 1 throu	ps 1 through 4 are immediate action steps						
-		Note 2 T	his procedur	e has a fold	out page					
			1. VE	Reactor trip b	IRIPPED:					
1		PO	•	Reactor trip t	ypass breakers		or OPE	N		
1		RU	•	Neutron flux						
			•	Rod position	ignts LH indicators less t	han or equal to 12	stens			
				Rod position	indicators less	han or equal to 12	steps.			

	Appendix D		Re	quired Op	erator Actior	าร		For	n ES	-D-2
	Op Test No.: Event Description	NRC	Scenario # je Break LOCA	5 , Cntmt Spra	Event # ay VIvs Auto op	7, 8, & 9 en fail, A Train RHF	Page	 ion vlv fai	of Is clos	57 ;ed.
	Time	Position			Applican	t's Actions or Bobo	vior			
		BOP	2. VERIF • Tur	Y turbine '	TRIPPED: valves CLO	SED.				
		BOP	3. VERIF • Atte • Pla • Ver	Y at least empt to re ce DG 1A rify Train <i>I</i>	one train of s store power -A control sv A Shutdown I	shutdown board to at least ONE vitch in START Boards ENERGI	s ENERG train of sh ZED	IZED. nutdowr	ı boaı	rds
		RO	4. DETER • EC • Any	RMINE if S CS pumps / SI alarm	61 actuated: s RUNNING. LIT [M-4D] (	SI will be actuat	(ed)		P	
Ċ		RO/BOP	RNO: DETERMIN a. IF ar • S OR • F OR • C	NE if SI re ny of the fo S/G presso RCS presso Containme	quired: ollowing cond ure less than sure less than	ditions exists: 600 psig, n 1870 psig, greater than 1.5	psig,			
			THEN ACT	UATE SI.						
	Evaluator Note	e: SRO/crev CRITERI	w should exe A.	ercise <b>FOI</b>	.DOUT PAG	E <u>EVENT DIAG</u>	NOSTIC	<u>5 f</u> or RC	P TF	ιΡ
		Correct F • RCS p availab • SI injec & 1B D OR	POAs implem ressure- 1-M le); ction flow- 1- ISCH FLOW	nented wo I-4: exo-se M-6, 1-FI-	uld be to ver ensors 1-XI-§ 63-170, CCF	ify: 94-101 & 102 (of PIT Flow & 1-FI-	ther indica 63-151 &	ators als 20, SI F	so PUMF	Ps 1A
		<ul> <li>Phase ISOLAT</li> <li>AND</li> <li>Stop al</li> </ul>	B isolation a FION PHASE I RCPs.	ctuation- E BTRAIN	1-M-6 1-XA- A & TRAIN	55-6C A-5, A-6: B"	"CONTAI	NMENT	-	
	Critical Step:	<b>Re-align CC</b> Crew, as par and take acti	<b>P suction to</b> t of POAs, sl on to re-aligr	<b>RWST a</b> hould ider h as follow	nd Discharg tify CCP suc /s:	<b>ge through the</b> ction/discharge f	CCPIT. low path i	ncorrec	tly ali	gned

Appendix D		Re	quired Op	perator Action	S		Fo	rm ES	6-D-
Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	33	of	5
Event Description:	La	rge Break LOCA,	Cntmt Spra	ay VIvs Auto ope	en fail, A Train RHR	sump suct	ion vlv f	ails clos	sed.
Time	Position			Applicant	's Actions or Behav	vior			
	Open 1-I	-CV-62-135 &	136 usin	g 1-M-5 hand	switches;			<u></u>	
	<ul> <li>Close 1-I</li> </ul>	FCV-62-132 &	133 usin	g 1-M-5 hand	lswitches;				
	Open 1-F	=CV-63-39 & 4	l0 using 1	-M-6 handsw	vitches;				
	Verify prop	er CCPIT flow	on 1-FI-6	3-170, CCPI	T Flow indicator				
	ES-0.5 Ste	p 11, <b>MONITC</b>	RECCS	operation, wi	Il also accompli	sh this			
			FOLD	OUT PAGE					
		RCP TRIP	CRITERI	<u>A</u>		····			
		IF any of th	e followir	ng conditions	occurs:				
		RCS pre     running     OR	ssure les	s than 1250 p	osig AND at leas	st one CC	P or S	l pum	р
		Phase B	isolation,						
		THEN STO	P all RC	Ps				,	
			GNOST	CS					
		• IF any s following	S/G pres :	sure is drop	ping uncontroll	ed, THEI	N PEF	RFOR	VI t
	RO/BOP	a. CLO	SE MSIV	s and MSIV b	ypass valves				
		b. IF an PER	y S/G pre F <b>ORM</b> the	essure continues following:	ues to drop unco	ontrolled,	THEN		
	RO	1) E	NSURE	SI actuated.					
		2) IF T	at least	one S/G is in LATE AFW to	tact (S/G pressu o faulted S/G(s)	ure contro :	lled or	rising	),
		•	CLOSE	AFW level of	control valves fo	r faulted	S/G(s)		
		•	IF any THEN	AFW valve fo PERFORM A	r faulted S/G C ppendix E, Isola	ANNOT b ating AFW	e CLC / to Fa	SED,	S/G
		3) E IS	NSURE a	at least one o AFW to faulte	f the following c d S/G(s):	onditions	met: <b>T</b>	HEN	
		<ul> <li>total AFW flow greater than 440 gpm</li> </ul>							
		•	Narrow one inta	Range level act S/G.	greater than 10	9% [25% <i> </i>	ADV] ir	n at lea	ast
Evaluator Note:	: Actions for	ES-0.5 are co	ontained i	n attachment	at back of scer	nario guid	e		
	BOP	5. PERFO	RM ES-0 ire.	.5, Equipmen	t Verifications V	VHILE co	ntinuin	g in th	is

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Appendix D		Required Operator Actions	Form ES-D-2
Op Test No.:	NRC	Scenario # <u>5</u> Event # <u>7, 8, &amp; 9</u> Page	34 of <u>57</u>
Event Description:	La	rge Break LOCA, Cntmt Spray VIvs Auto open fail, A Train RHR sump su	ction vlv fails closed.
Time	Position	Applicant's Actions or Behavior	
		6. DETERMINE if secondary heat sink available:	
		a. CHECK total AFW flow greater than 440 gpm.	
	RO	<ul> <li>b. CHECK narrow range level greater than 10% [25 one S/G.</li> </ul>	ADV] in at least
		c. CONTROL feed flow to maintain narrow range lev [25% ADV] and 50% in all S/Gs.	vel between 10%
		(Heat Sink is available from AFW:>440 gpm available	e.)
	RO	7. CHECK if main steam lines should be isolated:	
		a. CHECK if any of the following conditions have oc	curred:
		<ul> <li>Any S/G pressure less than 600 psig OR</li> </ul>	
		<ul> <li>Any S/G pressure dropping UNCONTROLLED OR</li> </ul>	•
		Phase B actuation	
		b. ENSURE MSIVs and MSIV bypass valves CLOS	ED
		c. ENSURE applicable Foldout Page actions COMP	LETED
	PO	8. CHECK RCP trip criteria:	
	RU	a. CHECK the following:	
		At least one CCP OR SLoump PLINNING	
		b. STOP RCPs	A
	50	9. MONITOR RCS temperatures:	
	RO	<ul> <li>IF any RCP running, THEN CHECK T-avg stable a between 547°F and °F</li> </ul>	t or trending
		<ul> <li>IF RCPs stopped, THEN CHECK T-cold stable or t 547°F and 552°F</li> </ul>	rending to between
		10. CHECK pressurizer PORVs, safeties, and spray valve	es:
	RO	a. Pressurizer PORVs CLOSED.	
		b. Pressurizer safety valves CLOSED.	
		c. Normal spray valves CLOSED.	

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	Appendix D		Req	uired Op	erator Action	S		For	m ES	S-D-2
	Op Test No.: Event Description:	NRC Larç	Scenario # ge Break LOCA, (	5 Cntmt Spra	Event # _	7, 8, & 9 In fail, A Train RHR	Page sump suct	35 ion vlv fa	of ils clos	57 sed.
	Time	Position			Applicant	s Actions or Behav	ior			
			d. Powe e. At lea	r to at lea st one bl	ast one block ock valve OF	valve AVAILAB PEN.	SLE.			
		CREW	11. DETERM • CHEC • CHEC	MINE S/C XK all S/C XK all S/C	G secondary G pressures ( G pressures g	pressure bound CONTROLLED greater than 140	aries are or RISIN( ) psig.	INTAC G.	T:	
			12. DETERM • All S/C • Secon Monito	<b>MINE</b> if S G narrow Idary rad ors. (App	/G tubes are range levels iation NORM . A performe	INTACT:: CONTROLLED IAL <b>USING</b> App d in ES-0.5).	) or DRO endix A, s	PPING. Second	ary F	Rad
C			13. DETERM Conta Conta LOWE Conta Rad M (RNO required)	<b>/INE</b> if R inment p inment s ER COMI inment ra ionitors. red)	CS is INTAC ressure NOF ump level NC PT TEMP HIC adiation NOR (App. B perfo	T: RMAL. DRMAL. GH alarm DARK MAL <b>USING</b> Ap prmed in ES-0.5	(. [M-5C, opendix E )	B1] 3, Conta	ainme	ent
			RNO: PERFORM t	he follow	/ing: 0.5 Appendix		Aitigation	Actions		
	Evaluator Note:	at Step 1 via SPDS designate condition direct the procedur	3.b, <b>MONITOI</b> 3. When a RE a one of the Be s using <b>1-FR-</b> crew to trans e(s).	R status D or OR D or OR D or OPE D, UNIT f ition to th	trees, the cre ANGE path s rators (typica I <b>STATUS T</b> I ne appropriate	w will implement tatus tree is obs illy the BOP) to <b>REES</b> . Once ve e RED and/or O	nt status t served, th verify sta erified, the RANGE	ree mone SRO tus tree e SRO s path	nitorii will shoul	ng Id
		Thermal event gui	b MON	R-Z.1, Hi	gh Containme	ent Pressure ma	ay exist.	They fo	llow	this
			c. GO T	O E-1, L	oss of React	or or Secondary	/ Coolant	•		

	Appendix D Op Test No.: Event Description: Time		Required Operator Actions						Form ES-D-2				
Construction	Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	36	of	57			
	Event Description	: Larg	Large Break LOCA, Cntmt Spray VIvs Auto open fail, A Train RHR sump suction vIv fails closed.										
	Time	Position			Applica	nt's Actions or Behavi	or						
	Crew transitions to E-1, Loss of Reactor or Secondary Coolant.												
	Evaluator Not	e: Red/Orang FR-P.1 and applicable	Red/Orange Path conditions may exist at this point; Operator performs 1-FR-0, verifying FR-P.1 and/or FR-Z.1 conditions exist. When verified, SRO will transition to the applicable FR(s) from E-1 st4ep in effect.										
		SRO	Enter and o	direct acti	ons of E-1								

Appendix D	·····	Req	uired Op	erator Action	ns		Fo	rm ES	S-D-2
Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	37	of	57
Event Description:	La	rge Break LOCA, (	Cntmt Spra	y VIvs Auto op	en fail, A Train RHR s	ump sucti	ion vlv fa	ails clo	sed.

Time	Position	Applicant's Actions or Behavior
		E-1, Loss of Reactor or Secondary Coolant.
	Note 1: This	procedure has a foldout page
Evaluator No	ote: Crew sho	ould stop or verify RCPs stopped by this point.
	RO	1. CHECK RCP trip criteria:
		a. CHECK the following:
		At least one CCP <b>OR</b> SI pump RUNNING
		AND
		<ul> <li>RCS pressure less than 1250 psig.</li> </ul>
		b. STOP RCPs.
	BOP	2. CHECK S/G secondary pressure boundaries INTACT:
		S/G pressures CONTROLLED or RISING
		<ul> <li>S/G pressures greater than 140 psig.</li> </ul>
	BOP	3. MAINTAIN Intact S/G narrow range levels:
		a. Greater than 10% [25% ADV].
		b. Between 10% [25% ADV] and 50%.
	BOP	4. VERIFY secondary radiation NORMAL:
		<ul> <li>a. CHECK secondary radiation NORMAL USING Appendix A, Secondary Rad Monitors.</li> </ul>
		b. NOTIFY Chem Lab to take S/G activity samples
		<ul> <li>WHEN Chem Lab is ready to sample S/Gs, THEN PERFORM the following:</li> </ul>
		1) ENSURE FCV-15-43 Blowdown Flow Control valve CLOSED.
		2) ENSURE Phase A RESET.
		3) <b>OPEN</b> blowdown isolation valves.
		d. NOTIFY RADCON to survey main steam lines and S/G blowdown.
		<ul> <li>e. WHEN S/G samples completed, THEN CLOSE blowdown isolation valves.</li> </ul>
	RO	5. MONITOR pressurizer PORVs and block valves:
		a. Power to block valves AVAILABLE
		b. Pressurizer PORVs CLOSED
		c. At least one block valve OPEN.

Appendix D		Required Operator Actions Form ES-D-2
Op Test No.:	NRC	Scenario # 5 Event # 7, 8, & 9 Page _ <u>38</u> of _ 57
Event Description:	Larg	e Break LOCA, Cntmt Spray VIvs Auto open fail, A Train RHR sump suction vIv fails closed.
	RO	6. MONITOR SI termination criteria:
		a. RCS subcooling based on core exit T/Cs greater than 40°F.
	•	(RNO required)
		RNO: GO TO Step 7.
Evaluator Note:	Crew wo follow thi	uld have identified either FR-P.1 or FR-Z.1 entry conditions by this time. They sevent guide.
	SRO	Enter and direct implementation of either FR-P.1 Pressurized thermal Shock or FR-Z.1, Containment High Pressure

	Appendix D	ppendix D Required Operator Actions						Fo	rm ES	3-D-2
	Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	39	of	57
1	Event Description:	La	nge Break LOCA, (	Cntmt Spra	ay VIvs Auto ope	en fail, A Train RHR	sump sucti	ion vlv fa	ails clo	sed.

Time	Position	Applicant's Actions or Behavior
		ES-1.3, Transfer To RHR Containment Sump
Critical Task:	Manually align flow prior to <b>Alignment</b> s	gn one train of RHR for Containment Sump Recirculation and establish ECCS Degraded Core Cooling Conditions. steps: ES-1.3 Steps 1 - 14
Critical Task	RO	1. SUSPEND FRP implementation.
		2. <b>DETERMINE</b> if containment spray should be stopped:
		a. <b>CHECK</b> any containment spray pump RUNNING.
		b. ENSURE the following:
		one Cntmt Spray pump     in PULL-TO-LOCK
		remaining Cntmt Spray pump     RUNNING.
		c. CHECK containment pressure greater than or equal to 2.0 psig.
		d. MONITOR one cntmt spray pump RUNNING and delivering flow.
		3. MONITOR RHR automatic switchover:
E. I. I. I.		a. CHECK containment sump level greater than 11%.
Evaluator Not	locally.	ttempts to open FCV-63-72; it failed closed and will not open remotely or
		b. CHECK containment sump valves FCV-63-72 and FCV-63-73 OPEN. ( <i>RNO required</i> )
		RNO:
		b. IF any sump valve is CLOSED, THEN ATTEMPT to open affected sump valve from MCR.
		c. CHECK RHR suction valves FCV-74-3 and FCV-74-21 CLOSING.
		4. MONITOR RWST supply to ECCS pumps:
		<ul> <li>RWST LVL LO-LO alarm DARK [M-6E, E4].</li> </ul>
		RWST level greater than 8%.

Appendix D		Req	uired O	perator Action	S	·····	Fo	orm ES	S-D-2
Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	40	of	57
Event Descriptior	: Lar	ge Break LOCA, (	Cntmt Spi	ray VIvs Auto ope	en fail, A Train RHR	sump suct	ion vlv f	ails clo	sed.
Time	Position			Applicant's	Actions or Bel	havior			
		ES-1.3, Tran	sfer To	RHR Contai	nment Sump				
		5. MONITO	DR RHF	R pumps RUNI	NING				
	CAUTION:	Transfer to	o sump	recirculation	may cause hig	jh radiati	ion in	Aux	
	NOTE: Ster	6 should be h	anded (	off to a Unit Or	nerator				
	<u></u>	6. PERFOI	RM the	following:					
		a. <b>DISP/</b> 1, 480	ATCH p V Boa	ersonnel to re rd Room Brea	store power to F ker Alignments.		USIN	G EA-	201-
		b. <b>OPEN</b> 153.	I RHR h	eat exchange	r outlet valves F	CV-70-1	56 and	FCV-	-70-
		c. VERIF	YCCS	flow FI-70-15	9A and FI-70-16	65A great	er thai	n 5050	) gpm.
		d. MONI	TOR CO	CS temperatur	e and surge tan	ik level.			
		7. VERIFY	RHR a	utomatic switc	hover:				
		a. VERIF	Y conta	ainment sump	valves FCV-63-	72 and F	CV-63	3-73 O	PEN.
			rea- FC	V-63-72 fails	to open)	*1.)			
		a. IF any TO LO	v contair <b>)CK</b> R⊦	nment sump v IR pump on at	alve(s) CANNO ffected train(s).	T be ope	ned, <b>T</b>	HEN F	PULL
Evaluator Not	e: Operator	places 1A-A RI	-IR Pum	np in P-T-L and	d continues.				
		IF Tra THEN	in A cor PERFC	ntainment sum <b>DRM</b> the follow	np valve FCV-63 ving:	3-72 CAN	NOT b	e ope	ned,
		1) <b>CL</b>	OSE FC	V-74-3 Train	A RHR suction	valve to s	atisfy	interlo	ck.
		2) WH 72.	IEN FC	V-74-3 is CLO	SED, <b>THEN AT</b>	TEMPT t	o OPE	EN FC	V-63-
		3) <b>WH</b> RU	<b>IEN</b> FC' NNING	V-63-72 is OP	EN, THEN ENS	URE RH	R Pum	пр А-А	
Evaluator Not	e: Operator I continues	eaves 1A-A RI aligning B Trai	HR Pum in RHR	np in P-T-L sin only to cold le	ce FCV-63-72 s g recirculation.	still will no	ot oper	n. Crev	V
		b. ENSU CLOS	RE RW: ED.	ST to RHR su	ction valves FC	V-74-3 ar	nd FC\	/-74-2	1
		1							

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Appendix D		Required Operator Actions	Form ES-D-
Op Test No.	NRC	Scenario # 5 Event # 7, 8, & 9 Pa	ge 41 of 57
Event Descriptio	n: Lar	ge Break LOCA, Cntmt Spray Vivs Auto open fail, A Train RHR sump	suction vlv fails closed.
Time	Position	Applicant's Actions or Behavio	*
		ES-1.3. Transfer To RHR Containment Sump	
	CAUTION:	SI pump operation with miniflow isolated and RCS pre head will result in SI pump damage.	ssure above shutof
	NOTE: The	following continuous action applies even after this proced	ure is exited
		8. <b>MONITOR</b> RCS pressure less than 1500 psig.	
		Poig	
		9. CLOSE SI pump miniflow to RWST valves:	<u> </u>
		• FCV-63-3	
		• FCV-63-4	
		• FCV-63-175	
		10. CLOSE RHR crosstie valves:	
		• FCV-74-33	
		• FCV-74-35.	
		11. <b>OPEN</b> CCP and SI pump suction valves from RHR.	
		<ul> <li>FCV-63-7</li> </ul>	anayayayayaya
		• FCV-63-6.	
		12. ALIGN RHR discharge to CCP and SI pump suction	ו.
		a. OPEN RHR discharge to CCP suction FCV-63-8.	
		b. OPEN RHR discharge to SI pump suction FCV-6	3-11.
		13. VERIFY Steps 9 through 12 COMPLETED	
		14. CHECK ECCS pump status:	
		a. CHECK BOTH RHR pumps RUNNING.	
		(RNO required)	
		RNO:	
		a. IF only one RHR pump is available, THEN PERF	<b>ORM</b> the following:
		1) ENSURE the following:	
		one CCP RUNNING (same train as running I	RHR pump preferre
		other CCP in PULL TO LOCK.	

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Appendix D		Req	uired Op	perator Action	S		Fo	rm ES	6-D-2		
Op Test No.	NRC	Scenario #	5	Event #	7, 8, & 9	Page	42	of	57		
Event Descriptio	n: La	rge Break LOCA, (	Cntmt Spr	ay VIvs Auto ope	en fail, A Train RHF	R sump sucti	on vlv f	ails clos	sed.		
Time	Position			Applicant's	Actions or Be	havior					
		ES-1.3, Tran	sfer To	RHR Contain	nment Sump						
Evaluator No	P-T-L foll	CP & SIP should owing completi	d be runr on of thi	ning, 1A-A CC s step.	P & SIP should	d remain o	r be p	laced	in		
		2) IF I EN	RCS pre	ss is greater t I pumps in Pl	than or equal to ULL TO LOCK.	o 1500 psig	g, THE	EN			
		3) <b>IF</b> I	RCS pre	ss is less that	n 1500 psig, <b>T</b> F	IEN ENSU	IRE th	e follo	win		
		<ul> <li>one SI pump RUNNING (same train as running RHR pump preferred)</li> </ul>									
<u> </u>		• 0	ther SI p	oump in PULL	TO LOCK						
Critical Task		4) <b>GO</b>	TO Cau	ution prior to S	Step 15.						
Critical Task	Manually a flow prior to Alignment	lign one train of Degraded Cor <b>steps: ES-1.3</b>	RHR fo Coolir Steps 1	r Containmer ng Conditions - <b>14</b>	t Sump Recircu	ulation and	l estat	olish E	CC		
	CAUTION:	Momentary lo result in CCP will NOT start 15. <b>MONITC</b>	oss of sh damage the RH <b>DR</b> shutd	utdown powe e since the bla R pumps lown boards c	r while aligned ackout sequenc continuously en	for sump n er will stan ergized.	ecircu t the (	llation CCPs	cor but		
		16. <b>RESET</b> 3	SI signal	l							
		17. <b>ALIGN</b> E	RCW S	ystem <b>USING</b>	EA-67-1, ERC	W Operat	ion.				
			FCCP								
		a. CLOS monito	E RWS <sup>-</sup> Dring CC	T suction valv	es LCV-62-135	and LCV-	62-13	6 WH	ILE		
		b. PLAC	E RWS 3-62-135	Suction valve	e handswitches	in A-AUT	O (pu	shed i	n):		
		• HS	62-136								
		c. ENSU • LC OR	<b>RE</b> at le V-62-132	ast one VCT	outlet valve CL	OSED:					
		• LC	V-62-133	•		e-tra					
		+									

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Appendix D		Req	uired Operato	r Actions		······	Forn	n ES	-D-;
Op Test No.: Event Description	NRC	Scenario # ge Break LOCA, (	5 Eve	ent # Auto open	7, 8, & 9 fail, A Train RHF	Page	 ion vlv fail	of _	57 sed.
Time	Position		App	licant's A	ctions or Bo	bayior			
		ES-1 3 Tran	sfer To RHR	Containr	nent Sumn	IIAVIOI			
			K nower RES		o ECV-63-1	······			
		b. CLOS	E FCV-63-1	NHILE mo	onitoring RHR	tlow.			
		20. <b>ISOLAT</b>	E SI pump su	ction from	RWST:				
		• CLOSE	E FCV-63-5 W	HILE mor	nitoring SI pu	mp flow.	·		
		21. ALIGN	containment s	pray sucti	on to contain	ment sum	p:		
		a. CHEC	K any of the NST level less	following of than	conditions me	<u>t:</u>			
		O O	equal to 8% R						
		• co gr	ntainment sum eater than or ea	p level qual to 56%	۶.				
		b. ENSU	RE containm	ent spray	pumps in PU	LL-TO-LO	CK.		
		c. CHEC	K FCV-63-72	Train A c	ontainment s	ump valve	OPEN.		
		RNO: c. GO TO	<b>D</b> Substep 21	.i.					N
		21. i. CHEC	<b>K</b> FCV-63-73	Train B co	ontainment su	ump valve	OPEN.		
		j. CLOSI	E FCV-72-21,	Train B cr	ntmt spray su	ction from	RWST		
		L. CHEC	K containme	nt pressure	e greater thar	n 2.0 psig <i>.</i>			
		m. CHEC	CK containme	nt sump le	evel greater th	nan 18% [	22% AD	V].	
		n. ESTA	<b>BLISH</b> Train I <b>ECK</b> Train B	3 Cntmt S	pray:	on aligned	to entr	ot eu	
		2) ST	ART cntmt sp	ray pump	B-B.				<u> </u>
		3) EN	SUKE FCV-/	2-2 I rain I	в Cntmt Spra	y isol valv		l	
		o. CHEC	K any cntmt s	spray pum	P RUNNING				
		p. ENSU • FCV	RE recirc valv -72-34 Train	/es CLOS A	ED for runnin	g Cnmt S	pray pur	np(s)	):
		• FCV	-72-13 Train	В					

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Appendix D		Required Operator Actions Form ES	6-D-
Op Test No	D.: NRC	Scenario # <u>5</u> Event # <u>7, 8, &amp; 9</u> Page <u>44</u> of	57
Event Descripti	ion: La	rge Break LOCA, Cntmt Spray VIvs Auto open fail, A Train RHR sump suction vIv fails clos	sed.
Time	Position	Applicant's Actions or Behavior	
		ES-1.3, Transfer To RHR Containment Sump	
		q. CHECK containment spray flow greater than 4750 gpm on each in service.	traiı
		22. <b>MONITOR</b> if RHR spray should be placed in service:	
		a. CHECK the following conditions met:	
		Containment pressure greater than 9.5 psig     AND	
		At least 1 hour has elapsed since beginning of accident     AND	
		At least one CCP AND one SI pump RUNNING.	•
		RNO:	
		a. <b>WHEN</b> conditions in Substep 22.a are met, <b>THEN PERFORM</b> Substeps 22.b and 22.c.	
		GO TO Step 23.	
	CAUTION:	Continued ECCS or spray pump operation following loss of suction may result in pump damage.	,
		23. MONITOR for sump blockage:	
		a. INITIATE EA-63-8, Monitoring for Containment Sump Blockage.	
		b. <b>CHECK</b> NO indication of cavitation or loss of suction to ECCS ar Containment Spray pumps.	nd
		24. <b>RESUME</b> FRP implementation.	
		25. ENSURE CCS to Spent Fuel Pit Cooling supplied from the unaffect unit USING EA-70-1, Component Cooling System Operation.	ted
		26. INITIATE RWST refill:	
		a. VERIFY RWST isolated from containment sump:	
		• FCV-63-1 CLOSED	
		FCV-72-22 CLOSED	
		• FCV-72-21 CLOSED.	
		b. <b>INITIATE</b> RWST refill <b>USING</b> EA-63-2, Refilling the RWST.	
	NOTE: If RO	CS pressure is less than 300 psig, E-1 will direct transitioning to ES-1.4, H Recirculation, when 5 hours has elapsed. Otherwise, a TSC evaluation is	lot
	need	ded to determine whether hot leg recirculation will be required later.	
		27. <b>DETERMINE</b> if hot leg recirculation will be required:	

Appendix D		Req	uired Op	erator Actic	ons		Fo	rm ES	S-D-2
Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	45	of	57
Event Description	n: Larg	e Break LOCA,	Cntmt Spra	ay Vivs Auto o	pen fail, A Train RHR	sump suct	ion vlv fa	ails clos	sed.
Time	Position			Applicant	s Actions or Be	havior			
		ES-1.3, Trar	nsfer To	RHR Conta	inment Sump				
		• CHEC	K RCS	pressure les	ss than 300 psig.				
					-				
		28. RETUR	N TO pro	cedure and	step in effect.				
	SR	U directs crev	w back to	procedure	and step in effec	<u>t.</u>			·····

Appendix D		Req	uired Op	erator Acti	ons		Fo	rm E	S-D-2
Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	46	of	57
Event Description:	La	rge Break LOCA, (	Cntmt Spra	ay VIvs Auto o	open fail, A Train RHR s	ump suct	ion vlv fa	ails clo	sed.

Time	Position	Applicant's Actions or Behavior
		FR-Z.1, High Containment Pressure
	NOTE: If this (Loss conc	s procedure has been entered for an orange path and performance of ECA-1.1 s of RHR Sump Recirculation) is required, FR-Z.1 may be performed urrently with ECA-1.1.
	RO	<ol> <li>MONITOR RWST level greater than 27%.</li> <li>(RNO when required)</li> </ol>
		RNO: IF ES-1.3 has NOT been entered, THEN GO TO ES-1.3, Transfer to RHR Containment Sump.
	RO	2. VERIFY Phase B valves CLOSED:
		<ul><li>Panel 6K PHASE B GREEN</li><li>Panel 6L PHASE B GREEN.</li></ul>
	RO	3. ENSURE RCPs STOPPED.
	SRO	4. DETERMINE if this procedure should be exited:
		<ul> <li>Any S/G pressure DROPPING in an uncontrolled manner</li> <li>OR</li> <li>Any S/G pressure less than 140 psig.</li> </ul>
	RO	b. CHECK containment pressure less than 12 psig. (RNO required)
		RNO: b. GO TO Step 5.
		5. VERIFY containment spray operation:
		a. CHECK RHR sump recirculation capability AVAILABLE.
	RO	b. Verify containment spray pump RUNNING.
	RO	c. CHECK RWST level greater than 27%. (RNO required)
		<ul> <li>c. IF any of following conditions met:</li> <li>RWST level less or equal to 8%</li> </ul>

Appendix D		Re	quired Ope	erator Action	าร		For	m ES	6-D-2
Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	47	of	57
Event Description	: Lan	ge Break LOCA,	Cntmt Spray	VIvs Auto op	en fail, A Train RHF	≀ sump sucti	ion vlv fa	ils clos	sed.
Time	Position			Applicant's	s Actions or Be	havior			
		FR-Z.1	, High Cor	ntainment	Pressure				
		• con	tainment s	ump level g	reater than 56%	),			
	CREW	THEN PER	FORM the	following:		<u></u>			
		1) <b>ENSURI</b> 1.3, Trar	E cntmt spi nsfer to RH	ay pump s R Containr	uction aligned fo nent Sump, Step	or sump re	circ US	SING	ES-
		2) <b>GO TO</b> S	Substep 5.	Э.	•				
	,,,,,,,,,,	5.e. VERIF	Y containm	ent sprav (	discharge valves				
		• FC	V-72-39	ione opray (			<u> </u>		
		• FC	V-72-2.						
		(RNO requ	ired)						
Critical	required mir (ES-0.5 Step RO	nimum spray f 13 directs co RNO:	ected, clos low require ompletion l	ing the reci ement. by BOP dui	rc valve(s) is no ing procedure p	t necessar	ry to me ce.)	eet th	
		e. OPEN va	alves for r	unning co	ntainment spra	y pumps.		·	
On 1-M-6, ope	rator uses 1-	HS-72-39A h	andswitch	to open 1	-FCV-72-39.				
Ope	rator uses 1-	f VEDIEV	naswitch	to open 1-	FCV-72-2; valve	e fails to o	open.		
		g. VERIFY train.	containme	ent spray fee	low greater tha	ED: n 4750 gr	om on	each	
On 1-M-6, ope A Tı	rator uses 1-l ain, '0' flow o	M-6 indicator on B Train.	rs 1-FI-72-	34 and 1-F	I-72-13; verifies	s adequat	e flow	for	
	BOP	6. MONITO	<b>DR</b> contain	ment air re	turn fans:				
	BOP	WHE     ENSU	N 10 minut JRE air ret	tes have ela urn fans Rt	apsed from Pha JNNING.	se B actua	ation, T	HEN	
		7. VERIFY	containme	ent ventilati	on dampers CL(	DSED:			
		Panel	6K CNTMT	VENT GRE	EN				
		Panel	6L CNTMT	VENT GREE	EN.				

Appendix D		Required	d Operator Action	S	·····	Form	ES-D				
Op Test No.	NRC	Scenario #	5 Event #	7, 8, & 9	Page	_ <u>48</u> _ 0	f				
Event Descriptio	on: La	rge Break LOCA, Cntm	t Spray VIvs Auto ope	en fail, A Train RHI	R sump suc	tion vlv fails	closed				
Time	Position		Applicant's	Actions or Be	havior						
		FR-Z.1, Hig	h Containment F	Pressure							
		8. VERIFY Phase A valves CLOSED:									
		Panel 6K P	HASE A GREEN								
		Panel 6L P	HASE A GREEN.								
		9. VERIFY cntn MANUAL]	nnt vacuum relief	isolation valves	S CLOSEI	D: [Pnl 6K					
		FCV-30-46	2	······							
		• FCV-30-47									
		• FCV-30-48									
			1								
		10. VERIFY MSI	Vs and MSIV byp	ass valves CL(	DSED.						
			<u> </u>								
		11. DETERMINE	if any S/G Intact	•	······						
		a. CHECK at	least one S/G pre	essure:							
		CONTROLLED or RISING									
		AND									
		Greater th	an 140 psig.				<del></del>				
	CAUTION:	Isolating all S/G	s will result in a lo	oss of secondar	v heat eir	k					
		12. DETERMINE	if any S/G Faulte	ed:	y noat on	IIX					
		a. CHECK S/C	B pressures:								
		Any S/G p in an unco	ressure DROPPING	)		<del></del>					
		OR									
		Any S/G p less than 1	ressure 140 psig.								
		b. ISOLATE fe	ed flow to affecte	ed S/G:							
		• MFW									
		• AFW									

Appendix D		Req	uired Op	erator Actio	ns		For	m ES-D-			
Op Test No.:	NRC	Scenario #		Event #	7, 8, & 9	Page	49	of5			
event Description:	Lar	ge Break LOCA, (	Cntmt Spra	iy VIvs Auto oj	pen fail, A Train RHF	R sump such	ion vlv fa	ils closed.			
Time	Position			Applicant	s Actions or Be	havior					
		FR-Z.1, High Containment Pressure									
		13. <b>MONITO</b>	<b>DR</b> if hydi	rogen ignite	rs and recombin	ers should	d be tur	ned on:			
		a. DISPA EA-20	a. <b>DISPATCH</b> personnel to open ice condenser AHU breakers <b>USING</b> EA-201-1, 480 V Board Room Breaker Alignments.								
		b. CHEC	K hydrog	gen concen	tration measurer	nent AVA	LABLE	•			
		Hyd     have     for a	rogen ana e been in / at least 5 n	lyzers ANALYZE ninutes.							
		c. CHEC	K contai	nment hydro	ogen concentrati	on less th	an 6%.				
		d. WHEN ENER Analyz	lice con GIZE hyc ers and	denser AHL Irogen ignite Igniters In S	J breakers have ers <b>USING</b> Appe ervice.	been ope ndix D, P	ned, <b>TH</b> lacing H	IEN Iydrogen			
		e. CHEC	K contair	iment hydro	gen concentratio	on less tha	an 0.5%	).			
		14. <b>MONITO</b>	<b>DR</b> if RHF	R sprav sho	uld be placed in	service:					
		a. CHE	CK the fo	ollowing:							
		• C g	ontainmer reater thar	nt pressure n 9.5 psig							
		A	ND								
		• A	t least 1 h ince begin	our has elaps ning of accid	ed ent						
		A	ND	-							
		• R to	HR suction containm	n ALIGNED ent sump							
		LA LA	ND								
		• A pi	t least one ump RUNI	CCP AND o NING.	ne SI						
		b. CHE	CK both	RHR pumps	S RUNNING.						
		c. ESTA	ABLISH 7	rain B RHF	R spray:						
		d. <b>MON</b>	ITOR co	ntainment p	ressure greater	than 4 psi	g				
		15. <b>MONITO</b>	R if cont	ainment spr	ay should be sto	opped:					
		a. CHEC	K any co	ntainment s	pray pump RUN	NING.					
		b. CHECI	K contain	ment press	ure less than 2.0	) psig.					
		c. CHECI	K contain	ment spray	suction aligned	to RWST.					
		d. RESE	Contain	ment Spray	/.						
		e. STOP	containm	ent spray p	umps and PLAC	E in A-AL	JTO.				

•

Appendix D		Red	Form ES-D-2								
Op Test No.:	NRC	Scenario #	Scenario # <u>5</u> Event # <u>7, 8, &amp; 9</u> Page								
Event Description	n: Larg	Large Break LOCA, Cntmt Spray VIvs Auto open fail, A Train RHR sump suction vIv fail									
Time	Time Position Applicant's Actions or Behavior										
	FR-Z.1, High Containment Pressure										
		f. CLOS	E contair	nment spray o	discharge valves						
		• FC\	/-72-39, T	rain A			··· ··				
		• FC\	/-72-2, Tr	ain B.		······					
	16. <b>RETURN TO</b> procedure and step in effect.										
	SR	O directs cre	w back t	o procedure a	and step in effec	t.					

	Appendix D		Req	uired Op	erator Action	ons		Fo	rm ES	3-D-2
La provincia de la comunitación de	Op Test No.:	NRC	Scenario #	5	Event #	7, 8, & 9	Page	_51	of	57
*	Event Description:	Lar	ge Break LOCA, (	Cntmt Spra	y VIvs Auto o	open fail, A Train RHR s	ump sucti	ion vlv fa	ails clo	sed.

Time	Position	Applicant's Actions or Behavior						
		FR-P.1, Pressurized Thermal Shock						
	RO	<ol> <li>MONITOR RWST level greater than 27%.</li> <li>(RNO when required)</li> </ol>						
		RNO: IF ES-1.3 has NOT been entered, THEN GO TO ES-1.3, Transfer to RHR Containment Sump.						
		2. MONITOR CST level greater than 5%.						
		3. CHECK RCS pressure greater than 300 psig.						
	CAUTION:	Isolating both steam supplies to the TD AFW pump when it is the only source of feed flow will result in loss of secondary heat sink.						
	NOTE: A "Fa 140	uited S/G <sup>e</sup> is any S/G whose pressure is dropping uncontrolled or less than sig.						
		4. CHECK T-cold STABLE or RISING. (RNO required- no operational impact due to the LBLOCA))						
		5. CHECK pressurizer PORV block valves:						
		a. Power to block valves AVAILABLE.						
		b. At least one block valve OPEN.						
	CAUTION:	Any time a pressurizer PORV opens, there is a possibility that it may stick open.						
		6. CHECK if pressurizer PORVs should be closed:						
		a. CHECK Cold Overpressure Protection System IN SERVICE. (RNO required)						
		<ul> <li>RNO:</li> <li>a. IF Cold Overpressure Protection System NOT armed, THEN GO TO Substep 6.d.</li> </ul>						
		b.a. MUNITOR pressurizer pressure less than 2335 psig.						

Appendix D		Required Operator Actions	Form ES-D-2
Op Test No.:	NRC	Scenario #         5         Event #         7, 8, & 9         Page           300 Brook LOCA         Catent Same Vilue A the set of the A To it is a transmission of the A To it it it is a transmission of the A To it it is a transmission	_52_of _57
		ge Break LOCA, Chtmt Spray Vivs Auto open fail, A Train RHR sump suc	tion vlv fails closed.
Time	Position	Applicant's Actions or Behavior	
		FR-P.1, Pressurized Thermal Shock	
		e. CHECK pressurizer PORVs CLOSED.	
		7. CHECK if ECCS in service:	
		Any SI pump RUNNING	
		OR	
		CCPIT flowpath established	
		*	
		8. CHECK if SI can be terminated:	
		a. RCS subcooling based on core exit T/Cs greater tha	n 90°F.
		(RNO required)	
		PERFORM the following:	
	Ayt = = =	1) IF RCS subcooling based on core exit T/Cs greater t RCP is running, THEN START one RCP:	han 40°F <b>AND</b> N
Evaluator Note:	SI canno SRO tra	t be terminated and RCP start conditions cannot be establisnsitions the crew to step 29	shed at this time;
		29. DETERMINE if RCS temperature soak required:	
		a. CHECK T-cold cooldown rate greater than 100°F in any	y 60 minute perio
		b. <b>PERFORM</b> the following:	
		<ol> <li>DO NOT COOL DOWN RCS UNTIL temperature has a soak time of at least 1 hour.</li> </ol>	is been stable for
		2) <b>DO NOT RAISE</b> RCS pressure during soak time.	
		<ol> <li>During RCS temperature soak time, concurrently PE of other procedures in effect which observe the following the following states and the following states and</li></ol>	<b>RFORM</b> actions
		RCS temperature is NOT reduced     AND	wing restrictions.
		RCS pressure is NOT raised.	
		30. <b>RETURN TO</b> procedure and step in effect.	
	SR	O directs crew back to procedure and step in effect.	

		Required Operator Actions Form							ES-D-2	
Op Test No.	: NRC	Scenario #	5	Event #	ES-0.5	Page	53	of	5	
Event Descriptio	on: Eq	Equipment Verifications								
Time	Position			Applicant's	s Actions or Beha	vior				
		ES-0.5, E	EQUIPM	ENT VERIFIC	CATIONS					
Evaluator No	ote: BOP con (includin	npletes ES-0.5 g any discrepa	includi ancies a	ng Appendic and actions ta	es A & B and r aken) to SRO.	eports c	omple	tion		
	BOP	1. VERIFY	D/Gs R	UNNING.						
	BOP	2. VERIFY	D/G ER	CW supply va	alves OPEN.	*****		······		
	BOP	3. VERIFY	at least	four ERCW p	umps RUNNIN	G				
······	BOP	4. VERIFY	CCS pu	mps RUNNIN	IG					
		Pump     Pump	1A-A (2	A-A) B-B)						
		Pump	<u>C-S.</u>							
	BOP	5. VERIFY	EGTS fa	ans RUNNING	G.					
	BOP	6. VERIFY	generat	or breakers O	PEN.					
	Crew	7. NOTIFY	at least	two AUOs to	report to MCR t	o be ava	lable f	or loca	al	
		actions.								
·····		8 VERIEV								
	BOP				10.					
		a. MD A	FW pur	nps						
	NOTE: AFW take S/G.	/ level control v n to control S/G	alves sh Blevels,	nould NOT be to establish fl	repositioned if low due to failur	manual a e, or to is	ction h solate a	as be a fault	en ed	
		9. CHECK	AFW val	ve alignment:						
	BOP		FY MD / FY TD /	AFW LCVs in	AUTO. PEN					
		c. VERI	FY MD	AFW pump re	circulation valve	es FCV-3	-400 a	nd FC	<b>X-</b> 3	

ppendix D		Required Operator Actions						
Op Test No.: NRC		Scenario # <u>5</u> Event # <u>ES-0.5</u> Page	54of					
lime	Position	Applicant's Actions or Behavior	······					
		ES-0.5, EQUIPMENT VERIFICATIONS						
		a. MEVV pumps IRIPPED						
	BOP	D. ENSURE the following:						
		MFW regulating valves CLOSED						
		MFW regulating bypass valve controller outputs	ZERO					
		MFW isolation valves CLOSED						
	ВОР	11. MONITOR ECCS operation:						
		a. VERIFY ECCS pumps RUNNING:						
		CCPs:						
		RHR pumps						
		SI pumps						
······		b. VERIFY CCP flow through CCPIT.						
		c. CHECK RCS pressure less than 1500 psig.						
		d. VERIFY SI pump flow.						
		e. CHECK RCS pressure less than 300 psig.	·····					
		f. VERIFY RHR pump flow.						
	BOP	12 VERIEY ESE systems ALIGNED:						
		a Phase A ACTUATED:						
		PHASE A TRAIN A alarm LIT IM 6C R51						
		PHASE A TRAIN B alarm LIT [M-6C, B6]						
		b. Cotmt Vent Isolation ACTUATED						
		CNTMT VENT ISOLATION TRAIN A clored LT						
		CNTMT VENT ISOLATION TRAIN B alarm LT	T [M-60, 05].					
			i [ivi-00, 00].					
		c. Status monitor panels:						
		6C DARK						
		6D DARK						
		6E LIT OUTSIDE outlined area						
		6H DARK						
		• 6J LIT.						

C

Appendix D		Req	Required Operator Actions For						m ES-D-2		
Op Test No.: Event Description:	NRC	Scenario # uipment Verificatio	5_	Event #	ES-0.5	Page	55	of	5		
······		•									
Time	Position			Applicant's	Actions or Beha	vior		<del></del>			
		ES-0.5, I	EQUIPM	ENT VERIFIC	ATIONS						
		d. Trai	n A statu	is panel 6K:							
		•	CNTMT		N						
		•	PHASE	A GREEN							
		e. Trai	n B statu	is panel 6L:							
		•	CNTMT	VENT GREEN	N						
		•	PHASE /	A GREEN			<u> </u>				
	BOP	13 MONIT	<b>OR</b> for co		rov and Dhase	D. o otvoti					
		a. CHE	CK for a	any of the follo	wing:	B actuati	on:				
		•	Phase B		wing.						
		OR		//010//120							
		• (	Containn	nent pressure	greater than 2	.8 psia					
		b. VER	RIFY con	tainment spra	y INITIATED:						
		1) C	ontainm	ent spray pun	nps RUNNING	ì.					
		2) C	ontainm 2-2 OPE	ent spray hea N.	der isolation va	alves FCV	-72-39	and	FC		
		3) C	ontainm CV-72-1	ent spray reci 3 CLOSED.	rculation valve	s to RWS	T FCV-	72-34	1 ar		
		4) C 5) P	ontainm anel 6E	ent spray hea LIT.	der flow greate	er than 47	50 gpm	n per t	trai		
		c. VER	IFY Pha	se B ACTUAT	TED:						
		• PF	IASE B	FRAIN A alarn	n LIT [M-6C, A	5].					
		• PH	IASE B	RAIN B alarn	n LIT [M-6C, A	6].					
	······	d. ENS	URE RC	Ps STOPPE	D.						
		e. VERI	FY Phas	e B valves CL	-OSED:						
		• Pa	nel 6K P	HASE B GRE	EN.						
		• Pa	nel 6L P	HASE B GRE	EN.						

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Appendix D		Required Operator Actions						Form ES-D-2		
Op Test No.: Event Description:	NRC Eq	Scenario # uipment Verificatio	5 ons	Event #	ES-0.5	Page	56	of	57	
Time	Position			Applicant's	Actions or Beha	avior				
		ES-0.5, E		ENT VERIFIC	ATIONS	76				
		f. WHE retur	<b>EN</b> 10 m n fans F	inutes have e RUNNING.	apsed, <b>THEN</b>	ENSURE	contaii	nment	air	
		14. MONITC closed:	14. <b>MONITOR</b> if containment vacuum relief isolation valves should be closed:							
		a. CHECK containment pressure greater than 1.5 psig.								
		b. CHE [Pnl • I • I	CK cntn 6K MAN FCV-30- FCV-30- FCV-30-	nnt vacuum re UAL] 46 47 48.	lief isolation va	Ives CLO	SED:			
	BOP	<ul> <li>15. CHECK secondary and containment rad monitors USING the following:</li> <li>Appendix A, Secondary Rad Monitors (attached)</li> <li>Appendix B, Containment Rad Monitors. (attached)</li> </ul>								
	BOP	16. WHEN Mitigatio	directed on Actio	by E-0, <b>THEI</b> ns.	N PERFORM A	oppendix [	), Hydi	ogen		
		17. CHECK [M-15, u • HS-7 • HS-7	pocket pper lef 77-410, 77-411,	sump pumps t corner] Rx Bldg Aux F Rx Bldg Aux F	STOPPED: Floor and Equip Floor and Equip	oment Dra oment Dra	in Sum in Sum	זף pun וף pun	np A np E	
	BOP	18. DISPATO ESF Actu	CH perso ation.	onnel to perfo	m EA-0-1, Eqւ	uipment C	hecks	Follow	ving	
	BOP	19. ENSURI and SI.	E plant a	announcemen	t has been ma	de regardi	ng Re	actor <sup>-</sup>	Trip	
Evaluator Note:	BOP com (including	pletes ES-0.5 g any discrepa	includir Incies a	ng Appendice nd actions ta	es A & B and r ken) to SRO.	eports co	omplet	ion		

 $\left( \begin{array}{c} \end{array} \right)$ 

	Appendix D	·····	Re	quired Ope	erator Acti	ons		Fo	rm ES	S-D-2
	Op Test No.:	NRC	Scenario #	5	Event #	ES-0.5	Page	57	of	57
4	Event Description:	Equ	ipment Verificat	ions						

 	(ES-0.5, EQUIPMENT VERIFICATIONS)						
APPENDIX A SECONDARY RAD MONITORS							
BOP	<ol> <li>CHECK following rad monitors including available trends prior to isolation:</li> </ol>						
	<ul> <li>Condenser exhaust recorder RR-90-119</li> <li>S/G blowdown recorder RR-90-120</li> <li>Main steam line rad monitors</li> <li>Post-Accident Main Steam Line rad recorder RR-90-268B points 3 (blue), 4 (violet), 5 (black), and 6 (brown). [M-31 (back of M-30)]</li> </ul>						
BOP	<ol> <li>IF secondary radiation is HIGH, THEN ENSURE Unit Supervisor notified.</li> </ol>						
	END OF TEXT						

	APPENDIX B							
	CONTAINMENT RAD MONITORS							
BOP	<ol> <li>CHECK following rad monitors:         <ul> <li>Upper containment high range rad monitors RM-90-271 and RM-90-272 NORMAL [M-30]</li> <li>Lower containment high range rad monitors RM-90-273 and RM-90-274 NORMAL [M-30]</li> <li>Containment rad recorders RR-90-112 and RR-90-106 NORMAL [M-12] (prior to isolation).</li> </ul> </li> </ol>							
BOP	<ol> <li>IF secondary radiation is HIGH, THEN ENSURE Unit Supervisor notified.</li> </ol>							
	END OF TEXT							

Appendix D	)		Scenario Outline			Form ES-D-1		
Facility: Examiners:	Sequoy	ah	Scenario No.: Operators	Scenario No.: 6 Op Test No.: Operators:				
Initial Conditi	ons: <u>7</u>	5% Power.		- - 				
Target CTs:	Manually Start an A	isolate/verify fe	edwater isolation prior to SG(s to reaching FR-H.1 bleed/fee	) inver d criter	ntory loss			
Event No.	Malf. No.	Event Type*						
<b>1.</b> T+0	SI02A	C – RO TS – SRO	Cold Leg Accumulator Nitro	Cold Leg Accumulator Nitrogen Leak				
<b>2.</b> T+10	RX11B	I – RO TS – SRO	First Stage Pressure Transn	nitter P	T-1-73 Fails High.			
<b>3.</b> T+20	MS12D	C - BOP	Lp #4 SG Atmos. Relief Valv	e Fails	s Partially Open			
<b>4.</b> T+30	FW18A	C – BOP	1A Main Feedwater Pump H	igh Vil	pration			
<b>5.</b> T+40	N/A	R – RO N –sro/bop	Plant Power Reduction		49999999999999999999999999999999999999			
<b>6.</b> T+65	FW20	M – All	Main Feedwater Header Bre	ak				
<b>7.</b> T+65	FW07A FW07B FW22B	M – All	1A-A MDAFW Pump Trip, el 1B-B MDAFW Fail to Auto S	ectrica tart, ai	l fault; rbound pump			
* (N)orr	mal, (R)eact	ivity, (I)nstrumer	nt, (C)omponent, (M)ajor					

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#### Appendix D

### Scenario 6 Summary

The crew will assume the shift at 75% Power with instructions to maintain 75% RTP per 0-GO-5 Section 5.1 Step 48 for Incore Flux Mapping for QPTR Tech Spec concerns.

After turnover, at Lead Examiner direction, insert a #1 Cold Leg Accumulator N2 leak. The crew will respond using alarm response procedures, (ARPs) 1-AR-M6-D A-1 which directs adjusting the pressure and/or level according to 1-SO-63-1, Cold Leg Injection Accumulators. SRO will identify Technical Specification 3.5.1.1.d Action a.

After Technical Specifications are addressed, at Lead Examiner direction, turbine first stage pressure transmitter, PT-1-73, Pimp Ch 1, will fail high. The crew will respond using ARP(s) 1-AR-M5-A C-6. The crew will respond to the automatic control rod motion by entering AOP-C.01, Rod Control System Malfunctions and perform the Immediate Operator Actions (IOAs) to stop the unexpected control rod motion. They then, transition to AOP-I.08, Turbine Impulse Pressure Instrument Malfunction to address the RCS temperature control, feedwater control and steam dump realignment (to steam pressure mode). SRO will identify to Technical Specification 3.3.1.1 Functional Unit 22E Action 8.b.

After Technical Specifications are addressed, at Lead Examiner direction, initiate the next malfunction, #4 SG Atmospheric Relief Valve fails open. The crew will respond using ARP(s) 1-AR-M5-A A-6, C-6 or 1-AR-M6-B D-7 and AOP-S.05, Steam Or Feedwater Leak which directs manual closure of the failed open relief valve and Tave-Tref deviation control.

At the Lead Examiner direction, 1A Main Feedwater Pump vibration will develop. The crew will respond using ARP(s) 1-AR-M3B A-1, B-5 which will require a manual load reduction for MFP shutdown. If the crew decides to manually trip the MFP, the SRO should enter AOP-S.01, Main Feedwater Malfunctions Section 2.7, Main Feedwater Pump Trip Below 76% Turbine Load.

When the crew has stabilized the unit, at the Lead Examiner direction, a Main Feedwater Header Break (MFLB) outside containment will occur. The crew will respond using ARP(s) 1-AR-M5-A B-7 and AOP-S.05, Steam or Feedwater Leak. The leak will increase to the point that a reactor trip is required. The crew should evaluate and manually trip the reactor prior to any automatic reactor trip actuation.

When the reactor trips, will perform IOAs, enter E-0, Reactor Trip or Safety Injection and transition to ES-0.1, Reactor Trip Response. Once Status Tree monitoring is implemented, the crew will identify no auxiliary feedwater flow capability. If Safety Injection is required, automatic initiation will fail requiring the crew to recognize and manually initiate SI.

1A-A MDAFW Pump tripped following startup on electrical fault; it will remain unavailable throughout the remainder of the scenario. 1B-B MDAFW Pump and the TDAFW Pump both are air/vapor bound. Subsequently the TDAFW Pump trips on overspeed. 1B-B MDAFW Pump will be manually stopped by the crew and be unavailable for the reminder of the scenario. The crew must recognize and restore AFW flow capability with the TDAFW Pump by directing the AUOs to vent and reset the pump restoring feedwater flow to SGs according to FR-H.1.

The scenario may be terminated, at the Lead Examiner direction when TDAFW Pump is restored prior to RCS Feed and Bleed initiation criteria.

EOP flow: E-0 - ES-0.1 - FR-H.1

PSA significant transient: Loss of Feed & MFW Line Break PSA significant action: Recovery of AFW (TDAFW Pump) PSA significant component failure: 1A-A MD AFW Pump


# NRC 1009 ESG-6 Booth Instruction File

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EVENT	IC/MF/RF/OR #	Description/Expected Actions/Booth Feedback
Simulator IC	IC-14 Perform switch check. PLACE the simulator in RUN before loading SCN file or starting the exercise. This will initialize ICS. Load SCENS: <u>1009 NRC ESG-6</u> Place simulator in RUN. Place OOS equipment in required position with tags. Clear alarms	<ul> <li>75%, BOL ~1000 MWD/MTU CB 'D' Rods @ 185 steps, all others @ 228 steps;</li> <li>[B] = 1189 ppm; Ba Blender setting: 29% Xe: -2529 pcm; Sm: -1019 pcm;</li> <li><u>Console Operator actions: Place simulator in run and perform the following:</u></li> <li>Allow the simulator to run before loading SCEN file.</li> <li>Place the MODE 1 sign on 1-M-4</li> <li>Place Train Week B sign</li> </ul>
MFs, RFs, ORs are active when the SCN file is loaded.		
1.	IMF SI02A f:1 k:1	<ul> <li>#1 CLA Lo-Pressure – Faulty Relief Valve; (Faulty relief valve corresponds to 10 psi/minute decrease at 500 psid CLA-containment pressure.)</li> <li>Prior to inserting Malfunction , ensure CLA pressure is being monitored;</li> </ul>
	DMF SI02A	THEN: Delete malfunction when CLA pressure drops to < 624 psig.
2.	IMF RX11B f:1 k:2	<ul> <li>PT-1-73, P IMP Ch 1 fails low- no-load value;</li> <li><u>Support staff report:</u> When MSS or IMs is contacted to trip bistables, inform the crew that the IMs will report to the MCR in ~45 minutes (WO package &amp; briefing time).</li> <li>Ch 1, PT-1-73 indicated on 1-M-4; directly affects the load reference Tref MCR indications are also reflected in the system responds to the Tref program low failure; <ul> <li>Steam Dump Cont Sys: will arm D solenoid, but dumps will not open since they are not armed;</li> <li>Rod Cont Sys: no-load value- 547°F value; Rods will insert</li> <li>SG Lvl Cont Sys: no-load value-~33% NR;</li> <li>Crew may <u>NOT</u> place FWC in MANUAL, but may monitor AUTO control establish/ control level at no-load value.</li> </ul> </li> <li>NOTE: The US may refer to AOP-C.01, Section 2.1, Continuous Rod Bank Movement Step 3.c will direct crew to AOP-I.08, Turbine Impulse Pressure Instrument Malfunction.</li> </ul>

# NRC 1009 ESG-6 Booth Instruction File

EVENT	IC/MF/RF/OR #	Description/Expected Actions/Booth Feedback
3.	IMF MS12D f:80 r240 k:3 {ZDIHS131}DMF MS12D	Lp #4 SG Atmos. Relief Valve Fails Open
		<u>Support staff report</u> : if dispatched, Security, AUO(s), report steam coming out of the top of West Valve Vault Room.
4.	IMF FW18A f:80 d:15 k:4 IOR ZAOPI4612 F:19.5 r:20 k:4	1A MFW Pump Hi Vibration w/ an oil leak at the pressure transmitter.
	IOR ZAOPI4617 F:165 r:15 k:4	<u>Support staff report</u> : When dispatched to investigate, wait ~3 minutes, report MFP vibration is 7.1 mils above baseline and slowly trending up; an oil line is leaking but is containable to this elevation/surrounding area.
		If dispatched, when requested, report as Engineering or Predictive Maintenance that local vibration is 7 mils above baseline
		<ul> <li>If Environmental Controls and/or Fire Protection personnel are dispatched, wait 5 minutes for each and report on station and implementing appropriate supporting actions.</li> </ul>
5.	N/A	Plant power reduction following MFP trip
		<u>Support staff report</u> : If requested, AUO(s) report Relay lights are dark- <b>NOT</b> armed.
6.	IMF FW20 f:50 k:6	<b>Feedwater line break in turbine building;</b> failure of common header, downstream of #1 FW Heater;
		<u>Support staff report</u> : If dispatched, AUO(s) report excessive steam and loud noise coming from the TB elevation near and above MF lines and areas around the FRVs.
7.	IMF FW07A f:1	1A-A MDAFW Pump Trip, electrical fault;
		<u>Support staff report</u> : when dispatched, wait 3 minutes and report AFW Pp Bkr has a faulty 50 relay and cannot be re-started;
7.	IMF FW09B f:1 IMF FW22B f:1 e:1 IMF FW07B f:1 d:180 e:1	1B-B AFW Pump AUTO-Start defeated; 1B-B Air-bound AFW Pump; 1B-B AFW Pump trip;
		1B-B AFW Pump is air-bound when the pump is started and indicates only no load current, no discharge flow; if AFW is required, no water will be added to S/Gs #3 & #4 until the pump is vented;
		<u>Support staff</u> : when dispatched, wait 4 minutes, report as TB AUO, the pump is hot to the touch, [pump be placed in P-T-L, for venting].

## NRC 1009 ESG-6 Booth Instruction File

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EVENT	IC/MF/RF/OR #	Description/Expected Actions/Booth Feedback	
7.	IMF FW22C f:1 e:1 IMF FW07C f:1 d:240 e:1	TDAFWP becomes air-bound when required to supply AFW flow and will trip ~4 minutes later.	
		Support staff report: SEE next line.	
When directed by Lead Examiner, perform the	DMF FW22C DMF FW07C	<b>TO VENT &amp; RESET</b> TDAFW Pump Mechanical Overspeed Trip & Airbound	
following:		To Vent: Delete TD Airbound & OvSpd TripTHEN,	
		<u>When directed by LEAD EXAMINER:</u> Report as AB AUO, notify the MCR that the TDAFW Pump has been vented and is ready to be reset, standing by [to receive direction to RESET]	
AND Insert k:17	IRF FWR27 f:0 k:17	TDAFWPp Ovr Spd Reset	
Termination Criteria: Lead Examiner direction when TDAFW Pump is restored prior to RCS Feed and Bleed initiation criteria.			



1009 ESG-6 Page 1 of 5

Unit 1 MCR CHECKLIST	Page 1.	of 3	Today
Part 1 - Completed by Off Mode 1, 76% Power PSA Risk: Green Grid Risk: Green	-going Shift / Reviewed I	by On-coming Shift NRC phone Author	entication <u>Code</u>
RCS Leakage ID .02 gpm, UNI	D .02 gpm	After 080	υ ΥΥΥΥ
	Common Teo	ch Spec Actions	
LCO/TRM - none -	Equipment INOP - none -	Time INOP	<u>Owner</u>
	U-1 Tech S	Spec Actions	
<u>LCO/TRM</u> - none -	Equipment INOP - none -	<u>Time INOP</u>	<u>Owner</u>
	Protected	l Equipment	
• - none -	Shift I	Priorities	
<ul> <li>Power was reduced to 70 Tech Spec concerns.</li> <li>Maintain current plant co</li> </ul>	6% Rx Power (73% Turb l Inditions until evaluation is	oad) ~36 hours ago for Incore I complete.	-lux Mapping for QPTR
Part 2 – Performed by on-c	coming shift		
Verify your current qualif	ications	Review Operating Log si days, whiche	nce last held shift or 3 ever is less
Standing Orders / Shift C	Orders 🛛 TACF	🛛 Imme	diate required reading
LCO Actions			
Part 3 – Performed by both	off-going and on-comir	ng shift	
Walk down of MCR Cont	rol Boards		

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1009 ESG-6 Page 2 of 5

SHIFT TURNOVER CHECKLIST	Page 2. of 3	Today
	MAIN CONTROL ROOM (7690)	
Train <u>B</u> Week		
	QUITSIDE (7666) (602 524 4)	
• All Equipment permet for europ	0013IDE (7006) [393-3214]	
• An Equipment normal for curren	t conditions	
	AUXILIARY BUILDING (7775)	
All Equipment normal for current	nt conditions	
<u>)</u>	PRINE DUU DUUG /7774) (FOR ALE	
All Equipment normal for current	t conditions	

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1009 ESG-6 Page 3 of 5

## SHIFT TURNOVER CHECKLIST

## Page 3. of 3

Today

Disabled Annunciators					
PANEL	WINDOW	ANNUNCIATOR	WO / PER Number		
		· · · · · · · · · · · · · · · · · · ·			

### Equipment Off-Normal (Pink Tags)

UNID And Noun Name	Panel	Problem Description	WO / PER Number

#### MCR WO LIST

ID And Noun Name	Panel	Problem Description	WO/PER Number
·			

#### 1009 ESG-6 Page 4 of 5

## UNIT ONE REACTIVITY BRIEF Date: Today Time: Now

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	1000000

RCS Boron: 1189 ppm	Today	BA Cor	ntroller Setpoint: 29% *	RCS B-10 Depletion: 2 ppm
Operable BAT: A	BAT A Boron: 685	<b>0</b> ppm	BAT C Boron: 6850ppm	RWST Boron: 2601 ppm
Nomina	Gallons per rod ste	p from 18	9: 17 gallons of acid, 75	gallons of water

\* Verify boric acid flow controller is set at Adjusted BA Controller Setting iaw 0-SO-62-7 section 5.1

Estimated values for a 1° Change in Tave \*\*

Gallons of acid: 22	Collopa of water: 04	Ded Otener 4
	Galions of water. 94	ROD STEDS: 1

Estimated rods/boron for emergency step power reduction \*\* (Assuming Xenon equilibrium and no reactivity effects due to Xenon. 2/3 total reactivity from rods, 1/3 from boron)

Power reduction amount	Estimated Final Rod Position	Estimated boron addition
10%	181 Steps on bank D	93 gallons
30%	161 Steps on bank D	291 gallons
50%	n/a	n/a

\*\* These values are approximations and not intended nor expected to be exact. The values may be superseded by Rx Engineering or SO-62-7 calculated values. These values are calculated assuming 100% steady state power operation only. Engineering data last updated <u>TODAY</u>. Data Valid up to three weeks from now.

### Previous Shift Reactivity Manipulations

Number of dilutions: 1	Number of borations:	Rod steps in:
Gallons per dilution: 12	Gallons per boration:	Rod steps out:
Total amount diluted: 12	Total amount borated:	Net change: IN/Out

Current Shift Estimated Reactivity Manipulations

**Remarks:** Rx Power ≈76% MWD/MTU – 1000 Xenon & Samarium at Equilibrium \*\*\*The boron letdown curve is flat for the next 25 EFPD.

Last Dilution Complete ~1 hour ago.

Next Unit 1 Flux Map is scheduled: three weeks from now

Unit Supervisor: \_

Name/Date

1009 ESG-6 Page 5 of 5

		Operat	IONS CHEF	msuy morma	lion	
_⊉			Boron	Results		
	Sample Point	Units	Boron	Date / Time	Goal	Limit
	U1 RCS	ppm	1189	Today / Now	Variable	Variable
	U2 RCS	ppm	816	Today / Now	Variable	Variable
	U1 RWST	ppm	2601	Today / Now	2550 - 2650	2500 - 2700
	U2 RWST	ppm	2569	Today / Now	2550 - 2650	2500 - 2700
	BAT A	ppm	6850	Today / Now	Variable	Variable
	BAT B	ppm	6850	Today / Now	Variable	Variable
L	BAT C	ppm	6850	Today / Now	Variable	Variable
	U1 CLA #1	ppm	2556	Today / Now	2470-2630	2400-2700
	U1 CLA #2	ppm	2575	Today / Now	2470-2630	2400-2700
	U1 CLA #3	ppm	2591	Today / Now	2470-2630	2400-2700
L	U1 CLA #4	ppm	2589	Today / Now	2470-2630	2400-2700
	U2 CLA #1	ppm	2531	Today / Now	2470-2630	2400-2700
	U2 CLA #2	ppm	2650	Today / Now	2470-2630	2400-2700
	U2 CLA #3	ppm	2522	Today / Now	2470-2630	2400-2700
	U2 CLA #4	ppm	2526	Today / Now	2470-2630	2400-2700
Ļ	Spent Fuel Pool	ppm	2547	Today / Now	<u>≥</u> 2050	<u>≥</u> 2000
		ithium Res	ults	- Turng training	Goal	Midpoint
	U1 RCS	ppm	1.1	Today / Now	>1	>1
	U2 RCS	ppm	2.43	Today / Now	2.18-2.48	2.33

Primary to Se	econdary L	eakrate In	formation (Total	CPM RM-90-9	9/119)
Indicator	Units	U1	Date / Time	U2	Date/Time
SI 50 S/G Leakage?	Yes/No	No	Today / Now	No	Today / Now
SI 137.5 CVE Leakrate	gpd	< 0.1	Today / Now	< 0.1	Today / Now
5 gpd leak equivalent	cpm	115	Today / Now	68	Today / Now
15 gpd (30 min increase)	cpm	265	Today / Now	83	Today / Now
30 gpd leak equivalent	cpm	490	Today / Now	206	Today / Now
75 gpd leak equivalent	cpm	1165	Today / Now	455	Today / Now
150 gpd leak equivalent	cpm	2290	Today / Now	870	Today / Now
CVE Air Inleakage	cfm	10	Today / Now	12.5	Today / Now
Bkgd on 99/119	cfm	40	Today / Now	40	Today / Now
Steady state conditions	are necessary	for an accurat	e determination of leak r	ate using the CVE	Rad Monitor

## **Operations Chemistry Information**



Appendix D		Scenario Outline Attachment
Op Test No.:	NRC	Scenario #6 Event #1 Page1 of4
Event Descriptior	n: Col	ld Leg Accumulator Nitrogen Leak.
Time	Position	Applicant's Actions or behavior
Simulator Op	erator: No a	ction required for Event 1
Alarms/Indica	ations	
Annunciate	or:	
1-M-6		
• 1-XA-5	5-6D Window	A-1, "PIS-63-126 ACCUMULATOR TANK 1 PRESSURE HI-LOW"
Indications	5	
• 1-PIS-6	3-128, 63-126,	, NO. 1 CL ACCUM PRESSURE indicates a lowering pressure
T = 0	Crew	Respond to 1-M-6 alarms in accordance with Alarm Response Procedures (ARPs)
	RO	Refer to ARP 1-AR-M6-D A-1:
		Probable Causes:
		1. Low pressure
		a. Possible nitrogen vent valve or accumulator safety valve leaking.
		b. Loss of accumulator inventory resulting in decreasing level.
	NOTE: T	he digital reading shall be used for the compliance instrument.
		Corrective Actions
		<ul><li>[1] CHECK CLA digital pressure indication on [1-PIS-63-128] and [1-PIS-6 126] (M-6).</li></ul>
		[2] IF CLA pressure is <624 psig OR >668 psig, THEN DECLARE the Accumulator inoperable.
		[3] ADJUST accumulator level and/or pressure in accordance with 1-SO-6 1, Cold Leg Injection Accumulators.
		[4] EVALUATE Technical Specifications, LCO 3.5.1.1 for applicability.
		<ol> <li>EVALUATE the following Tech Specs for applicability:</li> <li>3.5.1.1.d Cold Leg Injection Accumulators: A nitrogen cover-pressure of between 624 and 668 psig</li> </ol>

Appendix D			Scenari	o Outline			Atta	chme	nt 1
Op Test No.:	NRC	Scenario #	6	Event #	1	Page	_2	of	44
Event Description:	Co	Id Leg Accumulat	or Nitrogen	Leak.					

	Time	Position		Ar	oplicant's Actions or behavior					
			1	-SO-63-1, Cold Leg Ir	njection Accumulators					
		Sectio	on a	3.3 Adding Nitrogen t	o the Cold Leg Accumulators	:				
			CUC	Do not cross connect	t the Cold Leg Accumulator 1					
		CAUTION 2:		Each Cold Leg Accur	nulator shall be pressurized betwe	en 624 nsig				
			and 668 psig to comply with TS 3.5.1.1. The Accumulator safety relief							
			[1	] ENSURE Power Che	ecklist 1-63-1.01 complete.					
[2] ENSURE Valve Checklist 1-63-1.02 complete.										
			[3] ENSURE Valve Checklist 1-63-1.06 complete.							
-										
			[4	] VERIFY the following	y valves CLOSED:					
$\sim$				VALVE NUMBER	FUNCTION	INITIALS				
				1-FCV-63-107	No. 2 CL Accum N2 Supply Isol					
				1-FCV-63-87	No. 3 CL Accum N2 Supply Isol					
				1-FCV-63-63	No. 4 CL Accum N2 Supply Isol					
_			[5]	OPEN [1-FCV-63-64	N2 Supply to CL Accum.					
		NOTE 1: V	'erit ece	ying regulator output p essary to save time wh mulator	pressure in the following two steps m en restoring pressure on an inoperat	ay be waived if ble cold leg				
-		NOTE 2: If	nit ont	rogen regulator outlet	pressure is too low, Maintenance sho	ould be				
			[6]	IF Unit 1 nitrogen reg pressure indicated or greater than or equal	ulator 0-PCV-77-254 is OPERABLE, n 0-PI-77-272 (downstream of 0-PCV to 650 psig.	THEN VERIFY 777-254) is				
(										

Appendix D		Scenario Outline	Attachment *					
Op Test No.:	NRC	Scenario #6	Page <u>3</u> of <u>4</u>					
Event Descriptio	n: Co	d Leg Accumulator Nitrogen Leak.						
Time	Position	Applicant's Actions or behavio	or					
		[7] IF Unit 1 nitrogen regulator 0-PCV-77-254 is INOP ALIGN Unit 2 nitrogen regulator 0-PCV-77-253 to a accumulators as follows:	ERABLE, <b>THEN</b> supply U-1 cold leg					
		[a] OPEN [0-77-865A]						
		[b] VERIFY pressure indicated on 0-PI-77-269 (do 253) is greater than or equal to 650 psig.	wnstream of 0-PCV-					
	NOTE:	If CLA pressure is less than 600 psig, then temperature	monitoring is require					
		to prevent brittle fracture of nitrogen piping downstream 254.	of 0-PCV-77-253 or -					
		[8] IF Accumulator 1 pressure is less than 600 psig, <b>THEN PERFORM</b> the following during pressurization:						
		contact pyrometer.	[ <b>1-63-705]</b> using					
		[b] IF piping temperature approaches 40°F, THEN in close direction as necessary to maintain pipin than 40°F	THROTTLE [1-63-7 ng temperature grea					
		[c] WHEN CLA #1 pressure is greater than 600 ps temperature monitoring and OPEN [1-63-705]	ig, <b>THEN STOP</b> as desired.					
		[9] OPEN [1-FCV-63-127] No. 1 CL Accum N2 Supply nitrogen to accumulator.	Isolation to admit					
			Anne					
	NOTE: Tec	h Spec operability range for CLA pressure is 624-668 ps	ig.					
		[10] WHEN CLA #1 pressure increases to desired val	ue, <b>THEN</b>					
	·······	a. CLOSE [1-FCV-63-127].						
		b. CLOSE [1-FCV-63-64].						
		FULLY OPEN.	<b>KE [1-63-705]</b> is					
		d. IF [0-77-865A] was OPENED, THEN ENSURE CLOSED.	<b>[0-77-865A]</b> is					
•		1						
		END OF TEXT SECTION 8.3.1						

Appendix D	Appendix D Scenario Outline							nt 1	
Op Test No.:	NRC	Scenario #	6	Event #	1	Page	4	of	44
Event Description:	Col	ld Leg Accumulat	tor Nitroger	ı Leak.					

Time	Position	Applicant's Actions or behavior
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		<u>Operations Management</u> - Typically Shift Manager. <u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).
Lead Examin identified.	er may cue n	ext event when the CLA line up is returned to normal and Tech Specs are

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Appendix [	)	Scenario Outline	Attachment 1					
Op Test No.:	NRC	Scenario #6_ Event #2	Page5 of4					
Event Descript	tion: Firs	t Stage Pressure Transmitter PT-1-73 Fails High.						
Time	Position	Applicant's Actions of Date						
Simulator	Decretor: M/be	Applicant's Actions or Bena	avior					
Alarms/Indi Annunc 1-M-5 • 1-XA	-55-5A C-6, "TS-	68-2P/Q REAC COOL LOOPS T REF T AUCT HIGH-LO	OW"					
Indication 1-M-4 • Auto 1-M-5	ons matic Control Re	od motion						
• 1-TR T = 10	-68-2B, RCS/TUF Crew	BINE TEMP Respond to 1-M-5 alarms in accordance with Ala (ARPs)	rm Response Procedures					
	RO	Identifies automatic control rod motion with no runback in progress, position Rod Control Handswitch 1-HS-85-5110 to MANUAL						
	BOP/RO	Refer to ARP 1-AR-M5-A C-6						
	SRO	Direct entry to: AOP-C.01, Rod Control System Malfunctions, Se Bank Movement <b>OR</b> AOP-I.08, Turbine Impulse Pressure Instrument I	ect 2.1, Uncontrolled Rod Malfunction					
		AOP-C.01, Rod Control System Sect 2.1, Uncontrolled Rod Ba	Malfunctions ank Movement					
	NOTE: Step	1 is an immediate action step.						
	RO	<ol> <li>STOP uncontrolled rod motion:         <ul> <li>a. PLACE rod control in MAN.</li> <li>b. CHECK rod motion STOPPED.</li> </ul> </li> </ol>						
	CAUTION:	Control Rods should NOT be manually withdrawr	n during a plant transient.					
	RO/BOP	2. CHECK for plant transient:						
	RO	a. CHECK reactor power and T-avg STABLE	Ξ.					
	Crew	3. <b>CHECK</b> for instrumentation malfunction:						
	RO	a. CHECK nuclear instrumentation OPERAE	BLE.					

Appendix D		Scenario Outline					Atta	chme	nt 1
Op Test No.:	NRC	Scenario #	6	Event #	2	Page	6	of	44
					lign.			<i></i>	
Time	Position			Applicant's	Actions or Be	havior		<u></u>	
	RO	b. CHE	CK RCS	RTDs OPER	ABLE			<u></u>	
	BOP	c. CHE (RNO requi	CK turbi ired)	ne impulse pre	essure chanr	nels OPER/	BLE.		
	SRO	<b>RNO:</b> c. <b>GO TO</b>	AOP-1.08	3, Turbine Imp	ulse				
		AOP		hino Impuloo	Process in a		- 1 <i>C</i>		
		Section	2.1 Unit	1: Failure of	Turbine Imp 1-P-1-73	ulse Press	viaitun ure Ins	strum	ent
	RO/SRO	1. ENSUR	E control	rods in MANU	JAL.	0.1.0.1			
	NOTE: Lo	oss of Instrume elow 33%.	ent Powe	r to S/G level	setpoint prog	gram input v	vill driv	e setp	oint
	BOP	2. EVALUA S/G leve	ATE plac Is on pro	ing main feedv gram	water reg val	ves in MAN	UAL to	main	tain
		Based on N	OTE and	secondary pla	ant evaluatio	n, FRVs rer	nain in	AUTO	)
		3. ENSURI	E steam	dumps in stea	m pressure r	node:			
		a. PLA	CE stear	n dump FSV h	andswitches	in OFF.			
		b. PLA	CE stean	n dump mode	selector in S		SS mo	de.	
		c. <b>ENS</b>	URE zer	o output (dem	and).				
		d. PLA	CE stean	n dump FSV h	andswitches	in ON.			
		e. ENS	URE stea	am dump cont	roller setpoir	nt at 1005 p	sig.		
	SRO	4. EVALUA • 3.3.1.1, Ro Functiona Chamber w/ less tha	ATE the f eactor Tri al Unit 22 Pressure an Minimu	ollowing Tech o System Instru E: Reactor Tr o, P-13 - ACTIO m Number of C	Spec for appropriation System Internation Space System Internation 8.5: React Channels OPE	plicability terlocks, Tu tor Trip- Tur RABLE, dec	rbine In bine Tr are the	npulse ip; interlo	e ck
		inoperable an OPERABLE o	d verify th or apply th	at all affected c e appropriate A	channels of the ACTION stater	e functions li nent(s) for th	sted bel lose fun	ow are ctions	; 
	RO	5. <b>DETERN</b> Figure 3	INE Pro	gram T-avg fo NSSS / BOP, I	or current rea Program Rea	ictor power actor Avera	<b>USING</b> ae Tem	TI-28 perat	ure).

Appendix D		Scenario Outline Attachment						
Op Test No.:	NRC	Scenario #6 Event #2 Page7 of4						
Event Descriptio	on: Fin	st Stage Pressure Transmitter PT-1-73 Fails High.						
Time	Position	Applicant's Actions or Behavior						
	RO	<ol> <li>RESTORE T-avg to within 1°F of program value USING one of the following:</li> </ol>						
		POSITION control rods     OR						
		ADJUST turbine load     OR						
		ADJUST RCS boron concentration.						
	NOTE:       If performing this AOP in conjunction with AOP-I.11 for Eagle LCP failure, SRO determines NOTE is N/A         7       NOTIEX I&C to perform Appondix A. Pomoving Unit 1 Turking land							
	Crew	Pressure Loop 1-P-1-73 from Service.						
	Crew	8. INITIATE Maintenance on 1-P-1-73.						
	SRO	9. GO TO appropriate plant procedure.						
		END OF SECTION						
Evaluator No	te: The follo	ving CREW Brief and Notification actions are not contained in the procedure.						
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.						
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by t procedure or in the CREW brief.						
		Operations Management - Typically Shift Manager.						
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note:						

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Appendix D		Required Operator Actions Form ES-D-							
Op Test No.:	NRC	Scenario # <u>6</u> Event # <u>3</u> Page <u>8</u> of <u>4</u>							
	on: Lp #	#4 SG Atmos. Relief Valve Fails Partially Open							
Time	Position	Applicant's Actions or Behavior							
Simulator O	perator: Whei	n directed, initiate Event 3							
Indications/	Alarms								
Annuncia	itor:								
• 1-XA-	55-5A, A-6, "TS C-6, "TS	3-68-2M/N RC LOOPS T AVG/AUCT T AVG DEVN HIGH-LOW" 3-68-2P/Q REAC COOL LOOPS T REF T AUCT HIGH-LOW"							
1-M-6									
• 1-XA-	55-6B, D-7, "FS	3-3-103B STM GEN LOOP 4 STEAM/FEEDWATER FLOW MISMATCH"							
Indication	IS								
1-M-4									
<ul> <li>1-FI-3</li> <li>1-FI-1</li> </ul>	-103A, 103B SG -28A. 28B SG-4	-4 FW INLET FLOW CH-1, CH-2 indicating increasing flow (compared to SGs 1-3) STEAM FLOW CH-1, CH-2 indicating increasing flow (compared to SGs 1-3)							
1-M-5									
• 1-TR-0	68-2B RCS/TUR	BINE TEMP recorder shows RCS temperature deviating from reference temperature							
Significant F	Resultant Aları	ms/Indications:							
Auton	natic Control Ro	od motion in response to Secondary-to-Primary temperature mismatch							
T + 35	Crew	Respond to 1-M-5 & 6 alarms in accordance with Alarm Response							
	BOP/RO	Identifies ARP 1-AR-M5-A A-6, C-6 acknowledges alarm and, notifies SR							
	SRO	Acknowledges and enters AOP-S.05, Steam Or Feedwater Leak							
		AOP-S.05, Steam Or Feedwater Leak							
	Crew	1. MONITOR personnel safety:							
	Crew	MONITOR personnel safety:     a. IF steam or feedwater lines need to be immediately isolated to     protect personnel, THEN PERFORM the following:							
	Crew	<ol> <li>MONITOR personnel safety:</li> <li>a. IF steam or feedwater lines need to be immediately isolated to protect personnel, THEN PERFORM the following:         <ol> <li>TRIP the reactor.</li> </ol> </li> </ol>							
	Crew	<ol> <li>MONITOR personnel safety:         <ul> <li>a. IF steam or feedwater lines need to be immediately isolated to protect personnel, THEN PERFORM the following:</li></ul></li></ol>							
	Crew	<ol> <li>MONITOR personnel safety:         <ul> <li>a. IF steam or feedwater lines need to be immediately isolated to protect personnel, THEN PERFORM the following:</li></ul></li></ol>							
	Crew	<ol> <li>MONITOR personnel safety:         <ul> <li>a. IF steam or feedwater lines need to be immediately isolated to protect personnel, THEN PERFORM the following:</li></ul></li></ol>							
	Crew	<ol> <li>MONITOR personnel safety:         <ul> <li>a. IF steam or feedwater lines need to be immediately isolated to protect personnel, THEN PERFORM the following:</li></ul></li></ol>							

	Appendix D		Required Operator Actions Form ES-D-2							
C.	Op Test No.:	NRC	Scenario #         6         Event #         3         Page         9         of         44							
	Event Description	n: Lp‡	4 SG Atmos. Relief Valve Fails Partially Open							
	Time	Position	Applicant's Actions or Behavior							
		RO	2. MONITOR steam generator levels STABLE on program.							
	Evaluator No	<b>te:</b> BOP ac will clos	tion to place 1-HS-1-31, SG-4 ATM RELIEF VALVE CONTROL to CLOSE and e the #4 SG Atmospheric Relief Valve							
		BOP	3. CHECK the following:							
			S/G atmospheric relief valves CLOSED							
			(RNO required)							
			steam dumps CLOSED.							
		BOP	RNO: IF any S/G atmospheric relief valve or steam dump is leaking or failed open, THEN CLOSE valve(s) USING MCR switch							
			IF any valve CANNOT be closed N/A							
			4 CHECK main turbine on line							
			5. <b>MONITOR</b> the following:							
			reactor power STABLE							
			<ul> <li>reactor power less than or equal to 100% (3455 MWt).</li> <li>(RNO if required)</li> </ul>							
			RNO: REDUCE turbine load as necessary to maintain reactor power less than or equal to 100% (3455 MWt).							
		RO	<ol> <li>MONITOR T-avg within 3°F of T-ref.</li> <li>(RNO if required)</li> </ol>							
an a		SRO/ BOP	<b>RNO:</b> <b>REDUCE</b> turbine load as necessary to maintain T-avg within 3°F of T-ref (or program value).							
: Same		SRO	IF T-avg CANNOT be maintained within 5°F of T-ref (or program value), THEN PERFORM the following:							
		RO	a. TRIP the reactor							
		BOP	b. WHEN reactor is tripped, THEN CLOSE MSIVs.							

	Appendix D		Re	quired C	perator Action	ons Form ES-D-2					
C .	Op Test No.:	NRC	Scenario #	6	Event #	3	Page	10	of	4	
	Event Descriptio	n: Lp#-	4 SG Atmos. Re	elief Valve	Fails Partially Op	en	3				
	Time	Position			Applicant	s Actions or Beha	vior				
		Crew	c. <b>GO</b>	<b>TO</b> E-0,	Reactor Trip	or Safety Injection	on.				
	Evaluator No	ote: remaining crew actio	g Steps 7-14 ons.	should	be 'check/ver	ify' actions bas	sed on e	xpecte	d previou	us	
		NOTE: Tec	h Spec LCO	3.6.1.4 i	s applicable if	containment pre	essure ex	ceeds	0.3 psig.		
		RO 7. MONITOR containment pressure STABLE									
				-,							
		Crew	Steps 8-14								
			15. EVALU	ATE act	ions required t	o restore plant t	o normal.				
			16. <b>Go</b> to a	ppropria	te plant proced	dure.			,		
por a					END	OF SECTION	*				
	Evaluator No	ote: The fo	llowing CRE\ lure.	N Brief a	Ind Notification	n actions are not	t containe	d in the	Э		
			CREW Brid	<b>ef</b> would event.	typically be co	nducted for this	event as	time a	llows prio	۶r	
			Notificatio addressed	<b>ns</b> shoul by the pr	d be addresse ocedure or in	d as applicable the CREW brief	if not spe	cifically	1		
			<b>Operations</b>	Manage	ment - Typical	lly Shift Manage	r.				
			Maintenance (Note: Main	e Perso ntenance	nnel – Typicall notification m	y Maintenance a ay be delegated	Shift Supe	ervisor hift Ma	(MSS). nager).		
	Lead Examin is stable.	er may cue ne	xt event wh	en Atmo	spheric Relie	f Valve is close	ed and R	CS ten	nperature	e	

C

Appendix D		Re	****	Form ES-I					
Op Test No.:	NRC	Scenario #	6	Event #	4	Page	11	of	
Event Descript	ion: 1A	Main Feedwater	Pump Higl	า Vibration - Manua	al Trip required				
Time	Position			Applicant's	Actions or Beh	avior			
Simulator C Indications Annunci 1-M-5 • 1-XA Indicatio • ICS 1 Actic	Dperator: When /Alarms ator: -55-3B, B-5, "Th ns: ferminal: Secor	n directed, in IRUST PRETR Indary Mimics→	IP OR VI	ent 4 BRATION EXCE ED PUMPS-→CI	SSIVE"	'lcon (MFF	2 "A" ∣	RUN C	) U
Significant • 1-XA T = 30	Resultant Alari	ms/Indication AIN FEEDWAT	ER PUM	P TURBINE 1A	ABNORMAL"	arm Respo	nse Pr	ocedu	114
	Crew	(ARPs)							
	BOP/RO	Identifies Al	RP 1-AR	-M3B B-5, ackr	nowledges a	arm and, r	notifies	SRO	
	SRO	Acknowledg	jes and	implements AR	P actions				
		ARP 1-AR-I	M3B B-5						
		Probable C	auses:						
		1. Turbine of 2. Turbine of 3. Thrust bo 4. Loss of p	or pump s mechanic earing me cower to E	eal malfunction. al failure. chanical failure. Sently Nevada Pa	nel.				
		Excessive 1. Rotor Inte 2. Low Oil T 3. Bearing F 4. Loose Pa 5. Turbine v	Vibratio palance emperatu failure rts/Turbin ibration c	<u>n:</u> ire e Blading arry through.					
	NOTE 1: ICS the l	6. Excessive can be used t Electrical Rune	e Moisture o detern out value	e in Steam nine baseline vi e given on ICS.	bration data.	The baseli	ne cor	respoi	nc
	NOTE 2: Loca valu	al Bently-Neva es.	ida pane	I should be use	ed to determir	ne thrust be	earing	or vibi	rat

	Appendix D		Required Operator Actions Form ES-D-2								
Constant of the second	Op Test No.: Event Descriptic	NRC	Scenario # <u>6</u> Event # <u>4</u> Page <u>12</u> of <u>44</u> <i>N</i> ain Feedwater Pump High Vibration - Manual Trip required								
	Time	Position	Applicant's Actions or Behavior								
		NOTE 3: Bent wear (Aler	tly Nevada thrust bearing monitor will trip the MFPT on high thrust bearing r setpoint of 10 mils above baseline (forward movement only) with 2/2 logic. rt value is 7 mils above baseline.)								
		NOTE 4: MFV exce	<b>NOTE 4:</b> MFW pump and turbine bearing vibration on Bently-Nevada panel should not exceed 5 mils above baseline (Alert value is 3 mils above baseline.)								
			ARP Corrective Actions:								
	Evaluator No	ote: Once the reports v trip and	e crew has demonstrated the ability to determine MFP vibration severity, field will present an oil leak plus the vibration situation requiring a manual 1A MFP entry into AOP-S.01.								
		Applicat	ble section of AOP-S.01, Loss of Normal Feedwater follows this event guide.								
			[1] IF MFP trips, THEN GO TO AOP-S.01, Loss of Normal Feedwater								
G											
			[2] OBSERVE windows (A-1) or (B-1) to determine which MFPT is affected								
			[3] CHECK ICS, Secondary Mimics, MFP Bearing Data to determine the affected MFWP.								
			[4] IF Excessive Thrust Bearing wear is indicated, N/A								
			[5] IF Excessive Turbine Vibration is indicated. THEN								
			[a] DISPATCH operators to affected MEPT to perform the following:								
			CHECK local vibration indication on Bently-Nevada     panel (Refer to GOI-6, Apparatus Operations).								
			<ul> <li>CHECK for abnormal noises or other indications of problem.</li> </ul>								
C											
			[b] :MONITOR turbine vibration on ICS, Secondary Mimics, MFP Bearing Data.								
l											

		Re	quired C	perator Actions			Form ES-D					
Op Test No.:	NRC	Scenario #	6	Event #	4	Page	13	of				
Event Description	: 1A	Main Feedwater	Pump Hig	h Vibration - Manua	Il Trip required							
Time	Position			Applicant's	Actions or Beh	avior						
		[c] IF lo Pre	ocal vibra dictive M	ation indication laintenance and	at or above A I Engineering	lert value, for assista	THEN ince.	CON				
		[d] IF v bas	[d] IF vibration problem valid AND vibration exceeding 5 mils above baseline, THEN REMOVE MFWP from service using one of the following:									
O-GO-5, Normal Power Operation     OR     AOD C 02, Desid Studyness I, 10, 1, 11												
		• #	AUF-0.03, Rapid Shuldown of Load Reduction.									
		If the crew elects to trip 1A MFP, the SRO should enter AOP-S.01, Main Feedwater Malfunctions Section 2.7, Main Feedwater Pump Trip Below 70 Turbine Load.										
		Following A	OP-S.0 <sup>7</sup>	1 performance.	the crew will a	conduct a	brief					
Evaluator Not	e: The follow	wing CREW B	rief and	Notification action	ons are not co	ontained in	the pr	ocedu				
		CREW Brie to the next	e <b>f</b> would event.	typically be con	ducted for thi	s event as	time a	llows				
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.										
		Operations Maintenanc ( <b>Note:</b> Mair	Manage e Perso ntenance	<u>ment</u> - Typically <u>nnel</u> – Typically notification ma	<ul> <li>Shift Manage</li> <li>Maintenance</li> <li>y be delegate</li> </ul>	er. Shift Sup d to the S	ervisor hift Ma	(MSS				

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	Appendix D	Required Operator Actions						Form ES-D-2				
<u> </u>	Op Test No.:	NRC	Scenario #	6	Event #	4	Page	14	of	44		
	Event Description:	1A Main Feedwater Pump High Vibration - Manual Trip required										

Time	Position	Applicant's Actions or Behavior
		AOP-S.01, Main Feedwater Malfunctions
	Section 2	2.7, Main Feedwater Pump Trip Below 76% Turbine Load
	Crew	SRO directs AOP-S.01 Section 2.7 implementation
		[1] <b>MONITOR</b> at least one MFW pump RUNNING.
		[2] ENSURE running MEW nump loads as required
		[3] CHECK feedwater flow greater than steam flow.
		RNO:
		IF steam flow reduction is needed, THEN PERFORM the following:
		a. <b>REDUCE</b> turbine load <b>USING</b> valve position limiter.
		b. ENSURE control rods inserted as necessary to match T-avg and T-
		ref.
		[4] <b>MONITOR</b> steam generator levels returning to program level.
		(RNO required)
		RNO: REPEORM the following:
		a IF any MEW Requalive is in ALITO AND controller deviation is off-
		scale high with level above program, <b>THEN PLACE</b> affected MFW
		Reg valve controller(s) to MANUAL and back to AUTO to reset output.
	······································	b. IF manual control of MFWP speed or feed reg valve position is
		needed, THEN PERFORM the following as necessary:
		ADJUST running MFWP speed
		OR
		ADJUST MFW Reg valve position.
·		× · ·

Appendix D	Required Operator Actions							Form ES-D-		
Op Test No.:	NRC	Scenario #	6	Event #	4	Page	15	of		
Event Description:	1A	Main Feedwater	Pump High	Vibration - M	anual Trip required					
Time	Position			Applica	nt's Actions or Beh	avior				
	Section	AOP-S.0	1, Main F	eedwater	Malfunctions					
	Gection	c. IF re reac	actor trip tor and C	is imminen	t due to low S/G Reactor Trip or S	level, <b>THE</b> Safety Injec	N TRIP	the		
		d. WHE placi AUT	<b>EN</b> S/G le ng MFW O.	evels are sta P speed co	able and on prog ntrols and MFW	ram, <b>THEN</b> Reg valve	I EVALI	JATE ers in		
		[5] CHECK (RNO requ RNO:	(reactor <i>ired</i> )	power less	than 60%.					
		ENSURE a valves CLC	ffected M SED:	lain Feedwa	ater Pump Turbin	e Condens	ser isola	ition		
		• F • F • F	<sup>-</sup> CV-2-20 <sup>-</sup> CV-2-21	5, Condens 0, Condens	ate Inlet ate Outlet					
		b. MFV	VP B							
		• 1	-CV-2-21 -CV-2-21	1, Condens 6, Condens	ate Inlet ate Outlet					
		[6] ENSUR	E unit is	returning to	stable condition	S				
		[7] DISPAT	CH pers	onnel to inv	estigate MFW pu	ump trip.				
		[8] CHECK	C-7 LOS	SS OF LOA	D permissive DA	RK. [M4A,	window	' E-5]		
		[9] CHECK	valve po	sition limit l	ight DARK. [M-2	2]				

	Appendix D		F	Form ES-D-2								
(	Op Test No.:	NRC	Scenario #	6	Event #	4	Page16644					
	Event Description	on: 1A	Main Feedwate	er Pump Hig	h Vibration - Manua	al Trip required						
	Time	Position			Applicant's	Actions or Beh	avior					
		Section	AOP-S. 2.7, Main Fo	01, Main eedwater	Feedwater Mal Pump Trip Bel	functions ow 76% Turk	bine Load					
			RNO: RESTOR	E turbine	controls as nece	essary USING	Appendix B.					
	Evaluator N	ote: Append	lix B, Turbin	e Runbac	k Restoration fo	llows this eve	nt guide.					
		NOTE: To e whe	ensure unit i en determinii	s within ca ng final po	apacity of one M ower level:	FWP, the foll	owing should be considered					
		<ul> <li>Power should be reduced below 60% (if all cond booster pumps and heater drain tank pumps in service) or 55% (if two cond booster pumps in service).</li> </ul>										
		Less than or equal to 90% controller output should be maintained on running     MFWP										
en la compañía de la comp			[10] <b>IN</b>	ITIATE lo	ad reduction as	required <b>USI</b>	<b>NG</b> 0-GO-5.					
	<b>Evaluator Note:</b> Power reduction is controlled by rod motion and turbine load change. Once the desired plant load reduction (in this case 10-15%) is complete, the crew would assess reactor core distribution limits to determine boration control/changes. 0-SO-62-7, Boron Concentration Control is used to determine and control boron concentration changes required to manage these limits (specifically GO-5 Precautions 3.1 'O' and 'P'). Portions of Go-5 and											
		CALITICAL										
		CAUTION:	challenge r	eration at	control due to	els for exten kenon chang	ded periods may les.					
			[11] <b>C</b> ł	IECK Rea	actor power grea	ater than 5%.						
·			[12] <b>IN</b>	TIATE re	pairs on affected	d equipment						
			[13] <b>G</b> (	<b>) TO</b> appr	opriate plant pr	ocedure						
				, 	END	OF SECTIC	)N					
en e	Evaluator No	ote: SRO/CRE a brief at	W should i this time.	nsure rea	actor power is a	stable per A0	DP-S.01 and may conduct					
Section of Contract	Lead Examir	ner may cue no	ext event w	hen the C	REW has stab	ilized plant p	ower.					

Appendix	opendix D Required Operator Actions						Form ES-D-2					
Op Test No Event Desc	.: <u>NR</u> e	C Scenario # 1A Main Feedwater P	6 ump High	Event #	4 al Trip required	Page	17	of	44			
	SQN	MAIN FE	EDWAT	ER MALFUNCT	TIONS	AOP-S Rev. 16	.01					

Page 1 of 1

## APPENDIX B

### TURBINE RUNBACK RESTORATION

NOTE	This appendix is used to remove turbine from valve position limiter prior to starting load reduction following a BOP runback.	
[1]	ENSURE governor valve tracking meter centered close to ZERO.	
[2]	DEPRESS [TURB MANUAL] mode selector pushbutton.	
[3]	VERIFY [TURB MANUAL] lamp LIT.	
[4]	VERIFY reference and setter counters stabilize.	
[5]	ENSURE governor valve tracking meter centered close to ZERO.	
[6]	DEPRESS [OPER AUTO] mode selector pushbutton.	
[7]	VERIFY [OPER AUTO] lamp LIT.	
[8]	VERIFY reference and setter counters stabilize.	
[9]	IF VALVE POS LIMIT light is LIT, THEN REDUCE turbine load reference using SETTER UNTIL VALVE POS LIMIT light is DARK.	

	Appendix D		Required Operator Actions						Form ES-D				
94. 	Op Test No.: Event Descriptio	<u>NRC</u> n: Plar	Scenario # nt Power Reductio	6 on	Event #	5	Page	18	of4				
	Time	Position			Applicant's	Actions or Beh	avior						
ļ.	Simulator Op	perator: No ad	ctions for Eve	ent 5, Pla	int Power Red	duction							
	Alarms/Indic	ations availat	ons available: none										
	Evaluator No	ote: Due to reducti Step 15 Operate	current cond on, the first s 5.3, below. or information	itions an tep actu n on how	id if the crew ally performe ( to conduct f	chooses to p ed is in Section the load redu	perform a con 5.3 Step	0-GO-5 o 14 thr contain	power ough ed in				
-	T = 40	NOTES	prior to Sect	101 5.3 5	steps 1 and 7	; they follow:							
		0-GO-5 Secti	ion 5.3 Step 1	NOTES									
					NOTES		· · · · · · · · · · · · · · · · · · ·						
		1) This s portion condit with S	<ol> <li>This section may be used to reduce power to ~30% during plant shutdown OR a portion of this section may be performed to reduce power as required by plant conditions. Steps which are not required for partial load reduction may be marked N/A with SM concurrence as specified by SPP-2.2.</li> </ol>										
- 		2) Apper conde mainte	ndix D provides insate pressure enance.	guidance if second	e on recommen lary plant equir	ded power val oment must be	ues to main removed fr	tain om serv	ice for				
		3) Steps	5.3[2] through	5.3[6] ma	y be performed	d out of sequer	nce.						
		0-GO-5 Secti	on 5.3 Step 7	NOTES:									
		1) Guidance on restoration of EHC Control: Appendix B, <i>Turbine Runback Restoratio</i>				ols after a BOP runback is contained in tion. [c.4]							
		2) For co or unu	re operating re sual power ma	commend neuvers,	lations for situa contact Reacto	ations such as r Engineering	end of core for guidanc	life coa e. [c.5]	st down				
		3) It is re	commended th	at AFD be	e controlled wit	hin the target I	oand.						
		4) The fo (a) bor match (c) per AFD n control (e) rep	Ilowing general rate RCS to red TREF with TAVG iodically take ro ear the target v I AFD, and weat the above a	l approact luce RCS od control /alue, (d) as necess	h should be us T <sub>AVG</sub> within lin to MANUAL fr return rod cont sary to accomp	ed during pow hits of T <sub>REF</sub> , (b) rom AUTO and rol to AUTO w lish the load cl	er reduction reduce turb l insert the I hen not usi hange.	: ine load bank to i ng the b	l to move ank to				
		5) Action shall b or wate	s effecting read e adhered to fo er). All approp	tivity are or reactivit riate verifi	directed in the ly changes (i.e. ications and pe	following step. . reactivity bala er checks sha	0-SO-62-7 ince, amou Il be utilized	7 require nts of bo I during	ements pric acid				

	Appendix D Required Operator Actions							Form ES-D					
C.	Op Test No.:	NRC	Scenario #	6	Event #	5	Page	19	of	44			
And a second	Event Description:	Pla	ant Power Reduction	on									

	Time	Position	Applicant's Actions or Behavior				
	Evaluator No	ote: Accordi	ng to AOP S.01 Section 2.7 Step 10 NOTE:				
		NOTE: To cor	ensure unit is within capacity of one MFWP, the following should be nsidered when determining final power level:				
		•	Power should be reduced below 60% (if all cond booster pumps and heater drain tank pumps in service) or 55% (if two cond booster pumps in service).				
		•	Less than or equal to 90% controller output should be maintained on running MFWP				
		CREW	Load reduction as required USING 0-GO-5, NORMAL POWER OPERATION, Section 5.3 Power Reduction From 100% to 30%				
			NOTE				
Turbine Impulse pressure relay lights are located on L-262.Relay lights are dark who relays are NOT armed. Relay No. 4 is a spare.							
for the second s			[14] WHEN turbine load less than 71% (Unit 1) 72% (Unit 2), THEN PERFORM one of the following (N/A substep not performed):				
			[14.1] VERIFY Turbine Runback circuits are NOT armed by performing the following:				
			<ul> <li>A. ENSURE [PIS-47-13RLY1], (Turbine runback from MFP loss) is NOT LIT.</li> </ul>				
			B. ENSURE [PIS-47-13RLY2], (Turbine runback from No. 3 HDT) is NOT LIT.				
			C. ENSURE [PIS-47-13RLY3], (Closure of LCV-6-106B from Loss of any #3 HDTP) is NOT LIT.				
			[14.2] <b>VERIFY</b> Turbine Runback circuits are NOT armed by performing the following:				
-			A. ENSURE [FU2-47-13A], (Turbine runback from MFP loss) REMOVED (Aux Inst Rm. R71).				
			B. ENSURE [FU2-500-R071K3], (Turbine runback from No. 3 HDT) REMOVED (Aux Inst Rm R-75).				
			C. ENSURE jumper between P18-1 and P18-2 in Pnl 262, (Closure of LCV-6-106B from Loss of any #3 HDTP) REMOVED.				

Appendix D		Re	quired O	perator Actions	5		Form ES-I			
Op Test No.: Event Descriptior	<u>NRC</u>	Scenario # nt Power Reduct	<u> </u>	Event #	5	Page	_20	of		
Time	Position			Applicant's	Actions or Bel	navior				
	Valves LC load redu	V-6-106A and ction.	1 106B st	CAUTIO	N to be controll	ing proper	ly duri	ng uni	t	
		×=		NOTES						
	1) If hold may t	may be left running.								
	2) Shutd #3 he tank p	iown of the con ater drain purr pumps to pump	ndensate Ips should Inforward.	demineralizer b be based upor	ooster pumps header press	and Sure and abi	lity of t	he dra	in	
	3) This s	step may be de	eferred if p	performing load	reduction for /	\OP-S.01 o	r AOP-	S.04.		
	4) Steps	5.3[15] throug	jh 5.3[20]	may be perform	ned out of seq	uence				
		[15] <b>WHEN</b> followin	[15] WHEN between 55 to 70% turbine load, THEN PERFORM the following:							
		[15.1] SIMULTANEOUSLY STOP both operating cor demineralizer booster pumps in accordance with (N/A if NOT in service).							/3	
		[15.2] <b>(</b> (N//	<b>/ERIFY</b> A metho	#3 HDT runba d NOT used)	ack NOT arr	ned by en	ensuring either			
		Ste OR	p 5.3[14	.1]B complete	d					
		Ste	p 5.3[14	.2]B complete	d.					
		[15.3] <b>S</b> acc	<b>STOP</b> or ordance	ne of the three with 1,2-SO-{	#3 heater c 5-2.	Irain tank	pump	s in		
Evaluator Not	e: Due to o reductio would e decisio	current cond on, the first s and point be n based on s	itions ar step perf here, Ste secondar	nd if the crew ormed is Sect op 15.3. Takin y plant flows	chooses to p ion 5.3 Step g the HDT P and pressur	perform a ( 14. The p ump out w es.	0-GO-: ower i vould i	5 pow reduc be an	ei tie S	
Evaluator Not	e: The follow	ing CREW B	rief and N	Notification action	ons are not c	ontained in	the pr	rocedu	Ire	
		CREW Brie	<b>f</b> would t	ypically be con	ducted for th	is event as	time a	llows	pr	

	Required Operator Actions								
NRC	Scenario # <u>6</u> Event # <u>5</u> Pag	ge <u>21</u>	of	44					
ı: Pla	nt Power Reduction								
Position	Applicant's Actions or Behavior								
	<b>Notifications</b> should be addressed as applicable if not addressed by the procedure or in the CREW brief.	specifical	ly						
	Operations Management - Typically Shift Manager								
	<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). ( <b>Note:</b> Maintenance notification may be delegated to the Shift Manager)								
	NRC Pla Position	Required Operator Actions         NRC       Scenario #       6       Event #       5       Page         Plant Power Reduction       5       Page       10       Page       10       Page       10       Page       10       Page       10       Page       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10	Required Operator Actions       Formation         NRC       Scenario #       6       Event #       5       Page       21         Plant Power Reduction       Plant Power Reduction       Position       Applicant's Actions or Behavior         Position       Applicant's Actions or Behavior       Operations should be addressed as applicable if not specifical addressed by the procedure or in the CREW brief.         Operations Management       - Typically Shift Manager.         Maintenance Personnel       - Typically Maintenance Shift Supervisor         (Note: Maintenance notification may be delegated to the Shift Manager.	Required Operator Actions       Form ES         NRC       Scenario #       6       Event #       5       Page       21       of         Plant Power Reduction       Position       Applicant's Actions or Behavior         Position       Applicant's Actions or Behavior         Notifications should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.       Operations Management - Typically Shift Manager.         Maintenance Personnel – Typically Maintenance Shift Supervisor (MSS (Note: Maintenance notification may be delegated to the Shift Manager)					

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				Form ES-D					
Scenario #	6	Event #	5	Page	22	of	44		
ant Power Reduct	ion					_			
3	int Power Reduct	Int Power Reduction							

Time	Position	Applicant's Actions or Behavior
		0-SO-62-7, Boron Concentration Control Section 6.4, Borate
Evaluator No	ote: Power red 2.7 (in this controlling Concentra required t	duction to the desired plant load reduction as directed by AOP-S.01 Section s case 10-15%) is complete. GO-5 Precautions 3.1 'O' and 'P' direct g reactor core distribution limits and control rod height. 0-SO-62-7, Boron ation Control is used to determine and control boron concentration changes to manage these limits.
	Crew	SRO directs 0-SO-62-7 Section 6.4 implementation.
	CAUTION:	Returning the Boric Acid Blender to service after unplugging, cleaning, or maintenance on Boric Acid System could introduce debris, sludge, air or solidified boron into CCP suction resulting in pump damage. Extreme care must be exercised to properly flush the Boric Acid piping following an outage. [C.2]
	NOTE: If a ene and acco pres	large amount of boration is required (plant shutdown), Pzr heaters should be rgized to cause spray operation for equalizing boron concentration in RCS pressurizer. If Normal Spray is NOT available, then this should be omplished by use of Auxiliary Spray (1, 2-SO-62-1) in conjunction with ssurizer backup heaters.
		<ol> <li>ENSURE makeup system aligned for AUTO operation in accordance with Section 5.1.</li> </ol>
	NOTE: Step requ durin drop 3. 4	bs 2 and 3 are <b>N/A</b> for minor power changes OR if immediate boration is lired to maintain shutdown margin, to maintain rods above the insertion limit, ng an emergency shutdown (AOP-C.03), during recovery of a oped/misaligned rod (AOP-C.01), or at Chemistry recommendation in mode 5 or 6
		[2] <b>RECORD</b> the quantity of boric acid required to achieve desired boron concentration using Appendix D.
		gals
		[3] PERFORM Appendix I Independent Verification of Calculation for Amount of Boric Acid or Primary Water. (N/A if App. D was performed by SRO to verify data from Rx Engineering)

	Appendix D	tions	Form ES-D-2							
<u> </u>	Op Test No.:	NRC	Scenario #	6	Event #	5	Page	23	of	44
	Event Description:	Pla	ant Power Reduct	tion						

Time	Position	Applicant's Actions or Behavior
		0-SO-62-7, Boron Concentration Control
		Section 6.4, Borate
		[4] <b>DETERMINE</b> available boric acid volume in in-service BAT.
		aala
		gais
		[5] <b>PLACE [HS-62-140A]</b> , Boric Acid to Blender Flow Control Switch to
		the STOP position.
		PLACE [HS-62-140B], CVCS Makeup Selector Switch to the
		[0] BORATE position.
	PO	[7] ADJUST [FC-62-139], Boric Acid Flow Controller to the desired flow
	KU	rate.
	RO	[8] SET [FQ-62-139], Batch Integrator to the desired quantity.
		[9] PLACE [HS-62-140A] Boric Acid to Blender Flow Control Switch to the
	RO	START position.
		[10] <b>ENSURE</b> Boric Acid Pump aligned to blender in EAST speed by
	RO	right red light LIT on [HS-62-230A] OR [HS-62-232A].
	NOTE: Flow o	scillations and/or erratic controller response may require manual operation of
	Boric Acid Flo	w Controller [FC-62-139] until stable conditions exist.
	RO	[11] VERIEY Boric Acid Flow established

Appendix D	Required Operator Actions							Form ES-D-2		
Op Test No.: Event Description:	NRC	Scenario # Power Reducti	6 on	Event #	5	Page	24	of	44	
Time	Position			Applicar	nt's Actions or Be	havior				
		0-50-62-	7 Boro	Concontr	ation Control					

	Time	Position	Applicant's Actions or Behavior
			0-SO-62-7, Boron Concentration Control
		T	Section 6.4, Borate
		NOTE: It may ta on nuclear inst	ake approximately 15 minutes before any changes to reactivity are indicated rumentation or RCS temperature indication.
		RO	[12] <b>IF</b> reactor is critical, <b>THEN MONITOR</b> nuclear instrumentation and reactor coolant temperature to ensure proper response from boration.
	1	NOTE: BAT (Mod	operability limits are prescribed by TRM 3.1.2.6 (Modes 1-3) or 3.1.2.5 les 4-6).
		RO	[13] MONITOR Boric Acid Storage Tank level.
			~
C		RO	[14] IF Volume Control Tank level increases to 63 percent, THEN ENSURE [LCV-62-118], Volume Control Tank Divert Valve OPENS to divert excess water to the Holdup Tank.
		NOTE: Sam powe	ple may be obtained at normal RCS sample intervals provided the unit is at ar and the unit response following the boration is as expected.
			[15] WHEN boration is complete, THEN
		RO	[a] PLACE [HS-62-140A], Boric Acid to Blender Flow Control Switch to the STOP position.
			[b] CHECK no primary water flow on either [FI-62-142A] OR [FQ-62- 142].
			[c] ENSURE [FC-62-142], Primary Water to Blender Flow Controller is in AUTO position and the potentiometer (dial indicator) is set at 35%.
			[d] ADJUST [FC-62-139], Boric Acid Flow Controller to the desired blend solution in accordance with TI-44 Boron Tables.
			[e] ENSURE [FCV-62-128] is CLOSED.
			[f] PLACE [HS-62-140B], CVCS Makeup Selector Switch to the AUTO position.
C			[g] PLACE [HS-62-140A], Boric Acid to Blender Flow Control Switch to the START position.
			[h] IF RCS boron sample required, THEN NOTIFY Chem Lab to obtain RCS boron sample.

	Appendix D	Form ES-D-2								
(	Op Test No.:	NRC	Scenario #	6	Event #	5	Page	25	of	44
Sugar 1	Event Description:	Plant Power Reduction								

Time	Position	Applicant's Actions or Behavior			
0-SO-62-7, Boron Concentration Control					
Section 6.4, Borate					
	NOTE: Bora com	ition is done in batches until the total boron and/or power change is pleted.			
	RO	[16] <b>REPEAT</b> this section as required to complete total boron change.			
	RO	[17] WHEN total boration is complete,			
		[i] <b>THEN: REALIGN</b> the blender controls for <b>AUTO</b> makeup to the CVCS in accordance with Section 5.1.			
		[j] NOTIFY Chem Lab to obtain RCS boron sample.			
	SRO	[18] <b>IF</b> in modes 1, 2, or 3, <b>THEN ENSURE</b> requirements of TRM 3.1.2.6 are met.			
		[19] If in MODES 4, 5 or 6 THEN ensure requirements of TRM 3.1.2.5 are met			
		[20] GO TO appropriate plant procedure			
		END OF SECTION			
Appendix D	Required Operator Actions		Fc	Form ES-D-2	
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Op Test No.:	NRC Scenario # <u>6</u> Event # <u>5</u> Plant Power Reduction	i Page	e <u>26</u>	of	44
SQN 1,2	BORON CONCENTRATION CONTROL	0-SO-62-7 Rev. 58			

#### APPENDIX D

Page 1 of 1

### CALCULATION FOR AMOUNT OF BORIC ACID OR PRIMARY WATER (TI-44)

- **NOTE 1** One calculation is required for each major change.
- NOTE 2 Boric acid amounts to achieve required RCS boron concentration may be significantly higher than calculated amounts if CVCS demin resins are removing boron. Amount of boron removal by mixed bed resins will depend on RCS boron, resin age, whether demin bed was previously borated, and letdown temperature. Chemistry should be consulted if required to evaluate resin bed removal.
- [1] IF REACTF not used,
  - THEN

CALCULATE amount of primary water or boric acid required using TI-44.

RCS BORON	PPM CHANGE	AMOUNT PRIMARY WATER OR BORIC ACID
ppm Current		
ppm		
i arget		TOTAL GAL(s)

**NOTE** REACTF data sheets are to be signed by the preparer and reviewer.

[2] IF REACTF used attach printout to procedure.

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- **NOTE** IV is not required if appendix is performed by an SRO to verify data provided by Rx. Eng.
- [3] ENSURE independently verified by an SRO in accordance with Appendix I.

Page 163 of 201

Appendix D	<u> </u>		Fo	rm ES	S-D-2				
Op Test No.:	NRC	Scenario #	6	Event #	5	Page	27	of	44
Event Description:	Pla	ant Power Reduction	on						

SQN	BORON CONCENTRATION CONTROL	0-SO-62-7
1,2		Rev. 58
		Page 190 of 201

#### APPENDIX I Page 1 of 1

### INDEPENDENT VERIFICATION OF CALCULATION FOR AMOUNT OF BORIC ACID OR PRIMARY WATER (TI-44)

NOTE One calculation is required for each major change.

[1] IF REACTF not used, THEN

CALCULATE amount of primary water or boric acid required using TI-44.

RCS BORON	PPM CHANGE	AMOUNT PRIMARY WATER OR BORIC ACID
ppm Current		
ppm Target		
		TOTAL GAL(s)

**NOTE** REACTF data sheets are to be signed by the preparer and reviewer. [2] IF REACTF used attach printout to procedure.

	Appendix D	······································	R	equired Ope	ator Actions	;		Form E	ES-D-2
$\bigcirc$	Op Test No.: Event Descriptio	NRC n: Ma 1B	Scenario # in Feedwater He -B and TDAFWF	<u> </u>	Event # / AFW Malfuncti d w/ TDAFWP tr	6, 7 ons: 1A-A MDAF	Page	_28of ectrical faul	44
	Time Simulator Op Indications a Annunica 1-M-3 • 1-XA-5 • 1-XA-5 • 1-M-5 • 1-XA-5 • 1-M-6 • 1-XA-5	Position Derator: Whe ivailable: itors: i5-3A E-1, "P i5-3C C-6, "L E-6, "L E-6, "L B-7, "F B-7, "L	n directed, in S-2-129 LOW S-3-171D STM S-3-175D STM S-3-35A STEA S-3-42D STEA S-3-107D STM	nitiate Ever NPSH AT MI GEN #4 LE' GEN #4 LE' M GEN FEE M GEN FEE GEN LOOP	Applicant's A 1ts 6 & 7 P'S" VEL LOW" VEL LOW" VEL LOW" DWATER FLC HIGH-LOW D 4 LOW FW F	Actions or Beha DW HIGH" DEVIATION" LOW LOW WA	vior TER LEVEL		
	<ul> <li>Indicators</li> <li>1-M-4</li> <li>1-FI-1-</li> <li>1-LI-3-</li> <li>Significar</li> <li>Annunciat</li> <li>1-XA-5</li> <li>Deviations</li> <li>Increas</li> <li>Deviati</li> <li>Main fe</li> <li>Steam</li> </ul>	D-4, "L D-4, "L D-7, "F D-7, "F S: 103A, 103B, S 110, 107, 106, 110, 107, 106, or Resultant A ors: 5-2C, C-7, D-7 s or unexpecte se in feedwate ions on feedwate eedwater pum generator leve	G-4 FW INLET S-3-103B STM G-4 FW INLET SG-4NR LEVE Alarms/Indica , E-7: "LS-2-3/ d conditions: r flow. ater regulating o speed increa	AM GENERA GEN LOOP FLOW CH-1 L: decreasin ations: A, 2-9A, 2-12 y valves. asing.	ATOR LOOP 4 4 STEAM/FE	EOW LOW WA	V V V V LEVEL ABN	L" CH" IORMAL"	
	T = 70	CREW	Refer to ala	rm response	e procedures	and carries o	ut the follow	ving actio	ns:
	Evaluator No	te: Personne crew sho staff prior downstre	el safety is a c uld take appro to any field r am of No. 1 F	oncern sinc opriate actic eport) repor eedwater F	e this feedwa on once AUO t the leak loc leater.	ater break is o s (need to be ation as main	utside conta dispatched feedwater o	ainment; by the M common	the CR pipe
		SRO	Directs crew	/ to enter A	OP-S.05, Ste	am Or Feedwa	ater Leak.		
0	Evaluator No	te: Since the	following ste	AOI p is a "MOI ctor vs. turk	P-S.05, Stear	m Or Feedwa , the crew may	ter Leak	n the proc	cedure
		8 could b excessive challenge and trans	e the decision e delta betwee ed (i.e.: secon ition to E-0.	n reactor a dary make-	tiate a reacto nd secondar up capability	y power develo ), the crew ma	sition to E-C ops or hotw y decide to	). If an /ell level i trip the r	s eactor

	Appendix D	·····	Re	quired O	perator Actio	ns		Fo	rm ES	5-D-2
<u></u>	Op Test No.:	NRC	Scenario #	6	Event #	6, 7	Page	29	of	44
	Event Description:	Ma 1B-	in Feedwater Hea ·B and TDAFWPs	ader Break s vapor bou	w/ AFW Malfun und w/ TDAFWF	nctions: 1A-A MDAFW <sup>9</sup> trip	P Trip on e	electrica	l fault;	

Time	Position	Applicant's Actions or Behavior
Evaluator No	ote: Since the determ normal monitor within the trip the determ of the determined	his is a <b>"MONITOR"</b> step, the crew may continue in the procedure while ining Steam vs. feed line break. SG programmed level deviation following a load change is not unusual. The crew may continue in the procedure while ring SG levels in steps 1 & 2. Step 6 insures that RCS temperature is controlled hese normal ranges; if the crew cannot control these limits, they should decide he reactor and transition to E-0.
Critical Task	: Manually iso	late/verify feedwater isolation prior to SG(s) inventory loss.
	Crew	1. MONITOR personnel safety:
		<ul> <li>a. IF steam or feedwater lines need to be immediately isolated to protect personnel, THEN PERFORM the following:</li> </ul>
Critical Task	RO	1) TRIP the reactor.
	BOP	<ol> <li>IF leak is on steam lines OR source is unknown, THEN CLOSE MSIVs.</li> </ol>
Critical Task	BOP	<ol> <li>IF leak is on feedwater lines OR source is unknown, THEN PERFORM the following:</li> </ol>
	BOP	a) TRIP MFW pumps.
	BOP	b) CLOSE Feed Reg Valves.
	SRO	4) GO TO E-0, Reactor Trip or Safety Injection.
	BOP	2. MONITOR steam generator levels STABLE on program.
	BOP	3. CHECK the following:
		S/G atmospheric relief valves CLOSED
		steam dumps CLOSED.
	BOP	4. CHECK main turbine on line.
Evaluator No	ote: Since this reactor vs. and therefor reactor and E-0 here.	is a <b>"MONITOR"</b> step, the crew may continue in the procedure while developing a turbine power trend ( <b>RNO</b> second bullet). If so, steps 6 or 8 may be the decision point ore transition to reactor trip and E-0 implementation. If an excessive delta between d secondary power develops, the crew may decide to trip the reactor and transition to

C

Appendix D		Re	quired O	perator Action	IS		Fo	rm ES	)-D-2
Op Test No.:	NRC	Scenario #	6	Event #	6, 7	Page	30	of	44
Event Description:	Ma 1B	in Feedwater Hea -B and TDAFWPs	ader Break s vapor bou	w/ AFW Malfunc nd w/ TDAFWP	tions: 1A-A MDAF trip	WP Trip on e	electrica	l fault;	

Time	Position	Applicant's Actions or Behavior
		5 MONITOR the following:
	RO	reactor power STABLE
		(RNO required)
		reactor power less than or equal to 100% (3455 MWt).
		RNO:
		REDUCE turbine load as necessaryN/A
	SRO	IF any of the following conditions exist:
		<ul> <li>greater than 35 MWe load drop is required to maintain reactor power less than or equal to 100%</li> <li>OR</li> </ul>
		<ul> <li>steam leak results in reactor power rising by 3% or more</li> <li>OR</li> </ul>
		reactor power CANNOT be controlled by turbine load reduction
	SRO	THEN PERFORM the following:
	RO	a. TRIP the reactor.
	BOP	b. WHEN reactor is tripped, THEN CLOSE MSIVs.
	SRO	c. GO TO E-0, Reactor Trip or Safety Injection.
Evaluator Not	te: Since this developin ave, and restoring transient normal ra reactor a	is a <b>"MONITOR"</b> step, the crew may continue in the procedure while ng a T-ave vs. T-ref trend. The 3° delta between actual RCS temperature, T- programmed reference temperature, T-ref is the range the system is capable of following a normal load change. 5° delta is based on the maximum load for the RCS. Step 6 insures that RCS temperature is controlled within these anges; if the crew cannot control these limits, they should decide to trip the nd transition to E-0.
		6. MONITOR T-avg within 3°F of T-ref.
	KO	(RNO required)
	BOP	<b>RNO:</b> <b>REDUCE</b> turbine load as necessary to maintain T-avg within 3°F of T-ref (or program value).
	SRO	IF T-avg CANNOT be maintained within 5°F of T-ref (or program value), THEN PERFORM the following:

	Appendix D		Red	quired Op	perator Actio	ns		Fo	rm ES	-D-2
C.	Op Test No.:	NRC	Scenario #	6	Event #	6, 7	Page	31	of	44
Constant of the second	Event Description:	Mai 1B-	in Feedwater Hea -B and TDAFWPs	ader Break vapor bou	w/ AFW Malfun nd w/ TDAFWF	nctions: 1A-A MDAFW <sup>o</sup> trip	/P Trip on e	əlectrica	d fault;	

Time	Position	Applicant's Actions or Behavior
	RO	a. TRIP the reactor
	BOP	b. WHEN reactor is tripped, THEN CLOSE MSIVs.
	SRO	c. GO TO E-0, Reactor Trip or Safety Injection.
·····		
	SRO	IF a reactor trip is directed,
	5110	THEN GO TO E-0, Reactor Trip or Safety Injection.
	SRO	Direct Manual Rx Trip
	SRO	Enter E-0 and Direct Immediate Operator Actions (IOAs)
· · · · · · · · · · · · · · · · · · ·	NOTE: Tec	h Spec LCO 3.6.1.4 is applicable if containment pressure exceeds 0.3 psig.
	RO	7. MONITOR containment pressure STABLE
	BOP	8. MONITOR hotwell level STABLE:
		VERIFY LCV-2-9 maintaining hotwell level in AUTO.
	BOP	RNO: INITIATE makeup to hotwell:
		RNO a & b N/A: hotwell make-up is not affected by scenario malfunctions
		c. <b>IF</b> loss of hotwell level is imminent, <b>THEN PERFORM</b> the following:
4		1) <b>TRIP</b> the reactor.
		2) WHEN reactor is tripped, THEN CLOSE MSIVs.
		3) <b>GO TO</b> E-0, Reactor Trip or Safety Injection.
tration of the second		
41 d		IF a reactor trip is directed,
	SRO	THEN GO TO E-0, Reactor Trip or Safety Injection.
	SRO	Direct Manual Rx Trip
	SRO	Enter and Direct E-0 Immediate Operator Actions (IOAs)
	- I	

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	Appendix D		Rec	quired O	perator Actic	ons	Form ES-D-2				
(	Op Test No.: Event Description:	<u>NRC</u> Mai	Scenario # in Feedwater Hea	6der Break	Event # w/ AFW Malfur	6, 7 Anctions: 1A-A MDAFW	Page	<u>32</u>	of _	44	
		1B-B and TDAFWPs vapor bound w/ TDAFWP trip									

Time	Position	Applicant's Actions or Behavior
Evaluator No	te: Following surveys l discover event in	g IOA performance, prior to Steps 1-4 immediate action verification, RO/BOP MCBs for any expected automatic system response that failed to occur. Upon y, they may take manual action(s) to align plant systems as expected for the progress. (Ref. EPM-4, Prudent Operator Actions)
	Following Feedwat MAIN FEI open sig	g the reactor trip, RCS Tave will drop below 550°F, which makes up the er Isolation logic. Annunciator 1-XA-55-6B E-6, LOW TAVG REACTOR TRIP EDWATER VALVES ACTUATED (Tave <550°F and P-4, Reactor Trip Breaker nal) causes the feedwater isolation MOVs to close isolating the feedline break.
		E-0, Reactor Trip or Safety Injection
Annunicators	s/Indications a	s specified at Event 6 initiation
	Note 1 Steps	s 1 through 4 are immediate action steps
	Note 2 This	procedure has a foldout page
	RO	<ol> <li>VERIFY reactor TRIPPED:         <ul> <li>Reactor trip breakers OPEN</li> <li>Reactor trip bypass breakers DISCONNECTED or OPEN</li> <li>Neutron flux DROPPING</li> <li>Rod bottom lights LIT</li> <li>Rod position indicators less than or equal to 12 steps.</li> </ul> </li> </ol>
	BOP	<ul> <li>2. VERIFY turbine TRIPPED:</li> <li>Turbine stop valves CLOSED.</li> </ul>
	BOP	<ul> <li>3. VERIFY at least one train of shutdown boards ENERGIZED.</li> <li>Attempt to restore power to at least ONE train of shutdown boards</li> <li>Place DG 1A-A control switch in START</li> <li>Verify Train A Shutdown Boards ENERGIZED</li> </ul>
	RO	<ul> <li>4. DETERMINE if SI actuated:</li> <li>ECCS pumps RUNNING.</li> <li>Any SI alarm LIT [M-4D] (SI will be actuated)</li> <li>(RNO Required)</li> </ul>
	RO/BOP	<ul> <li>RNO:</li> <li>DETERMINE if SI required:</li> <li>a. IF any of the following conditions exists:</li> <li>S/G pressure less than 600 psig, OR</li> </ul>

(

	Appendix D		Re		Form ES-D-2							
<u> </u>	Op Test No.:	NRC	Scenario #	6	Event #	6, 7	Page	33	of _	44		
***********	Event Description	n: Mair 1B-E	1 Feedwater He 3 and TDAFWP	ader Break s vapor boı	w/ AFW Malfuncti und w/ TDAFWP tr	ions: 1A-A MDAF\ ˈip	NP Trip on e	electrical	fault;			
	Time	Position			Applicant's	Actions or Beha	avior					
			•	RCS pres	sure less than	1870 psig		<u></u>				
			OR			ter e peig,						
			•	Containm	ent pressure g	reater than 1.5	psig,					
			THEN ACTUATE SI.									
	Evaluator No	te: SRO/cre depress	w should ex urization dur	should exercise <b>FOLDOUT PAGE <u>EVENT DIAGNOSTICS</u> for SG ization during performance of the prudent operator actions (POAs)</b>								
		Correct required	POAs impler ) and verify I	nented w MFPs trip	ould then resul ped, FWI valve	It in ALL MSIVs	s closed, S	SI actua	ted (if	f		
	FOLDOUT PAGE											
			RCP TRIP CRITERIA – N/A									
			EVENT DIAGNOSTICS									
			IF any     following	S/G pre: g:	ssure is dropp	oing uncontrol	led, THEI	N PERI	FORM	I the		
(		RO/BOP	a. CLC	SE MSI	/s and MSIV by	ypass valves				· · · · · · · · · · · · · · · · · · ·		
			<ul> <li>b. IF any S/G pressure continues to drop uncontrolled, THEN PERFORM the following:</li> </ul>									
		RO	1)	ENSURE	SI actuated.							
			2) [	F at leas	st one S/G is <b>subsequent A</b>	intact (S/G pre ctions N/A	essure co	ntrolled	or ris	sing),		
	Evaluator Not	te: Actions for	ES-0.5 are of	contained	in attachment	at back of sce	nario guid	е				
		BOP	5. PERFO	ORM ES-0 ure.	0.5, Equipment	t Verifications \	WHILE co	ntinuing	in thi	S		
			6. DETER	RMINE if s	secondary hea	t sink available	:					
			a. CH	ECK tota	I AFW flow gre	ater than 440 g	gpm.	<b>-</b>				
		RO	D. CH	ECK narr	row range level	greater than 1	0% [25 A	DV] in a	it leas	st		
			c. CO	NTROL f	eed flow to ma	intain narrow r	ange leve	l betwee	ən 10'	%		
			(RNO real	/ired)		5/03.						
			RNO:				······					
Ċ		RO	a. IF S/G n START greater f	arrow rar AFW pun ihan 440	nge level is less nps and <b>ALIGN</b> gpm.	s than 10% [25 <b>\</b> valves as neo	i% ADV] ii cessary to	n all S/G raise A	βs, <b>T⊦</b> ∖FW fl	<b>IEN</b> ow		
		RO	b. MAINTA	<b>NN</b> total feater than	eed flow greate 10% [25% AD	er than 440 gpi VI in at least o	m UNTIL i ne S/G.	narrowi	range			

Appendix D	ndix D Required Operator Actions Form ES-D-2									
Op Test No.:	NRC	Scenario #	6	Event #	6, 7	Page	34	of	44	
Event Description	Event Description: Main Feedwater Header Break w/ AFW Malfunctions: 1A-A MDAFWP Trip on electrical fault; 1B-B and TDAFWPs vapor bound w/ TDAFWP trip									
	18	-B and TDAFWPs	vapor bou	und w/ TDAFWP	trip					

Time	Position	Applicant's Actions or Behavior				
		IF AFW flow greater than 440 gpm CANNOT be established, <b>THEN PERFORM</b> the following:				
		1) MONITOR status trees.				
<u></u>		2) GO TO FR-H.1, Loss of Secondary Heat Sink.				
	SRO	Directs BOP to suspend ES-0.5 performance, verify Status Trees' conditions				
	BOP	Identifies Heat Sink RED path and recommends transition to FR-H.1, Loss of Secondary Heat Sink.				
	Crew	FR-H.1 transition				

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	Appendix D		Red	quired C	perator Action	S		Fo	rm ES	5-D-2
<u></u>	Op Test No.:	NRC	Scenario #	6	Event #	6, 7	Page	35	of	44
	Event Description:	Ma 1B	in Feedwater Hea B and TDAFWPs	ider Break vapor boi	: w/ AFW Malfunct und w/ TDAFWP t	ions: 1A-A MDAF rip	WP Trip on e	electrica	l fault;	

Time	Position	Applicant's Actions or Behavior
		FR-H.1
		Loss of Secondary Heat Sink
	CAUTION:	Feeding an Intact or Ruptured S/G is preferred to feeding a Faulted S/G. Thermal stresses from feeding a Faulted S/G could rupture tubes, resulting in a Faulted-AND-Ruptured S/G.
	SRO	1. DETERMINE procedure applicability:
		a. CHECK the following:
		(RNO required)
		<ul> <li>Total feed flow less than 440 gpm due to operator action directed by another procedure.</li> <li>AND</li> </ul>
		Total feed flow capability of greater than 440 gpm AVAILABLE.
		RNO:
		a. GO TO Step 2.
		2. MONITOR RWST level greater than 27%.
Evaluator N	ote: The scer restored	ario intent is once the crew loops back to Step 3 an AFW pump will be following Feed & Bleed decision in step 5
		3. CHECK if secondary heat sink required:
		a. RCS pressure greater than any non-Faulted S/G pressure
		b. RCS temperature greater than 350°F.
		4. MONITOR at least one CCP available.
Evaluator N	ote: Critical	<b>Γask</b> is to Start an AFW Pump prior to reaching FR-H.1 bleed/feed criteria.
	At the Le	ad Examiner's direction, the TDAFWP will be restored to operation.
	NOTE: Press	surizer pressure greater than or equal to 2335 psig with rising RCS
	temp	erature and a low loop delta-T indicates loss of heat removal capability.
		5. MONITOR RCS feed and bleed criteria:
		(RNO required 1 <sup>st</sup> time through this step)
		a. CHECK the following:
		<ul> <li>Any three S/G wide range levels less than 20% [41% ADV]</li> <li>OR</li> </ul>
		<ul> <li>Pressurizer pressure greater than or equal to 2335 psig due to loss of secondary heat removal.</li> </ul>

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	Appendix D		Red	quired O	perator Action	ons		Fo	rm ES	-D-2	
<u> </u>	Op Test No.:	NRC	Scenario #	6	Event #	6, 7	Page	36	of	44	
	Event Description:	Main Feedwater Header Break w/ AFW Malfunctions: 1A-A MDAFWP Trip on electrical fault; 1B-B and TDAFWPs vapor bound w/ TDAFWP trip									

B-B and TDAFWPs vapor bound w/ TDAFWP trip	
--------------------------------------------	--

	Time	Position	Applicant's Actions or Behavior
			b. STOP RCPs
			c. GO TO Caution prior to Step 17.
			RNO:
			a. GO TO Step 6.
			6. MONITOR CST level greater than 5%.
			<ol> <li>ATTEMPT to establish AFW flow to at least one S/G in the following order of priority Intact, Ruptured, Faulted:</li> </ol>
			a. CHECK S/G blowdown isolation Valves CLOSED.
			b. CHECK control room indications for cause of AFW failure.
1			AFVV pump power supply
			AFVV valve alignment
			c. ESTABLISH MD AFW pump flow:
			1) ENSURE MD AFW pumps RUNNING.
			2) ENSURE AFW level control valves OPEN.
			401 CLOSED.
			•
			d. ESTABLISH TD AFW pump flow:
			1) ENSURE turbine steam supply valves OPEN:
			Either FCV-1-15 or FCV-1-16
			FCV-1-17 and FCV-1-18
			Trip and throttle valve, FCV-1-51.
			2) ENSURE AFW level control valves OPEN:
			3) RAISE TD AFW pump speed as necessary.
6		NOTE: Co	tiated in Step 17.
L.			8. MONITOR for AFW flow:
			a. CHECK total AFW flow to S/Gs greater than 440 gpm
			(RNO required)

	Appendix D		Red	quired O	perator Acti	ions		Fo	rm ES	3-D-2
Contract of	Op Test No.:	NRC	Scenario #	6	Event #	6, 7	Page	37	of	44
Sec. 1	Event Description:	Mai 1B-	in Feedwater Hea -B and TDAFWPs	ider Break vapor bou	w/ AFW Malfu nd w/ TDAFW	unctions: 1A-A MDAFWF /P trip	› Trip on (	electrica	l fault;	

Time         Position         Applicant's Actions or Behavior           RNO:         a. IF NO AFW flow can be verified, THEN:         1) ENSURE personnel dispatched to locally restore AFW flow.           2) GO TO Step 9.         2) GO TO Step 9.         2) GO TO Step 9.           IF AFW flow to at least one S/G verified,N/A         2) GO TO Step 9.           IIF AFW flow to at least one S/G verified,N/A         2) GO TO Step 9.           IIF AFW flow to at least one S/G verified,N/A         2) GO TO Step 9.           IIF AFW flow to at least one S/G verified,N/A         2) GO TO Step 9.           IIIF AFW flow to at least one S/G verified,N/A         2.           IIIF AFW flow to at least one S/G verified,N/A         2.           IIIF AFW flow to at least one S/G verified,N/A         2.           IIIF AFW flow to at least one S/GN/A         3.           IIIF AFW flow to at least one S/GN/A         3.           IIIF AFW N/A         5.           IIIF Condensate system AFW flow to at least one S/GN/A         3.           IIIF condensate system CANNOT be placed in service, THEN GO TO Step 16         5.           IIIF condensate system CANNOT be placed in service, THEN GO TO Step 16         6.           IIIF condensate system pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         7.           IIIF condensate systery		1	
RNO:       a. IF NO AFW flow can be verified, THEN:         1) ENSURE personnel dispatched to locally restore AFW flow.         2) GO TO Step 9.         IF AFW flow to at least one S/G verified,N/A         Evaluator Note:       Crew transitions to step 9 here.         9. STOP all RCPs.         10. MONITOR shutdown boards continuously energized.         Evaluator Note:         MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A         a. MFWNA         b. CHECK condensate system pumps         IF condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         (RNO:         0         16. CHECK RCS feed and bleed criteria:         (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         0         0         Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         0G TO Step 3.         2         3. CHECK If secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than any non-Faulted S/G pressure.         b. RCS temperature	i ime	Position	Applicant's Actions or Behavior
			RNO:
1) ENSURE personnel dispatched to locally restore AFW flow.         2) GO TO Step 9.         IF AFW flow to at least one S/G verified,N/A         Evaluator Note:         Crew transitions to step 9 here.         9. STOP all RCPs.         10. MONITOR shutdown boards continuously energized.         Evaluator Note:         MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A         a. MFW N/A         b. CHECK condensate system IN SERVICE:         (RNO required)         RNO:         b. START condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria:         (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         • OT O Step 3.			a. IF NO AFW flow can be verified, THEN:
2) GO TO Step 9.         IF AFW flow to at least one S/G verified,N/A         Evaluator Note:       Crew transitions to step 9 here.         9.       STOP all RCPs.         10. MONITOR shutdown boards continuously energized.         Evaluator Note:       10. MONITOR shutdown boards continuously energized.         Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A       a. MFWN/A         b. CHECK condensate system IN SERVICE:       (RNO required)         B. START condensate system pumps       IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria:       (RNO required)         •       Three S/G wide range levels less than 20% [41% ADV]. OR         •       Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:       GO TO Step 3.         •       3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.       b. RCS temperature greater than 350°F.			<ol> <li>ENSURE personnel dispatched to locally restore AFW flow.</li> </ol>
IF AFW flow to at least one S/G verified,N/A         Evaluator Note:       Crew transitions to step 9 here.         9. STOP all RCPs.         10. MONITOR shutdown boards continuously energized.         Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A         a. MFW N/A         b. CHECK condensate system IN SERVICE:         (RNO required)         RNO:         b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria:         (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			2) GO TO Step 9.
IF AFW flow to at least one S/G verified,N/A         Evaluator Note:       Crew transitions to step 9 here.         9. STOP all RCPs.         10. MONITOR shutdown boards continuously energized.         Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A         a. MFW N/A         b. CHECK condensate system IN SERVICE:         (RNO required)         RNO:         b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         7         7         7         7         7         7         8         7         7         8         8         9         9         9         9         9         9         9         9         9         9         9         9         9         9         9         9         9         9         9			
IF AFW flow to at least one S/G verified,N/A         Evaluator Note:       Crew transitions to step 9 here.         9. STOP all RCPs.         10. MONITOR shutdown boards continuously energized.         Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A         a. MFWN/A         b. CHECK condensate system IN SERVICE:         (RNO required)         RNO:         b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria:         (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			
Evaluator Note:       Crew transitions to step 9 here.         9. STOP all RCPs.         10. MONITOR shutdown boards continuously energized.         Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A         a. MFW N/A         b. CHECK condensate system IN SERVICE:         (RNO required)         RNO:         b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria:         (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			IF AFW flow to at least one S/G verified,N/A
	<b>Evaluator No</b>	ote: Crew tra	ansitions to step 9 here.
Image: Secondary Note:       10. MONITOR shutdown boards continuously energized.         Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         Image: Ima			9. STOP all RCPs.
Image: Secondary Note:       10. MONITOR shutdown boards continuously energized.         Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         Image: Ima			
Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A       a. MFWN/A         b. CHECK condensate system IN SERVICE:       (RNO required)         RNO:       b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16       Step 16         If condensate system CANNOT be placed in service, THEN GO TO Step 16       Three S/G wide range levels less than 20% [41% ADV].         OR       • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:       GO TO Step 3.         Step 3.       Step 3.			
Evaluator Note:       MFPs and Condensate system are not available for SG feed due to the MFW leak location and isolation.         11. ATTEMPT to establish MFW flow to at least one S/GN/A       a. MFW N/A         b. CHECK condensate system IN SERVICE:       (RNO required)         RNO:       b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16       16. CHECK RCS feed and bleed criteria:         (RNO required)       • Three S/G wide range levels less than 20% [41% ADV].         OR       • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:       GO TO Step 3.         3. CHECK if secondary heat sink required:       a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.       b. RCS temperature greater than 350°F.			10. MONITOR shutdown boards continuously energized
Interference       11. ATTEMPT to establish MFW flow to at least one S/GN/A         a.       MFW N/A         b.       CHECK condensate system IN SERVICE: (RNO required)         RNO:       NSTART condensate system pumps IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16.       CHECK RCS feed and bleed criteria: (RNO required)         •       Three S/G wide range levels less than 20% [41% ADV]. OR         •       Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:       3.         CHECK if secondary heat sink required:         a.       RCS pressure greater than any non-Faulted S/G pressure.         b.       RCS temperature greater than 350°F.	<b>Evaluator No</b>	ote: MFPs ar	Ind Condensate system are not available for SG feed due to the MEW leak
11. ATTEMPT to establish MFW flow to at least one S/GN/A         a. MFW N/A         b. CHECK condensate system IN SERVICE: (RNO required)         RNO:         b. START condensate system pumps IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria: (RNO required)         • Three S/G wide range levels less than 20% [41% ADV]. OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.		location	and isolation.
<ul> <li>a. MFW N/A</li> <li>b. CHECK condensate system IN SERVICE: (<i>RNO required</i>)</li> <li>RNO:</li> <li>b. START condensate system pumps IF condensate system CANNOT be placed in service, THEN GO TO Step 16</li> <li>16. CHECK RCS feed and bleed criteria: (<i>RNO required</i>)</li> <li>16. CHECK RCS feed and bleed criteria: (<i>RNO required</i>)</li> <li>Three S/G wide range levels less than 20% [41% ADV]. OR</li> <li>Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.</li> <li>RNO: GO TO Step 3.</li> <li>3. CHECK if secondary heat sink required:</li> <li>a. RCS pressure greater than any non-Faulted S/G pressure.</li> <li>b. RCS temperature greater than 350°F.</li> </ul>			11. ATTEMPT to establish MFW flow to at least one S/G. N/A
b. CHECK condensate system IN SERVICE: (RNO required)         RNO:         b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria: (RNO required)         • Three S/G wide range levels less than 20% [41% ADV]. OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO: GO TO Step 3.         • RNO: GO TO Step 3.			a. MFW N/A
(RNO required)         RNO:         b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria:         (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			b. CHECK condensate system IN SERVICE
RNO:       b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria: (RNO required)         • Three S/G wide range levels less than 20% [41% ADV]. OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			(RNO required)
b. START condensate system pumps         IF condensate system CANNOT be placed in service, THEN GO TO Step 16         16. CHECK RCS feed and bleed criteria: (RNO required)         • Three S/G wide range levels less than 20% [41% ADV]. OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO: GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			RNO:
IF condensate system CANNOT be placed in service, THEN GO TO Step 16  16. CHECK RCS feed and bleed criteria: (RNO required)  • Three S/G wide range levels less than 20% [41% ADV]. OR  • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.  RNO: GO TO Step 3.  3. CHECK if secondary heat sink required: a. RCS pressure greater than any non-Faulted S/G pressure. b. RCS temperature greater than 350°F.  Evaluator Note: the crew is in a procedural "da" loop until at least 3 of 4 SGs are less than 20% MIDE			b. START condensate system pumps
Step 16         16. CHECK RCS feed and bleed criteria: (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO: GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			IF condensate system CANNOT be placed in service. THEN GO TO
			Step 16
16. CHECK RCS feed and bleed criteria: (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			
16. CHECK RCS feed and bleed criteria:         (RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			
(RNO required)         • Three S/G wide range levels less than 20% [41% ADV].         OR         • Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.         RNO:         GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			16. CHECK RCS feed and bleed criteria:
Three S/G wide range levels less than 20% [41% ADV].     OR     Pressurizer pressure greater than or equal to 2335 psig due to loss o     secondary heat removal.     RNO:     GO TO Step 3.     3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.     Evaluator Note: the crew is in a procedural "do" loop until at least 3 of 4 SGs are less than 20% WIDE			(RNO required)
OR     Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.     RNO:     GO TO Step 3.     3. CHECK if secondary heat sink required:     a. RCS pressure greater than any non-Faulted S/G pressure.     b. RCS temperature greater than 350°F.			• Three S/G wide range levels less than 20% [41% AD\/]
Pressurizer pressure greater than or equal to 2335 psig due to loss o secondary heat removal.      RNO:     GO TO Step 3.      3. CHECK if secondary heat sink required:     a. RCS pressure greater than any non-Faulted S/G pressure.     b. RCS temperature greater than 350°F.  Evaluator Note: the crew is in a procedural "do" loop until at least 3 of 4 SGs are less than 20% MIDE.			OR
Secondary heat removal.      RNO:     GO TO Step 3.      3. CHECK if secondary heat sink required:     a. RCS pressure greater than any non-Faulted S/G pressure.     b. RCS temperature greater than 350°F.  Evaluator Note: the crew is in a procedural "do" loop until at least 3 of 4 SGs are less than 20% WIDE.			Pressurizer pressure greater than or equal to 2335 psig due to loss of
RNO:       GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			secondary heat removal.
GO TO Step 3.         3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			RNO:
3. CHECK if secondary heat sink required:     a. RCS pressure greater than any non-Faulted S/G pressure.     b. RCS temperature greater than 350°F.  Evaluator Note: the crew is in a procedural "do" loop until at least 3 of 4 SGs are less than 20% WIDE.			GO TO Step 3.
3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			
3. CHECK if secondary heat sink required:         a. RCS pressure greater than any non-Faulted S/G pressure.         b. RCS temperature greater than 350°F.			
a. RCS pressure greater than any non-Faulted S/G pressure.     b. RCS temperature greater than 350°F.			3. CHECK if secondary heat sink required
b. RCS temperature greater than 350°F.			a BCS pressure greater than any non-Faulted S/G pressure
Evaluator Note: the crew is in a procedural "do" loop until at least 3 of 4 SGs are less than 20% WIDE			b RCS temperature greater than 250°E
Evaluator Note: the crew is in a procedural "do" loop until at least 3 of 4 SGs are less than 20% WIDE			D. NOS temperature greater than 500°F.
	Evaluator No	te: the crow in	in a procedural "do" loop until at locat 2 of 4 SOc are loca there 000/ MUDE
range or some form of secondary make up is restored	L valuator NO	rance or co	m a procedular do loop until at least 3 01 4 SGS are less than 20% WIDE

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Appendix D	Required Operator Actions Form ES-							ES-D-2	
Op Test No.: NRC Scenario # 6 Event # 6, 7 Page 38 o								of	44
Event Description:	Ma 1B	Main Feedwater Header Break w/ AFW Malfunctions: 1A-A MDAFWP Trip on electrical fault; 1B-B and TDAFWPs vapor bound w/ TDAFWP trip							
Time	Time Position Applicant's Actions or Behavior								
The scenario intent is once the crew loops back to Step 3 an AFW pump will be restored following Feed & Bleed decision in step 5.							tored		

Lean Examiner may terminate the scenario following grow evolution of ED U 4 Sten 5
Even Examiner may terminate the Scenario Ionowing Crew evaluation of FR-H.1 Step 5.
Faad & Blood determination during the 2 <sup>ng</sup> need through the number laws
i eed & Dieed determination gunng the Z pass through the procedure

	Appendix D		Required Operator Actions Forr				m ES-D-2			
	Op Test No.: Event Description	<u>NRC</u> n: Equi	Scenario # pment verificatio	_39	of	44				
	Time	Position	1		Applicant	a Actiona as Dab				
			ES-0 5	FOLIP		SACIONS OF BEN	avior			
	Evaluator Not	te: BOP com (including	pletes ES-0. g any discre	5 includ	ing Appendic and actions t	ces A & B and aken) to SRO.	reports c	omplet	tion	
		BOP	1. VERIF	<b>r</b> D/Gs F	RUNNING.					
		BOP	2. VERIFY	<b>/</b> D/G El	RCW supply va	alves OPEN.				
		BOP	3. VERIFY	<b>r</b> at leas	t four ERCW p	oumps RUNNIN	IG			
		BOP	4. VERIFY • Pum • Pum • Pum	<b>/</b> CCS p p 1A-A ( p 1B-B ( p C-S.	umps RUNNIN 2A-A) 2B-B)	١G				
		BOP	5. VERIFY	(EGTS	fans RUNNING	G.				
		BOP	6. VERIFY	r genera	tor breakers C	PEN.				
		Crew	7. NOTIFY actions.	<b>f</b> at leas	t two AUOs to	report to MCR	to be ava	ilable fo	or loca	al
		BOP	8. VERIFY a. MD b. TD	AFW pu	umps RUNNIN mps	NG:				
		NOTE: AFW taker S/G.	level control to control S/	valves s G levels	hould NOT be , to establish f	e repositioned if low due to failu	manual a re, or to is	action h solate a	as be a faulte	en ed
$\bigcirc$		BOP	9. CHECK a. VEF b. VEF c. VEF 401	AFW va RIFY MD RIFY TD RIFY MD CLOSE	alve alignment AFW LCVs in AFW LCVs O AFW pump re D.	: AUTO. PEN. ecirculation valv	ves FCV-3	3-400 a	nd FC	:V-3-

		Required Operator Actions	Form ES
Op Test No.: Event Description:	NRC	Scenario # <u>6</u> Event # <u>ES-0.5</u> pment verifications	Page <u>40</u> of _
Time	Position	Applicant's Actions or Behavior	
		ES-0.5, EQUIPMENT VERIFICATIONS	
	BOP	<ul> <li>10. VERIFY MFW Isolation:</li> <li>a. MFW pumps TRIPPED</li> <li>b. ENSURE the following: <ul> <li>MFW regulating valves CLOSED</li> <li>MFW regulating bypass valve controller out</li> <li>MFW isolation valves CLOSED</li> </ul> </li> </ul>	tputs ZERO
	BOP	11. MONITOR ECCS operation:	
		<ul> <li>a. VERIFY ECCS pumps RUNNING:</li> <li>CCPs:</li> <li>RHR pumps</li> <li>SI pumps</li> </ul>	
		b. VERIFY CCP flow through CCPIT.	
		c. CHECK RCS pressure less than 1500 psig.	
		d. VERIFY SI pump flow.	
		f. VERIFY RHR pump flow.	
	BOP	12. VERIFY ESF systems ALIGNED:	
		a. Phase A ACTUATED:	
		PHASE A TRAIN A alarm LIT [M-6C, B5]	].
		• PHASE A TRAIN B alarm LIT [M-6C, B6	
		<ul> <li>b. Cntmt Vent Isolation ACTUATED:</li> <li>CNTMT VENT ISOLATION TRAIN A ala</li> <li>CNTMT VENT ISOLATION TRAIN B ala</li> </ul>	rm LIT [M-6C, C5]. rm LIT [M-6C, C6].
		<ul> <li>c. Status monitor panels:</li> <li>6C DARK</li> <li>6D DARK</li> <li>6E LIT OUTSIDE outlined area</li> <li>6H DARK</li> <li>6J LIT.</li> </ul>	

	Appendix D		R	equired O	perator Action	S		Fo	rm ES	5-D-2
$\bigcirc$	Op Test No.: Event Description:	<u>NRC</u> Equ	Scenario # lipment verificat	6	Event #	ES-0.5	Page	41	of	44
	Time	Position			Applicant's	s Actions or Beb	avior			
			ES-0.5	. EQUIPN		CATIONS				
			d. T	rain A stat	us panel 6K:					
			•	CNTMT	VENT GREE	N				
			•	PHASE	A GREEN					
			e. Ti	rain B stat	us panel 6L:	······································			<u> </u>	
			•	CNTMT	VENT GREE	N				
			•	PHASE	A GREEN					
· #	Evaluator Note:	Critical T cooling ec CSF	a <b>sk</b> is to ma quipment bef	nually act ore an ex	uate at least th treme (red-pat	ne minimum co h) challenge de	mplement evelops to	of cor the co	itainm Intainr	ent nent
		(ES-0.5 S	tep 13 direct	s complet	ion by BOP du	uring procedure	e performa	nce)		
$\cap$		BOP	13. MON	HECK for	containment sp	oray and Phase	e B actuati	on:		
				Phase F		owing.				
			0	R						
			•	Contain	ment pressure	greater than 2	2.8 psig			
	Critical Task		b. VI	ERIFY cor	ntainment spra	y INITIATED:				
	Critical		1)	Containr	nent spray pur	mps RUNNING	Э.			
	lask		2)	Containr 72-2 OP	nent spray hea EN.	ader isolation v	alves FCV	/-72-39	) and ∣	FCV-
			3)	Containr FCV-72-	nent spray rec 13 CLOSED.	irculation valve	es to RWS	T FCV	-72-34	1 and
			4)	Containn Panel 6E	nent spray hea LIT.	ader flow greate	er than 47	50 gpr	n per f	train.
			c. VE	ERIFY Ph	ase B ACTUA	TED:				
			•	PHASE B	TRAIN A alar	 m LIT [M-6С. А	<b>\</b> 5].			
			•	PHASE B	TRAIN B alar	m LIT [M-6C, A	.6].			
C								- <u></u>		
			d. El	<b>ISURE</b> R	CPs STOPPE	D.				

Appendix D	Required Operator Actions	Form ES-D-2	
Op Test No.: Event Descript	<u>NRC</u>	Scenario # <u>6</u> Event # <u>ES-0.5</u>	Page <u>42</u> of <u>4</u> 2
Time	Position	Applicant's Actions or Behavior	
	B	ES-0.5, EQUIPMENT VERIFICATIONS	
		e. VERIFY Phase B valves CLOSED:	
		Panel 6K PHASE B GREEN.	
		Panel 6L PHASE B GREEN.	
		f. WHEN 10 minutes have elapsed, THEN ENS return fans RUNNING.	URE containment air
		14. <b>MONITOR</b> if containment vacuum relief isolation closed:	valves should be
		a. CHECK containment pressure greater than 1	.5 psig.
		b. CHECK cntmnt vacuum relief isolation valves	CLOSED:
		• ECV-30-46	
		• FCV-30-47	
		• FCV-30-48.	
	BOP	<ul> <li>15. CHECK secondary and containment rad monitor</li> <li>Appendix A, Secondary Rad Monitors (attach</li> <li>Appendix B, Containment Rad Monitors. (attach</li> </ul>	s <b>USING</b> the following ed) ched)
	BOP	16. WHEN directed by E-0, THEN PERFORM Appe	ndix D, Hydrogen
		Willigation Actions.	*****
		17. CHECK pocket sump pumps STOPPED:	
		[IVI-15, upper lett corner]	at Deale Original
		<ul> <li>HS-77-410, Rx Bldg Aux Floor and Equipment</li> <li>HS-77-411, Rx Bldg Aux Floor and Equipment</li> </ul>	nt Drain Sump pump A nt Drain Sump pump E
		18 <b>DISPATCH</b> personnel to perform EA_0_1 Equipm	ent Checks Following
3	BOP	ESF Actuation.	
		19. ENSURE plant announcement has been made re	egarding Reactor Trip

Appendix D Required Operator Act						ons		For	m ES	-D-2
C.	Op Test No.:	NRC	Scenario #	6	Event #	ES-0.5	Page	43	of	44
Same?	Event Description:	Equi	ipment verificatio	ns						
	Time	Position			Applica	nt's Actions or Behav	ior			
			ES-0.5,	EQUIPM	ENT VERI	FICATIONS				
Evaluator Note: BOP completes ES-0.5 including Appendices A & B and reports completio (including any discrepancies and actions taken, i.e.: containment Spray or discrepancies per ES-0.5 Step 13) to SRO.								tion opera	ating	
	END (ES-0.5, EQUIPMENT VERIFICATIONS)									

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	Appendix D		Re	equired Op	erator Act	ions		Fo	rm ES	S-D-2
$\sim$	Op Test No.:	NRC	Scenario #	6	Event #	ES-0.5	Page	44	of	44
	Event Description:	Eq	uipment verificat	ions						

	(ES-0.5, EQUIPMENT VERIFICATIONS)					
	APPENDIX A SECONDARY RAD MONITORS					
E	30P <sup>1</sup>	<ol> <li>CHECK following rad monitors including available trends prior to isolation:</li> </ol>				
		<ul> <li>Condenser exhaust recorder RR-90-119</li> <li>S/G blowdown recorder RR-90-120</li> <li>Main steam line rad monitors</li> <li>Post-Accident Main Steam Line rad recorder RR-90-268B points 3</li> </ul>				
		(blue), 4 (violet), 5 (black), and 6 (brown). [M-31 (back of M-30)]				
E	30P <sup>2</sup>	<ol> <li>IF secondary radiation is HIGH, THEN ENSURE Unit Supervisor notified.</li> </ol>				
	END OF TEXT					

C

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APPENDIX B						
	CONTAINMENT RAD MONITORS					
BOP	<ol> <li>CHECK following rad monitors:         <ul> <li>Upper containment high range rad monitors RM-90-271 and RM-90-272 NORMAL [M-30]</li> <li>Lower containment high range rad monitors RM-90-273 and RM-90-274 NORMAL [M-30]</li> <li>Containment rad recorders RR-90-112 and RR-90-106 NORMAL [M-12] (prior to isolation).</li> </ul> </li> </ol>					
BOP	<ol> <li>IF secondary radiation is HIGH, THEN ENSURE Unit Supervisor notified.</li> </ol>					
	END OF TEXT					

	D		Scenario Outline Form ES-
Facility: Examiners	Sequo	yah	Scenario No.: 7 Op Test No.: NRC Operators:
Initial Cond	litions: ~	42% Power BOL Furbine Driven Au	Start 2 <sup>nd</sup> Main Feedwater Pump, Continue Power Escalation xiliary Feedwater Pump OOS for maintenance
Turnover:	Continue	plant startup. Cu	rrently at 0-GO-5 Section 5.1, Step 23
Target CTs	: Insert Ne Close Ms meeting	gative reactivity u SIVs and Stop/Isol prange path FR-P	sing control rods or boration prior to completion of FR-S.1 Step 4. ate AFW flow to Faulted S/G prior to transition out of E-2 but prior to 1 entry conditions
Event No.	Malf. No.	Event Type*	Event Description
1. T+0	N/A	R – RO N – SRO/BOP	~42% Start 2 <sup>nd</sup> MFP, Continue Power Escalation
<b>2.</b> T+20	CN02B	C – BOP	1B Condensate Booster Pump trip
<b>3</b> . T+30	RX06A	I – RO TS – SRO	Pzr Level Controlling Channel LT 68-339 fails low
<b>3.a</b> T+30	N/A	N – BOP	Restore Letdown following Pzr Level Ch failure.
<b>4.</b> T+40	RX16D	TS – SRO	#4 SG Narrow Range Level Transmitter LT 3-106 fails low.
<b>5.</b> T+45	RX24	I – BOP	Feedwater Header PT-3-1 Fails Low
<b>6.</b> T+55	MS06C	C – RO N – Crew	Small Steam Leak Outside Containment Upstream Of Loop #3 MSIV
<b>7</b> . T+65	RP01C [pre-insert]	C – RO	ATWS- Both RTBs fail to automatically or manually open from MCR
<b>8.</b> T+65	RD09	C – RO	Control Rods fail to move in Automatic- delayed
<b>9.</b> T+65	MS06C	M – All	Steam Leak increases to MSLB requiring Reactor Trip/Safety Injection
	EW04C		Loop #3 MDAEW/ LCV Eails Full Open

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#### Scenario 7 Summary

The crew will assume the shift with the unit in MODE 1, ~42% RTP with direction to continue plant startup from 0-GO-5 Section 5.1 Step 23 and place the 2nd Main Feedwater Pump in service according to 1-SO-2/3-1 Section 5.16.4 Step 8; then continue plant startup.

When the 2nd Main Feedwater Pump is in service and after the RO raises power, at Lead Examiner direction, 1B Condensate Booster Pump trip will occur. The crew will respond using alarm response procedures, (ARPs) 1-AR-M1B E-3 and enter AOP-S.04, Condensate or Heater Drains Malfunction Section 2.5. The SRO should direct the application of 0-GO-5, Normal Power Operations Section 5.1 Step 17 to start the available CBP, assuring secondary condensate flow/MFP suction pressure adequacy.

At Lead Examiner direction, the controlling pressurizer level channel LT 68-339 will fail low resulting in letdown isolation and Pzr heaters de-energized. The crew will respond using ARPs 1-AR-M5A C-3, E-3 and AOP-I.04, Pressurizer Instrument and Control Malfunctions Section 2.4. SRO will refer to Technical Specifications 3.3.1.1 Table 3.3-1 functional unit 11 Action 6; TS 3.3.3.7 Table 3.3-10 Functional Units 7 Action 2.

Following restoration of letdown, at Lead Examiner direction, a Steam Generator #4 narrow range level transmitter LT 3-106 will fail low. No plant transient will result due to the median selector circuit. The crew will respond using ARPs 1-AR-M3C D-2 and 1-AR-M5A B-7 and AOP-I.06 Section 2.2. SRO will refer to Technical Specifications 3.3.1.1 Table 3.3-1 Functional Unit 14.A & B, Action 9; 3.3.2.1 Table 3.3-3 Functional Unit(s) 5a- Action 17; 6.c.i.a & 6.c.ii.a & b-Action 36, 8.c- Action 22c.

At Lead Examiner direction, Feedwater header pressure transmitter PT-3-1 will fail low resulting in MFP speed increase to attempt to restore steam header to feedwater differential pressure to program. The crew will respond using ARPs 1-AR-M3C C-1 and 1-AR-M5A B-7, AOP-S.01 Section 2.3 is implemented, which directs manual MFP speed control. MFP speed control will remain in manual for the remainder of the scenario.

When plant is stable, at Lead Examiner direction, a small unisolable steam leak will occur on Steam Generator Loop 3 outside containment upstream of the Main Steam Isolation Valve. After identifying increasing reactor power with decreasing main generator megawatts, the crew will enter AOP-S.05, Steam or Feedwater Leak to stabilize the plant and monitor key parameters for Reactor Trip. The crew may attempt to manually trip the reactor based on Reactor/ Turbine power mismatch; if so, initiate the Main Steam Line Break (MSLB) once the reactor trip breakers are open.

When the small steam leak has been addressed, at Lead Examiner direction, the steam leak will be increased to a significant MSLB requiring Reactor Trip and Safety injection. When manual reactor trip is actuated, both reactor trip breakers will fail to open automatically and manually from the MCR resulting in an ATWS and entry into contingency procedure FR-S.1.

During response to the ATWS, control rods will initially insert in automatic but stop after ~10 seconds requiring manual rod insertion. When the Reactor is shutdown and Safety Injection occurred if required, the auxiliary feedwater supply valve to the faulted S/G will fail full open requiring that the associated AFW pump be stopped to stop feed flow to the faulted S/G. Local isolation of the failed AFW valve may also initiated.

E- Procedure Path: E-0 – FR-S.1 – E-0 – E-2

The scenario may be terminated when crew meets transition criteria to E-2.



# NRC 1009 ESG-7 Booth Instruction File

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7/17/2010

EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/BOOTH FEEDBACK
Simulator IC	IC-118 Perform switch check. Allow the simulator to run for at least 3 minutes before loading SCEN file or starting the exercise. This will initialize ICS. Load SCENS: <u>1009 NRC ESG-7</u> Place simulator in RUN. Place OOS equipment in required position with tags.	<ul> <li>42%, BOL ~150 MWD/MTU CB 'D' Rods @ 180 steps, all others @ 228 steps; [B] = 1350 ppm; Ba Blender setting: 28% Xe/Sm @ equilibrium</li> <li><u>Console Operator actions: Place simulator in run and perform the following:</u></li> <li>Set Ranges on Tave/Tref Recorder on 1-M-6 to ± 3 degrees for current conditions (System Menu/Strip Chart Assign Tab through to fix)</li> <li>Place the MODE 1 sign on 1-M-4</li> <li>Place Train Week A sign</li> </ul>
MFs, RFs, ORs are active when the SCN file is loaded.	Clear alarms IMF FW07C f:1 IOR ZLOHS151A_GREEN f:0 IOR ZLOHS117A_GREEN f:0 IOR ZLOHS118A_GREEN f:0	TDAFW Pump Is Inoperable. <u>Close</u> FCV-1-17 & 18 & <u>place Hold Notice</u> on HS-1-17&18 and FCV-1-51.
	IOR ZLOHS3136AA_GREEN1 f:0 IOR ZLOHS3136AA_GREEN2 f:0 IOR ZLOHS3136AA_RED1 f:0 IOR ZLOHS3136AA_RED2 f:0 IOR ZDIHS3136AA f:0 IOR ZLOHS3179AA_GREEN1 f:0 IOR ZLOHS3179AA_GREEN2 f:0 IOR ZLOHS3179AA_RED1 f:0 IOR ZLOHS3179AA_RED1 f:0 IOR ZLOHS3179AA_RED1 f:0	Also <u>place Hold order</u> on TDAFW Pump ERCW supply valves. Place Protected Equipment Tags on 1-M-4, MD AFW Pumps and 0-M-26, both EDGs
1.	- none -	~42% Power, Start 2 <sup>nd</sup> Main Feedwater Pump, Continue Plant
	IRF FWR10A f:3360 r:30 k:1 IRF FWR10B f:3700 r:30 k:11	<u>Support staff report:</u> Simulates I&C local speed changer adjustments as requested by MCR crew (vary 'f' value to obtain requested rpm on 1-M-3).
2.	IMF CN02B f:1 k:2	1B Condensate Booster Pump trip
		<u>Support staff report:</u> When AUO dispatched, wait ~3 minutes and report timed overcurrent relay target is actuated.
3.	IMF RX06A f:1 k:3	<b>Controlling Pzr LvI Transmitter fails Io (LT 68-339)</b> <u>Support staff report:</u> When MSS contacted, report that I&C will report to the MCR in ~ 25 minutes.
4.	IMF RX15D f:0 k:4	#4 SG LvI Transmitter fails Lo (LT 3-106) <u>Support staff report:</u> When MSS contacted, report that I&C will report to the MCR in ~ 45 minutes.

# NRC 1009 ESG-7 Booth Instruction File

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EVENT	IC/MF/RF/OR #	DESCRIPTION/EXPECTED ACTIONS/POOTH
		FEEDBACK
5.	IMF RX24 f:1 r:30 k:5	FW Header Pressure Transmitter fails Io (PT-3-1)
		Support staff report: When AUO dispatched, wait ~3 minutes and report no apparent local problems.
6.	IMF MS06C f:29 r:15 k:6	MS Leak Outside Containment - LP #3 upstream of MSIV
		<u>Support staff report:</u> When AUO dispatched, wait ~2 minutes, report steam coming from the East Valve Vault Room; No personnel safety issues observable.
Instructor Not	e: If Crew elects to manually trip are open.	for the small steam leak, MMF to the values below once the RTBs
7.	IMF RP01C f:1	ATWS- both Rx Trip Breakers Auto/Manual fail
	[Pre-insert]	Support staff report: below
8.	IMF RD09 f:1 e:7 d:10	Rods move in AUTO for 10 seconds following MT Manual Trip then Auto movement stops.
		Support staff report: none
	IRF RPR05A f:1 d:180 k:18 IRF RPR05B f:1 d:185 k:18	Opens Rx Trip Bkrs in sequence
		<u>Support staff report:</u> When AUO dispatched, wait 3 min 5 sec, report both Rx Trip Bkrs opened locally.
9.	MMF MS06C f:75 r:300	Increase MS Leak Outside Containment - LP #3 upstream of MSIV requiring Rx Trip & SI
		Support staff report: If previously dispatched, when contacted report leak much worse;
		If dispatched to look for steam/feedwater leaks, wait ~3 minutes, report steam coming from the East Valve Vault Room
10.	IMF FW04C f:1 e2	#3 MDAFW Main LCV-3-148 fails open
		<u>Support staff report:</u> When AUO dispatched, wait ~3 minutes, report the valve is full open; no apparent cause.
	IRF FWR05 f:0 k:20	MDAFW #3 LCV Isolation Valve 1-VLV-3-826 (Isolates Main and Bypass valves)
		<u>Support staff report:</u> When AUO dispatched, wait ~ 5 minutes, report 3-826 is closed
Termination	Criteria: When Crew meets t	transition criteria to E-2



Page 1

DELTA	REACTOR	POWER	ASSUMED	INSERTED	EXPECTED	DELTA RHC	BORON	DELTA	RECOMMEN	IRECOMMEN	IODINE
TIME	POWER	DEFECT	ROD HT	WORTH	XENON	BORON	CONC	PPM	DILUTION	BORATION	CONC
(hrs)	(%)	(pcm)	(steps)	(pcm)	(pcm)	(pcm)	(ppm)	(ppm)	(gal)	(gal)	(% eg)
0	42.0	740.7	180.0	-315.7	-2020.0		1350.0				42.0
1	50.0	865.5	190.0	-230.5	-1995.3	14.9	1347.6	-2.4	113	0	42.4
2	54.5	934.4	193.0	-203.5	-1960.4	7.0	1346.5	-1.1	53	0	43.4
3	59.0	1003.6	196.0	-177.3	-1925.0	7.6	1345.3	-1.2	58	0	44.7
4	63.5	1072.5	199.0	-152.2	-1891.8	10.5	1343.6	-1.7	80	0	46.3
5	68.0	1141.8	202.0	-128.1	-1862.4	15.8	1341.1	-2.5	121	0	48.2
6	72.5	1211.5	205.0	-105.0	-1838.4	22.6	1337.5	-3.6	173	0	50.4
7	75.0	1251.0	208.0	-84.1	-1822.9	3.1	1337.0	-0.5	24	0	52.7
8	75.0	1251.1	211.0	-64.7	-1820.5	-21.7	1340.5	3.4	0	40	54.9
9	75.0	1250.0	214.0	-47.2	-1830.6	-8.5	1341.8	1.4	0	16	56.9
10	75.0	1249.6	216.0	-36.1	-1849.8	7.6	1340.6	-1.2	58	0	58.7
11	75.0	1250.0	216.0	-36.0	-1875.1	25.7	1336.5	-4.1	197	0	60.3
12	75.0	1251.3	216.0	-36.0	-1904.5	30.7	1331.7	-4.9	236	0	61.7
13	75.0	1252.9	216.0	-36.0	-1936.3	33.3	1326.4	-5.3	257	0	63.0
14	75.0	1254.6	216.0	-35.9	-1969.2	34.6	1320.9	-5.5	268	0	64.2
15	75.0	1256.3	216.0	-35.9	-2002.3	34.8	1315.4	-5.5	271	0	65.3
16	75.0	1258.1	216.0	-35.8	-2035.0	34.4	1309.9	-5.5	268	0	66.2
17	75.0	1259.8	216.0	-35.8	-2066.7	33.4	1304.6	-5.3	262	0	67.1
18	75.0	1261.5	216.0	-35.8	-2097.1	32.1	1299.5	-5.1	252	0	67.9
19	75.0	1263.2	216.0	-35.7	-2126.0	30.5	1294.7	-4.8	241	0	68.6
20	75.0	1264.8	216.0	-35.7	-2153.2	28.8	1290.1	-4.6	228	0	69.2
150	MWD/MTU	J	Hold Tavg	= Tref +/- 1.	5F			Total	3160	56	
6820	BAT ppm								Small hourly	boration/dilution	ł
									volumes may	y be accumulate	d
for larger single additions											
Reason for Maneuver Reactor/Plant restart following forced outage				ed outage- {	50% hold 7	'5% hold					
Date			Today								
RxEng N	Name		J. Sidekick								
Comme	nts		none								

1009 ESG-7 Page 1 of 5

Unit 1 MCR CHECKLIST Page 1. c	f 3Today
Part 1 - Completed by Off-going Shift / Reviewed b Mode 1, 42% Power PSA Risk: Green Grid Risk: Green	/ On-coming Shift NRC phone Authentication <u>Code</u> Until 0800 XXXX
RCS Leakage ID .02 gpm, UNID .02 gpm	After 0800 YYYY
Common Tecl	Spec Actions
• None	
U-1 Tech S	pec Actions
LCO/TRM Equipment INOP TS LCO 3.7.1.2.a TDAFW T&T valve repair TS 3.3.3.7.18b action 1 TDAFWP ERCW - AFW	Time INOPOwner2 hours agoMMGValve Position2 hours agoMMG
Protected	Equipment
<ul> <li>Equipment/spaces for TDAFW Pump per 0-GO-16 ,</li> </ul>	Appx J
Shift P	forities
<ul> <li>Place the 2nd Main Feedwater Pump in service accordin Section 5.16.4 is in progress and complete through step MFPT as needed.</li> </ul>	g to 1-SO-2/3-1 Section 5.16.4, <i>Startup of Second MFPT.</i> 14. AUO, MIG, and PDM, support are present at the 1-B
<ul> <li>Plant Startup held at ~42% awaiting availability of MFP E Continue plant startup per Rx Engineering Spreadsheet. Appendix D and E have been completed. Pre-conditione</li> </ul>	for past 72 hrs. Currently in 0-GO-5 Section 5.1, Step 23. Spreadsheet has been verified by the SRO/STA. 1-SO-62-7 d Power level is 100%.
Part 2 – Performed by on-coming shift	
Verify your current qualifications	Review Operating Log since last held shift or 3 days, whichever is less
Standing Orders / Shift Orders X TACF	Immediate required reading
LCO Actions	
Part 3 – Performed by both off-going and on-coming	j shift
Walk down of MCR Control Boards	

1009 ESG-7 Page 2 of 5

SHIFT TURNOVER CHECKLIST

Page 2. of 3

Today

MAIN CONTROL ROOM (7690)
Train <u>B</u> Week
Protected Equipment:
MDAFW Pump A 1-HS-3-118A
MDAFW Pump B 1-HS-3-128A
■D/G 1A-A 1-HS-57-46A
■ D/G 1B-B 1-HS-57-73A
OUTSIDE (7666) [593-5214]
All Equipment normal for current conditions
<ul> <li>Equipment/spaces for TDAFWP protected per 0-GO-16 Appy 1</li> </ul>
AUXILIARY BUILDING (7775)
TDAFW pump was tagged 2 hours ago for repair to the T&T valve. The packing was blowing
excessively. Expected Return to service is 8 hours (WO 10-080025-000)
TURBINE BUILDING (7771) (593-8455)
All Equipment normal for current conditions
a sur equipment normal for current conditions

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1009 ESG-7 Page 3 of 5

### SHIFT TURNOVER CHECKLIST

### Page 3. of 3

Today

	Disabled Annunciators						
PANEL	WINDOW	ANNUNCIATOR	WO / PER Number				

#### Equipment Off-Normal (Pink Tags)

UNID And Noun Name	Panel	Problem Description	WO / PER Number

#### MCR WO LIST

ID And Noun Name	Panel	Problem Description	WO/PER Number

#### UNIT ONE REACTIVITY BRIEF Date: Today Time: Now

General Information

RCS Boron: 1350 ppm	Today	BA Cor	ntroller Setpoint: 28% *	RCS B-10 Depletion: 2 ppm
Operable BAT: A	BAT A Boron: 685	<b>0</b> ppm	BAT C Boron: 6850ppm	RWST Boron: 2601 ppm
Nominal	Gallons per rod ste	p from 18	9: 17 gallons of acid, 75	gallons of water

\* Verify boric acid flow controller is set at Adjusted BA Controller Setting iaw 0-SO-62-7 section 5.1

Estimated values for a 1° Change in Tave \*\*

Gallons of acid: 22

Gallons of water: 94

Rod Steps: 1

Estimated rods/boron for emergency step power reduction \*\* (Assuming Xenon equilibrium and no reactivity effects due to Xenon. 2/3 total reactivity from rods, 1/3 from boron)

Power reduction amount	Estimated Final Rod Position	Estimated boron addition
10%	181 Steps on bank D	93 gallons
30%	161 Steps on bank D	291 gallons
50%	n/a	n/a

\*\* These values are approximations and not intended nor expected to be exact. The values may be superseded by Rx Engineering or SO-62-7 calculated values. These values are calculated assuming 100% steady state power operation only. Engineering data last updated <u>TODAY</u>. Data Valid through three weeks from now.

Previous Shift Reactivity Manipulations

Number of dilutions: 1	Number of borations:	Rod steps in:	
Gallons per dilution: 12	Gallons per boration:	Rod steps out:	
Total amount diluted: 12	Total amount borated:	Net change:	IN/Out

Current Shift Estimated Reactivity Manipulations

**Remarks:** Rx Power – 42% MWD/MTU – 150 Xenon & Samarium at Equilibrium \*\*\* As Required by Reactor Engineering startup spreadsheet. \*\*\*The boron letdown curve is flat for the next 25 EFPD.

Last Dilution Complete ~1 hour ago.

Next Unit 1 Flux Map is scheduled: N/A

Unit Supervisor:

Name/Date

1009 ESG-7 Page 5 of 5

	Boron Results							
Sample Point	Units	Boron	Date / Time	Goal	Limit			
U1 RCS	ppm	1350	Today / Now	Variable	Variable			
U2 RCS	ppm	816	Today / Now	Variable	Variable			
U1 RWST	ppm	2601	Today / Now	2550 - 2650	2500 - 2700			
U2 RWST	ppm	2569	Today / Now	2550 - 2650	2500 - 2700			
BAT A	ppm	6850	Today / Now	Variable	Variable			
BAT B	ppm	6850	Today / Now	Variable	Variable			
BAT C	ppm	6850	Today / Now	Variable	Variable			
U1 CLA #1	ppm	2556	Today / Now	2470-2630	2400-2700			
U1 CLA #2	ppm	2575	Today / Now	2470-2630	2400-2700			
U1 CLA #3	ppm	2591	Today / Now	2470-2630	2400-2700			
U1 CLA #4	ppm	2589	Today / Now	2470-2630	2400-2700			
U2 CLA #1	ppm	2531	Today / Now	2470-2630	2400-2700			
U2 CLA #2	ppm	2650	, Today / Now	2470-2630	2400-2700			
U2 CLA #3	ppm	2522	Today / Now	2470-2630	2400-2700			
U2 CLA #4	ppm	2526	Today / Now	2470-2630	2400-2700			
Spent Fuel Pool	ppm	2547	Today / Now	<u>≥</u> 2050	<u>≥</u> 2000			
	ithium Res	ults	The second second	Goal	Midpoint			
U1 RCS	ppm	1.1	Today / Now	>1	>1			
U2 RCS	ppm	2.43	Today / Now	2.18-2.48	2.33			

# **Operations Chemistry Information**

Primary to Secondary Leakrate Information (Total CPM RM-90-99/119)								
Indicator	Units	U1	Date / Time	U2	Date/Time			
SI 50 S/G Leakage?	Yes/No	No	Today / Now	No	Today / Now			
SI 137.5 CVE Leakrate	gpd	< 0.1	Today / Now	< 0.1	Today / Now			
5 gpd leak equivalent	cpm	115	Today / Now	68	Today / Now			
15 gpd (30 min increase)	cpm	265	Today / Now	83	Today / Now			
30 gpd leak equivalent	cpm	490	Today / Now	206	Today / Now			
75 gpd leak equivalent	cpm	1165	Today / Now	455	Today / Now			
150 gpd leak equivalent	cpm	2290	Today / Now	870	Today / Now			
CVE Air Inleakage	cfm	10	Today / Now	12.5	Today / Now			
Bkgd on 99/119	cfm	40	Today / Now	40	Today / Now			
Steady state conditions	are necessary	for an accurate	e determination of leak r	ate using the CVE	Rad Monitor			



Appendix D		Ę	Scenario Outline						Attachment 1		
Op Test No.:	NRC	Scenario #	7	Event#	1		Page	1	of	43	
Event Description:	: ~42%	~42% Start 2 <sup>nd</sup> MFP, Continue Power Escalation									
Time	Position		A	pplicant'	s Actions	or beha	vior				
Simulator Ope	erator: No ac	tion required f	for Event	1							
Indications av	ailable: None	, Crew will pe	rform sta	rtup IAW	0-GO-5 Se	ction 5	.1, Step	o 23.			
Τ = 0	Following cou MFP in servic continuing pla	ollowing completion of crew turnover, at the SRO's direction, the BOP will place IFP in service Section 5.1 Power Ascension From 30% to 100% Step 23 in preparent ontinuing plant power escalation							ce the eparat	1B ion fo	
	SRO	Direct load in	crease fro	om ~42%	power in ac	cordan	ce with	0-GC	9-5, No	rmal	
		With verbal an	nion, begi	nning in S	Section 5.1,	at Step	23.				
	NOTE: 1) mi (U iso or 2) Mi	With verbal ap ain feed pump Init 1) or 65% (I plation valves if the running pu LCO 3.3.2.1 (3 FPT) allows on	proval fro in service Unit 2). Lo the pump ump. 3.3.2) func e channel	m the Op may be c ogic preve is <b>NOT</b> r tional uni to be ino	eration 5.1, erations Su leferred unt nts opening reset prior to t 6.f (AFW s perable in N	at Step perinter il power g the sta c exceed start fun Mode 1 1	23. Indent, p is appr andby N ding 9 r ction fo for up to	placing roxima IFPT millior or the o 4 ho	g the s ately 5 conde b lbs/hr trip of l	econ 5% nser flow both	
	NOTE: 1) mi (U iso or 2) Mi sta	With verbal ap ain feed pump Init 1) or 65% (I plation valves if the running pu LCO 3.3.2.1 (3 FPT) allows on arting up or shu	proval fro in service Unit 2). Lo the pump ump. 3.3.2) func e channel utting dow	ming in S m the Op may be c ogic preve to is <b>NOT</b> r to be ino n the seco	eration 5.1, erations Su leferred unt nts opening reset prior to t 6.f (AFW s perable in M ond MFPT.	at Step perinter il power the sta o exceed start fun Mode 1 t	23. Indent, p is appr andby M ding 9 r ding 9 r ction fo for up to	olacing roxima 1FPT millior or the o 4 ho	g the s ately 5 conde i lbs/hr trip of burs wl	econ 5% nser flow both	
	NOTE: 1) mi (U iso or 2) Mi sta SRO	With verbal ap ain feed pump Init 1) or 65% (I plation valves if the running pu LCO 3.3.2.1 (3 FPT) allows on arting up or shu [23] WHEN a	proval fro in service Unit 2). Lo the pump ump. 3.3.2) func e channel utting dow pproximat	ming in S m the Op may be c ogic preve to is <b>NOT</b> r stional uni to be ino <u>n the sec</u> tely 40% t	eration 5.1, erations Su leferred unt nts opening eset prior to t 6.f (AFW s perable in N ond MFPT. turbine load	at Step perinter il power the sta b exceed start fun Mode 1 t	23. Indent, p is appr andby M ding 9 r ction fo for up to	olacing roxima IFPT millior or the o 4 ho	g the s ately 5 conde b lbs/hr trip of burs wl	econ 5% nser flow both	
	NOTE: 1) ma (U iso or 2) Mi sta SRO BOP/ SRO	With verbal ap ain feed pump Init 1) or 65% (I plation valves if the running pu LCO 3.3.2.1 (3 FPT) allows on arting up or shu [23] WHEN a [23.1] VERIF	proval fro in service Unit 2). Lo the pump ump. 3.3.2) func e channel <u>utting dow</u> <u>pproximat</u> <b>Y</b> annunci	tional uni to be ino <u>n the seco</u> tator XA-5	t 6.f (AFW s perable in M bond MFPT. turbine load 5-4A, windo <b>C-20 AMSA</b>	at Step perinter il power g the sta o exceed start fund Mode 1 f : : : : : : : : : : : : : : : : : : :	23. Indent, p is appr andby M ding 9 r ction fo for up to	olacing roxima 1FPT millior or the o 4 ho	g the s ately 5 conde blbs/hr trip of burs w	econ 5% nser flow both nen	
	NOTE: 1) mi (U iso or 2) Mi sta SRO BOP/ SRO BOP/ SRO	With verbal ap ain feed pump Init 1) or 65% (I plation valves if the running pu LCO 3.3.2.1 (3 FPT) allows on arting up or shu [23] WHEN a [23.1] VERIF	proval fro in service Unit 2). Lo the pump ump. 3.3.2) func e channel utting dow pproximat Y annunci	nning in S m the Op may be c ogic preve o is <b>NOT</b> r stional uni to be ino <u>n the secc</u> ator XA-5 <b>C</b> ns on the ).	erations Su leferred unt ints opening reset prior to t 6.f (AFW s perable in N ond MFPT. turbine load 55-4A, windo <b>:-20 AMSA</b> <b>ARMED</b>	at Step perinter il power g the sta o exceed start fun Mode 1 f : : : : : : : : : : : : : : : : : : :	23. Indent, p is appr andby M ding 9 r ction fo for up to is <b>LIT</b> : dwater	placing roxima IFPT millior or the o 4 ho	g the s ately 5 conde b lbs/hr trip of burs wl	econ 5% nser flow both hen	

BOP	[23.2] <b>CLOS</b> (N/A o	E the drain ther pump	ns on the operating m )).	nain feedwater pum
		MFPT	DESCRIPTION	HANDSWITCH
		Α	DRAIN VALVES	HS-46-14
		В	DRAIN VALVES	HS-46-41
JRU	MFPT	in service	by performing the fo	lowina:
 SRU	MFPT	in service	by performing the fo	lowing:
 SRO	MFPT [24.1] <b>IF</b> the [24.2] <b>WHEN</b>	in service Operation I second N	by performing the for s Superintendent has <b>IFPT</b> is to be placed	lowing: approved… N/A in service, <b>THEN</b>
 SRO SRO SRO/	MFPT [24.1] <b>IF</b> the [24.2] <b>WHEN</b>	in service Operation I second N	by performing the fo s Superintendent has IFPT is to be placed	lowing: approved N/A in service, <b>THEN</b>
SRO SRO/ BOP	MFPT [24.1] IF the [24.2] WHEN PLACI 1,2-SC	in service Operation I second N E second D-2/3-1.	by performing the fo s Superintendent has <b>IFPT</b> is to be placed MFPT in service in ac	lowing: approved N/A in service, <b>THEN</b> ccordance with
 SRO SRO/ BOP	MFPT [24.1] IF the [24.2] WHEN PLACI 1,2-SC	in service Operation I second N E second D-2/3-1.	by performing the for s Superintendent has <b>IFPT</b> is to be placed MFPT in service in ac	lowing: approved N/A in service, <b>THEN</b> ccordance with

	Appendix D		Scenario Outline						Attachment 1			
	Op Test No.: Event Description	<u>NRC</u> : ~42%	Scenario Start 2 <sup>nd</sup> I	# MFP, Contin	Event # ue Power Escalation	1	Page	_2	of43			
	Time Position Applicant's Actions or behavior											
	Evaluator Not	e: The followin	llowing steps are from 1-SO-2/3-1 Section 5.16.4 beginning at step 8. The O were previously performed and snapped into the Scenario Initial Condition [8] PERFORM the following:									
	[a] ENUSRE [1-HCV-3-70], Main FW Pump 1A Bypass N//											
			[b] E (	ENUSRE [ CLOSED.	1-HCV-3-84] ], Main	FW Pu	mp 1B Bypa	ass Wa	rm-up Valve			
			[c]	F starting	1A MFP N/A							
			ו <b>ן [b]</b> ע	F starting alve betw	1B MFP, <b>THEN THR</b> een 30%-50% OPEN	OTTLE	[1-FCV-3-8] G [1-FIC-3-8	84] MF 84].	<sup>&gt;</sup> Recirc			
		NOTE: The pump be in	AFW start function on loss of both MFW pumps is inoperable when a M p is RESET but NOT pumping forward. LCO 3.3.2.1 allows the AFW stanoperable for up to 4 hours when starting up the second MFW pump. [9] RESET the Standby MFPT.									
for the second s			[10] ENSURE the following:									
					DESCRIPTION		VALVE		POSITION			
					ndenser met isol va		1-FCV-2-205A		OPEN			
			- 11		ndenser Unlet Isol v	alve	1-FUV-Z-		OPEN			
					ndenser Outlet Isol v	alve /alve	1-FCV-2-2	211A 216A	OPEN OPEN			
	NOTE:       Either stop valve handswitch will open both high pressure and low pressur valves for the applicable MFPT.         [11] OPEN the Stop Valves for the MFPT to be started by placing eit H/P or L/P handswitch to the RAISE position:						essure stop					
				MFPT	DESCRIPTION HA				.VE TION			
				1A	H/P Stop Valve	1-H	S-46-15A OF		EN			
					L/P Stop Valve	1-H	S-46-16A	OP	EN			
				1B	H/P Stop Valve	1-HS-46-43A		OP	EN			
					L/P Stop Valve	1-H	S-46-44A	OP	EN			
Ċ		BOP	[12] VE (as ind	RIFY the icated on	IFP turning gear motor has STOPPED. I-M-3, Turning Gear MFPT B handswitch,1-HS-46-38A)							

	Appendix D			Scenar	io Outline			Atta	chme	nt 1
~	Op Test No.:	NRC	Scenario #	7	Event #	1	Page	3	of	43
	Event Description:	~42	2% Start 2 <sup>nd</sup> MFP	, Continue	Power Escala	ation			_	

Time	Position	Applicant's Actions or behavior						
	CAUTION:	Observe MFP speed, flow, discharge pressure during the MPFT startup to prevent an inadvertent FW swing if the MFPT minimum speed setpoint is excessively high.						
	NOTE: The setti on h pres adju	feedwater pump speed controller will take control at the minimum speed ng and run the governor valve positioner out to its upper limit. Minimum speed igh pressure steam is 3100 to 3,300 rp <b>m</b> and 3650 to 3850 rp <b>m</b> on low sure steam. This value may vary based on previous hand speed changer stment.						
	CREW	[13] NOTIFY I&C to adjust the MFPT hand changer for the proper rpm as the second MFPT is accelerated.						
	NOTE 1:Vibra pane (dan bear	ation and thrust bearing wear should be monitored on local Bently Nevada el and ICS (Secondary Mimics, MFP Bearing Data). Max allowable vibration ger limit) is 5 mils above baseline; alert value is 3 mils above baseline. Thrust ing wear trip setpoint is 10 mils above baseline (7 mils alert above baseline).						
	NOTE 2:1A N ICS poin 331E temp 20" H temp	MFWP condenser vacuum may be monitored using 1-PI-2-331A (TB el. 685), computer point 1U2082, or by monitoring condenser drain temperature (ICS t 1T2360A). 1B MFWP condenser vacuum may be monitored using, 1-PI-2- 3 (TB el. 685), ICS computer point 1U2084, or by monitoring condenser drain berature (ICS point 1T2361A). Drain temp ≤160°F indicates vacuum of at least Hg. MFWP trip setpoint of 12.2 psia corresponds to ~5 "Hg vacuum or drain to of ~200°F.						
	BOP	141 MONITOP the following percentation during MEW/D starture						
		<ul> <li>Vibration and thrust bearing wear (at local panel).</li> <li>MFWP Condenser vacuum/drain temperature.</li> <li>Oil system and bearing temperatures.</li> </ul>						
	BOP	[15] OPEN Governor Valve by PERFORMING one of the following:						
		[a] IF MCR operation of Governor Valve Positioner is available, THEN PLACE the applicable Governor Valve Positioner to the RAISE position to open the steam chest valves and accelerate the MFPT:						
		1B GV Positioner→1-HS-46-40A →OPEN						
	BOP	[b] IF MCR operation of Governor Valve Positioner is unavailable, THEN:						

	Appendix D		Scenario Outline	Attachment 1						
	Op Test No.: Event Description	<u>NRC</u>	Scenario # <u>7</u> Event # <u>1</u> 6 Start 2 <sup>nd</sup> MFP, Continue Power Escalation	Page <u>4</u> of <u>43</u>						
	Time	Position	Applicant's Actions or behav	vior						
			1. ESTABLISH direct communications betw operating the U1 MFP speed control loca Control Room.	ween the personnel ally and the U1 Main						
			<ol> <li>DIRECT I&amp;C to slowly adjust U1 MFP S manual control of the MFP Governor Va steam chest vales and control MFPT specific steam chest vales and control MFPT specific</li> </ol>	peed Control using local lve Positioner to throttle eed.						
		CAUTION:	DO NOT increase second MFPT speed faster that control can maintain program d/p.	n the master speed						
		NOTE: As t	he second MFPT is loaded, the first MFPT should bac	k down in load.						
			[16] SLOWLY LOAD the second MFPT to raise MFI on MFPT speed controller matches the demand MFPT.	PT speed until demand output of the first						
			[17] ENSURE MFP Injection Water Intermediate Lea MFPs is approximately 200-250 psig.	akoff Pressure for <b>BOTH</b>						
C			[a] [1-PI-54-2], 1A MFP							
			AND							
			[b] [1-PI-54-6], 1B MFP							
			[18] ENSURE MFP Injection Water Differential Prese equal to or greater than 25 psid.	sure for pump started is						
			[a] [1-PDI-54-1], 1A MFP							
			OR							
			[b] [1-PDI-54-5], 1B MFP							
			[19] WHEN the output meter for the SIC for the seco output meter on the Master Controller, THEN PI SIC in AUTO.	nd MFPT matches the <b>_ACE</b> the second MFPT						
		·								
Арр	endix D			Scena	ario Outline		Attachment 1			
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Op Te Event	est No.: t Description	<u>NRC</u>	Scenario # 5 Start 2 <sup>nd</sup> N	<sup>#</sup> 7 IFP, Continu	Event #	1 Pag	e <u>5</u> of <u>43</u>			
	Time	Position	I	·····	Applicant's Act	ions or behavior				
			[20] CL	OSE the se	econd MFPT drain v	alves (N/A valves	not closed):			
				MFPT	DESCRIPTION	HANDSWITCH	POSITION			
				1A	Drain Valves	1-HS-46-14	CLOSED			
				1B	Drain Valves	1-HS-46-41	CLOSED			
		CAUTION 1:	MFP Re to the po MFP da	circ valves otential for mage.	s controllers should isolating all three in	NOT be operated termediate heater	in AUTOMATIC due strings and resultin			
		CAUTION 2:	on MFP	DP progra	RECIRC valve shou am.	Ild be performed s	lowly due to affect			
		BOP	[21] EN and	SURE [1-F in MANU/	<b>CV-3-70]</b> or <b>[1-FCV</b> AL.	/-3-84] MFP Recir	c valve is CLOSED			
3 3 20		CAUTION:	AUTION: Failure to readjust the minimum speed on the second MFWP could result in the second MFWP being unable to supply adequate feed flow in the event the first MFWP trips.							
		<b>NOTE:</b> The following step may be performed in parallel with power increase but should b completed prior to exceeding 55% power.								
			<b>[22] WH</b> are spe	EN MFWF in AUTO, ed on the s	P speed controllers [ THEN PERFORM the second MFWP:	<b>1-SIC-46-20A]</b> an ne following to adju	d <b>[1-SIC-46-20B]</b> ust the minimum			
			[a]	VERIFY b	oth MFWP speed co	ontroller bias settir	igs at 50%.			
			[b]	NOTIFY 18 second MF	C to slowly adjust t WP so that the MF	he hand speed ch WP speeds are ec	anger on the qual.			
		CAUTION 1:	A bias ao unless e maximur trips.	djustment valuated b n speed al	in the upward direct y Systems Enginee nd the ability to fully	ion (> 50%) shoul ring since this cou load in the event	d NOT be used ld impact a MFPT's the other MFPT			
		CAUTION 2	Transfer 50% will the Mast will resul	ring a MFF result in a er MFPT ( t in an inst	PT Controller from M n instantaneous spe Controller from Man antaneous speed cl	fanual to Auto with eed change of the ual to Auto with bia hange of the MFP	n the bias not set to MFPT. Transferring as not set to 50% T.			
		NOTE 1 The	e following ervice an	g step may d in <b>AUTO</b>	y be performed at an	ny time when both	MFPTs are			

Appendix D		Scenario Outline						Attachment 1	
Op Test No.:	NRC	Scenario #	E	Event #	1	Page	6	of	43
Event Descriptio	n: ~	42% Start 2 <sup>nd</sup> MFI	<sup>&gt;</sup> , Continue Pow	ver Escalation					
16									
						<u></u>			
Time	Positior	n	A	pplicant's	Actions or I	behavior			
Time	Position	n With both MF control bias of each other (os	A PTs in AUTO n one of the c scillating).	pplicant's A it may beco operating Mi	Actions or I ome necess PTs to prev	<b>behavior</b> ary to adjus vent MFPTs	t the M from f	IFPT s ighting	pee

<b>SLOWLY ADJUST</b> one MFPT speed control bias in downward direction (0% to 50%) until desired flow balance is achieved.
End of Section 5.16.4

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Appendix D	opendix D Scenario Outline					Attachment 1			
Op Test No.:	NRC	Scenario #	7	Event #	1	Page	7	of	43
Event Description:	~42	2% Start 2 <sup>nd</sup> MFP	, Continue	Power Escala	ation			-	

Position		Applicant's Actions or behavior					
0-SO	-62-7 Boro	n Concentratio	on Control, Section 6	6.2 Dilute			
te: Dilutions v subseque hour as d	vill be perfo ent power e etermined l	ormed based or scalation, large by the crew.	n the RE-provided Rea volume dilutions will	activity Spreads be divided ever	heet; during Ily over each		
An extra l pressurize	oank of pre er spray op	ssurizer heater eration for equ	s (Back-up Group 1C) alizing boron concentr	will be energiz ation in RCS ar	ed to cause nd pressurizer.		
RO	[1] ENS posit	1] ENSURE unit is <u>NOT</u> in a Tech Spec or TRM action that prohibits positive reactivity additions. [C.1]					
		crease of 1% is	s equal to 1380 gallon	s (TI-28 fig. C.2	21).		
RO	[2] ENS expe	CRE sufficient	capacity available in t of CVCS letdown: ( <b>N//</b>	he HUT selecte <mark>A</mark> if <u>not</u> used)	d to receive		
		HUT	LEVEL	INITIALS			
		A	%				
		В	%				
RO	[3] ENS with	URE makeup s Section 5.1.	system is aligned for <b>A</b>	UTO operation	in accordance		
RO	[4] REC boro	ORD the quant n concentration gals	ity of dilution water re using Appendix D. (I	quired to achiev <b>N/A</b> for minor p	ve desired ower changes)		
NOTE D in	ue to eyeb iitial calcula sults have	all interpolation ation. The follov been discusse	the verified calculation ving signoff indicates to d and are close enoug	on may slightly o that any differer ah to be conside	differ from the nces in the two ered validated.		
RO	[5] PER Amou SRO	F <b>ORM</b> Append unt of Boric Aci to verify data f	ix I Independent Verifi d or Primary Water. (I rom Rx Engineering)	cation of Calcu N/A if App. D wa	lation for as performed by		
RO	[6] PLAC	CE [ <u>HS-62-140</u> STOP positio	<b>A]</b> , Boric Acid Supply n.	to Blender Flov	v Control Switch		
	Position 0-SO 0-SO 0-SO vorse vo	Position         0-SO-62-7 Boro         ie: Dilutions will be performed to subsequent power end out as determined to the pressurizer spray op         An extra bank of prepressurizer spray op         RO       [1] ENS position         NOTE       HUT level in         RO       [2] ENS expendent         RO       [3] ENS with         RO       [3] ENS expendent         NOTE       HUT level in         RO       [4] REC boro         NOTE       Due to eyebbinitial calcula results have         RO       [5] PERI Among SRO         RO       [6] PLAC to the	Position       A         0-SO-62-7 Boron Concentration         ie: Dilutions will be performed based or subsequent power escalation, large hour as determined by the crew.         An extra bank of pressurizer heater pressurizer spray operation for equation for equation for equation in the subsequent power escalation for equation for equating the equate for equation for equate for equating the	Position       Applicant's Actions of 0-SO-62-7 Boron Concentration Control, Section ( subsequent power escalation, large volume dilutions will hour as determined by the crew.         An extra bank of pressurizer heaters (Back-up Group 1C) pressurizer spray operation for equalizing boron concentr         RO       [1] ENSURE unit is NOT in a Tech Spec or T positive reactivity additions. [C.1]         NOTE       HUT level increase of 1% is equal to 1380 gallon         RO       [2] ENSURE sufficient capacity available in t expected amounts of CVCS letdown: (N// HUT         LEVEL       A         RO       [3] ENSURE makeup system is aligned for A with Section 5.1.         RO       [4] RECORD the quantity of dilution water re boron concentration using Appendix D. (I gals         NOTE       Due to eyeball interpolation the verified calculatio initial calculation. The following signoff indicates i results have been discussed and are close enoug         RO       [5] PERFORM Appendix I Independent Verifi Amount of Boric Acid or Primary Water. (I SRO to verify data from Rx Engineering)         RO       [6] PLACE [ <u>HS-62-140A]</u> , Boric Acid Supply to the STOP position.	Position         Applicant's Actions or behavior           0-SO-62-7 Boron Concentration Control, Section 6.2 Dilute           e:         Dilutions will be performed based on the RE-provided Reactivity Spreads subsequent power escalation, large volume dilutions will be divided even hour as determined by the crew.           An extra bank of pressurizer heaters (Back-up Group 1C) will be energiz pressurizer spray operation for equalizing boron concentration in RCS ar RO           [1] ENSURE unit is NOT in a Tech Spec or TRM action that positive reactivity additions. [C.1]           NOTE         HUT level increase of 1% is equal to 1380 gallons (TI-28 fig. C.2           RO         [2] ENSURE sufficient capacity available in the HUT selecte expected amounts of CVCS letdown: (N/A if not used)           HUT         LEVEL         INITIALS           A        %		

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_ <u>Ap</u>	opendix D			Attachment 1						
Ор	Test No.:	NRC	Scenario #	7	Event #	1	Page	8	of	43
Eve	ent Description:	~42	2% Start 2 <sup>nd</sup> MFF	, Continue	Power Escalat	ion				

	Time	Position	Applicant's Actions or behavior
		0-SO-	62-7 Boron Concentration Control, Section 6.2 Dilute
		RO	[7] PLACE [HS-62-140B], CVCS Makeup Selector Switch to the DILUTE position.
		RO	[8] ENSURE [ <u>HS-62-140D</u> ], Boric Acid Valve to the Blender is CLOSED (Green light is LIT).
		RU	[9] SET [FQ-62-142], Batch Integrator for the desired quantity
		NOTE Pr gr se	imary Water Flow Controller [FC-62-142] receives its reference signal (70 pm) from setpoint potentiometer (dial indicator) located on panel M-6. A stoppint of 35% corresponds to a 70 gpm primary water flow rate
C		RO	[10] ADJUST [FC-62-142], Primary Makeup Water Flow Controller for the desired flow rate
		RO	[11] PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control Switch to the START position.
			ow oscillations and/or erratic controllor response mov require menual
		or ex	peration of Primary Water Flow Controller [FC-62-142] until stable conditions ist.
-		RO	[12] VERIFY the following;
-			[a] Inlet to top of VCT [FCV-62-128] is OPEN.
-			[b] Primary Water flow by [FI-62-142A] OR [FQ-62-142].
		NOTE: All	ternate dilution in small amounts is acceptable on a regular basis, provided no unificant changes in seal water temperature or seal leakoff are indicated
		Ba	t to exceed once per 30 minutes. ICS points for No. 1 seal leakoffs and seal
		Wa	aler temperatures on the RCP's should be monitored during and after dilution.
		RO	[13] IF primary water addition to the bottom of the VCT [FCV-62-144] is desired, THEN
		RO	[a] CLOSE [FCV-62-128] with [HS-62-128].
		RO	[b] OPEN [FCV-62-144] with [HS-62-144].

Appendix D		Scenario Outline	Attachment
Op Test No.:	NRC	Scenario # Event # 1	Page _ 9 _ of
Event Description	ו: ~42	% Start 2 <sup>nd</sup> MFP, Continue Power Escalation	
Time	Position	Applicant's Actions or	behavior
	0-SO-	62-7 Boron Concentration Control, Section 6	.2 Dilute
	RO	[c] VERIFY Primary Water flow by [FI-62-	142A] OR [FQ-62-142].
	NOTE It	may take approximately 15 minutes before any dicated on nuclear instrumentation or RCS tem	changes to reactivity are perature indication.
		[14] MONITOR nuclear instrumentation an to ensure the proper response from dilution	d reactor coolant temperatu on.
		[15] IF [LI-62-129], Volume Control Tank L THEN ENSURE [LCV-62-118], Volume C OPENS to divert excess water to the Hold	evel, increases to 63 perce control Tank Divert Valve lup Tanks.
		[16] WHEN dilution is complete, THEN [a] PLACE [HS-62-140A], Boric Acid to B	Blender Flow Control Switch
		the STOP position. [b] IF [FCV-62-144] was previously OPEN 144] with [HS-62-144].	NED, THEN CLOSE [FCV-6
		[c] VERIFY no primary water flow on either 142].	er [FI-62-142A] OR [FQ-62
Lead Examine	er may direct are associa until all dilu	<ul> <li>initiation of the next event at his discretion.</li> <li>ted with performance of repetitive dilutions of tions are complete.</li> <li>[17] IF power increase in progress and add required, THEN use this table to re-perform page)</li> </ul>	Steps on the next two par or may not be performed litional dilutions will be m steps [4] through [18] (ne
		[19] <b>REALIGN</b> the blender controls for <b>AU</b> <sup>-</sup> accordance with Section 5.1.	<b>TO</b> makeup to the CVCS in
	NOTE S	[20] ENSURE dilution(s) is logged in Unit N ample may be obtained at normal RCS sample in over and the unit response following the dilution	Narrative Log. Intervals provided the unit is
		[21] IF RCS boron sample is required, THE obtain RCS boron sample.	EN NOTIFY Chem Lab to
		End of Section (	2.0

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Appendix D			Scenar	Attachment 1				
Op Test No.:	NRC	Scenario #	7	Event #	1	Page _	<u>10</u> of	43
Event Description:	~4	2% Start 2 <sup>nd</sup> MFP	, Continue	Power Escalation				
Time	Position			Applicant's	Actions or beh	avior		
	<u>0-SC</u>	D-62-7 Boron (	Concent	ration Control,	Section 6.2 Di	lute		
	quantity of a	STE	P			1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rc</sup>
concentratior	using Appe	ndix D.	juired to a	chieve desired bi	oron			
[5] PERFORM A	ppendix I, IV	of Calculation for	or amount	of BA or PW.		Quantity	Quantity	Quan
[6] PLACE [HS-6	2-140A1 Bo	ric Acid Supply	to Blanda	Elow Control Su	vitab to the	SRO	SRO	SRO
STOP positio	on.							
[7] PLACE [ <u>HS-6</u>	<b>52-140B]</b> , C∖	/CS Makeup Se	lector Swi	tch to the <b>DILUT</b> I	E position.		Π	
[8] ENSURE [ <u>HS</u>	- <b>62-140D]</b> B	oric Acid Valve t	o Blender	is CLOSED (Gre	een light LIT).			
9] SET [FQ-62-142], Batch Integrator for the desired quantity.								/
[10] ADJUST [F( rate.	<b>C-62-142]</b> , Pi	rimary Makeup V	Vater Flov	v Controller for th	e desired flow			
[11] PLACE [HS-	<b>-62-140A]</b> , B	A Supply to Bler	nder Flow	Control Switch to	START.			
[12] VERIFY the	following:							
[a] Inlet to to [b] Primary	op of VCT <b>[F</b> Water flow b	<b>CV-62-128]</b> is O y <mark>[FI-62-142A]</mark> c	PEN. or [FQ-62-	<b>142]</b> .				
[13] IF PW addition	on to top of \	/CT [FCV-62-12	<b>8]</b> is not v	varranted, but PV	V addition to the			
[a] CLOSE	e vor <u>(FCV-</u> [FCV-62-128	<u>-62-144</u> ] is desir Niwith <b>[HS-62-12</b>	ed, IHEN 81					
[b] OPEN [F	CV-62-144]	with [HS-62-144	<u>•</u> ].					
[c] VERIFY	Primary Wat	er flow by <b>[FI-62</b>	-142A] or	[FQ-62-142]				
[14] MONITOR n	uclear instrui	mentation and re	eactor coc	lant temperature	to ensure the			
proper respo	onse from dil	ution.						
[15] IF [ <u>LI-62-12</u>	BI, VCT level, BI, VCT Dive	, increases to 63 rt Valve. <b>OPEN</b> S	s percent, 5 to divert	excess water to	the HUTs.			
[16] WHEN dilution	on is complet	e, THEN						
	[HS-62-140/	A, Boric Acid to	Blender F	low Control Swite	ch to STOP			
with [HS	- <u>62-144</u> ] was -62-144].	previously OPE	ENED, IA	EN CLOSE [FC	/-02-144			
[c] VERIFY	no primary v	vater flow on eit	her [ <b>FI-62</b>	-142A] or [FQ-62	<u>-142]</u> .			
[d] ENSURE	[FCV-62-12	28] is CLOSED.						
[18] IF Step [17 PERFORM	] will be rep the followir	eated, THEN					<u> </u>	<u> </u>
[a] PLACE	[ <u>HS-62-140</u> E	J, CVCS Make	up Selecto	r Switch to the A	UTO position	1 <sup>st</sup> 01/		
[b] PLACE [c] ENSURI	[HS-62-140A E dilution is le	▲], BA to Blende ogged in Unit Na	r Flow Co arrative Lo	ntrol Switch to <b>S</b>	TART position.	i CV		
r.1		- 3300 01		9.			L	-

	Appendix D		Scenario Outline A	ttachment 1
C	Op Test No.: Event Description:	NRC 1B (	Scenario # Event # 2 Page1 <sup>.</sup> Condensate Booster Pump trip	1 0f
	Time	Position	Applicant's Actions or Behavior	
	Simulator Ope	rator: Whei	n directed, initiate Event 2	
	Indications/Ala Annunciator	arms 		
	1-M-1	18 E-2 "MO		
	1-M-3			
	• 1-XA-55-	3A A-4, "COI	NDENSATE BOOSTER PUMP 1A FAIL TO START"	
	Indications: 1-M-3			
	• 1-EI-2-97	, CBP-A AMP	PS decrease to '0'	
	indicato	111-21201	in the pressure	
	Significant Res Annunciator	sultant Aları ::	ms/Indications:	
	1-M-3 • 1-XA-55-	3A E-1. "PS-:	2-129 I OW NPSH AT MEP'S"	
()	T + 20	BOP	Identifies alarm 1-XA-55-3A B-4, "Condensate Booster Pump 1 Start", acknowledges alarm and, notifies SRO	B Fail To
State of the second sec				
			Pofers to and implements Condensate Resister Russing elements	
			procedure (ARP), Probable Causes:	sponse
		ROP	[1] Dispetabos on ALIO Jacolly	
		BOF	[1] Dispatches an AOO locally, [2] VERIFY NPSH > 20 psig.	
			[3] IF Condensate Boost Pump Tripped, THEN GO TO AOF	P-S.04,
			Condensate of Heater Drains Malfunction.	
		SRO	Directs entry into and implementation of AOP-S.04, Condensate Drains Malfunction Section 2.5, Condensate Booster Pump Tri	te or Heater
			AOP-S 04. Condensate or Heater Drains Malfunct	tion
			Section 2.5, Condensate Booster Pump Trip	
	Evaluator Note	: Secondary	y pressures and flows will fluctuate but stabilize; implementation	of step 1 RNO
and a second		operating	conditions to reach step 5 RNO to start the standby CBP, 1C.	
$\bigcirc$		SRO/	1. VERIFY two condensate booster pumps RUNNING.	
		BOD	(KNU- reference)	
			IF NO condensate booster pumpis running N/A	

	Appendix D	opendix D Scenario Outline						Attachment 1		
1 mars	Op Test No.:	NRC	Scenario #	7	Event #	2	Page	12	of	43
	Event Description:	1B	Condensate Boo	ster Pump	trip					
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Time	Position	Applicant's Actions or Behavior
		IF one condensate booster pump is running <b>AND</b> secondary pump cavitation indicated, <b>THEN PERFORM</b> the following:
		b TRIP MEW numps
		c. <b>GO TO</b> E-0. Reactor Trip or Safety Injection
		2. MONITOR Steam generator levels returning to program. [M-4].
		3. MONITOR reactor power:
		a. CHECK ICS thermal power indication AVAILABLE.
	-	<ul> <li>REDUCE turbine load as necessary to maintain 10 minute average power less than applicable limit (3455 or 3411 MWt).</li> </ul>
		<ol> <li>DISPATCH operator to investigate cause of Condensate Booster Pump trip.</li> </ol>
Evaluator N	ote: SRO, cr Ascensi	rew should elect to start 1C CBP according to 0-GO-5 Section 5.1, Power on From 30% to 100% Step 25 adhering to step 17 of the same section:
	(17.) STA	<b>RT</b> the following pumps in accordance with 1,2-SO-2/3-1: 21 Second CBP
	CAUTION:	Reducing turbine load too rapidly could result in further drop in condensate
		pressure due to reduction in heater drain flow. Recommended load rate is 1% per minute if turbine load reduction is needed.
	NOTE: Seve	ere MFW pump cavitation is likely if inlet pressure is less than 250 psig.
		5. <b>MONITOR</b> Feedwater pump inlet pressure greater than 320 psig. [M-3, PI-2-129]
		(RNO required)
		RNO:
		<b>EVALUATE</b> starting additional available condensate system pumps (Hotwell, Cond. Booster, Cond. DI Booster).
		REDUCE turbine load until N/A
		<b>IF</b> severe cavitation of MFW pumps is indicated, <b>THEN TRIP</b> reactor and <b>GO TO</b> E-0, Reactor Trip or Safety Injection.

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	Appendix D Scenario Outline							Atta	chme	ent 1
r	Op Test No.:	NRC	Scenario #	7	Event #	2	Page	13	of	43
	Event Description:	1B Condensate Booster Pump trip								

Time	Position	Applicant's Actions or Behavior
		<ol> <li>MONITOR Condensate Booster pump suction pressure greater than 100 psig. [M-3, PI-2-77]</li> </ol>
		<ol> <li>NOTIFY Maintenance to investigate and repair pump malfunction as necessary.</li> </ol>
		8. CHECK reactor power greater than 85%
		(RNO required)
		RNO:
		GO TO Step 10.
		10. GO TO appropriate plant procedure.
Evaluator No	te: The fo	llowing CREW Brief and Notification actions are not contained in the dure.
		<b>CREW Brief</b> would typically be conducted for this event as time allows prior to the next event.
		<b>Notifications</b> should be addressed as applicable if not specifically addressed by the procedure or in the CREW brief.
		Operations Management - Typically Shift Manager.
		<u>Maintenance Personnel</u> – Typically Maintenance Shift Supervisor (MSS). (Note: Maintenance notification may be delegated to the Shift Manager).
Lead Examin	er may cue ne	ext event when 1C CBP is in service.

		Scenario Outline	Attachment							
Op Test No.	: <u>NRC</u>	Scenario # Event # 3	Page <u>14</u> of							
Event Descriptio	on: Pzr	Level Controlling Channel LT 68-339 fails low								
Time	Position	Applicant's Actions or Behav	ior							
Simulator O	perator: Whe	n directed, initiate Event 3								
Indications// Annuncia 1-M-5 • 1-XA-!	Alarms ator: 55-5A C-3, "PI	RESSURIZER LEVEL HIGH-LOW"								
•	E3, "PR	ZR LVL LOW HEATER OFF & LETDOWN SECURED"								
1-M-4	ns:									
• 1-LI-68	8-339 RCS PZR	LEVEL indicates '0' level								
Significant F	Resultant Alar	ms/Indications:								
1-M-6 • 1-FI-6		HX OUTLET ELOW indicates (0' flow								
0-M-27										
O-XA-27B-B A-5, "LETDOWN HX OUTLET FLOW/TEMP ABNORMAL"										
	RO	RO Identifies alarm 1-XA-55-5A C-3, "PRESSURIZER LEVEL HIGH-LOW acknowledges alarm and, notifies SRO								
	US	Direct entry to AOP-I.04, Pressurizer Instrument Malf Pressurizer Level Instrument Malfunction	function, Section 2.4							
	NOTE: A	opendix M shows layout of PZR level control for operate	or reference							
	RO	1. CHECK LI-68-339 indicates NORMAL ( <i>RNO required</i> )								
		<ul> <li>RNO:</li> <li>PERFORM the following:</li> <li>a. ENSURE LEVEL CONTROL CHANNEL SELEC 339E in LT-68-335 &amp; 320.</li> <li>b. ENSURE LEVEL REC CHANNEL SELECTOR S LT 68 220 or LT 68 225</li> </ul>	TOR switch XS-68- witch XS-68-339B i							
		c. <b>GO TO</b> Step 4.								
		4. CHECK letdown IN SERVICE. (RNO required)								
		RNO: RESTORE letdown USING EA-62-5, Establishing No Letdown.	rmal Charging and							

Appendix D	)	Scenario Outline	Attachm
Op Test No	o.: <u>NRC</u>	Scenario # Event # 3	Page <u>15</u> of
Event Descripti		Level Controlling Channel L1 68-339 fails low	
Time	Position	Applicant's Actions or Be	havior
Evaluator N	ote: The follo	owing steps are from EA-62-5 performed by the RO	to reestablish Letdo
		40 OPERATOR ACTIONS	etc.
		4.1 Section Applicability	
		2. IF normal letdown flow is to be established, TH	IEN GO TO Section
	NOTE FA	4.3 Establishing Normal Letdown Flow	
	be e	stablished	if Normal Letdown c
	SRO	1. IF charging flow NOT established, THEN PERI	FORM Section 4.2
	RO	2. VERIFY pressurizer level greater than 17%.	
	RO	3. ENSURE letdown orifice isolation valves CLOS	SED:
		LETDOWN ORIFICE ISOLATION VALVES	CLOSED √
		FCV-62-72	
		FCV-62-73	
		FCV-62-74	
		4. <b>OPEN</b> letdown isolation valves:	
	RU	LETDOWN ISOLATION VALVES	OPEN
		FCV 62 69	
		FOV 02-03	
		FGV-52-70	
		FCV-62-77	
	NOTE: F	Placing cooling water on the Letdown Heat Exchanget down flow should prevent TIS-62-79B/A from actu CV-70-192.	ger prior to restoring ating and fully openi
······	RO	5. PLACE [HIC-62-78] in MANUAL, AND OPEN	[TCV-70-192] to ~50
	RO	<ol> <li>PLACE letdown pressure controller [PCV-62-8 ADJUST output between 40% and 50%, (50%)</li> </ol>	<b>31]</b> in MANUAL and -60% open).
	BO	7. ADJUST charging flow as necessary to prever	nt flashing in the letdo

Appendix D		Scenario Outline	Attachment
Op Test No.: Event Descriptior	NRC n: Pzr	Scenario # Event #3	Page <u>16</u> of
Time	Position	Applicant's Actions or Po	haviar
		8. OPEN letdown orifice isolation valves as need	ed:
		LETDOWN ORIFICE ISOLATION VALVES	OPEN √
		FCV-62-72	
		FCV-62-73	
		FCV-62-74	
	NOTE:	Normal letdown pressure is 325 psig at normal ope	rating temperature.
		9. ADJUST letdown pressure controller [PCV-62 desired pressure.	-81] output to obtain
		10. ADJUST letdown pressure controller [PCV-6	2-81] setpoint to match
		existing pressure.	
		11. PLACE letdown pressure controller [PCV-62	- <b>81]</b> in AUTO.
	NOTE: N	Jormal letdown temperature is ~100°F.	
		12. ADJUST [HIC-62-78A] to obtain desired letd indicated on [TI-62-78].	lown temperature, as
		13. PLACE [HIC-62-78A] in AUTO.	
	NOTE: L	etdown temperature may swing due to repeated ac hich causes letdown temperature control valve TC	tuation of TIS-62-79B/A V-70-192 to fully open.
		<ol> <li>IF necessary to stabilize letdown temperature following:</li> </ol>	e, THEN PERFORM the
		<ul> <li>PLACE [HIC-62-78A] in MANUAL and AD, OPEN direction.</li> </ul>	JUST controller output ir
		<ul> <li>b. WHEN letdown heat exchanger outlet temp approximately 100°F, THEN PLACE [HIC-</li> </ul>	perature is stabilized at 62-78A] in AUTO.
		15 ENSURE high temperature divertively a FUS	62 70A1 in DEMIN positi

		Attachment 1								
Op Test No.:	NRC	Scenario # Event # 3 F	Page <u>17</u> of <u>4</u>							
Event Description	n: Pzr	Level Controlling Channel LT 68-339 fails low								
Time	Position	Applicant's Actions or Behavi	or							
		16. ADJUST charging and letdown as necessary to	maintain RCP seal							
		injection flow and pressurizer level.								
		17. IF CCP suction is aligned to the RWST N/A								
		18. <b>GO TO</b> Section 4.1, step in effect.								
	RO	Returns to AOP-I.04								
Evaluator Not	te: Continu	<b>ling</b> with AOP-I.04 with Tech Spec Evaluation. EA-62-5	5, Letdown restoratio							
		5. EVALUATE the following Tech Specs for applicab	ilitv <sup>.</sup>							
		3.3.1.1. Reactor Trip System Instrumentation	inty.							
		Table 3.3-1 functional unit 11 Action 6: w/ number of OPER	ABLE Chs one less th							
		total, SU and/or PWR OPs may proceed provided the follow	ving are satisfied:							
		a. INOPERABLE Ch placed in tripped condition w/i 6 hrs.								
		to 4 hrs for surveillance testing of other channels per Sn	Ch may be bypassed							
		<ul> <li>3.3.3.5 Remote Shutdown Instrumentation – N/A</li> </ul>								
		3.3.3.7 Accident Monitoring Instrumentation								
		Table 3.3-10 Functional Units 7 Action 2.a: w/ Chs one less	than minimum channe							
		required, restore INOPERABLE Ch to OPERABLE w/i 30 d 6 hrs & HT SHDN w/i next 6 hrs.	ays or HT STBY w/i ne							
		6. ENSURE pressurizer heaters restored to service.								
	CAUTION:	RCS pressure changes and changes in RCS boron co differences between Pzr and RCS boron) may impact	ncentration (due to core reactivity.							
		7. MONITOR reactor power:								
		a. CHECK reactor in Mode 1 or 2.								
		b. MONITOR core thermal power for unexpected	changes.							
	NOTE: If p	If performing AOP in conjunction with AOP-I.11 for an Eagle LCP failure N/A								
	Crew	8. <b>NOTIFY</b> MIG to remove failed pressurizer level ch <b>USING</b> appropriate Appendix:	annel from service							
		L-68-339 (L-459) Appendix I	the Mine Wood Mean distances							

	Appendix D		Scenario Outline	Attachment 1
(	Op Test No.: Event Description:	<u>NRC</u> #4 S	Scenario # _ 7 Event # _ 4 team Generator narrow range level transmitter fails low.	Page <u>18</u> of <u>43</u>
	Time	Position	Applicant's Actions or Be	havior
	Simulator Ope	rator: When	directed. initiate Event 4	
	Indications/Ala Annunciator 1-M-3 • 1-XA-55- 1-M-6 • 1-XA-55- Indications:	irms : 3C, D-2 "EAN 6B D-4, "LS-3	I/TTD SG LOOP 4 LO LO LEVEL" 3-106B STEAM GENERATOR LOOP 4 LOW LOW WAT	TER LEVEL"
	1-M-4 • 1-LT-3-10	06, SG-4 NR L	evel indicates downscale	
	Evaluator Note	BOP	ansient occurs due to median selection circuit Identifies alarm 1-XA-55-6B D-4, "LS-3-106B STE LOW LOW WATER LEVEL", acknowledges alarn	EAM GENERATOR LOOP 4 n and, notifies SRO
free .		SRO	Direct entry to AOP-I.06, Steam Generator Instru 2.2, Unit 1 S/G level instrument malfunction	ment Malfunction, Section
			AOP-I.06, Steam Generator Instrum Section 2.2, Unit 1 S/G Level Instrum	ent Malfunction
		SRO	1. EVALUATE the following Tech Specs for app	licability:
			<ul> <li>3.3.1.1, Reactor Trip System Instrumentation Table 3.3-1 Functional Unit 14.A &amp; B, <u>Action 9</u>: w/ nur less than total, SU and/or PWR OPs may proceed pro- satisfied:</li> <li>a. INOPERABLE Ch placed in tripped condition w/i 6</li> <li>b. affected protection set, Trip Time Delay for one affer match the TTD for multiple affected SGs (TM) w/i 4</li> <li>c. Minimum Chs OPERABLE met; however, INOPER up to 4 hrs for surveillance testing of other channel</li> </ul>	mber of OPERABLE Chs one vided the following are hrs. ected SG (TS) adjusted to hrs. ABLE Ch may be bypassed s per Spec 4.3.1.1.1.
			<ul> <li>3.3.2.1, Engineered Safety Feature Actuation Syst Table 3.3-3 Functional Unit(s) 5a- <u>Action 17</u>: w/ OPER SU and/or PWR OPs may proceed provided the fol satisfied:         <ul> <li>INOPERABLE Ch placed in tripped condition v</li> <li>Minimum Chs OPERABLE is met; however, IN</li> <li>bypassed up to 4 hrs for surveillance testing of other</li> </ul> </li> </ul>	tem Instrumentation ABLE Chs 1 less than Total, llowing conditions are w/i 6 hrs. NOPERABLE Ch may be er Chs per Spec 4 3 2 1 1
C			<ul> <li>Table 3.3-3 Functional Unit(s) 6.c.i.a &amp; 6.c.ii.a &amp; b- <u>Ac</u></li> <li>Chs one less than Total Chs, SU and/or PWR OPs following conditions are satisfied:</li> <li>a. INOPERABLE Ch placed in tripped condition v</li> <li>b. affected protection set, TTD for 1 affected SG for multiple affected SGs (TM) w/i 4 hrs.</li> <li>c. Minimum Chs OPERABLE met; however, INO bypassed up to 4 hrs for surveillance testing other</li> </ul>	tion 36: w/ # of OPERABLE may proceed provided w/i 6 hrs. (TS) adjusted to match TTD PERABLE Ch may be Chs per Spec 4.3.2.1.1.

	Appendix D			Scenar	io Outline			Atta	chme	ent 1	
Cons.	Op Test No.:	NRC	Scenario #	7	Event #	4	Page	19	of	43	
and the second s	Event Description:	#4 Steam Generator narrow range level transmitter fails low.									

Time	e Position	Applicant's Actions or Behavior
		<ul> <li>OPERABLE, declare interlock INOPERABLE, verify all affected Chs of functions below are OPERABLE or apply appropriate ACTION statement(s):</li> <li>C. Turbine Trip - SG Level Hi-Hi; Feedwater Isolation - SG Level Hi-Hi</li> <li>3.3.3.5 Remote Shutdown Instrumentation – N/A</li> <li>3.3.3.7 Accident Monitoring Instrumentation</li> <li>Table 3.3-10 Functional Units 7 <u>Action 2.a</u>: w/ Chs one less than minimum Chs required, restore INOPERABLE Ch to OPERABLE w/i 30 days or HT STBY w/i next 6 brs &amp; HT SHDN w/i next 6 brs</li> </ul>
NOTE:	If performing AOP	in conjunction with AOP-I.11 for an Eagle LCP failure N/A
	Crew	<ol> <li>NOTIFY IM to remove failed S/G level instrument from service USING appropriate Appendix:</li> </ol>
		Loop 4: L-3-106 – Ch II - Appendix V
When Te	echnical Specificat	ons are addressed, the Lead Examiner may cue the next event

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Appendix D	)		Scenario C	Outline			Attachn	nent 1
Op Test No	.: <u>NRC</u>	Scenario #	<u>7</u> E	vent#	5	Page	of	43
Event Descripti	on: Fee	dwater Header PT	-3-1 Fails Lov	1				
These	<b>D</b>							
Simulator O	Position			plicant's Ac	tions or Beh	avior		
Indications/ Annuncia 1-M-3 • 1-XA- Indication 1-M-3 • 1-LR- • 1-PC- 1-M-4 • 1-FI-3 flow-	Alarms ator: 55-3C, C-1 "PS-3 ns: 2-12, HOTWELL 46-20, 20A, 20B, -35A, 35B, 48A, above steam flo	3-4 NO 1 FW HT LEVEL C CONI MFPT 1A&1B 9 48B, 90A, 90B, w	R PRESSUI DENSER de Speed CON 103A, 103B	RE ΗΙ" creasing trend ΓROL speed d , SG-1 thru 4 §	d emand increa SG FW INLET	ເຣes FLOW Cht	s 1&2 inc	reasing
Significant I Indication 1-M-4 • SI-412 Evaluator N	Resultant Alarr ns: 2, ROD Speed (& ote: For this	indications	: its) indicate	outward rod r	notion (poten	tial)	edure dir	
	enter A0 BOP ma	OP-S.01 Sections of the section of t	n 2.1. Sect action(s) as	tion 2.1 Step	1 is an IMME Step 1 from	DIATE AC	CTION ste	ectry ep; the rection.
	BOP	Identifies ala acknowledge	rm 1-XA-55 es alarm and	-3C, C-1 "PS d, notifies SR	-3-4 NO 1 FW O	/ HTR PR	RESSURE	E HI",
	BOP	Takes manua pressure and	al control of I flow.	MFP (Master	r) Speed cont	rol and re	duce Fee	edwater
	Crew	Refer to anni	unciator Re		dure			
	BOP	[1] DISPAT valves of a. 1-PS b. 1-PS c. 1-PS	CH operato cen: V-3-4 V-3-14 V-3-24	r to #1 feedwa	ater heaters to	o verify th	e followir	ıg
		[2] REDUCE	feedwater	pressure to ≤	1100 psi <b>g</b> .			

 $( \cap$ 

.: NRC	Scenario # _ 7 Event # _ 5 Page _ 21 of _	4
on: Fee	edwater Header PT-3-1 Fails Low	
Position	Applicant's Actions or Behavior	
	[3] WHEN pressure reduces to ~1100 psig, THEN VERIFY the above mentioned PSV's closed.	
	[4] IF alarm still illuminated or by SRO decision, THEN GO TO AOP-S.0 Loss of Normal Feedwater.	)1,
SRO	Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.0, Operator Actions.	3
	AOP-S.01, MAIN FEEDWATER Malfunction Section 2.3. Failure of Automatic MEW Pump Control	
BOP/	1. Unit 1 Only:	
SRO	DIAGNOSE the failure and identify and Failure of MFW Pump Control	
SRO	Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3, Failure of Automatic MFW Pump Control	,
NOTE: S	tep 1 is an IMMEDIATE ACTION.	
BOP	1. <b>RESTORE</b> feedwater pressure:	
	a. PLACE affected MFP speed controller(s) in MANUAL:	
	<ul> <li>MFPT 1A 1B Speed Control</li> <li>OR</li> <li>MFPT 1A Speed Controller</li> <li>OR</li> </ul>	
	MFPT 1B Speed Controller	
	<ul> <li>ADJUST speed on affected MFP(s) to restore feedwater pressure normal (~1040 psig at full power).</li> </ul>	e to
BOP	2. DETERMINE if MFP trip is needed:	
	a. CHECK BOTH MFW pumps IN SERVICE.	
	<ul> <li>b. IF MFW pump trip is needed due to loss of speed control, THEN PERFORM the following:</li> <li>1) TRIP affected MFP.</li> </ul>	
	NRC         >n:       Fee         Position	NRC         Scenario #         7         Event #         5         Page         21         of           m:         Feedwater Header PT-3-1 Fails Low           Position         Applicant's Actions or Behavior           [3] WHEN pressure reduces to ~1100 psig, THEN VERIFY the above mentioned PSV's closed.           [4] IF alarm still illuminated or by SRO decision, THEN GO TO AOP-S.(Loss of Normal Feedwater.           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.0 Operator Actions.           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction Section 2.3, Failure of Automatic MFW Pump Control           BOP/         1. Unit 1 Only:           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3           SRO         Direct entry to AOP-S.01, MAIN FEEDWATER Malfunction, Section 2.3           SRO         Direct entr

Appendix D	pendix D Scenario Outline							chme	ent 1
Op Test No.:	NRC	Scenario #	7	Event #	5	Page	22	of	43
Event Description:	Fee	Feedwater Header PT-3-1 Fails Low						-	

Time	Position	Applicant's Actions or Behavior
	CAUTION:	Feed flow transients may impact core thermal power.
		3. MAINTAIN steam generator level(s) on program.
	NOTE: Appe	endix C may be used to determine program feedwater D/P for current power.
		4. CHECK Feed Flow Channels NORMAL. [M-4]
	CAUTION: F	Reactor operation at low power levels for extended periods may challenge
	re	eactivity control due to xenon changes.
	BOP	5. CHECK Reactor power greater than 5%.
	CREW	6. INITIATE repairs on failed equipment.
		7. GO TO appropriate plant procedure.
		END OF SECTION
When Plant his discretio	is stable with M on.	IFP speed control in manual, Lead Examiner may cue the next event at

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Appendix D			Scenari	o Outline			Atta	chme	nt		
Op Test No	.: <u>NRC</u>	Scenario #	7	Event #	6	Page	23	of			
Event Description	on: Sm	Small Steam Leak Outside Containment Upstream Of Loop #3 MSIV									
Time	Position			Applicant's	Actions or Be	havior					
Simulator O	perator: Whe	n directed, in	itiate Eve	ent 6							
Indications/, Indication 1-M-1 • 1-XR- 1-M-3 • 1-LR-; 1-M-4 • 1-XI-9	Alarms 1s: 57-107, GENER 2-12, HOTWELL 2-5005C, 5006C	ATOR MEGAW . LEVEL C CON :, 5007C, 5008C	'ATTS dec IDENSER C, RX POV	creasing decreasing tre VER Chs I-IV, N	end I-41 – 44, NIS F	Power Ran	ge indi	icators	S		
Significant F Indication 1-M-4 • SI-412	Resultant Aları ıs: 2, ROD Speed ({	ms/Indication	s: hts) indic	ate outward ro	d motion						
	BOP	Identifies R: and notifies	k Power i SRO.	ndicators incre	asing, Genera	ator Mega	watts o	decrea	isi		
	CREW	Monitors co secondary o	ntainmer contamina	t pressure, ter ation	nperature and	rad monit	tors for	r prima	ary		
	CREW	Diagnose S increase, co	econdary Intainmer	r leak outside ont conditions not	containment ba ormal, Hotwell	ased on N I level dec	IS pow reasing	ver g.			
	SRO	Direct entry	to AOP-	S.05, Steam or	<sup>-</sup> Feedwater Le	eak					
		1									
			Δ	OP-S.05, Stea Section 2.0	am or Feedwa , Operator Act	ter Leak					
		1. <b>MONITO</b>	A R person	OP-S.05, Stea Section 2.0 nel safety:	am or Feedwa , Operator Act	ter Leak ions					
		1. MONITO a. IF ste perso	A R person am or fe	OP-S.05, Stea Section 2.0 nel safety: edwater lines r EN PERFORM	am or Feedwa , Operator Act need to be imr I the following	ter Leak tions nediately :	isolate	d to p	rot		
		1. MONITO a. IF ste perso 1) T	A R person am or fe nnel, <b>TH</b> <b>RIP</b> the r	OP-S.05, Stea Section 2.0 nel safety: edwater lines r EN PERFORM eactor.	am or Feedwa , Operator Act need to be imr I the following	ter Leak tions mediately I:	isolate	d to p	rol		
		1. MONITO a. IF ste perso 1) T 2) IF	A R person am or fe nnel, <b>TH</b> <b>RIP</b> the r leak is c ISIVs.	OP-S.05, Stea Section 2.0 nel safety: edwater lines r EN PERFORM eactor. on steam lines	am or Feedwa , Operator Act need to be imr I the following <b>OR</b> source is	ter Leak tions mediately t: unknown,	isolate THEN	d to p I CLO	rot		
		1. MONITO a. IF ste perso 1) T 2) IF N 3) IF	A R person am or fe nnel, TH RIP the r leak is c ISIVs. leak is c ERFORM	AOP-S.05, Stea Section 2.0 nel safety: edwater lines r EN PERFORM eactor. on steam lines on feedwater lin f the following:	am or Feedwa , Operator Act need to be imr If the following OR source is nes OR source	ter Leak ions mediately : unknown, e is unkno	isolate THEN	d to p I CLO HEN	rot		
		1. MONITO a. IF ste perso 1) T 2) IF N 3) IF P a	A R person am or fe onnel, TH RIP the r leak is c ISIVs. leak is c ERFORM TRIP M	OP-S.05, Stea Section 2.0 nel safety: edwater lines r EN PERFORM eactor. on steam lines on feedwater lin the following FW pumps.	am or Feedwa , Operator Act need to be imr I the following OR source is nes OR source	ter Leak ions nediately : unknown, e is unkno	isolate THEN	d to p I CLO HEN	rot SE		
		1. MONITO a. IF ste perso 1) T 2) IF N 3) IF P a	A R person am or fe onnel, TH RIP the r leak is c ISIVs. leak is c ERFORM TRIP M	AOP-S.05, Stea Section 2.0 nel safety: edwater lines r EN PERFORM eactor. on steam lines on feedwater lin f the following: FW pumps. Feed Reg Val	am or Feedwa , Operator Act need to be imr I the following OR source is nes OR source	ter Leak ions mediately : unknown, e is unkno	isolate THEN	d to p I CLO HEN	rot SE		

	<b></b>	Scena	rio Outline	······		Atta	chme	ent 1
NRC	Scenario #	7	Event #	6	Page	24	of	43
Sma	all Steam Leak O	utside Co	ntainment Upstrea	m Of Loop #3 M	ISIV			
Position			Applicant's	Actions or B	ehavior			<u> </u>
	NRCSma	NRC Scenario # Small Steam Leak O Position	NRC Scenario # _ 7 Small Steam Leak Outside Con	NRC Scenario # 7 Event #	NRC Scenario # 7 Event # 6 Small Steam Leak Outside Containment Upstream Of Loop #3 M Position Applicant's Actions or B	NRC       Scenario #       7       Event #       6       Page         Small Steam Leak Outside Containment Upstream Of Loop #3 MSIV         Position       Applicant's Actions or Behavior	NRC       Scenario #       7       Event #       6       Page       24         Small Steam Leak Outside Containment Upstream Of Loop #3 MSIV         Position       Applicant's Actions or Behavior	NRC       Scenario #       7       Event #       6       Page       24       of         Small Steam Leak Outside Containment Upstream Of Loop #3 MSIV       Small Steam Leak Outside Containment Upstream Of Loop #3 MSIV         Position       Applicant's Actions or Behavior

	identify	expected to move through AOP-S.05; probably about Step 8 to 10, they will that they cannot maintain at-power plant operations, transition back to Step 2
	RNO an	d initiate a reactor trip.
	BOP	<ol> <li>MONITOR steam generator levels STABLE on program. (RNO required)</li> </ol>
		RNO:
	· · · · · · · · · · · · · · · · · · ·	IF reactor trip is imminent due to low S/G level, <b>THEN PERFORM</b> the following:
		a. TRIP the reactor.
		b. GO TO E-0, Reactor Trip or Safety Injection.
v		
	BOP	3. CHECK the following:
		S/G atmospheric relief valves CLOSED
		Steam dumps CLOSED.
	BOP	4 CHECK main turbing on ling
	RO	5. MONITOR the following:
		reactor power less than 100%
		reactor power less than or equal to 100% (3455 MWt).
	RO	6. <b>MONITOR</b> T-avg/T-ref deviation less than 5°F
	NOTE: Te	ch Spec LCO 3.6.1.4 is applicable if containment pressure exceeds 0.3 psig.
	RO	7. MONITOR containment pressure STABLE.
Evaluator No	 te: Hotwell I	evel will fluctuate and secondary make-up flow will increase, perhaps be
	unable to exercise	o keep up with Hotwell level loss due to the break size. The crew may Step 8 RNO even though secondary make-up control is functioning correctly.
	BOP	8. MONITOR hotwell level STABLE:
		VERIFY LCV-2-9 maintaining hotwell level in AUTO.
	BOP	RNO: INITIATE makeup to hotwell:
		a. PLACE LIC-2-9, Auto Makeup, in MANUAL. [M-2]

		Attachment
Op Test No.:	NRC	Scenario # Event # 6 Page25 of
Event Description:	Sma	all Steam Leak Outside Containment Upstream Of Loop #3 MSIV
Time	Position	Applicant's Actions or Behavior
		b. OPEN LCV-2-9 USING LIC-2-9, Auto Makeup, as necessary to
		maintain hotwell level.
		c. IF loss of hotwell level is imminent, THEN PERFORM the following
		1) IRIP the reactor.
		2) WHEN reactor is tripped, THEN CLOSE MSIVs.
		3) GO TO E-0, Reactor Trip or Salety Injection.
	BOP	9. VERIFY generator megawatts STABLE or DROPPING.
	BOP	10. CHECK the following containment parameters NORMAL:
		Containment temperature
		Containment humidity
		11. VERIFY NO abnormal leakage from S/G safety valves:
	BOP	<ul> <li>NOTIFY Security to visually scan east and west valve vault room areas on affected unit</li> <li>OR</li> </ul>
	BOP	DISPATCH operator to verify NO abnormal leakage from east and west valve vault rooms [inspect from outside rooms]
	SRO	12. <b>EVALUATE</b> EPIP-1, Emergency Plan Initiating Conditions Matrix. (Notify Shift Manager to Evaluate REP)
	BOP	
	NOTE: Te	ch Spec LCO 3.7.1.3 requires at least 240,000 gal for CST volume.
	BOP	13. MONITOR CST levels greater than 70%.
	CREW	14. VERIFY leak IDENTIFIED and ISOLATED. (RNO required)
	SRO	<b>RNO:</b> EVALUATE dispatching operators with radios to identify leak.
	SRO	IF leak CANNOT be isolated, THEN EVALUATE rapid shutdown USING AOP-C.03, Rapid Shutdown or Load Reduction.

Appendix D		Scenario Outline	Attachment '
Op Test No.:	NRC	Scenario # Event # 6 Page	26of4
Event Descriptio	n: Sma	all Steam Leak Outside Containment Upstream Of Loop #3 MSIV	
Time	Position	Applicant's Actions or Behavior	
		15 EVALUATE actions required to reactions the	1
		15. EVALUATE actions required to restore plant to norma	H.
		16. <b>GO TO</b> appropriate plant procedure.	

crew has determined there is a secondary leak outside containment.

Appendix D

		ocenano outime	Attachment 1
Op Test No.:	NRC Scenario #		3, 9, 10 Page of43
Event Description:	Steam Leak to Br (10 sec delay) & ;	reak O/S Containment Upstream Lp #3 #3 SG MDAFWP Lvl Control VIv fails o	MSIV w/ ATWS, Rods fail to move in auto
Time Po	sition	Applicant's Actio	ns or Behavior
Simulator Operato	r: When directed,	MODIFY Event 6- increase st	eam leak to break size
Annunicators: 1-M-6 1-AR-M6B A- 1-AR-M6B B- 1-AR-M6B C- 1-AR-M6B D- Indications: 1-M-1 1-XR-57-107, 1-M-3 1-LR-2-12, H0 1-M-4 1-XI-92-50050 increasing (e	7, "FS-3-35B STM G 7, "FS-3-48B STM G 7, "FS-3-90B STM G 7, "FS-3-103B STM G GENERATOR MEG DTWELL LEVEL C C C, 5006C, 5007C, 500 xceeding >3% w/ se	SEN LOOP 1 STEAMFEEDWATER SEN LOOP 2 STEAMFEEDWATER SEN LOOP 3 STEAMFEEDWATER GEN LOOP 4 STEAMFEEDWATE AWATTS decreasing CONDENSER decreasing (w/ max 08C, RX POWER Chs I-IV, N-41 – econdary power- Turbine Impulse	₹ FLOW MISMATCH" ₹ FLOW MISMATCH" ₹ FLOW MISMATCH" ℜ FLOW MISMATCH simum make-up flow) • 44, NIS Power Range indicators e Pressure- Tref)
Significant Resulta Indications: 1-M-4 • SI-412, ROD \$	nt Alarms/Indicati	ions: lights) indicate unexpected outv	ward rod motion
S	RO Direct ma Injection • M	anual Rx Trip and MSIV closure based on AOP-S.05 criteria: IONITOR step 5, Rx Power not	; enter E-0, Rx Trip Or Safety stable
	• M	IONITOR step 8, Hotwell Level	loss imminent)
	• M	IONITOR step 8, Hotwell Level E-0, reactor Trip or	loss imminent) safety Injection
F	Perform I ₹O 1. VERI (RNO red	IONITOR step 8, Hotwell Level E-0, reactor Trip or E-0 Immediate Operator actions FY reactor TRIPPED: quired)	loss imminent) safety Injection (IOAs)

	Appendix D			Scenar	io Outline			Atta	chme	nt 1
<i>(</i>	Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	28	of	43
	Event Description:	Ste (10	am Leak to Breal sec delay) & #3	k O/S Cont SG MDAF\	ainment Upstr VP LvI Contro	ream Lp #3 MSIV w/ AT I VIv fails open.	WS, Rods	s fail to r	nove in	auto

Time	Position	Applicant's Actions or Behavior
		FR-S.1, Nuclear Power Generation/ATWS.
	RO	Identify ATWS after attempting manual Rx Trip initiation with both M-4 and M-6 Rx Trip Switches (1-RT-1 & 1-RT-2).
	BOP	Initiate a manual Main Turbine trip
	SRO	Direct entry to FR-S.1, Nuclear Power Generation/ATWS
	CAUTION: R	CPs should NOT be tripped with reactor power greater than 5%.
	NOTE: Steps	1 and 2 are immediate action steps.
Evaluator No	ote: Crew ma IS TRIP control v	ay close MSIV's and attempt to isolate AFW to faulted S/.G <u>WHEN REACTOR</u> <u>PED</u> during performance of FR-S.1. When attempting to isolate AFW, level ralve will not close and crew may elect to stop 1B AFW Pump at that time.
Critical Task	: Insert Neg Step 4.	ative reactivity using control rods or boration prior to completion of FR-S.1
	RO	<ol> <li>VERIFY reactor TRIPPED:         <ul> <li>Reactor trip breakers OPEN</li> <li>Reactor trip bypass breakers OPEN or DISCONNECTED</li> <li>Neutron flux DROPPING</li> <li>Rod bottom lights LIT</li> <li>Rod position indicators less than or equal to 12 steps.</li> </ul> </li> <li>(RNO required)</li> </ol>
Critical Task	: Prior to con automaticall rods.	n <b>pletion of FR-S.1 step 4,</b> RO should identify rod failing to insert y 10 sec after turbine Trip initiates rod insertion and begin manually inserting
CRITICAL TASK	RO	RNO: TRIP reactor.
		<ul> <li>IF reactor trip breakers will NOT open,</li> <li>THEN</li> <li>MAINTAIN <u>auto or manual</u> rod insertion at max achievable rate UNTIL rods are at bottom.</li> </ul>
	BOP	<ul> <li>2. VERIFY turbine TRIPPED:</li> <li>ALL turbine stop valves CLOSED</li> </ul>

	Appendix D			Scenar	rio Outline			Atta	chme	nt 1
1 million	Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	29	of	43
Constant of the second	Event Description:	Ste (10	eam Leak to Breal ) sec delay) & #3 :	k O/S Cont SG MDAF\	ainment Upstr WP LvI Contro	eam Lp #3 MSIV w/ AT I VIv fails open.	WS, Rods	s fail to n	nove in	auto

Time	Position	Applicant's Actions or Behavior
		FR-S.1, Nuclear Power Generation/ATWS.
		3. CHECK AFW System operation:
		a. MD AFW pumps RUNNING
	BOP	b. TD AFW pump RUNNING as necessary.
		(Not Running Tagged OOS in initial conditions)
		c. MD AFW LCVs in AUTO.
		d. TD AFW LCVs OPEN.
<b>Critical Tas</b>	k: Insert Negativ	e reactivity using control rods or boration prior to completion of FR-S.1 Step 4.
		4. EMERGENCY BORATE RCS by performing the following:
		a. ENSURE at least one CCP RUNNING.
CRITICAL TASK	BOP	b. <b>INITIATE</b> Emergency Boration <b>USING</b> EA-68-4.
		c. VERIFY charging flow path established:
		• FCV-62-90 OPEN
		• FCV-62-91 OPEN
		<ul> <li>FCV-62-86 or FCV-62-85 OPEN</li> </ul>
		d. CHECK pressurizer pressure less than 2335 psig.
		· · · · · · · · · · · · · · · · · · ·
	Crew	5. VERIFY Containment Purge isolated:
		a. VERIFY containment purge and vent dampers (System 30) CLOSED.
		[Panel 6K and 6L]
	Crew	6. MONITOR SI NOT actuated:
		a. S.I. ACTUATED permissive DARK [M-4A, D4].
Evaluator N	ote: May hav	e manually actuated SI previously. Auto SI will likely occur when MSIV's are
	closed a	fter Rx Trip in FR-S.1 and as the faulted S/G continues to depressurize.
Evaluator N	ote: Crew wi	l likely have dispatched personnel prior to reaching this step.
	2 AUOs	will be dispatched, one to open the RTRs/RTRyps in the $\Delta B$ : the second to
	open the	MG supply breakers at the 480VAC Unit Boards in the TB.
		7. Check reactor and turbine trip status
	RO	a. reactor tripped
	BOP	b. turbine TRIPPED:

Appendix D			Scena	rio Outline			Atta	chme	ent 1
Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	30	of	43
Event Description:	St (1)	eam Leak to Brea 0 sec delay) & #3	k O/S Cont SG MDAF\	ainment Upstre WP Lvl Control	eam Lp #3 MSIV w/ A VIv fails open.	TWS, Rode	s fail to r	nove ir	i auto

Time	Position	Applicant's Actions or Behavior
		FR-S.1, Nuclear Power Generation/ATWS.
		ALL turbine stop valves CLOSED.
	RO	8. MONITOR reactor subcritical:
		a. Power range channels less than 5%.
		b. Intermediate range SUR NEGATIVE.
		c. GO TO Step 19.
	SRO	19. ENSURE status tree monitoring initiated.
	SRO	Ensure Status Trees monitoring and Direct entry to E-2, Faulted SG Isolation.
		(Status Tree monitoring should already be implemented due to previous transition to FR-S.1)
	BOP	20. MAINTAIN S/G narrow range levels:
		a. Power range channels less than 5%.
		b. Between 10% [25% ADV] and 50%.
		21. <b>MONITOR</b> boration termination criteria:
	RO	a. NOTIFY Chem Lab to sample RCS boron concentration.
		b. CHECK for all of the following:
		<ul> <li>all control rods FULLY INSERTED</li> </ul>
		<ul> <li>RCS temperature greater than 540°F</li> </ul>
		no RCS dilution has occurred.
	SRO	22. RETURN TO procedure and step in effect.
		SRO directs crew to return to E-0 Step 1

Appendix D	endix D Scenario Outline							Attachment 1			
Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	31	of	43		
Event Description:	Ste (10	eam Leak to Break 0 sec delay) & #3 :	k O/S Con SG MDAF	tainment Upstre WP LvI Control	∍am Lp #3 MSIV w/ A⁻ Vlv fails open.	TWS, Rods	; fail to r	nove in	i auto		

Time	Position	Applicant's Actions or Behavior
		E-0, reactor Trip or safety Injection
		Perform E-0 Steps 1-4 high level only; FR-S-1 directed E-0 Steps 1-4 and
		ES-0.5 performance
	RO	1. VERIFY reactor TRIPPED:
	BOP	2 VERIEV turbine TRIPRED:
	BOP	3. VERIFY at least one 6.9KV shutdown board ENERGIZED on this unit
	RO	4. DETERMINE if SI actuated:
		(RNO for reference)
		RNO:
		DETERMINE if SI required:
		a. IF any of the following conditions exists:
		• S/G pressure less than 600 psig,
		• RCS pressure less than 1870 psig
		OR
		<ul> <li>Containment pressure greater than 1.5 psig,</li> </ul>
		THEN ACTUATE SI.
		b. IF SI is NOT required N/A
		5 <b>PERFORM</b> ES-0.5 Equipment Verifications W/HILE continuing in this
		procedure.
		6. DETERMINE if secondary heat sink available:
		a. CHECK total AFW flow greater than 440 gpm.
		b. CHECK narrow range level greater than 10% [25% ADV] in at least
		one S/G.

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Appendix D			Scena	rio Outline			Atta	chme	ent 1
Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	32	of	43
Event Description:	Ste (10	eam Leak to Breal ) sec delay) & #3 :	k O/S Con SG MDAF	tainment Upstr WP LvI Control	eam Lp #3 MSIV w/ A I VIv fails open.	TWS, Rods	s fail to r	nove ir	1 auto

Time	Position	Applicant's Actions or Behavior
		E-0, reactor Trip or safety Injection
	RO	7. CHECK if main steam lines should be isolated:
		a. CHECK if any of the following conditions have occurred:
		<ul> <li>Any S/G pressure less than 600 psig OR</li> </ul>
		Any S/G pressure dropping UNCONTROLLED.     OR
		Phase B actuation
		b. ENSURE MSIVs and MSIV bypass valves CLOSED
		c. ENSURE applicable Foldout Page actions COMPLETED
	RO	<ul> <li>8. CHECK RCP trip criteria:</li> <li>a. CHECK the following:</li> <li>RCS pressure less than 1250 psig.</li> <li>AND</li> <li>At least one CCP OR SI pump RUNNING</li> <li>b. STOP RCPs</li> </ul>
	RO	<ul> <li>9. MONITOR RCS temperatures:</li> <li>IF any RCP running, THEN CHECK T-avg stable at or trending between 547°F and °F.</li> <li>OR</li> <li>IF RCPs stopped, THEN CHECK T-cold stable or trending to between 547°F and 552°F.</li> </ul>
	RO	<ul> <li>10. CHECK pressurizer PORVs, safeties, and spray valves:</li> <li>a. Pressurizer PORVs CLOSED.</li> <li>b. Pressurizer safety valves CLOSED.</li> <li>c. Normal spray valves CLOSED.</li> <li>d. Power to at least one block valve AVAILABLE.</li> <li>e. At least one block valve OPEN.</li> </ul>

Appendix D			Scena	rio Outline			Atta	chme	ent 1
Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	33	of	43
Event Description:	Ste (10	eam Leak to Breal 0 sec delay) & #3	k O/S Con SG MDAF	tainment Upstre WP LvI Control `	am Lp #3 MSIV w/ A VIv fails open.	TWS, Rode	s fail to r	nove in	auto

Time	Position	Applicant's Actions or Behavior
		E-0, reactor Trip or safety Injection
	CREW	<ul> <li>11. DETERMINE S/G secondary pressure boundaries are INTACT:</li> <li>CHECK all S/G pressures CONTROLLED or RISING.</li> <li>CHECK all S/G pressures greater than 140 psig.</li> <li>(RNO Required)</li> </ul>
	SRO	RNO: PERFORM the following:
	SRO	a. <b>MONITOR</b> status trees – Status tree monitoring previously initiated.
		b. GO TO E-2, Faulted Steam Generator Isolation.
		Crew transitions to E-2, Faulted Steam Generator Isolation.

Appendix D			Scena	rio Outline			Atta	chme	ent 1
Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	34	of	43
Event Description:	Ste (10	eam Leak to Brea ) sec delay) & #3	k O/S Con SG MDAF	tainment Upstre WP LvI Control	am Lp #3 MSIV w/ A VIv fails open.	TWS, Rods	s fail to r	nove in	auto

Time	Position	Applicant's Actions or Behavior
		E-2, Faulted Steam Generator Isolation
Evaluator N	ote: Critical Ta	ask is to Isolate the faulted SG before transition out of E-2
	[Steps 1- 4	f inclusive completes operator-directed actions to isolate the faulted SG(s)
	CAUTION: L	Inisolating a faulted S/G or secondary break should NOT be considered INLESS needed for RCS cooldown.
Critical Task	BOP 1. CHECK MSIVs and MSIV bypass valves CLOSED.	
	BOP	2. CHECK ANY S/G secondary pressure boundary INTACT:
		Any S/G pressure CONTROLLED or RISING
	BOP	3. IDENTIFY Faulted S/G(s):
		a. CHECK S/G pressures:
		Any S/G pressure DROPPING in an uncontrolled manner
		OR
		Any S/G pressure less than 140 psig.
	CAUTIONS:	<ul> <li>Secondary heat sink requires at least one S/G available.</li> </ul>
		<ul> <li>If the TD AFW pump is the only source of feed flow, isolating both steam supplies will result in loss of secondary heat sink.</li> </ul>
Evaluator No	ote: Critical Ta	sk is to Isolate the faulted SG before transition out of E-2
	[Steps 1- 4	inclusive completes operator-directed actions to isolate the faulted SG(s)]
Critical Task		4. ISOLATE Faulted S/G(s):
	BOP	a. <b>ENSURE</b> MFW isolated to faulted S/G(s) by any of the following:

			Attachment				
Op Test No.: NRC		Scenario #	7	Event #	7, 8, 9, 10	Page <u>35</u> of 4	
Event Description: Ster (10		am Leak to Break O/S Containment Upstream Lp #3 MSIV w/ ATWS, Rods fail to mov sec delay) & #3 SG MDAFWP LvI Control VIv fails open.					
Time	Position			Applicant	's Actions or Beha	vior	
		E-2, Faul	ted Stea	n Generato	or Isolation		
		• fe	edwater i	solation val	ve CLOSED [M-4	4]	
		OR					
		• fe	edwater	regulating v	alve and bypass	valve CLOSED [M-3].	
	BOP	b. ENS	URE AFW	isolated to	faulted S/G(s):		
		• C		DAFW LCV			
		• C	LOSE TE	AFW LCV	and <b>PLACE</b> in P	ULL TO LOCK.	
	BOP	c. CHE (RNO requ	CK S/G # ired)	1 or #4 fault	ed.		
		RNO: c. GO TO S	Substep 4	.e.			
	BOP	d. VERI	<b>FY</b> S/G b	owdown va	lves CLOSED.		
	BOP	e. VERI	FY atmos	pheric relief	CLOSED.		
	BOP	5. CHECK	CST leve	el greater th	an 5%.		
	BOP	6. VERIFY	seconda	ry radiation	NORMAL:		
		a. CHI Sec	ECK secc	ndary radia ad Monitors	tion NORMAL US	SING Appendix A,	

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Appendix D		Scenario Outline						chme	nt 1
Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	36	of	43
Event Description	n: Ste (10	am Leak to Break sec delay) & #3 {	CO/S Con SG MDAF	tainment Upstre WP LvI Control	am Lp #3 MSIV w/ A VIv fails open.	TWS, Rods	fail to r	nove in	auto
Time	Position			Applican	t's Actions or Beha	ivior			
		E-2, Fau	Ited Ste	am Generat	or Isolation				
		b. <b>NO</b>	TIFY Ch	em Lab to ta	ke S/G activity sa	amples.			
		с WH	EN Che	m l ah is rea	dy to sample S/C		DEDE		
	BOP	follo	owing:		uy to sample 3/G		PERF		.ne
		1) E		FCV-15-43	Blowdown Flow (	Control va	lve CL	OSEL	).
		2) 6		Phase A sig					
		d. NC	TIFY R	ADCON to su	irvey main steam	lines and	S/G b	olowdo	own.
		e. <b>W</b> F val	<b>IEN</b> S/G ves.	samples co	mpleted, <b>THEN (</b>	CLOSE blo	owdow	/n isola	atior
	RO/	7 01/50/							
	SRO	7. CHECK	SI term	ination criter	18:				
		a. RCS	S subco	oling based o	n core exit T/Cs	greater th	an 40°	°F.	
	BOP	b. Sec	ondary l	neat sink:					
		• N	arrow r	ande level in	at least one In	tact S/G	areate	r than	10

	<ul> <li>Narrow range level in at least one Intact S/G greater than 10% [25% ADV]</li> </ul>
	OR
	Total feed flow to Intact S/Gs greater than 440 gpm.
RO	c. RCS pressure stable or rising.
RO	d. Pressurizer level greater than 10% [20% ADV].

f.

Appendix D		Scenario Outline							Attachment 1		
Op Test No.:	NRC	Scenario #	7	Event #	7, 8, 9, 10	Page	37	of	43		
Event Description	: Ste (10	am Leak to Brea sec delay) & #3	k O/S Cont SG MDAF	ainment Upstre WP LvI Control V	am Lp #3 MSIV w/ A √Iv fails open.	TWS, Rods	s fail to r	nove in	auto		
Time	Position			Applican	t's Actions or Beha	vior					

		E-2, Faulted Steam Generator Isolation
	SRO	e. GO TO ES-1.1, SI Termination.
	SRO	8. GO TO E-1, Loss of Reactor or Secondary Coolant.
		END
Lead Examine	er may term	ninate the scenario at E-2 Step 7.e, SI Termination criteria determination.

	Appendix D		Re	quired O	perator Actio	ns		For	m ES	3-D-2
11	Op Test No.: Event Descriptio	<u>NRC</u> n: Equi	Scenario # pment verificatio	 ons	Event #	ES-0.5	Page	38	of	43
	Time	Position			Applican	t's Actions or Beha	vior			
			ES-0.5,	EQUIPN	IENT VERIF	ICATIONS				
	Evaluator No	ote: BOP com (including	pletes ES-0. any discre	5 includi pancies :	ing Appendi and actions	ices A & B and r taken) to SRO.	eports c	omplet	ion	
									-	
		BOP	1. VERIF	<b>Y</b> D/Gs R	UNNING.					
		BOP	2. VERIF	Y D/G EF	RCW supply	valves OPEN			••••••	
					<u></u>					
					······		·····			
		BOP	3. VERIF	Y at least	four ERCW	pumps RUNNIN	G			
	`									
	·····	BOP	4. VERIF	Y CCS pi	umps RUNN	ING				
			Pum	p 1A-A (2	2A-A)		**************************************			
			Pum	p 1B-B (2	2B-B)					
			• Pum	p C-S.						
		BOP	5. VERIF	Y EGTS f	ans RUNNIN	NG.		······		
		BOP	6. VERIF	<b>/</b> generat	or breakers	OPEN				
							·····			
		*****	7 10715							
		Crew	actions	<b>r</b> at least	two AUOs to	o report to MCR I	to be ava	lable fo	or loca	al
		BOD	8. VERIF	AFW pu	umps RUNN	ING:				
		BUP	b. TD	AFW pur	mps np.					
		NOTE: AFW taker S/G	level control to control S	valves s /G levels,	hould NOT b , to establish	e repositioned if flow due to failu	manual a re, or to is	iction h solate a	as be fault	en ed
			9. CHECK	AFW va	lve alignmer	nt:				
			a. VEF	RIFY MD	AFW LCVs	in AUTO.				
		BOP	b. VEF		AFW LCVs (	DPEN.			,	
			c. VEF 401		A⊢W pump ⊃.	recirculation valv	es FCV-3	s-400 ai	nd FC	JV-3-

C

Арр	endix D Required Operator Actions							Form ES-D-2				
Ор Т	est No.:	NRC	Scenario #		Event #	ES-0.5	Page	39	of	43		
Ever	nt Description:	Eq	Equipment verifications									

Time	Position	Applicant's Actions or Behavior
		ES-0.5, EQUIPMENT VERIFICATIONS
		10. VERIFY MFW Isolation:
		a. MFW pumps TRIPPED
	BOP	b. ENSURE the following:
		<ul> <li>MFW regulating valves CLOSED</li> </ul>
		<ul> <li>MFW regulating bypass valve controller outputs ZERO</li> </ul>
		MFW isolation valves CLOSED
	BOP	11. MONITOR ECCS operation:
		a. VERIFY ECCS pumps RUNNING:
		CCPs:
		RHR pumps
		SI pumps
		b. VERIFY CCP flow through CCPIT.
		c. CHECK RCS pressure less than 1500 psig.
		d. VERIFY SI pump flow.
		e. CHECK RCS pressure less than 300 psig.
		f. VERIFY RHR pump flow.
	BOD	12. VERIFY ESF systems ALIGNED:
		a. Phase A ACTUATED:
		PHASE A TRAIN A alarm LIT [M-6C, B5].
		PHASE A TRAIN B alarm LIT [M-6C, B6].
		b. Cntmt Vent Isolation ACTUATED:
		<ul> <li>CNTMT VENT ISOLATION TRAIN A alarm LIT [M-6C, C5].</li> </ul>
		<ul> <li>CNTMT VENT ISOLATION TRAIN B alarm LIT [M-6C, C6].</li> </ul>
		c. Status monitor panels:
		6C DARK
		• 6D DARK
		6E LIT OUTSIDE outlined area
		6H DARK
		• 6J LIT.

	Required Operator Actions						Fo	Form ES-D-2		
Op Test No.:	NRC	Scenario #	1	Event #	ES-0.5	Page	40	of	4;	
Event Description:	Eq	uipment verificatio	ons							
Time	Position			Applicant	s Actions or Beh	avior				
		ES-0.5,	EQUIPN	IENT VERIFIC	CATIONS					
		d. Tra	ain A stat	us panel 6K:						
		•	CNTMT	VENT GREE	N					
		•	PHASE	A GREEN						
		e Tr		us nanel 6l ·						
		•	CNTMT	VENT GREE	N					
		•	PHASE		14					
				<u>NORLER</u>						
Evaluator Note:	Critical Cooling e	<b>Fask</b> is to man equipment befo	ually actions an external sectors and the sectors and the sectors and the sectors and the sectors are sectors and the sectors are sectors and the sectors are sect	uate at least th treme (red-pat	ne minimum co h) challenge do	mplement evelops to	of cor the co	ntainm Intainr	ent ner	
· · · · · · · · · · · · · · · · · · ·	(ES-0.5 S	Step 13 directs	complet	ion by BOP du	uring procedure	e performa	nce)			
	BOP	13. <b>MONI</b>	FOR for c	containment sp	oray and Phase	e B actuat	ion:			
		a. <b>CH</b>	IECK for	any of the foll	owing:					
		•	Phase E	3 ACTUATED						
		OF	2							
		•	Contain	ment pressure	e greater than 2	2.8 psig				
		b. VE	RIFY cor	ntainment spra						
		1)	Containr	nent sprav pur	mps RUNNING	G.				
		2)	Containn 72-2 OP	nent spray hea EN.	ader isolation v	alves FC	/-72-39	9 and	FC\	
		3)	Containn FCV-72-	nent spray rec 13 CLOSED.	irculation valve	es to RWS	T FCV	/-72-34	1 ar	
		4) 5)	Containn Panel 6E	nent spray hea LIT.	ader flow great	er than 47	50 gpr	n per i	trair	
						151				
					m LIT IM SC /	∿0j. \61				
						<u>.</u>				
	Appendix D		Required Operator Actions					Form ES-D-2		
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мини , : 	Op Test No.: Event Description:	<u>NRC</u> Equ	Scenario #	1 Event #	ES-0.5	Page	41	of _	43	
	Time	Position		Applicant'	s Actions or Beh	avior				
			ES-0.5, EQ		CATIONS		÷			
			e. VERIFY	Phase B valves (	CLOSED:					
			Pane	6K PHASE B GF	REEN.					
			Pane	I 6L PHASE B GR	EEN.					
			f. WHEN	10 minutes have e ans RUNNING.	lapsed, THEN	ENSURE	contair	ment	air	
			14. MONITOR closed:	if containment vac	uum relief isola	ation valve	s shoul	d be		
			a. CHECK	containment pres	sure greater th	an 1.5 psi	а.			
			b. CHECK	cntmnt vacuum re	elief isolation va	alves CLO	SED:			
			[Pnl 6K	MANUAL]						
100.m.			• FC	√-30-46						
. at 5 at 4			• FC'	√-30-47						
ag south		1999-1999-1999-1999-1999-1999-1999-199	• FC'	√-30-48.						
		BOP	15. CHECK se • Append • Append	condary and conta ix A, Secondary R ix B, Containment	ainment rad mo ad Monitors (a Rad Monitors.	onitors <b>USI</b> ttached) (attached)	NG the	e follo	wing:	
		BOP	16. <b>WHEN</b> dire	ected by E-0, <b>THE</b> Actions.	N PERFORM /	Appendix [	D, Hydr	ogen		
			17. <b>CHECK</b> po [M-15, upp • HS-77- • HS-77-	cket sump pumps er left corner] 410, Rx Bldg Aux 411, Rx Bldg Aux	STOPPED: Floor and Equi Floor and Equi	pment Dra pment Dra	in Sum	ip pur	np A np B	
		BOP	18. <b>DISPATCH</b> ESF Actuati	personnel to perfo	orm EA-0-1, Eq	uipment C	hecks	Follov	ving	

Appendix D		Required Operator Actions For							rm ES-D-2	
Op Test No.:	NRC	Scenario #	1	Event #	ES-0.5	Page	42	of	43	
Event Description	n: Equip	ment verification	าร							
	ſ	1								
Time	Position	Position Applicant's Actions or Behavior								
ES-0.5, EQUIPMENT VERIFICATIONS										
	BOP 19. ENSURE plant announcement has been made regarding Reactor Trip and SI.				Trip					
Evaluator Note: BOP completes ES-0.5 including Appendices A & B and reports completion (including any discrepancies and actions taken, i.e.: containment Spray operating discrepancies per ES-0.5 Step 13) to SRO.										
	END (ES-0.5, EQUIPMENT VERIFICATIONS)									

Appendix D	Required Operator Actions						Form ES-D-2			
Op Test No.:	NRC	Scenario #		Event #	ES-0.5	Page	43	of	43	
Event Description:	Equipment verificatio		ons							

(ES-0.5, EQUIPMENT VERIFICATIONS)						
	APPENDIX A					
		SECONDARY RAD MONITORS				
	BOP	1. <b>CHECK</b> following rad monitors including available trends prior to isolation:				
	l	Condenser exhaust recorder RR-90-119				
		S/G blowdown recorder RR-90-120				
	,	Main steam line rad monitors				
		<ul> <li>Post-Accident Main Steam Line rad recorder RR-90-268B points 3 (blue), 4 (violet), 5 (black), and 6 (brown).</li> </ul>				
		[M-31 (back of M-30)]				
	BOP	2. <b>IF</b> secondary radiation is HIGH,				
		THEN				
		ENSURE Unit Supervisor notified.				
END OF TEXT						

APPENDIX B						
CONTAINMENT RAD MONITORS						
BOP	1. CHECK following rad monitors:					
	<ul> <li>Upper containment high range rad monitors RM-90-271 and RM-90- 272 NORMAL [M-30]</li> </ul>					
	<ul> <li>Lower containment high range rad monitors RM-90-273 and RM-90- 274 NORMAL [M-30]</li> </ul>					
	<ul> <li>Containment rad recorders RR-90-112 and RR-90-106 NORMAL [M- 12] (prior to isolation).</li> </ul>					
BOP	2. IF secondary radiation is HIGH,					
	THEN					
	ENSURE Unit Supervisor notified.					
	END OF TEXT					