

Facility: VC SUMMER Scenario No.: 1 Op-Test No.: 99-1

Examiners: G. HOPPER
L. MELLEN
M. SYKES

Operators:

Objectives: _____

Initial Conditions: PLANT OPERATING AT 90% POWER. 'B' TRAIN EQUIPMENT IN SERVICE. PCV-445A HAS BEEN ISOLATED DUE EXTERNAL LEAKAGE. 'C' ACCUM PRESS HI/LO ANNUNCIATOR JUST ALARMED. HEAVY THUNDERSTORMS IN THE AREA.

Turnover: PCV-444B HAS MINOR SEAT LEAKAGE. 'A' TRAIN COMPONENT COOLING PUMP OOS SERVICE FOR MAINTENANCE (CLEARING TAGS). 30 GPD LEAKAGE ON 'A S/G.

Event No.	Malf. No.	Event Type*	Event Description
1		N-RO	RAISE 'C' ACCUMULATOR PRESSURE
2	PRS-001A PRS-004B	I-RO	PZR PRESSURE CONTROL CHANNEL PT-444 FAILS HI (SEVERITY=2500, RAMP=15) PCV-444B STICKS OPEN (SEVERITY=50%, RAMP=5, DELAY=5, TRIGGER=JMLPRS1A)
3	MSS-009E	I-BOP	'C' STEAMLINER FLOW XMITTER FT-494 FAILS LO (SEVERITY=0, RAMP=10)
4	CCW-007B	C-BOP	LOSS OF OPERATING COMPONENT COOLING WATER TRAIN <i>reestablish efflu & letdown</i>
5a		N-RO	REALIGN LETDOWN TO DEMINERALIZERS
6	CVC-004A	C-RO	RCP 'A' #1 SEAL FAILURE (SEVERITY=7.5, RAMP=120)
7		R-ALL	SRO DIRECTS POWER REDUCTION TO <38% @ 3%/MINUTE
8	CVC-004A RCS-006A	M-ALL	RCP 'A' #1 SEAL FAILURE (SEVERITY 100, RAMP=30) RCP SEAL LOCA (SEVERITY=300, RAMP=180, DELAY=60)
	LOA-EPS-138		'B' TRAIN EQUIPMENT FAILS TO AUTO SI. MANUALLY ACTUATE 'B' TRAIN ECCS EQUIPMENT (SELECT=OPEN, TRIGGER=JPPLSI(1))
	PMP-CS004S		'A' CHARGING PUMP SHEARED SHAFT
	MSS-008B		FAIL BANK 1 STEAM DUMP VALVE OPEN (SEVERITY=100, RAMP=10, DELAY=5, TRIGGER=JPPLSI(1))

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

ALL

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 Event Description: Pressurizer Pressure Control Channel PT-444 Fails High
Pressurizer PORV, PCV-444B, Sticks Open

Time	Position	Applicants Actions or Behavior
1439	RO	Operator verifies failed Control Channel
		<ul style="list-style-type: none"> • PI-444 indicates HI • PZR CNTRL PRESS HI Annunciator • PZR PRESS HI/LO Annunciator • PZR PRESS HI Annunciator
	✓	Checks position of Pressurizer PORV's and places PCV-444B control switch to CLOSE.
		✓ Shuts Valve MVG-8000B, Block Valve for PCV-444B.
		Compare Control Channel Indications to Protection Channel PI-455, 456, and 457. This may have been done in Step 1.
	✓	Close the Pressurizer Spray Valves PCV-444C and PCV-444D.
	✓	Control the PZR PRESS Master Control in Manual.
	✓	Operate Pressurizer Heaters and Spray Valves in Manual to control RCS pressure between 2220 PSIG and 2250 PSIG.
		Verify PI-445, CNTRL CHAN PRESS PSIG, Indication is Normal.
		Ensure Rod CNTRL BANK SEL Switch is in AUTO.
		Maintain RCS Pressure between 2220 PSIG and 2250 PSIG.

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 Event Description: Loss of Operating Component Cooling Water Train

Time	Position	Applicants Actions or Behavior
1256	BOP	Operator recognizes indications for a trip of 'B' CCW Pump
		<ul style="list-style-type: none"> • CCP B/C Trip Fail Annunciator • 'B' CCW Pump Amps reading 0 • CCW Loop B PP DISCH PRESS LO Annunciator
		Within one minute the operator should
		<ul style="list-style-type: none"> • Start 'C' CCW Pump on 'A' Train • Start 'A' Charging Pump • Stop 'B' Charging Pump
		<i>isolated below?</i>
		Operator should establish 'A' CCW Train and the Active Train
		<ul style="list-style-type: none"> • Start MVB-9503A, CC to RHR HX A, stroking in the Closed direction • When flow on FI-7034 is between 5000 GPM and 4000 GPM rapidly <ul style="list-style-type: none"> - Open MVB-9687A/9525A - Open MVB-9524A/9526A - Close MVB-9524B/9526B - Close MVB-9687B/9525B - Open MVB-9503B • Have Auxiliary Building operator verify sample flow to RML2A is greater than one GPM • Ensure the following Valves have not closed on High Flow <ul style="list-style-type: none"> - MVG-9625 - MVG-9626 - MVG-9583 - MVT-9593A/B/C

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Event Description: Realign Letdown to Demineralizers

Time	Position	Applicants Actions or Behavior
	RO	Operator verifies conditions are met to restore Letdown Demin Flow
		<ul style="list-style-type: none">• Annunciator XCP-613 (1-2), DEMIN FLO DIVERT TEMP HI, clear
		<ul style="list-style-type: none">• Letdown temperature on TI-143 less than 135°F
		Operator places TCV-143, LTDN TO VCT OR DEMIN, in DEMIN/AUTO.

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 Event Description: Reactor Coolant Pump 'A' Number One Seal Failure

Time	Position	Applicants Actions or Behavior
1529	RO	Operator recognizes indications of abnormal leakoff from 'A' RCP #1 Seal <ul style="list-style-type: none"> • RCP A #1 SL LKOFF FLO HI/LO Annunciator
		Operator breaks out ARP XCP-617 (2-1) and monitors Seal Leakoff Flow on FR-154B.
		Operator ensures Seal Injection Flow to 'A' RCP is greater than 8 GPM on FI-130A.
		Operator ensures CCW Flow to 'A' RCP Thermal Barrier is between 35 GPM and 60 GPM on FM-7138.
		Operator monitors lower Seal Water Bearing temperature on T0417A.
		Operator monitors #1 Seal Leakoff temperature on T0181A.
		Operator determines that #1 Seal Leakoff Flow is greater than 6 GPM by monitoring FR-154A, RCP SL LKOFF HI RANGE.
		Commence plant power reduction to allow securing 'A' RCP within 8 hours.
		After the subsequent Safety Injection, the operator should secure 'A' RCP.
		Within three to five minutes after 'A' RCP is secured, close RCP 'A' Seal Leakoff PVT-8141A.

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 Event Description: Power Reduction to < 38% @ 3%/Min.

Time	Position	Applicants Actions or Behavior
	SRO	CRS directs power reduction at 3%/min.
	BOP	Reduces Turbine Load <ul style="list-style-type: none"> • Deenergizes LOAD LMT circuit • Energizes DEC LOAD RATE circuit • Selects 3%/min. on LOAD RATE LMT - % • Depress DECREASE pushbutton to reduce LOAD SET to value directed by CRS
	RO	Monitors control rods to ensure T_{AVE} is decreasing with automatic inward rod motion.
	RO	Opens MVG-8104 as necessary to minimize $T_{AVE} - T_{REF}$ mismatch.
	BOP	Secure one MFP per SOP-210 when directed by CRS <ul style="list-style-type: none"> • Open MFP Turbine Drain Valve MOV-1-5 • Place MFP recirculation in Manual • Decrease MFP speed controller output to 0 • Trip the MFP using the FWP PP TRIP/RESET switch at the MCB • Dispatches operator to verify HP & LP Stop Valves have closed • Ensures MFP turbine is on turning gear when speed is 0.
	BOP	Secures one MFBP when directed by CRS.

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Event Description: RCP Seal LOCA

'B' Train ESFLS Failure, 'A' Charging Pump Broken Gear Box Bank 1
Steam Dump Fails Open

Time	Position	Applicants Actions or Behavior
1539	RO	Recognizes increase in 'A' RCP #1 Seal Failure/Seal LOCA <ul style="list-style-type: none"> RCP Seal Bearing temperature increasing PZR level decreasing Charging flow increasing
	RO/BOP	Trips the reactor when directed by CRS or when SOP-101 RCP trip criteria are met.
1540	RO/BOP	Auto Manually SI's when directed by CRS or after automatic SI.
	RO	Secures 'A' RCP after the reactor trip.
	RO	Performs Immediate Actions of EOP-1.0 <ul style="list-style-type: none"> Verifies reactor trip
	BOP	Performs Immediate Actions of EOP-1.0 <ul style="list-style-type: none"> Verifies turbine trip Verifies ESF buses energized
	BOP	Recognizes failure of 'B' Train ESFLS to sequence and informs RO/CRS
1541	RO	Recognizes 'A' Charging Pump low amps and informs CRS. Calls AB operator to investigate.
	RO	Closes PVT-8141A, 3-5 minutes after securing 'A' RCP. <i>Done</i>
	RO	<i>Report on loss of RB 2058 MTR</i> Directs TB operator to rack up 'C' Charging Pump on 'A' Train and rack down 'A' Charging Pump.

Op-Test No.: 99-1 Scenario No.: 1 Event No.: 8 Page 2 of 3Event Description: RCP Seal LOCA'B' Train ESFLS Failure, 'A' Charging Pump Broken Gear Box Bank 1
Steam Dump Fails Open

Time	Position	Applicants Actions or Behavior
	RO/BOP	Crew should NOT secure 'B' & 'C' RCPs when RCS pressure decreases < 1400 psig until SI flow is established from 'C' Charging Pump.
	RO	During initial check after Immediate Actions: <ul style="list-style-type: none"> • Recognizes 'B' RHR failed to start and manually starts it • Recognizes one 'B' Train RBCU failed to start and manually starts it • Recognizes 'B' SWBP did not start and manually starts it.
	BOP	Performs Attachment 3 of EOP-1.0 to verify proper operation of all ESF equipment (If not already performed by the NROATC). <ul style="list-style-type: none"> • Recognizes 'B' RHR failed to start and manually starts it. • Recognizes one 'B' Train RBCU did not start and manually starts it • Recognizes 'B' SWBP did not start and manually starts it.
	BOP/RO	Recognizes failure of one Bank 1 Steam Dump and attempts to manually close with the steam dump controller
	BOP/RO	Dispatches an operator to locally close or isolate the failed open steam dump.
	SRO	Transitions to EOP-2.0, <i>Loss of Reactor on Secondary Coolant.</i>
	RO	Resets SI, Phase A Isolation, Phase B Isolation.
	BOP	Resets ESF Loading Sequencers.

