Facility: __VC SUMMER_____   Scenario No.: ___2____   Op-Test No.: _99-1

Examiners: ____G. HOPPER_____   Operators:
           _____L. MELLEN_____
           _____M. SYKES_____

Objectives: _____

_____

Initial Conditions: _PLANT OPERATING AT 90% POWER. 'B' TRAIN EQUIPMENT IN SERVICE. PCV-445A HAS BEEN ISOLATED DUE EXTERNAL LEAKAGE. 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	CRF-008	I-RO	T-REF FAILS LOW (*SEVERITY=557, RAMP=5*)
2	TUR-007B PCS-002	C-BOP R-ALL- RO	LOSS OF STATOR COOLING (*SEVERITY=.35, RAMP=120*) FAILURE OF AUTOMATIC RUNBACK (*SELECT=RUNBACK FAIL*)
3	CVC-015A CVC-020	C-RO	LETDOWN PRESSURE CONTROL VALVE PCV-145 FAILS CLOSED (AUTO) (*SEVERITY=0, RAMP=5*) LETDOWN RELIEF VALVE FAILS OPEN (*SET=FAIL AFTER LIFTING*)
4		N-RO	PLACE EXCESS LETDOWN IN SERVICE
5	MSS-001B	I-BOP	'A' S/G PRESSURE XMITTER PT-475 FAILS LO (*SEVERITY=0, RAMP=5*)
6	RCS-002A	C-RO R-RO	'A' S/G TUBE LEAK INCREASE (*SEVERITY=2.5, RAMP=120*)
6A	PLP-CND-001	C-ALL R-ALL	DECREASING MAIN CONDENSER VACUUM (*SEVERITY=3500, RAMP=120*) COMMENCE POWER REDUCTION **(IF NECESSARY)**
7	MSS-004B MSS-004C VLV-MS-009P VLV-MS037P	M-ALL	MAIN STEAM LINE BREAK AT COMMON TDEFW HDR (*SEVERITY=5E5, RAMP=60*) MAIN STEAM LINE BREAK AT COMMON TDEFW HDR (*SEVERITY=5E5, RAMP=60* 'C' ISOLATION VALVE TO TDEFP (2802B) FAILS OPEN(*SEVERITY=100*) TDEFP LOW SPEED FAILURE (SIMULATES LOW STEAM FLOW TO TDEFP) (*SEVERITY=15*)

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

Op-Test No.: __99-1__ Scenario No.: __2__ Event No.: __1__ Page __1__ of __1__
Event Description: T_{REF} Fails Low

Time	Position	Applicants Actions or Behavior
8:04	RO	Verifies Rod Motion not required.
		Verifies T_{REF} has failed. *little slow*
		Places ROD CNTRL BANK SEL switch in MAN.
		Adjusts Rods to maintain T_{AVE} within 1°F of T_{REF} (if necessary).
		(483.9 calculated)
		Performs actions of AOP-403.3 as directed by CRS.

Op-Test No.: __99-1__   Scenario No.: __2__   Event No.: __2__   Page __1__ of __1__

Event Description: Loss of Stator Cooling

                Failure of Automatic Runback

Time	Position	Applicants Actions or Behavior
8.9	BOP	Acknowledges GEN AUX PNL TRBL annunciator.
		Breaks out ARP.
	RO	Dispatches TB Operator to investigate GEN AUX PNL TRBL alarm.
1812+		When TB AO reports back that PROTECTION CIRCUITS ENERGIZED local annunciator in alarm, recognizes a runback should be in progress.
1812		Reduces Turbine Load using the LOAD LMT SET.
	RO	Drives in rods manually and/or uses emergency boration to attempt to maintain $T_{AVE} - T_{REF}$ within 1°F and keep Bank D rods above rod insertion limits.
	BOP	Stops manual load reduction when TB AO reports stator cooling has been restored.
	RO	Uses rods/boration to maintain $T_{AVE} - T_{REF}$ within 1°F.
	BOTH	Performs actions of AOP-214.2 as directed by CRS.
		760 ww
		mentioned "c" SG IVI deviation Hi - expected
		due to load transient. FUQ

Op-Test No.: __99-1__   Scenario No.: __2__ Event No.: __3__ Page __1__ of __1__

Event Description: __Letdown Pressure Control Valve PCV-145 Fails Closed (AUTO)__

__Letdown Relief Valve Fails Open.__

Time	Position	Applicants Actions or Behavior
8:32	RO	Recognizes PCV-145 has failed closed.
		Takes manual control of PCV-145 and opens PCV-145.
		Determines letdown relief valve has failed open by PRT pressure/temperature increasing, PRT annunciator, or letdown relief tailpipe temperature not decreasing.
		Isolates Letdown
		• Closes PVT-8149A _Letdown Orifice Iso_
		• Closes PVT-8149C
		• Closes LCV-459
		• Closed LCV-460
		Isolates Charging
		• Places FCV-122 in Manual
		• Closes FCV-122
		• Closes MVG-8107 (optional)
		• Closes MVG-8108 (optional)
		Takes actions of AOP-102.1 as directed by the CRS.

Op-Test No.: _99-1___   Scenario No.: _2_   Event No.: _4_   Page _1_ of _1_

Event Description: _Place Excess Letdown in Service_

Time	Position	Applicants Actions or Behavior
	RO	Verifies core power < 2898 MWt.
		Places PVM-8143 to VCT position.
		Opens MVT-8100.
		Opens MVT-8112.
		Opens PVT-8153.
		Opens PVT-8154.
		Slowly throttles open HVC-137.
		Maintains XS Letdown HX temperature < 165°F (TI-139).

Op-Test No.: __99-1__ Scenario No.: __2__ Event No.: __5__ Page __1__ of __1__
Event Description: __'A' S/G Pressure Transmitter (PT-475) Fails Low__

Time	Position	Applicants Actions or Behavior
8:44	BOP	Recognizes PT-475 failed low.
		Takes manual control of 'A' Feed Reg Valve FCV-478.
		Opens FCV-478 so feed flow > steam flow in 'A' S/G.
		Places FW CONTROL CHANNEL SEL switch to the FY 475A position.
		Places STEAM CONTROL CHANNEL SEL switch to the FY 476A position.
		Restore 'A' S/G level to ≈ 61%.
8:49		Place FCV-478 in automatic.

Op-Test No.: __99-1__   Scenario No.: __2__ Event No.: __6__ Page __1__ of __1__
Event Description: 'A' S/G Tube Leak Increase

Time	Position	Applicants Actions or Behavior
	RO	Acknowledges RMG-19A Annunciator
		Takes actions of ARP-XCP-646 (2-1)
✓	SRO	• Requests HP to survey Steamlines
✓	SRO	• Directs Chemistry to sample S/Gs for activity
✓	RO/BOP	• Have TB AO verify Condenser Exhaust aligned to AB Charcoal Exhaust.
D	BOP	• Have AB operator reduce 'A' S/G Blowdown flow to minimum.
		Takes actions of AOP-102.1
	RO/BOP/ SRO	• Determines RCS leak rate by performing STP-114.002 on IPCS
✓	BOP	• Adjust PWR PZR A SETPT Controller to 8.85
✓	RO/BOP	• When directed by CRS, commence plant shutdown
	-	

Op-Test No.: _99-1_   Scenario No.: __2__   Event No.: __6A__   Page __1__   of _1__

Event Description: Decreasing Main Condenser Vacuum Power Reduction

Time	Position	Applicants Actions or Behavior
.	BOP	Recognizes decreasing Main Condenser Vacuum.
		Opens MVB-102A or 102B and starts 'C' Main Condenser Vacuum Pump.
		Trips turbine if load < 300 MWe (with vacuum > 5" Hg).

Op-Test No.: __99-1__   Scenario No.: __2__ Event No.: __7__ Page __1__ of __3__

Event Description: __Main Steam Line Break at Common TDEFP Header__

Time	Position	Applicants Actions or Behavior
9:16	RO/BOP	Recognize indications of Main Steam break
		• Reactor power increasing
		• 'B' & 'C' S/G levels increasing
		• 'B' & 'C' FRV opening
		• Report from AB operator
	RO/BOP	Trips reactor if/when directed by CRS.
9:26	BOP	Closes MSIVs when directed by CRS.
	RO	Takes immediate actions of EOP-1.0
		• Verifies reactor trip
		• Manually activates SI (back-up signal)
	BOP	Takes immediate actions of EOP-1.0
		• Verifies turbine trip
		• Verifies ESF buses energized
9:24	RO	• Manually activates SI (back-up signal) 1874 psig
	BOP/RO	Recognizes high steam flow in 'B' & 'C' S/G.
	BOP/RO	When high steam flow recognized, may recommend to CRS to close MVG-2802A and 2802B.
	BOP / dc	Performs Attachment 3 of EOP-1.0 to verify proper operation of all ESF equipment.
		• Matches flags on running equipment if not already done

Op-Test No.: _99-1_ Scenario No.: _2_ Event No.: _7_ Page _2_ of _3_

Event Description: _Main Steam Line Break at Common TDEFP Header_

Time	Position	Applicants Actions or Behavior
9:18	BOP/RO	Closes MVG-2802A and 2802B when directed by CRS.
	BOP/RO	Recognizes 2802B did not close and steam flow on 'B' S/G went to 0 mpph.
	BOP/RO	Directs IB operator to locally close 2802B (if inhabitable).
	SRO	Crew transitions to EOP-3.0, *Faulted Steam Generator Isolation.*
	BOP	Performs isolation of 'C' S/G.
		• Closes MVK-1633C (RO)
		• Closes PVT-2843C
		• Closes PVT-2877B
		• Places 'C' Power Relief to PWR REL
		• Closes FCV-3551
		• Closes FCV-3556
		• Directs AB operator to close 1017C, 1018C, 1019C, 1020C
		• Close MVG-2802A and 2802B (if not already done)
		• Directs IB operator to deenergize MVG-2802A and MVG-2802B
	SRO	Verifies high radiation on 'A' S/G and transitions to EOP-4.0, *Steam Generator Tube Rupture.*

Op-Test No.: __99-1__   Scenario No.: __2__   Event No.: __7__   Page __3__   of __3__

Event Description: __Main Steam Line Break at Common TDEFP Header__

Time	Position	Applicants Actions or Behavior
	BOP	Isolates flow from 'A' SG
		• Adjusts Power Relief Setpoint to 8.85 and places in PWR REL.
		• Places STM DUMP INTERLOCK switches to BYP INTLK
		• Closes PCT-2843A
		• Closes PVT-2877A
	BOP	Isolates flow to 'A' S/G.
		• Closes FCV-3531 (if 'A' S/G NR level > 30%)
		• Closes FCV-3536 (if 'A' S/G NR level > 30%)
	SRO	Determines required core exit TC temperature and controller setpoint based on 'A' S/G pressure. Informs RO/BOP of those valves.
	BOP	Dump steam from 'B' S/G (also 'C' S/G if MVG-2802 closed locally)
		• Blocks steamline SI
		• Opens 'B' S/G power relief
		• Closes 'B' S/G power relief and adjust setpoint when target temperature reached.
	RO	RESET SI, Phase A, Phase B,
	BOP	Reset ESFLS
	RO	Establish Instrument Air to RB
		• Opens PVA-2659
		• Opens PVA-2660
		• Directs TB operator to reset 'A' IA compressor