

FINAL SUBMITTAL

V. C. SUMMER NUCLEAR STATION

EXAM NO. 50-395/2000-301

August 7 - 11, 2000

**FINAL SCENARIOS, OPERATOR
ACTIONS, & OUTLINES**

Facility: Summer	Scenario No.: 1	Op-Test No.: _____
Examiners: Miller - SROs Ernstes, Sykes - ROs, BOP	Operators: Davis, Guerra, Harris - SRO Shue, Lindler, Price - RO Surrogate, Phillips, Surrogate - BOP	
<p>Objectives: Evaluate applicants' abilities to maneuver unit, respond to rod control system and charging system malfunctions, and use EOPs to respond to a SBLOCA with a LOOP and no available high head safety injection.</p> <p>Initial Conditions: IC-12; 50% power, MOL, equilibrium Xenon and Samarium. "A" charging pump running, PORV 444B inoperable and unable to be cycled (block valve closed and power removed), "C" charging pump racked/tagged out, "B" Charging pump set with sheared shaft, "A" EDG set to fail to load onto bus, "B" SWBP set not to load automatically on the "B" DG (manual start possible).</p> <p>Turnover: 50% steady state, "C" Charging pump and PCV-444B out of service, severe thunderstorms in area. Ready to commence uppower per GOP-4.0, step 3.17.</p>		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (RO) R (BOP) N (SRO)	Increase power to 95%
2	TUR-12	I (RO) I (SRO)	Controlling turbine first stage pressure transmitter fails to 0 over 15 second period.
3	CVC-16	C (RO) C (SRO)	FCV-122 fails closed/sticks closed.
4	EPS-1, RCS-6	M (RO) M (BOP) M (SRO)	LOOP without delay and with "A" EDG failure to load, followed closely by SBLOCA of size to drive operators to EOP-17.0

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

Event Description: Controlling first stage pressure transmitter fails to 0 over 15 second period. Initiated while power increase in progress and before 600 MWe.

Time	Position	Applicant's Actions or Behavior
	RO	Identify channel failure through either (AOP-401.7): comparison with operable channel noting inward rod motion or its effects Annunciators RCS Tav _g /T REF DEV HI/LO Status Lights 1 st STG PRESS CHAN III 1 st STG PRESS CHAN IV PERMISV C-7A PB-447A (1 st STG PRESS) PERMISV C-7B PB-447B 91 st STG PRESS) Arming of steam dump system
		Place ROD CNTRL BANK SEL Switch in MANUAL [AOP-401.7 step 1]
		Ensure TREF 1 st STG PRESS Switch positioned to operable channel [AOP-401.7 step 2]
		Adjust Control Rods until Tav _g is within 1 F of Tref [AOP-401.7 step 3]
		Restore Auto Rod Control [AOP-401.7 step 6]
	BOP	Check if Main Turbine Load > 10% [AOP-401.7 step 4]
		Place Steam Dump Mode Selector Switch in STM PRESS [AOP-401.7]
	SRO	Direct/Coordinate operator actions
		Notify I&C to place AMSAC in Bypass [AOP-401.7 step 8]
	SRO/RO	Within 6 hours, trip bistables FB-474A, 484A, 494A

Op-Test No.: _____ Scenario No.: 1 Event No.: 4/5 Page 1 of 4		
Event Description: Loss of Offsite Power with failure of "A" EDG to load followed closely by SBLOCA		
Time	Position	Applicant's Actions or Behavior
	SRO	Enter EOP-1 and direct post-trip actions
		Announce plant conditions over page system [EOP-1, step 7]
		Direct transition to EOP-2 [EOP-1.0, step 14]
	RO	Verify reactor trip [EOP-1, step 1]
		Initiate SI if req'd Verify SI equipment - identify no High Head SI (A chg pump deenergized, B chg pump with sheared shaft, C chg pump inop) [EOP-1, step 4/5/6]
		Verify RB pressure < 12 psig [EOP-1, step 8]
		Verify TCS Tcold trending to 557 F [EOP-1, step 9]
		Verify PORVs and Pzr spray valves closed [EOP-1, step 10]
		Verify power available to at least 1 PORV block valve and at least one block valve open [EOP-1, step 10]
		Check if RCS is intact [EOP-1, step 14] Identify SBLOCA
	BOP	Verify turbine trip [EOP-1, step 2]
		Identify ESF bus "A" as deenergized [EOP-1, step 3]
		Attempt to restore the "A" bus per AOP-304.
		Verify no SG faulted [EOP-1, step 12]
		Verify secondary radiation levels indicate SG not ruptured [EOP-1, step 13]

Op-Test No.: _____ Scenario No.: 1 Event No.: 4/5

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Event Description: **Loss of Offsite Power with failure of "A" EDG to load followed closely by SBLOCA**

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions of EOP-2
		Direct transition to EOP-17.0 if appropriate
		Direct transition to EOP-2.1
	RO	Reset both SI RESET TRAIN A(B) switches [EOP-2, step 4]
		Reset containment isolation [EOP-2, step 5]
		Verify PORVs closed, power available to at least 1 PORV block valve and at least one block valve open [EOP-2, step 7]
		Establish Instrument air to to the RB [EOP-2, step 9]
		Check if RB Spray should be stopped [EOP-2, step 11]
		Check if RHR pumps should be stopped [EOP-2.0, step 12]
		Shift CCW to fast speed in B loop [EOP-2.0, step 16b]
	BOP	Check intact SG levels [EOP-2, step 3]
		Check if secondary radiation levels are normal [EOP-2, step 6]
		Place both ESF LOADING SEQ A(B) RESETS to NON-ESF LCKOUTS and AUTO-START BLOCKS [EOP-2, step 8]

Op-Test No.: _____ Scenario No.: 1 Event No.: 4/5			Page 3 of 4
Event Description: Loss of Offsite Power with failure of "A" EDG to load followed closely by SBLOCA			
Time	Position	Applicant's Actions or Behavior	
	SRO	Direct actions of EOP 17.0	
		Direct transition to EOP-2.1	
	RO	Verify Phase A AND containment ventilation isolation [EOP-14.0 step 1]	
		Check if RB spray is required [EOP-17.0 step 2] Ensure both spray pumps operating Ensure proper valve lineup Verify RWST level >18% Ensure suction from RWST open Close sump isolations, loops A & B Verify RB spray flow >2500 gpm in at least 1 train Verify Phase B isolation	
		Ensure 2 RBCU fans running in slow [EOP-17.0 step 3]	
		Verify Service Water flow to RBCUs [EOP-17.0 step 4] Ensure both service water booster pumps operating Start B SWBP manually Verify flow > 2000 gpm for at least 1 train	
	BOP	Ensure all MSIVs/BPVs closed [EOP-17.0 step 5]	
		Determine that no SGs are faulted [EOP-17.0 step 6]	

Event Description: **Loss of Offsite Power with failure of "A" EDG to load followed closely by SBLOCA**

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions of EOP 2.1
		Initiate RCS Cooldown to Cold Shutdown [EOP-2.1 step 4]
	RO	Check if RHR pumps should be stopped [EOP-2.1, step 2]
		Check intact SG Levels [EOP-2.1, step 3]
		Verify subcooling on TI-499A(B)>30F [EOP-2.1, step 5]
		Check if SI system is in service [EOP-2.1, step 6]
		Turn off all pressurizer heaters [EOP-2.1, step 7]
		Depressurize RCS to refill pressurizer [EOP-2.1, step 8] - cycle one PORV as necessary to depressurize
		Verify Pzr level>30% [EOP-2.1, step 8]
	BOP	Verify ALL buses energized from offsite power [EOP-2.1, step 1]
		- Use appropriate procedures to restore offsite power
		Verify Main Steam Isolation Valves open for non-faulted SGs [EOP-2.1 step 4]
		Dump steam via atmospheric PORVs for cooldown [EOP2.1, step 4]

Facility: VC_SUMMER Scenario No.: 2 Op-Test No.: _____

Examiners: MIKE ERNSTES
MARK MILLER
M. SYKES

Operators: SHUE, PHILLIPS, PRICE - SROs
SURROGATE, GUGGERA, SURROGATE TROs
DAVIS, LINDLER, HARRIS BOP

Objectives: Evaluate the applicants' abilities to maneuver the unit, remove a feed pump from service, respond to instrument failures, respond to a loss of a condensate pump, a steam pressure transmitter failure, a S/G power relief failing open, and a Main Steamline Break with an ATWS.

Initial Conditions: 100% power, MOL, equilibrium Xenon and Samarium. 'C' S/G has a tube leak below Tech Specs and trending upward. Both RTBs fail to open and the TDEFP trips upon receiving a start signal.

Turnover: 100% power, MOL, equilibrium Xenon and Samarium. 'C' S/G has a slight tube leak (25 gpd) that has been trending upward over the last 7 days. Predictive maintenance has recommended removing 'A' MFP from service for bearing repairs. Crew is to reduce power to 88% and remove 'A' MFP from service within one hour.

Event No.	Malif. No.	Event Type*	Event Description
1		R (BOP) N (SRO)	REDUCE POWER TO 88% AND REMOVE 'A' MFP FROM SERVICE.
2	MSS-009B	I (BOP) I (SRO)	NON-CONTROLLING STEAM FLOW CHANNEL FT-475 FAILS HIGH (SEVERITY=6E6, RAMP=5)
3	FWM-002A	C (BOP) C (SRO)	'A' CONDENSATE PUMP TRIP
4	XMT-MS0350	I (BOP) I (SRO)	PT-2000, 'A' S/G POWER RELIEF TRANSMITTER FAILS HIGH (SEVERITY=1300)
5	MSS-003B	M (BOP) M (SRO)	STEAMLINE BREAK ON 'A' MAIN STEAM LINE INSIDE CONTAINMENT WITH ATWS (SEVERITY=4E6, RAMP=60)
0	PCS-009AB PCS-009BB		RTB 'A' FAILS TO OPEN IN AUTO OR MANUAL RTB 'B' FAILS TO OPEN IN AUTO OR MANUAL
0	FWM-003C		TDEFP TRIP ON START

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

Op-Test No.: _____ Scenario No.: 2 Event No.: 5 Page 1 of 1
 Event Description: Steamline Break on 'A' Main Steam Line Inside Containment causing an SI with an ATWS. ATWS terminated in EOP-13.0 with the opening of the Rod Drive MG Set breakers by the local operator.

Time	Position	Applicants Actions or Behavior
	RO	Recognize failure of automatic reactor trip by: <ul style="list-style-type: none"> - Containment pressure >3.6 psig with RTBs closed. - Red first-out annunciator with RTBs closed.
	BOP	Recognize failure of automatic reactor trip by: <ul style="list-style-type: none"> - Steamline pressure <675 psig with RTBs closed. - Red first-out annunciator with RTBs closed.
	RO/BOP	Attempt to manually trip the reactor by taking the manual reactor trip switch to TRIP.
	SRO	Initially enter EOP-1.0 and direct actions to trip the reactor.
		Transition to EOP-13.0 when it is determined the reactor did not trip.
		Directs the IB operator to locally trip the reactor per EOP-13.0, Attachment I.
	RO	Verify reactor trip [EOP-13.0, step 1] <ul style="list-style-type: none"> - Attempt to trip the reactor using the reactor trip switch. - Determines all RTBs are open and reactor is still critical. - Leaves rods in AUTO to insert control rods. - Manually inserts rods when rod speed drops below 40 spm.
		Initiates emergency boration by opening MVG-8104 [step 4].

Time	Position	Applicants Actions or Behavior
Op-Test No.: _____ Scenario No.: <u>2</u> Event No.: <u>5</u> Page <u>1</u> of <u>2</u> Event Description: <u>Steamline Break on 'A' Main Steam Line Inside Containment causing an SI with an ATWS. ATWS terminated in EOP-13.0 with the opening of the Rod Drive MG Set breakers by the local operator.</u>		
	BOP	Verify turbine/Generator Trip [EOP-13.0, step 2]. <ul style="list-style-type: none"> - Verify all Turbine STM STOP VLVs closed. - Ensure main generator breaker and field breaker is open. - Trip the EXC FIELD BKR.
		Ensure EFW Pumps are running [step 3]; Determines that the TDEFP is not running. Informs the CRS and directs AB operator to investigate. (AB operator will reset the trip and throttle valve if dispatched and TDEFP will start).
	BOP/RO	Performs steps 1-8 of EOP-1.0, if/when directed by CRS.
	RO/BOP	Verifies Containment Ventilation Isolation Valves closed [step 5].
		Checks S/G levels >50% (using adverse containment values) [step 6].
		Ensures all dilution paths are isolated [step 7]: <ul style="list-style-type: none"> - Places RX COOL SYS MU in STOP. - Directs AB operator to close XVD-8430, 8454, and 8441.
		Checks for reactivity insertion due to uncontrolled cooldown [step 8].
		Ensures MSIVs are closed [step 9].
		Determines that 'A' S/G is FAULTED [step 10] Note: Per OAG-103.4, EFW to the faulted S/G may be immediately isolated when the faulted S/G has been positively identified.
		Isolates 'A' S/G [step 11].
		Verify core exit thermocouple temperatures <1200°F [step 12].
		Verifies reactor is subcritical [step 13].

