Draft Submittal
(Pink Paper)

1. Operating Test Simulator Scenarios
AND Outlines

VOGTLE EXAM 2002-301
50-424 AND 50-425

NOVEMBER 26, &
DECEMBER 2 - 13, 2002

DRAFT

Facility: Vogtle Scenario No.: 1 Op-Test No.: _____

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: Plant operating at 90% power. 'B' train equipment in service. PORV has been isolated due to external leakage. Heavy thunderstorms in the area.

Turnover: Spray valve has minor seat leakage. 'A' train component cooling pump has just been returned to service. 20 gpd leak on 'A' S/G All prerequisites for power increase were met on the previous shift. You have been directed to increase power to 95%. Once power has been increased, swap to "A" Train Component Cooling and remove "B" train pump from service.

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO	Raise Power to 95%
2		C-RO	Just Before reaching 95% power. RD09 Control Rod Urgent Failure. Rods to manual to correct.
3		N-RO	swap to "A" Train Component Cooling and remove "B" train pump from service.
4		C-BOP	EL09 Loss of 480V SWGR. Ground fault causes overcurrent trip.
5		I-BOP	pressurizer level control failure- system ends up in manual -
6		I-RO	FW16 heater 4 level Transmitter Failure - (reactor power increases due to decreased feed water temperature) Rods are in Manual from Event # 2 Operator must raise power manually to correct for feedwater malfunction.
7		M-ALL	Main Feedwater Pump-B Trip. Enter AOP -Rapid Insertion Of Control Rods, Borate as Necessary (appears to go as planned; however water, not Boron is injected from system) Dilution event now in progress. Operators depress Start Setback Pushbutton to attempt to lower Load To 850 Mwe, Third Condensate Pump fails to start. All Attempts to trip reactor fail. Reactor must be shutdown manually, with alternate Boron Source.

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

DRAFT

Appendix D Scenario Outline Form ES-D-1

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

Examiners: _____ Operators: _____

Initial Conditions: Plant operating at 90% power. 'B' train equipment in service. PORV has been isolated due to external leakage. 'C' accumulator pressure HI/LO annunciator has just alarmed. Heavy thunderstorms in the area.

Turnover: Spray valve has minor seat leakage. 'A' train component cooling pump OOS service for maintenance (clearing tags). 20 gpd leak on 'A' S/G.

Event No.	Malf. No.	Event Type*	Event Description
1		N-RO	Raise 'C' accumulator pressure
2		I-RO	Pressurizer pressure control channel fails HI. Spray valve sticks open.
3		I-BOP	'C' steamline flow transmitter fails low.
4		C-BOP	Loss of operating component cooling water train.
5		C-RO	RCP 'A' #1 seal failure
6		R-ALL	SRO directs power reduction
7		M-ALL	RCP 'A' #1 seal failure results in RCP seal LOCA
			'B' train equipment fails to auto SI. Manually actuate 'B' train ECCS equipment
			'A' charging pump sheared shaft
			Fail bank 1 steam dump valve open

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

DRAFT

Facility: Vogtle Scenario No.: 3 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: The plant is at 85% power with #3 condensate pump out of service and the 'A' train MDAFW pump is OOS, and the NR temperature instrument loop 1 has failed low. The bistables have been tripped for this failure.

Turnover: Reactor power is 85%, MOL. The following Tech Specs components are failed:

- 'A' MDAFW pump is OOS due to mechanical seal failure. It has been OOS for 48 hours & not expected to RTS within the remaining LCO time due to parts unavailability, the LCO has been written.
- Also affecting AFW is a severe packing leak that has occurred on the high pressure side of 1-1301-U4-051, a chemical cleaning isolation valve on the steam header from 'A' S/G to the TDAFW pump. As a result, 1HV-3009, steam supply to the TDAFW pump from 'A' S/G is tagged shut and power has been removed from the valve. The manual upstream isolation valve, 1-1304-U4-005, is also tagged shut to allow the work.
- As a result of this work, the plant is in a 6 hour shutdown requirement per Tech Spec 3.7.1.2 due to 2 inoperable trains of AFW.
- Loop 1 NR temp instrument has failed low 5 hours ago, the bistables have been tripped, and I&C is working on the work package.
- Also, the #3 Condensate pump is OOS due to a motor failure that occurred 3 days ago. No RTS date has been set.
- Plant management has directed the plant to be shutdown to Mode 3 within the next 3.5 hours.
- The system operator has been notified of the pending power reduction.
- The plant has been operating with a known S/G tube leak of 20 gpd for the past monthe on 'A' S/G. The leak rate has been stable at this value since onset.
- In addition a tornado alert has been issued for Burke and Richmond counties. There are heavy thunderstorms occurring at this time. The severe weather checklist has been completed in the last hour.

Event No.	Malf. No.	Event Type*	Event Description
1		R-RO	Power reduction IAW Tech Spec shutdown requirements.
2		C-RO	CCP 'A' trips.
3		I-BOP	SJEA/SPE Rad monitor fails off scale high.
4		I-BOP	Controlling feed flow channel fails low on 'B' S/G.

5		I-RO	Controlling PZR pressure transmitter fails at 100%
6		N-RO	
7		M-ALL	500 GPM SGTR on 'A' S/G
8			Primary reactor trip handswitch fails to function (ATWS)
9			Auto reactor trip fails to occur.
10			MDAFW pump fails to auto start

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

Event No.	Malf. No.	Event Type*	Event Description
1		N-RO	Place NCP in service
2		RO-R	Increase power to 98%
3	SG03a	BOP-I	SG Pressure Transmitter fails low
4a 4b 4c	EL13	SRO-C BOP-C RO-C	Loss of 120 VAC vital power 1AY1A (channel I instrumentation), (N41 failure, Steam Generator Control Instrument failure letdown isolation)
5	Panel Draw O/R	RO-C	Following the loss of power to 1AY1A CVCS letdown isolation valve 1LV-0459 will not reopen when normal letdown is being restored. The RO will be required to place CVCS excess letdown in service to allow control of Pressurizer level.
6	FW16	SRO-I RO-I BOP-I	Feedwater Heater 4 level transmitter failure & Feedwater Heater 5A Hi-Hi level ,loss of extraction steam (AOP 18016-C)
7	CO05b Cond Pump O/R AF03b	ALL-M	Condensate Pump "B" trips with the failure of Condensate Pump "C" to start. Crew enters AOP-18016-C; Rapid insertion of control rods, Borate as necessary . Operating Crew recognize the need to manually trip the Reactor due to the feedwater conditions. RO attempts to trip the Reactor however it cannot be tripped from the Control Room.. Crew enters 19211-C start manual rod insertion, trip the Turbine, initiate emergency boration. Reactor is locally tripped and crew transition to 19000-C after completion of 19211-C. Upon entry into 19000-C the TDAFW pump will trip on overspeed and the Train "B" MDAFW pump will have a broken pump coupling resulting in a loss of heat sink. The Crew will enter 19231 to perform actions for recover of secondary heatsink, after progressing through the procedure the TDAFW Pump will be repaired and the plant will recover.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

Facility: VOGTLE Scenario No.: 1 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is at 95%. RCS boron concentration is at 1308 ppm, BOL conditions. B Train equipment in service.

Turnover:

1. _____Plant Startup is in progress.
2. _____Rx power is 95%.
3. _____ Train "A" MDAFW Pump is OOS due to mechanical seal failure. It has been OOS for 48 hours and not expected to return to service within the remaining LCO time due to parts unavailability, (T.S. 3.7.5 Condition "B") LCO has been written.
4. _____The NCP has just been returned to service following maintenace PM's.
5. _____The Aux Bldg SO has been dispatched to the NCP and the pre-start checks have been performed. When you assume the shift the SS has directed the NCP be placed in service for engineering.
7. _____After the NCP has been placed in service you are to continue the power increase to 98% per 12004-C. (step 4.1.xx) All prerequisites for the power increase were met on the previous shift. The Load Dispatcher has been notified of the power increase.
8. _____The last shift entered AOP 18009-C due to a 20 GPD tube leak on Steam generator #1. All actions of Section "B" have been completed with the exception of the radiation monitors which still need to be reset.
9. _____ In addition a tornado alert has been issued for Burke and Richmond Counties. There are heavy thunderstorms occuring at this time. The severe weather checklist has been completed in the last hour.

Event No.	Malf. No.	Event Type*	Event Description
1		N-RO	Place NCP in service
2		RO-R	Increase power to 98%
3	SG03a	BOP-I	SG Pressure Transmitter fails low
4a 4b 4c	EL13	SRO-C BOP-C RO-C	Loss of 120 VAC vital power 1AY1A (channel I instrumentation), (N41 failure, Steam Generator Control Instrument failure letdown isolation)
5	FW16	SRO-I RO-I BOP-I	Feedwater Heater 4 level transmitter failure & Feedwater Heater 5A Hi-Hi level ,loss of extraction steam (AOP 18016-C)
6	CO05b Cond Pump O/R AF03b	ALL-M	Condensate Pump "B" trips with the failure on Condensate Pump "C" to start. Crew enters AOP-18016-C; Rapid insertion of control rods, Borate as necessary . Operating Crew recognize the need to manually trip the Reactor due to the feedwater conditions. RO attempts to trip the Reactor however it cannot be tripped from the Control Room.. Crew enters 19211-C start manual rod insertion, trip the Turbine, initiate emergency boration. Reactor is locally tripped and crew transition to 19000-C after completion of 19211-C. Upon entry into 19000-C the TDAFW pump will trip on overspeed and the Train "B" MDAFW pump will have a broken pump coupling resulting in a loss of heat sink. The Crew will enter 19231 to perform actions for recover of secondary heatsink, after progressing through the procedure the TDAFW Pump will be repaired and the plant will recover.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

PREINSERTS:

Initial Conditions:

- _____ Reset to IC #____ (NRC #1 snap)
- _____ Insure Information Board in Control Room is updated
- _____ Shift sign in and reactivity breifing sheets provided
- _____ RO & BOP Name plates on Panel D
- _____ Check EOP's, AOP's, UOP's, SOP's used in the last scenario clear of red marks
- _____ IPC is Mode 1
- _____ Check Control Rod Group Step Counters
- _____ Unit 2 suppling the Aux Steam Header

Select to following QMCB positions:

- _____ Steam Seals System "Caution Tag" supplied from Aux Stm Hdr
- _____ Hotwell Makeup Controller "Caution Tag" in manual at 50%
- _____ Train "B" CCP in service
- _____ All Controlling channels selected to channel #1
- _____ All Train "B" Equipment Running
- _____ Align plant for operation with minor S/G tube leak per AOP-18009-C section "B"
- _____ Ensure all QPCP and QHVC recorders running in auto
- _____ Train "A" MDAFW Pump is "Tagged Out" due to mechanical seal failure

Insert simulator malfunctions:

- _____ (Malfunction SG01e at 20%) 20 GPD tube leak on Steam Generator #1 malfunction (Let run for 11 minutes to stablize)
- _____ (ES01) Failure of the Automatic Reactor Trip
- _____ (ES02) Failure of the Manual Reactor Trip
- _____ (RD07) Control Rods Fail to move in Automatic
- _____ (AF03b) Broken Pump coupling on Train "B" MDAFW Pump

Simulator Overrides & Remote Functions:

- _____ Condensate Pump "C" fails to start malfunction
  Panel Drawings-B1-AFW-Cond Pump "C"-STOP
- _____ ALB50 (CR HI/LO ΔP)
  Panel Drawings-HV1-ALB50-CR Hi/Lo Diff Press-OFF
- _____ ALB20 (Turbine/Gen Trouble)
  Panel Drawings-B2-ALB20-E01-OFF
- _____ ALB62 (Gen Gas Non Sys Alarm)
  Panel Drawings-QPLP2-ALB62-F02-OFF
- _____ ALB36 (1ABB Trouble)
  Panel Drawing-EAB3-ALB36 C02-OFF

Op-Test No.: 1 Scenario No.: 1 Event No.: 1 Page 3 of 9

Event Description: Swap CVCS Charging Pumps (Start NCP; Stop CCP "B")

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Gives direction for RO to start NCP and stop CCP "B" per SOP 13006-1
	RO	Actions: • Refers to SOP-13006-1 "Section 4.2.1" • Verifies Boron concentration in CCP "B" using control status board • Verifies 1HV-8110 OPEN • Places 1FIC-0121 in manual control • Starts NCP (1HS-0275) • Observe increase in charging flow • Stops CCP "B" (1HS-0274A) • Adjust RCP seal injection between 8-13 GPM • Returns CVCS System controls to automatic after conditions stablize
	BOP	Actions: • Assists RO in Monitoring plant paramenters during pump swap

Op-Test No.: 1 Scenario No.: 1 Event No.: 2 Page 3 of 9

Event Description: Increase Power to 98%

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Gives crew briefing on the power increase • Directs Operators to increase power to 98% • Refers to UOP 12004-C, Power Operation
	RO	Actions: • Commences dilution • Maintains rods above insertion limits • Maintains Tave within 2 deg Tref • Maintains AFD within target band
	BOP	Actions: • Loads Turbine per SOP.

Op-Test No.: 1 Scenario No.: 1 Event No.: 3 Page 5 of 9

Event Description: ***Steam Generator #1 Controlling Pressure Channel Fails Low***

Malfunction: ***SG03a at 0% (1PT-514)***

Time	Position	Applicant's Actions or Behavior
	BOP	Actions: • Take manual control of Steam Generator #1 MFRV and MFP ΔP controllers to stablize Steam Generator #1 level and match steam and feed flows. (Immediate Operator Action) • Maintain S/G #1 level between 60-70% NR • Swap controlling channel per USS direction

	SRO	Actions:
		• Enter AOP-18001-C Section "F" for failed Steam Generator Pressure channel.
		• Direct (BOP) to select unaffected controlling channel per Table F2
		• Return MFRV and MFPs to auto
		• Notify Operations duty manager
		• Have Maintenance Work order written
		• Refer to Technical Specifications
		  • 3.3.2 (SI) Functional Unit 1.e condtion D
		  • 3.3.2 (SLI) Functional Unit 4.d(1) condition D
		  • 3.3.4 (Remote S/D) Functional Unit 13 Condition A

Op-Test No.: 1 Scenario No.: 1 Event No.: 4 Page 4 of 9

Event Description: Loss of vital AC Bus 1AY1A

Simulator operator CUE: When SO or maintenance is dispatched report back, 1AY1A normal incoming breaker (02) is tripped and the flag for the ground relay is actuated. Maintenance recommends 1AY1A be inspected because they are unsure where the fault originated.

Malfunction: **EL13A**

Time	Position	Applicant's Actions or Behavior

	RO/BOP	Actions:
		• Identify loss of 1AY1A.
		  • ARP on electrical panel (BOP)
		  • Recognize failed channel 1 instruments. (RO/BOP)
		• Manually Control Steam Generator Levels and MFP speed (BOP)
		• Swap Steam Generator Controlling channels per USS direction (BOP)
		• Return Steam Generator Level Control to automatic when conditions are stablized (BOP)
		• Recognize CVCS letdown has isolated. (RO)
		• Select Non affected controlling channel per USS direction for Pressurizer level control (RO)
		• Recognize Train A pressure instrument failure 1-PT-455. (RO)
		• Perform actions for failed Pressurizer pressure channel as directed by the USS. (RO)
		  • Sprays in manual control (RO)
		  • 1HS-455A in close (RO)
		  • Control Pressurizer pressure operate heaters and spray to maintain Pressurizer pressure between 2220-2250 psig.(RO)
		  • 1PIC-455A in manual at 25% demand (RO)
		  • Swap controlling channels(457/456). (RO)
		  • Return control system to automatic.(RO)
		  • Place recorder 1PS-455G to channel 457 position (RO)
		• Defeat failed channel for Tavg and ΔT as directed by the USS (RO)
		• Restore CVCS letdown to service per SOP-13006-1 (RO)
		  • CLOSE 1-HV-8149A, 1-HV-8149B, and 1-HV-8149C
		  • CLOSE 1-LV-0460 AND 1-LV-0459
		  • CLOSE 1-HV-8145
		  • OPEN 1-HV-15214

Op-Test No.: 1 Scenario No.: 1 Event No.: 4 Page 4 of 9

Event Description: Loss of vital AC Bus 1AY1A

Simulator operator CUE: When SO or maintenance is dispatched report back, 1AY1A normal incoming breaker (02) is tripped and the flag for the ground relay is actuated. Maintenance recommends 1AY1A be inspected because they are unsure where the fault originated.

Malfunction: **EL13A**

Time	Position	Applicant's Actions or Behavior
		• OPEN 1-HV-8160 • OPEN 1-HV-8152 • 1-PIC-0131 LETDOWN PRESS in MANUAL and output adjusted to 50% to 75% • 1-TIC-0130 LETDOWN HX OUTLET TEMP in MANUAL and output adjusted to 50% • Check Pressurizer level >17% • Raise charging flow to between 80-90 GPM • Maintain seal injection flow between 8-13 GPM • Verify OPEN 1-HV-8106 and 1-HV-8105 • OPEN 1-LV-0460 and 1-LV-0459 • OPEN 1-HS-8149B or 1-HS-8149C • When 1-PI-0131A LETDOWN PRESS stabilizes between 360 and 380 psig, PLACE 1-PIC-0131 in AUTO • PLACE 1-TIC-0130 LETDOWN HX OUTLET TEMP in AUTO and ENSURE it maintains temperature less than or equal to 115°F • Return charging to automatic when conditions allow • Block Channel 1 rod stop (BOP) • Place Steam Dumps in "Steam Pressure Mode" per USS direction (BOP) • Verify P-13 BPLP Status light per USS direction (RO/BOP) • Maintain Stable Plant Conditions (RO/BOP) • Verify NI-41 Interlocks per Tech Spec required actions for T.S.3.3.1-1 Functions (16)a,b,c,d,e,f and 3.3.2-1 function 8b • Dispatch Control Buliding SO and Maintenance to investigate problem • Shutdown any standby CCW, NSCW or ACCW pump that automaticlly started due to the power loss per USS direction (RO/BOP)

Op-Test No.: 1 Scenario No.: 1 Event No.: 4 Page 4 of 9

Event Description: Loss of vital AC Bus 1AY1A

Simulator operator CUE: When SO or maintenance is dispatched report back, 1AY1A normal incoming breaker (02) is tripped and the flag for the ground relay is actuated. Maintenance recommends 1AY1A be inspected because they are unsure where the fault originated.

Malfunction: **EL13A**

Time	Position	Applicant's Actions or Behavior

	SRO	• Block failed NI channel.
		  • Rod stop bypass for failed channel
		  • Comparator channel defeat for failed channel
		  • Power mismatch bypass for failed channel
		  • Upper section for failed channel
		  • Lower section for failed channel
		
		Actions:
		• Enter AOP 18032-C Section "A" "Loss of vital instrument panel 1AY1A".
		• Enter AOP 18001-C Section "A" "Due to 1PI-455 controlling channel".
		• Dispatch operator/maintenance to investigate 120 VAC instrument panel 1AY1A power loss. (Do Not Restore Power until maintenance has investigated cause of the power loss)
		• Enter AOP 18001-C "Section H" due to 1PT-505 failure.
		• Direct (RO/BOP) in swap controlling channels for Steam Generator Level, Pressurizer Level and Pressurizer pressure and return to normal operation.
		• Defeat Failed loop 1 Tavg and ΔT.
		• Verify TS interlocks.
		  • Tech Spec 3.3.1-1 functions 16a,b,c,d,e, and 3.3.2-1 function 8b.
		• Enter AOP-18002-C for failed NI.
		• Block failed NI channel.
		• Notify Operations duty manager.
		• Have Maintenance Work order written.
		• Refer to Technical Specifications.
		  • Apply TS 3.8.7 Condition A
		  • Apply TS 3.8.9 Condition B

Op-Test No.: 1 Scenario No.: 1 Event No.: 5 Page 6 of 9

Event Description: ***Loss Of Feedwater Heaters results in Reactor Power increase***

Malfunction: **FW16A**

Simulator Operator: **Override 1HS4302A Feedwater Heater 5A Extraction Steam Stop Valve to the closed position**
Panel Drawing-B2-TUR-HS4302A-CLOSED (5A)
Panel Drawing-B2-TUR-HS4343A-CLOSED (4A)

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Actions: • Recognizes Reactor Power is increasing due to the lower main feedwater temperature (RO/BOP) • Manual Control rod insertion to lower Reactor Power below 100% as required (RO) • Lower Main Turbine Load to maintain Reactor Power below 100% (BOP) • Restore Tavg to program. (RO/BOP) • Verify plant parameters are within normal operating range ; Pressurizer Level / Pressure, Steam Generator Levels.
	SRO	Actions: • Refers to AOP 180016-C Section "C" and directs crew operations • Directs (RO/BOP) to maintain Reactor Power below 100% by all indications • Initiate maintenance. • Notify Operations duty manager. • Have Maintenance Work Order written.

Op-Test No.: 1 Scenario No.: 1 Event No.: 6 Page 6 of 9

Event Description: **Condensate Pump "B" trips and Pump "C" fails to start Automatically or manually.**

Malfunction: **CO05b**

Simulator Operator: **Insure malfunctions are in place to prevent automatic, manual Reactor Trip & Automatic Control Rods Movement.**

Time	Position	Applicant's Actions or Behavior

	RO/BOP	Actions:
		• Recognizes Condensate Pump "B" has tripped and initiates: (BOP):
		  • Load Setback circuit
		  • Condensate Pump "C" manual start (Note Pump will NOT start due to simulator override)
		  • Main Feedwater Pump "A" is at maximum output
		• Manual Control rod insertion to lower Reactor Power to within the copaciy of one MFP (RO)
		• Recognizes that Condensate Pump "C" failing to start will required a manual Reactor Trip; informs operating crew of problem (BOP)

	SRO	Actions: • Refers to AOP 180016-C Section "C" and directs crew operations • Directs (RO/BOP) to reduce Reactor Power to within the capicity of the "A" MFP • Direct (RO) to manually trip the Reactor

Op-Test No.: 1 Scenario No.: 1 Event No.: 6 Page 7 of 9

Event Description: **When the Operating Crew attempts to manually trip the Reactor following the MFP trip, it will fail to trip. The crew will enter 19211-C (ATWT) for required actions to shutdown the plant. Following the Reactor trip the crew will transition to back to 19000-C at which time the TDAFW Pump will trip on overspeed (MDAFW Pump "B" will be running with a broken pump coupling).**

Simulator Operator: **Allow crew to progress past step 7 in 19211-C and if a reasonable amount of time has elapsed, insert Reactor trip.**

- **Remove malfunction (ES01) Failure of the Automatic Reactor Trip.**
- **TDAFW Pump trips on overspeed (AF02C)**
- **Remote Function (AF22) will be used to reset the T&TV.**

Cue: **Time Dispatched_____**
Report Back_____

- **The Train "B" MDAFW pump motor is running but the pump coupling is broken.**
- **Maintenance engineering report the TDAFW Pump tripped due to a slug of water in the steam line and can be operated after reset.**

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Actions: (19211-C) • Attempt to manually trip the Reactor using BOTH Control Room Handswitches (RO) • Dispatches the Control Building SO to Locally Manually trip the Unit 1 Reactor (USS/RO/BOP) • Manually insert Control Rods (RO) Note: When the RO places the Rod Control System in Automatic they must recognize the failure of the system to automatically insert the Control Rods and return to manual insertion • Manually Trip the Main Turbine (BOP) • Start AFW System (BOP) • Identify that Reactor Power is >5% (RO) • Initiate Emergency Boration (RO/BOP) • Align CVI per USS direction (BOP) • Dispatch Auxiliary Building SO to locally shut 1-1208-U4-183 (USS/RO/BOP)

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Event Description: **When the Operating Crew attempts to manually trip the Reactor following the MFP trip, it will fail to trip. The crew will enter 19211-C (ATWT) for required actions to shutdown the plant. Following the Reactor trip the crew will transition to back to 19000-C at which time the TDAFW Pump will trip on overspeed (MDAFW Pump "B" will be running with a broken pump coupling).**

Simulator Operator: **Allow crew to progress past step 7 in 19211-C and if a reasonable amount of time has elapsed, insert Reactor trip.**

- **Remove malfunction (ES01) Failure of the Automatic Reactor Trip.**
- **TDAFW Pump trips on overspeed (AF02C)**
- **Remote Function (AF22) will be used to reset the T&TV.**

Cue: **Time Dispatched**_____
Report Back_____

- **The Train "B" MDAFW pump motor is running but the pump coupling is broken.**
- **Maintenance engineering report the TDAFW Pump tripped due to a slug of water in the steam line and can be operated after reset.**

Time	Position	Applicant's Actions or Behavior
		• Verify Core Exit TC's less than 1200 degrees F.(BOP) • Perform first 16 steps of 19000-C as time permits if Safety Injection is automatically actuated (BOP) Actions: (19000-C) • Following the Reactor trip and completion of 19211-C the crew will transition back to 19000-C. • Verify Rx Trip (RO) • Verify turbine trip. (BOP) • Verify power to AC emergency busses. (BOP) • Check if SI Actuated. (RO) • Verify Feedwater isolation. (BOP) • Verify MLB indications for both trains of ECCS equipment aligning for injection phase. (RO) • Verify containment isolation Phase A actuated. (RO) • MDAFW Pumps running. (NOTE: operator should recognize the MADFW Pump "B" has no discharge pressure and dispatch an operator to check locally) (BOP) • SG blowdown isolated (BOP) Actions: (19231-C)

Op-Test No.: 1 Scenario No.: 1 Event No.: 6 Page 7 of 9

Event Description: **When the Operating Crew attempts to manually trip the Reactor following the MFP trip, it will fail to trip. The crew will enter 19211-C (ATWT) for required actions to shutdown the plant. Following the Reactor trip the crew will transition to back to 19000-C at which time the TDAFW Pump will trip on overspeed (MDAFW Pump "B" will be running with a broken pump coupling).**

Simulator Operator: **Allow crew to progress past step 7 in 19211-C and if a reasonable amount of time has elapsed, insert Reactor trip.**

- **Remove malfunction (ES01) Failure of the Automatic Reactor Trip.**
- **TDAFW Pump trips on overspeed (AF02C)**
- **Remote Function (AF22) will be used to reset the T&TV.**

Cue: **Time Dispatched**_____
Report Back_____

- **The Train "B" MDAFW pump motor is running but the pump coupling is broken.**
- **Maintenance engineering report the TDAFW Pump tripped due to a slug of water in the steam line and can be operated after reset.**

Time	Position	Applicant's Actions or Behavior
	SRO	• Check CCP status (RO) • Check RCS pressure <2335 psig (RO) • Check S/G levels (BOP) • Try to establish AFW flow (BOP)(Check alignment) • SGBD valves shut • S/G sample valves shut • Check suction to AFW pumps • Check AFW discharge throttle valve open • Check TDAFW Pump: • 1HV-5106 open • 1PV-15129 is Closed (due to the overspeed) • Governor Valve operating properly. • The BOP directs the Outside Building SO to locally reset the T&TV when ready <u>Actions:</u> • Directs/Insures the RO has manually tripped the Reactor Using BOTH Control Room Handswitch. • Enters 19211-C (ATWT). • Directs/Insures the BOP has manually tripped the Main Turbine • Ensures the Control Building Operator Has been dispatched to

Op-Test No.: 1 Scenario No.: 1 Event No.: 6 Page 7 of 9

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Simulator Operator: **Allow crew to progress past step 7 in 19211-C and if a reasonable amount of time has elapsed, insert Reactor trip.**

- **Remove malfunction (ES01) Failure of the Automatic Reactor Trip.**
- **TDAFW Pump trips on overspeed (AF02C)**
- **Remote Function (AF22) will be used to reset the T&TV.**

Cue: **Time Dispatched**_____
Report Back_____

- **The Train "B" MDAFW pump motor is running but the pump coupling is broken.**
- **Maintenance engineering report the TDAFW Pump tripped due to a slug of water in the steam line and can be operated after reset.**

Time	Position	Applicant's Actions or Behavior
		locally manually trip the Unit 1 Reactor. • Insure AFW in service • Direct the BOP to initiate Emergency Boration • Direct BOP to align CVI • Direct isolation of dilution paths • Directs RO to check Reactor Power <5% Actions: • Direct RO to check CCP status • Directs RO to Check RCS pressure <2335 psig • Direct BOP to check S/G levels • Try to establish AFW flow (BOP)(Check alignment) • Direct the Outside Operator to reset the T&TV when conditions allow • When >570 GPM AFW is established transition to 19000-C

Facility: VOGTLE Scenario No.: 2 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is at 95%. RCS boron concentration is at 1308 ppm, BOL conditions. B Train equipment in service. ECCS accumulator #3 pressure is low. CCW train B in PTL.

Turnover:

1. _____Plant Startup is in progress.
2. _____Rx power is 95%.
3. _____1PV-0456 is in the shut position due to seat leakage.
4. _____1HV-8000B is shut to comply with Technical Specification 3.4.11 Condition "A".
5. _____ ECCS accumulator #3 pressure is low due to a minor leak. After assuming the shift repressurize the accumulator using SOP 13105-1.
6. _____ CCW train B pumps in PTL, clearance has just been released. Functional testing scheduled approxiamtely 2 hours from now.
7. _____The last shift entered AOP 18009-C due to a 20 GPD tube leak on Steam generator #1. All actions of Section "B" have been completed with the exception of the radiation monitors which still need to be reset.
8. _____ In addition a tornado alert has been issued for Burke and Richmond Counties. There are heavy thunderstorms occuring at this time. The severe weather checklist has been completed in the last hour.

Event No.	Malf. No.	Event Type*	Event Description
1		N-RO	Raise #3 accumulator pressure
2	PR-02A 100% PR-05 5%	RO-I	PRZR pressure channel fails high PORV-455A fails partially open on transient
3	FW14 0%	BOP-I	MFP discharge pressure fails low
4	CC01A O/R pmp5	BOP-C	Loss of CCW train B
5	CV07	RO-C	NCP trips
6	RP06A 15%	C-RO ALL-R	RCP #1 seal #1 failure (5.2 gpm) mgmt says S/D in 30 min SRO directs rapid power reduction per 18013-C
7	RP06a 100% RC05a 1.5% MS01 100% ES19B SI06a	M-ALL	RCP seal LOCA B train CVI failure SIP-1A fails to start PV-507C fails open (steam Dump) Stop scenario when 19012-C is entered

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

PREINSERTS:

Initial Conditions:

- _____ Reset to IC #__ (NRC #2 snap)
- _____ Insure Information Board in Control Room is updated
- _____ Shift sign in and reactivity breifing sheets provided
- _____ RO & BOP Name plates on Panel D
- _____ Check EOP's, AOP's, UOP's, SOP's used in the last scenario clear of red marks
- _____ IPC is Mode 1
- _____ Check Control Rod Group Step Counters
- _____ Unit 2 suppling the Aux Steam Header

Select to following QMCB positions:

- _____ 1PV-0456 in shut position with "Caution Tag"
- _____ 1HV-8000B in shut position with "Caution Tag"
- _____ Steam Seals System "Caution Tag" supplied from Aux Stm Hdr
- _____ Hotwell Makeup Controller "Caution Tag" in manual at 50%
- _____ All Controlling channels selected to channel #1
- _____ All Train "B" Equipment Running
- _____ Align plant for operation with minor S/G tube leak per AOP-18009-C section "B"
- _____ Ensure all QPCP and QHVC recorders running in auto

Insert simulator malfunctions:

- _____ (Malfunction SG01e at 20%) 20 GPD tube leak on Steam Generator #1
- _____ (ES19B) CVI Train "B" failure
- _____ (SI01C) at 100% until low pressure alarm then remove malfunction
- _____ (SI06A) SI Pump "A" fails to automatically start on the SI signal

Simulator Overrides & Remote Functions:

- _____ CCW pump #5 – STOP
  Panel Drawings-AL-CCW-HS1856A-STOP
- _____ ALB50 (CR HI/LO ΔP)
  Panel Drawings-HV1-ALB50-CR Hi/Lo Diff Press-OFF
- _____ ALB20 (Turbine/Gen Trouble)
  Panel Drawings-B2-ALB20-E01-OFF
- _____ ALB62 (Gen Gas Non Sys Alarm)
  Panel Drawings-QPLP2-ALB62-F02-OFF

Op-Test No.: 1 Scenario No.: 2 Event No.: 1 Page 3 of 9

Event Description: ***Raise #3 ECCS accumulator Pressure***

Time	Position	Applicant's Actions or Behavior
	RO	SOP 13105-1 selected: • OPEN ACCUM N2 ISO VLV 1HV8880. • VERIFY pressures rising • OPEN the ACCUM N2 SUPPLY/VENT VLV: Accumulator 3 1HV8875C and/or 1HV8875G • When the Accumulators reach the desired pressure, CLOSE the valve opened in Step above • When accumulators are at the desired pressure, CLOSE 1HV-8880

Op-Test No.: 1 Scenario No.: 2 Event No.: 2 Page 3 of 9

Event Description: ***PRZR pressure PT-455 fails high and PORV 455A fails partially open***

Malfunctions: **PR02A @ 100%, PR05 @ 5%**

Remote Function: ***PR03 when requested to remove power from 1HV8000A***

Time	Position	Applicant's Actions or Behavior
	RO	Immediate actions: • Close Spray valves • Close PORV-455A • Energize PZR Heaters Master Controller placed in manual @ 25% Select 457/456 for control Return heaters, spray valves, and PORV, master controller to AUTO Select unaffected channel for panel recorder (457) Verify P-11 in proper state for plant condtions (1 hr LCO action) Observes dual indication for PORV-455A Shuts PORV Block Valve 1HV-8000A
	SRO	18001-C section C referenced Notifies duty manager of AOP entry Contacts maintenance to initiate repairs Refers to Tech Specs: • LCO 3.3.1 Functional Unit 6 - Condition E Functional Unit 8a - Condition M Functional Unit 8b - Condition E • LCO 3.3.2 Functional Unit 1d - Condition D Functional Unit 8b – Condition L • LCO 3.4.11 Condition B • Request SSS to remove power from 1HV-8000A

Op-Test No.: 1 Scenario No.: 2 Event No.: 3 Page 5 of 9

Event Description: ***MFP Discharge pressure indication (PT-508) fails low***

Malfunction: **FW14 @ 0% (set ramp time at 11 seconds)**

Time	Position	Applicant's Actions or Behavior
	BOP	• Diagnose PT-508 failed low • Take manual control of MFP master controller • Match steam and feed flows on all 4 SGs • Operate Main Feedwater Pump ΔP in manual
	SRO	• Reference 18016-C section A • Notifies duty manager of AOP entry • Contacts maintenance to initiate repairs • Inform BOP of responsibilities regarding manual control of Main Feedwater Pump ΔP

Op-Test No.: 1 Scenario No.: 2 Event No.: 4 Page 4 of 9

Event Description: ***Loss of CCW train B (pump 1 trips, pump 5 fails to start)***

Malfunction: **CC01A**

Simulator Operator CUE: Report Back when dispatched to CCW Pump #1:

Time Called: _____
Report back time:_____

Control Building SO and Maintenance: Phase A,B,C (150 device) Overcurrent Flags are present and the 186 lockout is tripped for CCW Pump #1.

Auxiliary Building SO: that are no obvious problems noted locally at the CCW Pump #1

Simulator Operator CUE: Report Back when dispatched to CCW Pump #5:

Control Building SO and Maintenance: The Breaker to CCW Pump #5 appears to not be racked in completely and the racking mechanism may be damaged.

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnose only CCW pump #3 is running Attempt manual start of pump #5 Stop CCW train A Place CCW train B in service Dispatch SO to place SFPC train B in service Dispatch SO to investigate CCW pumps/breakers
	SRO	Enters 18020-C Loss of CCW Notifies duty manager of AOP entry Contacts maintenance to initiate repairs Tech Spec: LCO 3.7.7 condition B (72 hour shutdown)

Op-Test No.: 1 Scenario No.: 2 Event No.: 5 Page 6 of 9

Event Description: **NCP Trips**

Malfunction: **CV07**

Simulator Operator CUE: Report Back when dispatched to CCW Pump #1:

Time Called: _____
Report back _____

Auxiliary Building SO and Maintenance: The NCP Pump appears to be OK. Maintaince suspects a faulty relay caused the problem.

Time	Position	Applicant's Actions or Behavior

	RO	• Isolate CVCS letdown
		• Verify Charging Pump lineup
		  • OPEN 1-HV-8471A (1-HV-8471B) CCP-A(B) SUCTION
		  • OPEN 1-HV-8111A (1-HV-8111B) CCP-A(B) MINIFLOW,
		  • OPEN 1-HV-8110 CCP A & B COMMON MINIFLOW,
		  • CLOSE 1-HV-0190A (1-HV-0190B) CHARGING THROTTLE,
		  • OPEN 1-HV-8485A (1-HV-8485B) CCP-A(B) DISCHARGE ISOLATION,
		  • If starting CCP-B, OPEN 1-HV-8438 CCP DISCHARGE HEADER CROSS-CONNECT
		  • SET 1-HIC-182 for MAXIMUM Seal Flow (0% demand).
		  • ENSURE 1-FIC-0121 CHARGING FLOW in MAN and SET to minimum
		  • ENSURE 1-LI-0185 VCT level indicates between 30 and 80%.
		• Start CCP 1A or 1B
		• Raise charging to 80-90 GPM
		• RCP seal injection flow 8-13 GPM/pump
		• Initiate letdown flow
		• Place letdown pressure and ACCW temperature controllers in auto
		• Dispatch SO to investigate NCP and preform CCP presart checks

Op-Test No.: 1 Scenario No.: 2 Event No.: 5 Page 6 of 9

Event Description: **NCP Trips**

Malfunction: **CV07**

Simulator Operator CUE: Report Back when dispatched to CCW Pump #1:

Time Called: _____
Report back _____

Auxiliary Building SO and Maintenance: The NCP Pump appears to be OK. Maintaince suspects a faulty relay caused the problem.

Time	Position	Applicant's Actions or Behavior

	SRO	• Enters 18007-C "Section B"
		  • Have RO isolate CVCS letdown flow
		  • Check ACCW System in service
		  • Check indication that NCP did not trip due to gas binding
		  • Direct starting of CCP (A or B)
		• Dispatches Operator and maintenance to investigate problem
		• Notifies duty manager of AOP entry
		• Has SSS initiate work order
		
		• (Note Only INFO LCOs for this failure)

Op-Test No.: 1 Scenario No.: 2 Event No.: 6 Page 6 of 9

Event Description: ***RCP #1 seal #1 failure (5.2 gpm)***

Malfunction: ***RP06A @ ramp slowly @ 15% (watch indication)***

Cue: ***Duty Manager instructs USS to shutdown unit in next 30 minutes and secure RCP #1 when contacted by USS about problem. Load Dispatcher will be notified by duty manager***

Time	Position	Applicant's Actions or Behavior
	RO	Seal Failure: • Diagnose RCP seal failure (Controlled leakage hi/lo flow alarm) • SOP 13003-1 RCP operation with seal abnomality • Use figures 1&2 to determine RCP must be stopped in 8 hours 18013-C Actions: • Insert Control control rods/borate as necessary • Energize all Pressurizer Heaters • Tave/Tref within 3 degrees • Maintain Reactor Power and Turbine Power matched • Maintain Pressurizer Level & pressure in normal control band
	BOP	• Reduce turbine load • Maintain S/G in normal control band
	SRO	Seal Failure: • Using 13003-1 confirm decision tree • Seal injection > 8 gpm & <130 deg F • Seal leakoff outside normal ops band (figure 2) • Seal leakoff <5.5 gpm & above min required • Shutdown RCP w/i 8 hours 18013-C Actions: • Enters 18013-C for rapid down power • Notify chemistry >15% power change in 1 hour

Op-Test No.: 1 Scenario No.: 2 Event No.: 6 Page 6 of 9

Event Description: ***RCP seal LOCA (300 gpm)***

Malfunction: (1) **RP06A 100% "RCP #1 seal failure"**
(2) **RC05A @ 1.5% "Hot Leg Break at 450 GPM"**
(3) **MS01 @ 100% " Steam Dump Valve 1PV-507C fails fully open"**

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Diagnose leak increasing • Increases charging flow to maintain PZR level • Manually trips reactor • Manual SI Actions: (19000-C) • Verify Rx Trip (RO) • Verify turbine trip. (BOP) • Verify power to AC emergency busses.(BOP) • Check if SI Actuated. (RO) • Verify Feedwater isolation. (BOP) • Verify MLB indications ECCS equipment aligning for injection phase. (RO) • Verify containment isolation Phase A actuated. (RO) • Verify AFW Pumps running. (BOP) • SG blowdown isolated (BOP) • TDAFW pump running. (BOP) • Verify ECCS pumps running: CCP, SI, RHR. **(Manually starts SI Pump "A")** (RO) • Verify 2 CCW pumps running on each Train. (RO) • Verify 2 NSCW pumps running on each Train. (RO) • Verify containment ventilation isolation (CVI). (RO) • Check if MSIV should be isolated (RO/BOP) • Check containment spray not required. (RO) • Verify DG running. (BOP) • Verify ECCS flows. (RO) • Verify total AFW flow greater than 570 GPM. (BOP) • Verify ECCS alignment on MLBs. (RO) • Verify RCS temperatures. **(Should find 1PV-507C failed open and actuate MSLI)**(RO/BOP)

Op-Test No.: 1 Scenario No.: 2 Event No.: 6 Page 6 of 9

Event Description: ***RCP seal LOCA (300 gpm)***

Malfunction: (1) **RP06A 100% "RCP #1 seal failure"**
(2) **RC05A @ 1.5% "Hot Leg Break at 450 GPM"**
(3) **MS01 @ 100% " Steam Dump Valve 1PV-507C fails fully open"**

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs RO to maintain PZR level • Directs RO to manually trip reactor and intiate manual SI • Enters 19000-C, Reactor trip/SI • Insures all immediate actions are performed per 19000-C. • Directs operator actions per the 19000-C direction. • Ensures proper communication between crewmembers. • Diagnose Primary LOCA • Enter 19010-C, Response to LOCA • Transistion to 19012-C Post LOCA cooldown/depressurization

Facility: VOGTLE Scenario No.: 2 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is at 95%. RCS boron concentration is at 1308 ppm, BOL conditions. B Train equipment in service. ECCS accumulator #3 pressure is low. CCW train B in PTL.

Turnover:

1. _____Plant Startup is in progress.
2. _____Rx power is 95%.
3. _____1PV-0456 is in the shut position due to seat leakage.
4. _____1HV-8000B is shut to comply with Technical Specification 3.4.11 Condition "A".
5. _____ ECCS accumulator #3 pressure is low due to a minor leak. After assuming the shift repressurize the accumulator using SOP 13105-1.
6. _____ CCW train B pumps in PTL, clearance has just been released. Functional testing scheduled approxiamtely 2 hours from now.
7. _____The last shift entered AOP 18009-C due to a 20 GPD tube leak on Steam generator #1. All actions of Section "B" have been completed with the exception of the radiation monitors which still need to be reset.
8. _____ In addition a tornado alert has been issued for Burke and Richmond Counties. There are heavy thunderstorms occuring at this time. The severe weather checklist has been completed in the last hour.

Event No.	Malf. No.	Event Type*	Event Description
1		N-RO	Raise #3 accumulator pressure
2	PR-02A 100% PR-05 5%	RO-I	PRZR pressure channel fails high PORV-455A fails partially open on transient
3	FW14 0%	BOP-I	MFP discharge pressure fails low
4	CC01A O/R pmp5	BOP-C	Loss of CCW train B
5	CV07	RO-C	NCP trips
6	RP06A 15%	C-RO ALL-R	RCP #1 seal #1 failure (5.2 gpm) mgmt says S/D in 30 min SRO directs rapid power reduction per 18013-C
7	RP06a 100% RC05a 1.5% MS01 100% ES19B SI06a	M-ALL	RCP seal LOCA B train CVI failure SIP-1A fails to start PV-507C fails open (steam Dump) Stop scenario when 19012-C is entered

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

PREINSERTS:

Initial Conditions:

- _____ Reset to IC #__ (NRC #2 snap)
- _____ Insure Information Board in Control Room is updated
- _____ Shift sign in and reactivity breifing sheets provided
- _____ RO & BOP Name plates on Panel D
- _____ Check EOP's, AOP's, UOP's, SOP's used in the last scenario clear of red marks
- _____ IPC is Mode 1
- _____ Check Control Rod Group Step Counters
- _____ Unit 2 suppling the Aux Steam Header

Select to following QMCB positions:

- _____ 1PV-0456 in shut position with "Caution Tag"
- _____ 1HV-8000B in shut position with "Caution Tag"
- _____ Steam Seals System "Caution Tag" supplied from Aux Stm Hdr
- _____ Hotwell Makeup Controller "Caution Tag" in manual at 50%
- _____ All Controlling channels selected to channel #1
- _____ All Train "B" Equipment Running
- _____ Align plant for operation with minor S/G tube leak per AOP-18009-C section "B"
- _____ Ensure all QPCP and QHVC recorders running in auto

Insert simulator malfunctions:

- _____ (Malfunction SG01e at 20%) 20 GPD tube leak on Steam Generator #1
- _____ (ES19B) CVI Train "B" failure
- _____ (SI01C) at 100% until low pressure alarm then remove malfunction
- _____ (SI06A) SI Pump "A" fails to automatically start on the SI signal

Simulator Overrides & Remote Functions:

- _____ CCW pump #5 – STOP
  Panel Drawings-AL-CCW-HS1856A-STOP
- _____ ALB50 (CR HI/LO ΔP)
  Panel Drawings-HV1-ALB50-CR Hi/Lo Diff Press-OFF
- _____ ALB20 (Turbine/Gen Trouble)
  Panel Drawings-B2-ALB20-E01-OFF
- _____ ALB62 (Gen Gas Non Sys Alarm)
  Panel Drawings-QPLP2-ALB62-F02-OFF

Op-Test No.: 1 Scenario No.: 2 Event No.: 1 Page 3 of 9

Event Description: ***Raise #3 ECCS accumulator Pressure***

Time	Position	Applicant's Actions or Behavior
	RO	SOP 13105-1 selected: • OPEN ACCUM N2 ISO VLV 1HV8880. • VERIFY pressures rising • OPEN the ACCUM N2 SUPPLY/VENT VLV: Accumulator 3 1HV8875C and/or 1HV8875G • When the Accumulators reach the desired pressure, CLOSE the valve opened in Step above • When accumulators are at the desired pressure, CLOSE 1HV-8880

Op-Test No.: 1 Scenario No.: 2 Event No.: 2 Page 3 of 9

Event Description: ***PRZR pressure PT-455 fails high and PORV 455A fails partially open***

Malfunctions: **PR02A @ 100%, PR05 @ 5%**

Remote Function: ***PR03 when requested to remove power from 1HV8000A***

Time	Position	Applicant's Actions or Behavior
	RO	Immediate actions: • Close Spray valves • Close PORV-455A • Energize PZR Heaters Master Controller placed in manual @ 25% Select 457/456 for control Return heaters, spray valves, and PORV, master controller to AUTO Select unaffected channel for panel recorder (457) Verify P-11 in proper state for plant condtions (1 hr LCO action) Observes dual indication for PORV-455A Shuts PORV Block Valve 1HV-8000A
	SRO	18001-C section C referenced Notifies duty manager of AOP entry Contacts maintenance to initiate repairs Refers to Tech Specs: • LCO 3.3.1 Functional Unit 6 - Condition E Functional Unit 8a - Condition M Functional Unit 8b - Condition E • LCO 3.3.2 Functional Unit 1d - Condition D Functional Unit 8b – Condition L • LCO 3.4.11 Condition B • Request SSS to remove power from 1HV-8000A

Op-Test No.: 1 Scenario No.: 2 Event No.: 3 Page 5 of 9

Event Description: ***MFP Discharge pressure indication (PT-508) fails low***

Malfunction: **FW14 @ 0% (set ramp time at 11 seconds)**

Time	Position	Applicant's Actions or Behavior
	BOP	• Diagnose PT-508 failed low • Take manual control of MFP master controller • Match steam and feed flows on all 4 SGs • Operate Main Feedwater Pump ΔP in manual
	SRO	• Reference 18016-C section A • Notifies duty manager of AOP entry • Contacts maintenance to initiate repairs • Inform BOP of responsibilities regarding manual control of Main Feedwater Pump ΔP

Op-Test No.: 1 Scenario No.: 2 Event No.: 4 Page 4 of 9

Event Description: ***Loss of CCW train B (pump 1 trips, pump 5 fails to start)***

Malfunction: **CC01A**

Simulator Operator CUE: Report Back when dispatched to CCW Pump #1:

Time Called: _____
Report back time:_____

Control Building SO and Maintenance: Phase A,B,C (150 device) Overcurrent Flags are present and the 186 lockout is tripped for CCW Pump #1.

Auxiliary Building SO: that are no obvious problems noted locally at the CCW Pump #1

Simulator Operator CUE: Report Back when dispatched to CCW Pump #5:

Control Building SO and Maintenance: The Breaker to CCW Pump #5 appears to not be racked in completely and the racking mechanism may be damaged.

Time	Position	Applicant's Actions or Behavior
	BOP	Diagnose only CCW pump #3 is running Attempt manual start of pump #5 Stop CCW train A Place CCW train B in service Dispatch SO to place SFPC train B in service Dispatch SO to investigate CCW pumps/breakers
	SRO	Enters 18020-C Loss of CCW Notifies duty manager of AOP entry Contacts maintenance to initiate repairs Tech Spec: LCO 3.7.7 condition B (72 hour shutdown)

Op-Test No.: 1 Scenario No.: 2 Event No.: 5 Page 6 of 9

Event Description: **NCP Trips**

Malfunction: **CV07**

Simulator Operator CUE: Report Back when dispatched to CCW Pump #1:

Time Called: _____
Report back _____

Auxiliary Building SO and Maintenance: The NCP Pump appears to be OK. Maintaince suspects a faulty relay caused the problem.

Time	Position	Applicant's Actions or Behavior

	RO	• Isolate CVCS letdown
		• Verify Charging Pump lineup
		  • OPEN 1-HV-8471A (1-HV-8471B) CCP-A(B) SUCTION
		  • OPEN 1-HV-8111A (1-HV-8111B) CCP-A(B) MINIFLOW,
		  • OPEN 1-HV-8110 CCP A & B COMMON MINIFLOW,
		  • CLOSE 1-HV-0190A (1-HV-0190B) CHARGING THROTTLE,
		  • OPEN 1-HV-8485A (1-HV-8485B) CCP-A(B) DISCHARGE ISOLATION,
		  • If starting CCP-B, OPEN 1-HV-8438 CCP DISCHARGE HEADER CROSS-CONNECT
		  • SET 1-HIC-182 for MAXIMUM Seal Flow (0% demand).
		  • ENSURE 1-FIC-0121 CHARGING FLOW in MAN and SET to minimum
		  • ENSURE 1-LI-0185 VCT level indicates between 30 and 80%.
		• Start CCP 1A or 1B
		• Raise charging to 80-90 GPM
		• RCP seal injection flow 8-13 GPM/pump
		• Initiate letdown flow
		• Place letdown pressure and ACCW temperature controllers in auto
		• Dispatch SO to investigate NCP and preform CCP presart checks

Op-Test No.: 1 Scenario No.: 2 Event No.: 5 Page 6 of 9

Event Description: **NCP Trips**

Malfunction: **CV07**

Simulator Operator CUE: Report Back when dispatched to CCW Pump #1:

Time Called: _____
Report back _____

Auxiliary Building SO and Maintenance: The NCP Pump appears to be OK. Maintaince suspects a faulty relay caused the problem.

Time	Position	Applicant's Actions or Behavior

	SRO	• Enters 18007-C "Section B"
		  • Have RO isolate CVCS letdown flow
		  • Check ACCW System in service
		  • Check indication that NCP did not trip due to gas binding
		  • Direct starting of CCP (A or B)
		• Dispatches Operator and maintenance to investigate problem
		• Notifies duty manager of AOP entry
		• Has SSS initiate work order
		
		• (Note Only INFO LCOs for this failure)

Op-Test No.: 1 Scenario No.: 2 Event No.: 6 Page 6 of 9

Event Description: ***RCP #1 seal #1 failure (5.2 gpm)***

Malfunction: ***RP06A @ ramp slowly @ 15% (watch indication)***

Cue: ***Duty Manager instructs USS to shutdown unit in next 30 minutes and secure RCP #1 when contacted by USS about problem. Load Dispatcher will be notified by duty manager***

Time	Position	Applicant's Actions or Behavior
	RO	Seal Failure: • Diagnose RCP seal failure (Controlled leakage hi/lo flow alarm) • SOP 13003-1 RCP operation with seal abnomality • Use figures 1&2 to determine RCP must be stopped in 8 hours 18013-C Actions: • Insert Control control rods/borate as necessary • Energize all Pressurizer Heaters • Tave/Tref within 3 degrees • Maintain Reactor Power and Turbine Power matched • Maintain Pressurizer Level & pressure in normal control band
	BOP	• Reduce turbine load • Maintain S/G in normal control band
	SRO	Seal Failure: • Using 13003-1 confirm decision tree • Seal injection > 8 gpm & <130 deg F • Seal leakoff outside normal ops band (figure 2) • Seal leakoff <5.5 gpm & above min required • Shutdown RCP w/i 8 hours 18013-C Actions: • Enters 18013-C for rapid down power • Notify chemistry >15% power change in 1 hour

Op-Test No.: 1 Scenario No.: 2 Event No.: 6 Page 6 of 9

Event Description: ***RCP seal LOCA (300 gpm)***

Malfunction: (1) **RP06A 100% "RCP #1 seal failure"**
(2) **RC05A @ 1.5% "Hot Leg Break at 450 GPM"**
(3) **MS01 @ 100% " Steam Dump Valve 1PV-507C fails fully open"**

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Diagnose leak increasing • Increases charging flow to maintain PZR level • Manually trips reactor • Manual SI Actions: (19000-C) • Verify Rx Trip (RO) • Verify turbine trip. (BOP) • Verify power to AC emergency busses.(BOP) • Check if SI Actuated. (RO) • Verify Feedwater isolation. (BOP) • Verify MLB indications ECCS equipment aligning for injection phase. (RO) • Verify containment isolation Phase A actuated. (RO) • Verify AFW Pumps running. (BOP) • SG blowdown isolated (BOP) • TDAFW pump running. (BOP) • Verify ECCS pumps running: CCP, SI, RHR. **(Manually starts SI Pump "A")** (RO) • Verify 2 CCW pumps running on each Train. (RO) • Verify 2 NSCW pumps running on each Train. (RO) • Verify containment ventilation isolation (CVI). (RO) • Check if MSIV should be isolated (RO/BOP) • Check containment spray not required. (RO) • Verify DG running. (BOP) • Verify ECCS flows. (RO) • Verify total AFW flow greater than 570 GPM. (BOP) • Verify ECCS alignment on MLBs. (RO) • Verify RCS temperatures. **(Should find 1PV-507C failed open and actuate MSLI)**(RO/BOP)

Op-Test No.: 1 Scenario No.: 2 Event No.: 6 Page 6 of 9

Event Description: ***RCP seal LOCA (300 gpm)***

Malfunction: (1) **RP06A 100% "RCP #1 seal failure"**
(2) **RC05A @ 1.5% "Hot Leg Break at 450 GPM"**
(3) **MS01 @ 100% " Steam Dump Valve 1PV-507C fails fully open"**

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs RO to maintain PZR level • Directs RO to manually trip reactor and intiate manual SI • Enters 19000-C, Reactor trip/SI • Insures all immediate actions are performed per 19000-C. • Directs operator actions per the 19000-C direction. • Ensures proper communication between crewmembers. • Diagnose Primary LOCA • Enter 19010-C, Response to LOCA • Transistion to 19012-C Post LOCA cooldown/depressurization

Facility: VOGTLE Scenario No.: 3 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is at 95%. RCS boron concentration is at 1194 ppm, BOL conditions. Shutdown in progress due to Tech Spec action requirement.

Shift Turnover:

1. _____Plant Shutdown is in progress.
2. _____Rx power is 95%.
3. _____Train "A" MDAFW Pump is OOS due to mechanical seal failure. It has been OOS for 48 hours and not expected to return to service within the remaining LCO time due to parts unavailability, LCO has been written.
4. _____Also affecting AFW is a severe packing leak tahe has occurred on the high pressure side of 1-1301-U4-051, a chemical cleaning isolation valve on the Steam Header from S/G #1 to the TDAFW Pump. As a result, 1HV-3009, steam supply ti the TDAFW Pump from S/G #1 is tagged shut and power has been removed from the valve. The manual upstream isolation valve, 1- 1304-U4-005 ,is also tagged shut to allow maintenace to repack the valve.
5. _____As a result of this work, Unit 1 is in a 6 hour shutdown requirement per Tech. Spec. 3.7.5 Condition "C" due to 2 inoperable AFW Trains.
6. _____Air Compressor #2 is tagged out for moter replacement.
7. _____Plant Management has directed Unit 1 be in Mode 3 within the next 3.5 hours.
8. _____The System Operator has been notified of the pending power reduction.
9. _____The SS has directed you to have the RO increase CVCS letdown flow to 120 GPM per chimistry department request.
10. _____The last shift entered AOP 18009-C due to a 20 GPD tube leak on Steam generator #1. All actions of Section "B" have been completed with the exception of the radiation monitors which still need to be reset.
11. _____In addition a tornado alert has been issued for Burke and Richmond Counties. There are heavy thunderstorms occuring at this time. The severe weather checklist has been completed in the last hour.

Event No.	Malf. No.	Event Type*	Event Description
1		RO-N	Increase CVCS letdown flow to 120 GPM per chemistry request (SS direction during shift turnover)
2		RO-R	Decrease power to Mode 3
3	OR	BOP-C	Air Compressor #1 Trips
4	CV13 CV01	RO-C	VCT level transmitter 1LT-112 fails low, with auto M/U failure
5	FW02b 0%	BOP-I	Controlling feedwater flow channel fails low on S/G #2 (1FT-520)
6	PR02a 100%	RO-I	Controlling Pressurizer pressure channel fails high (1PI-455)
7	SG01a 50%	ALL-M	500 GPM S/G #1 tube rupture

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

PREINSERTS:

Initial Conditions:

- _____ Reset to IC #15 (Snap for NRC #3) Snap #_____
- _____ Insure Information Board in Control Room is updated
- _____ Shift sign in and reactivity breifing sheets provided
- _____ RO & BOP Name plates on Panel D
- _____ Check EOP's, AOP's, UOP's, SOP's used in the last scenario clear of red marks
- _____ IPC is Mode 1
- _____ Check Control Rod Group Step Counters
- _____ Unit 2 suppling the Aux Steam Header

Select to following QMCB positions:

- _____ All Controlling channels selected to channel #1
- _____ Align plant for operation with minor S/G tube leak per AOP-18009-C section "B"
- _____ Ensure all QPCP and QHVC recorders running in auto
- _____ Place Clearance Tag on AFW Train "A" Pump (PTL Position) (Use Panel Drawings to override the Pump to stop)
- _____ Place Clearance Tag on AFW Train "A" Discharge valves: Place in local control and override valves shut (Remote Function for AFW)
- _____ Place Clearance Tag on Air Compressor #2 (Stop position) Panel Drawing-AL-NSW-HS9383-stop(Also turn off RED/AMBER/GREEN light indication for A/C #2.
- _____ Place Clearance Tag on TDAFW Pump steam supply isolation Valve 1HV-3009

Insert simulator Malfunctions:

- _____ (Malfunction SG01e at 20%) 20 GPD tube leak on Steam Generator #1 malfunction
- _____ (ES01) Failure of the Automatic Reactor Trip
- _____ (CV01) VCT automatic makeup failure
- _____ (AF05B) MDAFW Pump "B" fails to automatically start

Simulator Overrides & Remote Functions:

- _____ Reactor Trip Handswitch on "C" to CLOSE position
  Panel Drawings-C-NIM-HS40007-CLOSE
- _____ Air Compressor #4 Handswitch to Stop
  Panel Drawings-A1-NSW-HS9381-STOP
- _____ Override 1HV-3009 shut and remove light inditcation
  Panel Drawings-B1-AFW-HS3009-CLOSE (Use Panel Drawings to turn off RED & GREEN light indication)
- _____ Override Train "A" AFW Pump to off position and remove power from Handswitch light for Clearance
- _____ Override discharge Valves for Train "A" AFW Pump to shut position
  Remote Function (AF20, AF18 in LOCAL ; AF19, AF21 to 0%)
  Panel Drawings-A2-ALB04-F03-OFF (F04-OFF)
- _____ ALB50 (CR HI/LO ΔP)
  Panel Drawings-HV1-ALB50-CR Hi/Lo Diff Press-OFF
- _____ ALB20 (Turbine/Gen Trouble)
  Panel Drawings-B2-ALB20-E01-OFF
- _____ ALB62 (Gen Gas Non Sys Alarm)
  Panel Drawings-QPLP2-ALB62-F02-OFF

Op-Test No.: 1 Scenario No.: 3 Event No.: 1 Page 3 of 9

Event Description: **Increase CVCS letdown flow to 120 GPM**

Time	Position	Applicant's Actions or Behavior
	RO-N	Actions: • SOP-13006-1 Section 4.2.4 • Raise charging flow to between 120-130 GPM • Main RCP seal injection flow between 8-13 GPM • Place 1-PIC-0131 in manual and lower pressure between 100-120 psig • Open 45 GPM orifice valve • Adjust 1-PTC-0131 to between 360-380 psig • Return system to automatic

Op-Test No.: 1 Scenario No.: 3 Event No.: 2 Page 3 of 9

Event Description: **Decrease Reactor Power (Mode 3 in 3.5 hours)**

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Gives crew briefing on the power decrease • Directs Operators to increase power (Mode3 in 3.5 hours) • Refers to UOP 12004-C, Power Operation
	RO	Actions: • Commences boration • Maintains rods above insertion limits • Maintains Tave within 2 deg Tref • Maintains AFD within target band
	BOP	Actions: • Loads Turbine per SOP.

Op-Test No.: 1 Scenario No.: 3 Event No.: 3 Page 3 of 9

Event Description: **Air Compressor #1 Trips (Air Compressor #4 fails to automatically start)**

Malfunction/Override: Trigger the following:

1. Panel Drawings-A1-NSW-HS19338-STOP
2. Panel Drawings-A1-NSW-A/C #1 RED light OFF
3. Panel Drawings-A1-NSW-A/C #1 GREEN light ON
4. Panel Drawings-A1-NSW-A/C #1 AMBER light ON
5. Panel Drawings-????????????for alarm on 1NB03

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Enters AOP-18028-C Secton "A" • Directs RO to Start Air Compressor #4 • Dispatch Operator & Maintenance to investigate • Have SSS write Work Order and make notifications
	BOP	Actions: • Trend air pressure on IPC • Starts Air Compressor #4 • Dispatch Operator to investigate problem

Op-Test No.: 1 Scenario No.: 3 Event No.: 4 Page 3 of 9

Event Description: **VCT Level transmitter 1LT-112 fails low (Automatic VCT makeup should have initiated with this problem however to function will not operate. The RO should identify this problem and inform the USS.**

Malfunction: **Check (CV01) active then insert (CV13)**

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Enters AOP-18007-C Secton "C" • Dispatch Operator & Maintenance to investigate • Have SSS write Work Orders for 1LT-112 & Automatic makeup failures, and make notifications • Provide direction to RO (BOP) on VCT status during briefing
	RO	Actions: • Identify that 1LT-112 failure • Verify VCT level using alternate indication (IPC) • Identify that automatic makup should have been initiated by the failure. • Determine that manual VCT makeup will be required until system is repaired.

Op-Test No.: 1 Scenario No.: 3 Event No.: 5 Page 3 of 9

Event Description: **Controlling Feedwater Flow channel fails low on S/G #2 (1FT-520)**

Malfunction: **FW02b at 0%**

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Enters AOP-18001-C Section "G" • Directs BOP to control S/G #2 flow in manual • Have SSS notify Maintenance to investigate • Have SSS write Work Order and make notifications
	BOP	Actions: • Determine failure of 1LT-520 (controlling channel) Immediate actions: • Take manual control of S/G #2 MFRV and MFP control level between 60-70% • Select non affected controlling channel • Return system to automatic

Op-Test No.: 1 Scenario No.: 3 Event No.: 6 Page 3 of 9

Event Description: **Controlling Pressurizer pressure channel fails high.**

Malfunction: **PR02a at 100%**

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: Enters 18001-C section "C" Notifies duty manager of AOP entry Contacts maintenance to initiate repairs Refers to Tech Specs: • LCO 3.3.1 Functional Unit 6 - Condition E Functional Unit 8a - Condition M Functional Unit 8b - Condition E • LCO 3.3.2 Functional Unit 1d - Condition D Functional Unit 8b – Condition L • LCO 3.4.11 Condition B • Request SSS to remove power from 1HV-8000A
	RO	Actions: Immediate actions: • Close Spray valves • Close PORV-455A • Energize PZR Heaters • Master Controller placed in manual @ 25% • Select 457/456 for control • Return heaters, spray valves, and PORV, master controller to AUTO • Select unaffected channel for panel recorder • Verify P-11 in proper state for plant condtions (1 hr LCO action)

Op-Test No.: 1 Scenario No.: 3 Event No.: 7 Page 3 of 9

Event Description: **500 GPM Tube Rupture On S/G #1**

Malfunction: **SG01a @ 50%**

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Identifies from indications of high radiation on secondary and lowering Pressurizer level & Pressure that a S/G tube rupture is in progress • Directs operator actions to maintain Pressurizer level & pressure • Directs operator the manually trip the Unit One Reactor due to the decreasing Pressurizer Level & pressure • Enters 19000-C. • Insures all immediate actions are performed per 19000-C. • Directs operator actions per the 19000-C direction. • Ensures proper communication between crewmembers. • Transitions to 19030-C due to secondary High Radiation OR uncontrolled level rise on S/G #1. • Directs the isolation of S/G #1 per 19030-C • Directs the maximum rate cooldown per 19030-C
	RO/BOP	Actions: (19000-C) • Identifies from indications of high radiation on secondary and lowering Pressurizer level & Pressure that a S/G tube rupture is in progress • Increases Charging (start additional charging pump if time permits) to maintain Pressurizer level and pressure. • Actuates manual Reactor Trip (NOTE: QMCB panel "C" Handswitch will not function and the RO will be required to us Panel "A" Handswitch) (RO) • Verify Rx Trip (RO) • Verify turbine trip. (BOP) • Verify power to AC emergency busses. (BOP) • Check if SI Actuated. (RO) • Verify Feedwater isolation. (BOP) • Verify MLB indications for both trains of ECCS equipment aligning for injection phase. (RO) • Verify containment isolation Phase A actuated. (RO) • MDAFW Pumps running. (NOTE: operator must manually start MDAFW Pump "B") (BOP) • SG blowdown isolated (BOP)

Op-Test No.: 1 Scenario No.: 3 Event No.: 7 Page 3 of 9

Event Description: **500 GPM Tube Rupture On S/G #1**

Malfunction: **SG01a @ 50%**

Time	Position	Applicant's Actions or Behavior
		• TDAFW pump running. (BOP) • Verify ECCS pumps running: CCPs, SI, RHR. (RO) • Verify 2 CCW pumps running on each train. (RO) • Verify 2 NSCW pumps running on each train. (RO) • Verify containment ventilation isolation (CVI). (RO) • Check if MSLIVs should be isolated. (RO/BOP) • Check containment spray not required. (RO) • Verify DG running. (BOP) • Verify ECCS flows. (RO) • Verify total AFW flow greater than 570 GPM. (BOP) • Verify ECCS alignment on MLBs. (RO) • Verify RCS temperatures. (RO/BOP) • Identify ruptured S/G on uncontrolled level rise or secondary high radiation (BOP) • Isolates all flow to S/G #1 when identified and level is >10% NR (BOP) • Isolates S/G #1 per USS direction in 19030-C • Performs maximum rate cooldown of S/G #1 to target Core exit temperature

Appendix D | Scenario Outline | Form ES-D-1

Facility: VOGTLE Scenario No.: 4 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: The plant is at 95%. RCS boron concentration is at 1308 ppm, BOL conditions. B Train equipment in service.

Turnover:

1. _____Plant Startup is in progress.
2. _____Rx power is 95%.
3. _____1PV-0456 is in the shut position due to seat leakage.
4. _____1HV-8000B is shut to comply with Technical Specification 3.4.11 Condition "A".
5. _____ ECCS Accumulator #2 level is low due to a minor leak. After assuming the shift raise the accumulator level per SOP-13105-C
6. _____The last shift entered AOP 18009-C due to a 20 GPD tube leak on Steam generator #1. All actions of Section "B" have been completed with the exception of the radiation monitors which still need to be reset.
7. _____ In addition a tornado alert has been issued for Burke and Richmond Counties. There are heavy thunderstorms occuring at this time. The severe weather checklist has been completed in the last hour.

Event No.	Malf. No.	Event Type*	Event Description
1		RO-N	Raise #2 accumulator level
2		RO-R	Increase power to 98%
3	CV12	RO-I	VCT level transmitter 1LT-185 fails high
4	RC10c 100%	RO-I	Loop #3 NR Tavg fails high (TE-431B)
5	SG02h 100%	BOP-C	Controlling S/G #4 level transmitter (1LT-549) fails high
6	MS03b 100%	BOP-C	ARV #2 (1PV-3010) fails open due to controlling pressure transmitter failure
7	GE01 EL02, 03 EL01a 15Sec/ TD MS04c 100% SY01A, B, D, E, G, H, J, K, M	M-ALL	• Loss of offsite power • DG 1B trips after starting • Faulted S/G #3 (IRC)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

PREINSERTS:

Initial Conditions:

- _____ Reset to IC #__ (NRC #4 snap)
- _____ Insure Information Board in Control Room is updated
- _____ Shift sign in and reactivity breifing sheets provided
- _____ RO & BOP Name plates on Panel D
- _____ Check EOP's, AOP's, UOP's, SOP's used in the last scenario clear of red marks
- _____ IPC is Mode 1
- _____ Check Control Rod Group Step Counters
- _____ Unit 2 suppling the Aux Steam Header

Select to following QMCB positions:

- _____ 1PV-0456 in shut position with "Caution Tag"
- _____ 1HV-8000B in shut position with "Caution Tag"
- _____ All Controlling channels selected to channel #1
- _____ All Train "B" Equipment Running
- _____ Align plant for operation with minor S/G tube leak per AOP-18009-C section "B"
- _____ Ensure all QPCP and QHVC recorders running in auto

Insert simulator malfunctions:

- _____ (Malfunction SG01e at 20%) 20 GPD tube leak on Steam Generator #1
- _____ SI02B at 100% until low level is received for accumulator #2 alarm then remove malfunction

Simulator Overrides & Remote Functions:

- _____ ALB50 (CR HI/LO ΔP)
  Panel Drawings-HV1-ALB50-CR Hi/Lo Diff Press-OFF
- _____ ALB20 (Turbine/Gen Trouble)
  Panel Drawings-B2-ALB20-E01-OFF
- _____ ALB62 (Gen Gas Non Sys Alarm)
  Panel Drawings-QPLP2-ALB62-F02-OFF

Op-Test No.: 1 Scenario No.: 4 Event No.: 1 Page 3 of 9

Event Description: **Raise #3 ECCS accumulator Level**

Time	Position	Applicant's Actions or Behavior
	RO	Actions: • SOP 13105-1 Secton 4.2.1 selected: • Check miniflow path for SI pump aligned • Start SI pump • Open 1HV-8888 • Open 1HV-8871 • Open 1HV-8878B • Monitor Accum #2 level • When desired level is reached close valves

Op-Test No.: 1 Scenario No.: 4 Event No.: 2 Page 3 of 9

Event Description: **Increase Reactor Power to 98%**

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Gives crew briefing on the power increase • Directs Operators to increase power to 98% • Refers to UOP 12004-C, Power Operation
	RO	Actions: • Commences dilution • Maintains rods above insertion limits • Maintains Tave within 2 deg Tref • Maintains AFD within target band
	BOP	Actions: • Loads Turbine per SOP.

Op-Test No.: 1 Scenario No.: 4 Event No.: 3 Page 3 of 9

Event Description: **VCT level transmitter 1LT-185 fails high. Result in letdown flow being diverted to the RHUT. VCT level will lower to the automatic makeup setpoint of 30% if not noticed be the operators.**

Malfunction: ***CV12***

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Directs operator to place 1-LV-0112A to the VCT position • Directs operator to Monitor VCT level using 1-LT-0112 (IPC) • Alerts operator that the automatic swap-over on low VCT level is not functional. • Caution the operators of the possible loss of suction to the CCP's • Have Maintenance Work order written.
	RO	Actions: • Identify failed VCT level channel (1-LT-185) • Trend 1-LT-115 on the IPC computer. • Place 1-LV-0112A to the VCT position. • Be aware of the possible loss of suction potential to the CCP's.

Op-Test No.: 1 Scenario No.: 4 Event No.: 4 Page 3 of 9

Event Description: **Loop #3 NR temperature instrument fails high. Control rods would move in if controls were in automatic, however with power ramp in progress they should be in manual control.**

Malfunction: ***RC10c @ 100%***

Time	Position	Applicant's Actions or Behavior

	SRO	Actions:
		• Enters AOP 18001-C Secton "B"
		• Has operator place rod control in manual (should be there)
		• Have operator verify Tavg is on program
		• Defeat failed channel
		• Notify Operations duty manager.
		• Have Maintenance Work order written.
		• Refer to Technical Specifications.
		  • 3.3.1 Function 6 Condition E
		  • 3.3.1 Function 7 Condition E
		  • 3.3.2 Function 5b Condition I

	RO	Actions: • Identify the failed channel is Loop #3 • Insure control rods in manual control (immediate action) • Adjust Tavg to Tref if required • Place Tavg defeat switches (1TS-412T & 1TS-411F) to Loop #3 position

Op-Test No.: 1 Scenario No.: 4 Event No.: 5 Page 3 of 9

Event Description: **Controlling S/G #4 level transmitter (1LT-549) fails high. Results in the Loop #4 MFRV going in the shut direction to lower feedwater flow.**

Malfunction: ***SG02D @ 100%***

Time	Position	Applicant's Actions or Behavior

	SRO	Actions:
		• Enters AOP 18001-C Secton "E"
		• Has operator control S/G #4 MFRV in manual to restore level between 60-70%
		• Have operator select unaffected controlling channel
		• Directs operator to restore system to automatic when conditions have stablized.
		• Notify Operations duty manager.
		• Have Maintenance Work order written.
		• Refer to Technical Specifications.
		  • 3.3.1 Function 13 Condition E
		  • 3.3.2 Function 5c Condition I
		  • 3.3.2 Function 6b Condition D
		  • 3.3.3 Info LCO

	BOP	Actions: • Identify the failed channel is Loop #4 (1LT-549) • Place MFRV on Loop #4 in manual control and control level between 60-70% • Select an unaffected controlling channel • Restore system to automatic when conditions allow

Op-Test No.: 1 Scenario No.: 4 Event No.: 6 Page 3 of 9

Event Description: **ARV on Loop #2 (1PV-3010) fails open due to controlling transmitter failing high. The operate should identify the condition when the alarm is received on high tailpipe temperature and Reactor Power is observed to be increasing with Main Turbine Load lowering.**

Malfunction: ***MS03b @ 100%***

Time	Position	Applicant's Actions or Behavior

	SRO	Actions:
		• May enters AOP 18008-C for secondary leakage
		• Alert operator keep Reactor Power below 100% by all indications
		• Directs operator that manually shut 1PV-3010 (using 1PIC-3110)
		• Notify Operations duty manager.
		• Have Maintenance Work order written.
		• Refer to Technical Specifications.
		  • 3.3.4 (Info only)
		  • 3.3.4 (info only)

	BOP	Actions: • Identify the failed open ARV on Loop #2 • Keep Reactor Power below 100% by all indications • Place 1PIC-3010 in manual control and lower output to 0%, closing the ARV

Op-Test No.: 1 Scenario No.: 4 Event No.: 7 Page 3 of 9

Event Description: **Loss of offsite power, Reactor will automatically trip, D/G 1A will trip during load sequencing followed by a major secondary fault in Containment on S/G #3.**

Malfunction: List::

1. **GE01 (Mian Generator Trip)**
2. **EL02, EL03 (Loss of RAT's)**
3. **(SY01A,B,D,E,G,H,J,K,M) (PCB's tripping in the high voltage switchyard)**
4. **MS04c @ 100% (S/G #3 faulted IRC)**
5. **EL01A @ 15 second time delay (D/G 1A Trip on OS)**

Time	Position	Applicant's Actions or Behavior
	SRO	Actions: • Identifies Automatic Reactor Trip • Enters 19000-C • Reconizes the loss of 1BA03 • Insures all immediate actions are performed per 19000-C. • Directs operator actions per the 19000-C direction. • Ensures proper communication between crewmembers. • Transitions to 19020-C due to S/G #3 low pressure • Directs the operator in isolating S/G #3 in 19020-C • Transitions to either 19001-C or 19010-C depending on conditions at the time • When time permits should dispatch personnel to 1BA03 and switchyard.
	RO/BOP	Actions: (19000-C) • Verify Rx Trip (RO) • Verify turbine trip. (BOP) • Verify power to AC emergency busses. (alert the operating crew on the loss of power to 1BA03)(BOP) • Check if SI Actuated. (RO) • Verify Feedwater isolation. (BOP) • Verify MLB indications "A" Train ECCS equipment aligning for injection phase. (RO) • Verify containment isolation Phase A actuated. (RO) • Train "A" MDAFW Pump running. (BOP) • SG blowdown isolated (BOP) • TDAFW pump running. (BOP)

Op-Test No.: 1 Scenario No.: 4 Event No.: 7 Page 3 of 9

Event Description: **Loss of offsite power, Reactor will automatically trip, D/G 1A will trip during load sequencing followed by a major secondary fault in Containment on S/G #3.**

Malfunction: List::

1. **GE01 (Mian Generator Trip)**
2. **EL02, EL03 (Loss of RAT's)**
3. **(SY01A,B,D,E,G,H,J,K,M) (PCB's tripping in the high voltage switchyard)**
4. **MS04c @ 100% (S/G #3 faulted IRC)**
5. **EL01A @ 15 second time delay (D/G 1A Trip on OS)**

Time	Position	Applicant's Actions or Behavior
		• Verify ECCS pumps running: CCP, SI, RHR. (RO) • Verify 2 CCW pumps running on "A" Train. (RO) • Verify 2 NSCW pumps running on."A" Train. (RO) • Verify containment ventilation isolation (CVI). (RO) • Check if MSLIVs should be isolated. (BOP should recognize that S/G #3 is faulted and isolate all AFW flow to that S/G) (RO/BOP) • Check containment spray not required. (RO) • Verify DG Train "A" running. (BOP) • Verify ECCS flows. (RO) • Verify total AFW flow greater than 570 GPM. (BOP) • Verify ECCS alignment on (Train "A") MLBs. (RO) • Verify RCS temperatures. (RO/BOP) • Isolate S/G #3 in 19020-C per USS direction (BOP)