SIMULATOR SCENARIOS AS PRESENTED TO AND REVIEWED BY FACILITY

EXAM REVIEW COMMENT SHEETS INCLUDED.

4/17/01

Facility: DC Cook Scenario No.: 1 Op-Test No.: 2001301

Examiners: _____ Operators: _____

[all]

Initial Conditions: 100% power, The East RHR pump is OOS for a motor bearing repair and is expected back in 10 hours (21 hours of 72 hours) Tech Spec 3.5.2.d

Turnover: STP.027.CD has just been completed and the diesel generator is ready to be shut down and unloaded. ~~A 200 MW power decrease has been requested by the System Dispatcher.~~ Both units are at 100% power. The East CCP is in service.

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Event No.	Malf. No.	Event Type*	Event Description
1		N	Unload and secure the CD D/G for the completion of the STP
2	RCO3	Minor	Small break LOCA (10 gpm) [redacted]
** [redacted]	[10]	~~C(BO)~~	~~As a Turbine begins load decrease auto EH control fails~~
3		R	Power decrease using boration
4	CV ~~19A~~ 30A	C(RO)	East CCP ~~fails on overcurrent~~ Sheared shaft
~~5~~	RX27	I(BO)	Feedwater flow controller fails low [redacted] 50%
~~6~~	CV12	I(RO)	Charging pump flow controller fails low [10% open]
7	RC01A	Major	Large break LOCA [75%] 5:00 ramp
8	~~ED12A~~ ~~ED05E~~	RP05A C(BO)	T21A Fail, to Close in ~~Vital bus T21A fails~~ [redacted]
9	RP13A	BC 12A C(RO)	Auto Phase A does not occur

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

** Removed because DC Cook operates turbine in manual for power changes

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __1___ Page _1_ of ___

Event Description: Normal – Unload and Secure DGCD per 02-OHP.4021.032.001CD

Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP to shutdown the DG and maintain overview of operations
	BO	Using Attachment 2 Step 4.4
		Reduce diesel load to 1000 kW and hold for approximately 10 minutes
		As applicable, open the following diesel generator output breakers: T21D8 T21C3
		Adjust diesel speed to 60 Hz
		Verify DG2CD START GEN & 69/4KV VOLTMETER SEL switch in - OFF
		Using Step 4.6 Verify the following breakers – OPEN, T21D8 T21C3 DGTCD
		Verify diesel UNLOADED for approximately 2 minutes

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __1___ Page _1_ of ___

Event Description: Normal – Unload and Secure DGCD per 02-OHP.4021.032.001CD

Time	Position	Applicant's Actions or Behavior
	BO	Stop DG2CD using ANY of the following methods: Place DG2CD Stop-Run Control switch to STOP Press Emergency trip pushbutton in Control Room Verify green target at DG2CD Stop-Run Control switch Complete Data Sheet No. 1 Independently verify the following control switches in NEUTRAL: DG2CD 4kV CB T21D8 DG2CD 4kV CB T21C3 Monitor boards
	RO	

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __2___ Page _1_ of ___

Event Description: RCS Leak (10 gpm), Malfunction RC03, 10 gpm ramp over 10 minutes

Time	Position	Applicant's Actions or Behavior
	RO	Acknowledge annunciators for PZR and VCT.
		Recognize leak indications and check the following parameters: VCT level decreasing, PZR level decreasing, Charging flow increasing, Containment radiation levels increasing
	SRO	Enters procedure 02-OHP.4022.002.020 'EXCESSIVE REACTOR COOLANT LEAKAGE' and begins leak rate calculation
	SRO, RO,	Begins checks for leak location and indications
	BO	Indications lead to leak inside of containment
	SRO	Determine to begin plant shutdown per 02-OHP.4021.001.003 'POWER REDUCTION'
	RO	Begin shutdown by boration
	BO	Begin Turbine shutdown in manual
	SRO	Refer to Tech Spec 3.4.6.2. a & .b (RCS leakage)
		LCO is 1 gpm unidentified and no pressure boundary leakage. Must be in Hot Standby in 6 hours.

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __3___ Page _1_ of ___

Event Description: Power decrease using boration

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure 02-OHP.4021.001.003 section 4
		Direct RO to select AUTO Rod Control Mode
	RO	Select AUTO Rod Control Mode on the Full Length Bank Selector Switch
	BO	Commence manual load reduction using the load-limiter or operating device
	RO	Use boration to maintain T_{AVE} (Add **XXX** gallons per shift turnover sheet)
	BO	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __4___ Page _1_ of ___

Event Description: East CCP fails on overcurrent, Malfunction CV13A

Time	Position	Applicant's Actions or Behavior
	RO	Recognize CCP breaker T21D7, RCP seal flow low alarm, letdown isolation, CCP pump E motor overload alarm (Panel 209 Drop 12).
	SRO	Direct RO to start 'W' CCP, investigate and determine cause of trip and refer to Tech Specs. 3.5.2.a (72 hour LCO)
	RO	Restore letdown per procedure 02-OHP.4021.003.001, section 4.1, 'Re-establishing Normal Letdown' • Place 2-QRV-302, cold letdown path select, in DIVERT • Verify charging >75 gpm • Verify letdown orifice valves closed • Verify CCW from letdown Hx outlet control valve OPEN • Adjust 2-QRV-301, letdown pressure control, to 50% • Open one of the letdown orifice valves • Adjust 2-QRV to maintain a nominal pressure of 160-350 psig • Place 2-QRV-301 in AUTO • Position control switch 2-QRV-303 to AUTO • Null 2-CRV-470 controller and place in AUTO
	BO	Monitor boards
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __5___ Page _1_ of ___

Event Description: Feedwater Pump DP controller failure, RX27, failure of DP controller to 25%

Time	Position	Applicant's Actions or Behavior
	BO	Recognize the low DP and shift the controller to manual and place the feed pump turbine speed controller in manual. Feedwater DP will then be the responsibility of the BO during the continuation of the shutdown
	SRO	Check the Tech Specs – none required
	RO	Monitor boards for changes due to FW changes
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __6___ Page _1_ of ___

Event Description: Centrifugal charging pump flow control valve failure, Malfunction CV12, valve fails at 10% open

Time	Position	Applicant's Actions or Behavior
	RO	Recognize that QRV-251 'Charging Pump Flow Controller" has failed. RCP seal flow low alarm, PZR level low, regenerative heat exchanger outlet temperature high
		Try to manually operate QRV-251
		Manually operate the charging pumps or shift to the PDP
	SRO	Check Tech Specs for charging Tech Specs. 3.5.2.a (This is second train of ECCS therefore 3.0.3 is applicable)
	BO	Stop ramp to minimize PZR level changes
	RO/BO	Match T_{AVE} and T_{REF} to minimize PZR level changes using rods or turbine
	SRO/RO/BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'

Time	Position	Applicant's Actions or Behavior
	RO/SRO	Recognize indications of a LOCA, Loss of PZR level, increasing Charging flow, increasing containment pressure, humidity and temperature
	SRO	May direct manual reactor trip.
	BO	Turbine trip, electrical bus transfer occurs, vital bus T21A does not energize. (event 8)
	SRO	Begin 02-OHP.4023.E-0, 'Reactor Trip or Safety Injection'
	Crew	Crew perform immediate actions of E-0
	RO	Auto Phase A does not occur, manually initiate Phase A (event 9)
	Crew	Crew notes the following equipment not operating: 2S SI Pump W CCP W CS Pump W RHR Pump W ESW Pump W CCW Pump W AFW Pump

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __7, 8, 9__ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'

Time	Position	Applicant's Actions or Behavior
	BO	Complete Attachment 'A' of E-0
	RO	Stop RCPs
	BO	Attempt to re-energize T21A using 02-OHP.4023.Sup.009 'Restoration of 4kV Buses from EP' - investigation reveals: A dropped overcurrent relay that can be reset Restore power to the bus per Attachment 'G' Step 6 • Check Panel 219, Drop 75 '4kV Bus T21A CB T21A9 Trip' annunciator CLEAR • Check Panel 219, Drop 88 'TR21A Differential Operated' annunciator CLEAR • Place T21A11, DG2AB supply to bus T21A, control switch in PULL TO LOCKOUT • Verify the following breakers OPEN WITH GREEN TARGET: • T21A9, Bus 2A supply to bus T21A, • T21A6, 4kV supply to TR21PHA

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: _7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A.

Time	Position	Applicant's Actions or Behavior

	BO	• Place the following control switches in PULL TO LOCKOUT:
		  • West MDAFW pump
		  • West CCP
		  • South SI pump
		  • West CTS pump
		  • West CCW pump
		  • West ESW pump
		• Close T21A12, 4kV EP Supply to Bus T21A
		• Restore loads as necessary while maintaining EP less than 42 Amps for One Unit or 78 Amps for Both Units

	SRO	Transition to E-1
	STA	Initiate monitoring of Critical Safety Function Status Tree
	SRO	Transition to FR.P-1
	RO	Reset SI Reset Containment Isolation Phase 'A' and 'B'
	SRO	Transition to E-1
		Termination of Scenario

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: _____ Page _1_ of ___

Event Description:

Time	Position	Applicant's Actions or Behavior

Facility: DC Cook Scenario No.: 1 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 100% power, The East RHR pump is OOS for a motor bearing repair and is expected back in 10 hours (21 hours of 72 hours) Tech Spec 3.5.2.d

Turnover: STP.027.CD has just been completed and the diesel generator is ready to be ~~shut down and unloaded. A 200 MW power decrease has been requested by the System Dispatcher.~~ Both units are at 100% power. The East CCP is in service.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Unload and secure the CD D/G for the completion of the STP
2	RCO3	Minor	Small break LOCA (~~10 gpm~~ 30 gpm)
**		~~C(BO)~~	~~As a Turbine begins load decrease auto EH control fails~~
3		R	Power decrease using boration
4	CV13A	C(RO)	East CCP ~~fails on~~ overcurrent
5	RX27	I(BO)	Feedwater flow controller fails low
6	~~CV12~~	~~I(RO)~~	~~Charging pump flow controller fails low~~
7	RC01	Major	Large break LOCA
8	~~ED05E~~	C(BO)	Vital bus T21A fails
9	RP13A	C(RO)	Auto Phase A does not occur

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

** Removed because DC Cook operates turbine in manual for power changes

Op-Test No.: 2001301 Scenario No.: 1 Event No.: 1 Page 1 of ___

Event Description: Normal – Unload and Secure DGCD per 02-OHP.~~4021.032.001CD~~ 4030-STP-027 CD

Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP to shutdown the DG and maintain overview of operations
	BO	Using Attachment ~~2~~ 1 Step 4.~~4~~ 26.11
		Reduce diesel load to ~~1000~~ 500 kW and hold for approximately ~~10~~ 2 minutes
		As applicable, open the following diesel generator output breakers: T21D8 T21C3
		Adjust diesel speed to 60 Hz
		Verify DG2CD START GEN & 69/4KV VOLTMETER SEL switch in - OFF
		Using Step 4.~~6~~ 26.12 Verify the following breakers – OPEN, ~~T21D8~~ DG2CD 4KV CB T21C23 ~~T21C3~~ ~~DGTCD~~
		Verify diesel UNLOADED for approximately 2 minutes

REWRITE PER STP

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __1___ Page _1_ of ___

Event Description: Normal – Unload and Secure DGCD per 02-OHP.4021.032.001CD

Time	Position	Applicant's Actions or Behavior
	BO	Stop DG2CD using ANY of the following methods: Place DG2CD Stop-Run Control switch to STOP Press Emergency trip pushbutton in Control Room Verify green target at DG2CD Stop-Run Control switch Complete Data Sheet No. 1 Independently verify the following control switches in NEUTRAL: DG2CD 4kV CB T21D8 DG2CD 4kV CB T21C3 Monitor boards
	RO	

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __2___ Page _1_ of ___

Event Description: RCS Leak (~~10 gpm~~ 5 to 10%), Malfunction RC03, ~~10~~ 5 gpm ramp over ~~10 minutes~~ 30 minutes

Time	Position	Applicant's Actions or Behavior
	RO	Acknowledge annunciators for PZR and VCT.
		Recognize leak indications and check the following parameters: VCT level decreasing, PZR level decreasing, Charging flow increasing, Containment radiation levels increasing
		STP.016 FOR LEAK RATE —
	SRO	Enters procedure 02-OHP.4022.002.020 'EXCESSIVE REACTOR COOLANT LEAKAGE' and begins leak rate calculation
		PUT IN STEPS FOR THIS PROCEDURE
	SRO, RO,	Begins checks for leak location and indications
	BO	Indications lead to leak inside of containment
	SRO	Determine to begin plant shutdown per 02-OHP.4021.001.003 'POWER REDUCTION'
	RO	Begin shutdown by boration
	BO	Begin Turbine shutdown in manual
	SRO	Refer to Tech Spec 3.4.6.2. a & .b (RCS leakage)
		LCO is 1 gpm unidentified and no pressure boundary leakage. Must be in Hot Standby in 6 hours.

4021.003.001 restore charging & letdown

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __3___ Page _1_ of ___

Event Description: Power decrease using boration

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure 02-OHP.4021.001.003 section 4
		Direct RO to select AUTO Rod Control Mode
	RO	Select AUTO Rod Control Mode on the Full Length Bank Selector Switch
	BO	Commence manual load reduction using the load-limiter or operating device
	RO	Use boration to maintain T_{AVE} (Add ~~XXX~~ 60 per batch gallons per shift turnover sheet)
	BO	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __4____ Page _1_ of ___

Event Description: East CCP ~~fails on overcurrent, Malfunction CV13A~~ SHAFT SHEAR CV30A

Time	Position	Applicant's Actions or Behavior
	RO	Recognize CCP ~~breaker T21D7~~ SHAFT SHEAR, RCP seal flow low alarm, letdown isolation, CCP pump E motor overload alarm (Panel 209 Drop 12).
	SRO	Direct RO to start 'W' CCP, investigate and determine cause of trip and refer to Tech Specs. 3.5.2.a (72 hour LCO)
	RO	LOCKOUT 'E' CCP ~~Restore letdown per procedure 02-OHP.4021.003.001, section 4.1, 'Re-establishing Normal Letdown'~~ • ~~Place 2-QRV-302, cold letdown path select, in DIVERT~~ • ~~Verify charging >75 gpm~~ • ~~Verify letdown orifice valves closed~~ • ~~Verify CCW from letdown Hx outlet control valve OPEN~~ • ~~Adjust 2-QRV-301, letdown pressure control, to 50%~~ • ~~Open one of the letdown orifice valves~~ • ~~Adjust 2-QRV to maintain a nominal pressure of 160-350 psig~~ • ~~Place 2-QRV-301 in AUTO~~ • ~~Position control switch 2-QRV-303 to AUTO~~ • ~~Null 2-CRV-470 controller and place in AUTO~~
	BO	Monitor boards
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

MOVE TO EVENT #1

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __5___ Page _1_ of ___

Event Description: Feedwater Pump DP controller failure, RX27, failure of DP controller to ~~25%~~ 50%

Time	Position	Applicant's Actions or Behavior
	BO	Recognize the low DP and shift the controller to manual and place the feed pump turbine speed controller in manual. Feedwater DP will then be the responsibility of the BO during the continuation of the shutdown
	SRO	Check the Tech Specs – none required
	RO	Monitor boards for changes due to FW changes
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __6___ Page _1_ of ___

Event Description: Centrifugal charging pump flow control valve failure, Malfunction CV12, valve fails at ~~10~~ 25% open

Time	Position	Applicant's Actions or Behavior
	RO	Recognize that QRV-251 'Charging Pump Flow Controller" has failed. RCP seal flow low alarm, PZR level low, regenerative heat exchanger outlet temperature high Try to manually operate QRV-251 ~~Close QRV-200~~ shift ~~all~~ flow to seals and ~~Manually operate the charging pumps or shift to the PDP~~ throttle QRV-200 to
	SRO	Check Tech Specs for charging Tech Specs. 3.5.2.a (This is second train of ECCS therefore 3.0.3 is applicable)
	BO	Stop ramp to minimize PZR level changes
	RO/BO	Match T_{AVE} and T_{REF} to minimize PZR level changes using rods or turbine
	SRO/RO/BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'

Time	Position	Applicant's Actions or Behavior
	RO/SRO	Recognize indications of a LOCA, Loss of PZR level, increasing Charging flow, increasing containment pressure, humidity and temperature
	SRO	May direct manual reactor trip.
	BO	Turbine trip, electrical bus transfer occurs, vital bus T21A does not energize. (event 8)
	SRO	Begin 02-OHP.4023.E-0, 'Reactor Trip or Safety Injection'
	Crew	Crew perform immediate actions of E-0
	RO	Auto Phase A does not occur, manually initiate Phase A (event 9)
	Crew	Crew notes the following equipment not operating: 2S SI Pump W CCP W CS Pump W RHR Pump W ESW Pump W CCW Pump W AFW Pump

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'

Time	Position	Applicant's Actions or Behavior
	BO	Complete Attachment 'A' of E-0
	RO	Stop RCPs
	BO	Attempt to re-energize T21A using 02-OHP.4023.Sup.009 'Restoration of 4kV Buses from EP' - investigation reveals: A dropped overcurrent relay that can be reset Restore power to the bus per Attachment 'G' Step 6 • Check Panel 219, Drop 75 '4kV Bus T21A CB T21A9 Trip' annunciator CLEAR • Check Panel 219, Drop 88 'TR21A Differential Operated' annunciator CLEAR • Place T21A11, DG2AB supply to bus T21A, control switch in PULL TO LOCKOUT • Verify the following breakers OPEN WITH GREEN TARGET: • T21A9, Bus 2A supply to bus T21A, • T21A6, 4kV supply to TR21PHA

or sup 12 off of EP

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: _7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A.

Time	Position	Applicant's Actions or Behavior

	BO	• Place the following control switches in PULL TO LOCKOUT:
		  • West MDAFW pump
		  • West CCP
		  • South SI pump
		  • West CTS pump
		  • West CCW pump
		  • West ESW pump
		• Close T21A12, 4kV EP Supply to Bus T21A
		• Restore loads as necessary while maintaining EP less than 42 Amps for One Unit or 78 Amps for Both Units

	SRO	Transition to E-1
	STA	Initiate monitoring of Critical Safety Function Status Tree
	SRO	Transition to FR.P-1
	RO	Reset SI Reset Containment Isolation Phase 'A' and 'B'
	SRO	Transition to E-1
		Termination of Scenario

Op-Test No.: 2001301 Scenario No.: 1 Event No.: _____ Page _1_ of ___

Event Description:

Time	Position	Applicant's Actions or Behavior

Facility: DC Cook Scenario No.: 1 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 100% power, The East RHR pump is OOS for a motor bearing repair and is expected back in 10 hours (21 hours of 72 hours) Tech Spec 3.5.2.d

Turnover: STP.027.CD has just been completed and the diesel generator is ready to be shut down and unloaded. A 200 MW power decrease has been requested by the System Dispatcher. Both units are at 100% power. The East CCP is in service.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Unload and secure the CD D/G for the completion of the STP
2	RCO3	Minor	Small ~~break LOCA~~ RCS leak (10 gpm)
**		~~C(BO)~~	~~As a Turbine begins load decrease auto EH control fails~~
3		R	Power decrease using boration
5 4	CV13A	C(RO)	East CCP ~~fails on overcurrent~~ shaft shear
6 5	RX27	I(BO)	Feedwater flow controller fails low
4 6	CV12	I(RO)	Charging pump flow controller fails low
7	RC01	Major	Large break LOCA
8	ED05E	C(BO)	Vital bus T21A fails
9	RP13A	C(RO)	Auto Phase A does not occur

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

** Removed because DC Cook operates turbine in manual for power changes

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __1___ Page _1_ of ___

Event Description: Normal – Unload and Secure DGCD per 02-OHP.4021.032.001CD

Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP to shutdown the DG and maintain overview of operations
	BO	Using Attachment 2 Step 4.4
		Reduce diesel load to ~~1000~~ 500 kW and hold for approximately 10 minutes
		As applicable, open the following diesel generator output breakers: T21D8 T21C3
		Adjust diesel speed to 60 Hz
		Verify DG2CD START GEN & 69/4KV VOLTMETER SEL switch in - OFF
		Using Step 4.6 Verify the following breakers – OPEN, T21D8 T21C3 DGTCD
		Verify diesel UNLOADED for approximately 2 minutes

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __1___ Page _1_ of ___

Event Description: Normal – Unload and Secure DGCD per 02-OHP.4021.032.001CD

Time	Position	Applicant's Actions or Behavior
	BO	Stop DG2CD using ANY of the following methods: Place DG2CD Stop-Run Control switch to STOP Press Emergency trip pushbutton in Control Room Verify green target at DG2CD Stop-Run Control switch Complete Data Sheet No. 1 Independently verify the following control switches in NEUTRAL: DG2CD 4kV CB T21D8 DG2CD 4kV CB T21C3 Monitor boards
	RO	

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __2___ Page _1_ of ___

Event Description: RCS Leak (10 gpm), Malfunction RC03, 10 gpm ramp over 10 minutes

Time	Position	Applicant's Actions or Behavior
	RO	Acknowledge annunciators for PZR and VCT.
		Recognize leak indications and check the following parameters: VCT level decreasing, PZR level decreasing, Charging flow increasing, Containment radiation levels increasing
	SRO	Enters procedure 02-OHP.4022.002.020 'EXCESSIVE REACTOR COOLANT LEAKAGE' and begins leak rate calculation
	SRO, RO,	Begins checks for leak location and indications
	BO	Indications lead to leak inside of containment
	SRO	Determine to begin plant shutdown per 02-OHP.4021.001.003 'POWER REDUCTION'
	RO	Begin shutdown by boration
	BO	Begin Turbine shutdown in manual
	SRO	Refer to Tech Spec 3.4.6.2. a & .b (RCS leakage)
		LCO is 1 gpm unidentified and no pressure boundary leakage. Must be in Hot Standby in 6 hours.

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __3___ Page _1_ of ___

Event Description: Power decrease using boration

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure 02-OHP.4021.001.003 section 4 Direct RO to select AUTO Rod Control Mode
	RO	Select AUTO Rod Control Mode on the Full Length Bank Selector Switch
	BO	Commence manual load reduction using the load-limiter or operating device
	RO	Use boration to maintain T_{AVE} (Add **XXX** gallons per shift turnover sheet)
	BO	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __4___ Page _1_ of ___

Event Description: East CCP fails on ~~overcurrent~~ shaft shear, Malfunction CV13A

Time	Position	Applicant's Actions or Behavior
	RO	Recognize CCP breaker T21D7, RCP seal flow low alarm, letdown isolation, CCP pump E motor overload alarm (Panel 209 Drop 12).
	SRO	Direct RO to start 'W' CCP, investigate and determine cause of trip and refer to Tech Specs. 3.5.2.a (72 hour LCO)
	RO	Restore letdown per procedure 02-OHP.4021.003.001, section 4.1, 'Re-establishing Normal Letdown' • Place 2-QRV-302, cold letdown path select, in DIVERT • Verify charging >75 gpm • Verify letdown orifice valves closed • Verify CCW from letdown Hx outlet control valve OPEN • Adjust 2-QRV-301, letdown pressure control, to 50% • Open one of the letdown orifice valves • Adjust 2-QRV to maintain a nominal pressure of 160-350 psig • Place 2-QRV-301 in AUTO • Position control switch 2-QRV-303 to AUTO • Null 2-CRV-470 controller and place in AUTO
	BO	Monitor boards
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __5___ Page _1_ of ___

Event Description: Feedwater Pump DP controller failure, RX27, failure of DP controller to 25%

Time	Position	Applicant's Actions or Behavior
	BO	Recognize the low DP and shift the controller to manual and place the feed pump turbine speed controller in manual. Feedwater DP will then be the responsibility of the BO during the continuation of the shutdown
	SRO	Check the Tech Specs – none required
	RO	Monitor boards for changes due to FW changes
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __6___ Page _1_ of ___

Event Description: Centrifugal charging pump flow control valve failure, Malfunction CV12, valve fails at 10% open

Time	Position	Applicant's Actions or Behavior
	RO	Recognize that QRV-251 'Charging Pump Flow Controller" has failed. RCP seal flow low alarm, PZR level low, regenerative heat exchanger outlet temperature high
		Try to manually operate QRV-251
		Manually operate the charging pumps or shift to the PDP
	SRO	Check Tech Specs for charging Tech Specs. 3.5.2.a (This is second train of ECCS therefore 3.0.3 is applicable)
	BO	Stop ramp to minimize PZR level changes
	RO/BO	Match T_{AVE} and T_{REF} to minimize PZR level changes using rods or turbine
	SRO/RO/BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'

Time	Position	Applicant's Actions or Behavior
	RO/SRO	Recognize indications of a LOCA, Loss of PZR level, increasing Charging flow, increasing containment pressure, humidity and temperature
	SRO	May direct manual reactor trip.
	BO	Turbine trip, electrical bus transfer occurs, vital bus T21A does not energize. (event 8)
	SRO	Begin 02-OHP.4023.E-0, 'Reactor Trip or Safety Injection'
	Crew	Crew perform immediate actions of E-0
	RO	Auto Phase A does not occur, manually initiate Phase A (event 9)
	Crew	Crew notes the following equipment not operating: 2S SI Pump W CCP W CS Pump W RHR Pump W ESW Pump W CCW Pump W AFW Pump

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'

Time	Position	Applicant's Actions or Behavior
	BO	Complete Attachment 'A' of E-0
	RO	Stop RCPs
	BO	Attempt to re-energize T21A using 02-OHP.4023.Sup.009 'Restoration of 4kV Buses from EP' - investigation reveals: A dropped overcurrent relay that can be reset Restore power to the bus per Attachment 'G' Step 6 • Check Panel 219, Drop 75 '4kV Bus T21A CB T21A9 Trip' annunciator CLEAR • Check Panel 219, Drop 88 'TR21A Differential Operated' annunciator CLEAR • Place T21A11, DG2AB supply to bus T21A, control switch in PULL TO LOCKOUT • Verify the following breakers OPEN WITH GREEN TARGET: • T21A9, Bus 2A supply to bus T21A, • T21A6, 4kV supply to TR21PHA

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: _7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A.

Time	Position	Applicant's Actions or Behavior

	BO	• Place the following control switches in PULL TO LOCKOUT:
		  • West MDAFW pump
		  • West CCP
		  • South SI pump
		  • West CTS pump
		  • West CCW pump
		  • West ESW pump
		• Close T21A12, 4kV EP Supply to Bus T21A
		• Restore loads as necessary while maintaining EP less than 42 Amps for One Unit or 78 Amps for Both Units

	SRO	Transition to E-1
	STA	Initiate monitoring of Critical Safety Function Status Tree
	SRO	Transition to FR.P-1
	RO	Reset SI Reset Containment Isolation Phase 'A' and 'B'
	SRO	Transition to E-1
		Termination of Scenario

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: _____ Page _1_ of ___

Event Description:

Time	Position	Applicant's Actions or Behavior

Facility: DC Cook Scenario No.: 1 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 100% power, The East RHR pump is OOS for a motor bearing repair and is expected back in 10 hours (21 hours of 72 hours) Tech Spec 3.5.2.d

Turnover: STP.027.CD has just been completed and the diesel generator is ready to be shut down and unloaded. A 200 MW power decrease has been requested by the System Dispatcher. Both units are at 100% power. The East CCP is in service.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Unload and secure the CD D/G for the completion of the STP
2	RCO3	Minor	Small break LOCA (10 gpm)
**		~~C(BO)~~	~~As a Turbine begins load decrease auto EH control fails~~
3		R	Power decrease using boration
4	CV13A	C(RO)	East CCP fails on overcurrent
5	RX27	I(BO)	Feedwater flow controller fails low
6	CV12	I(RO)	Charging pump flow controller fails low
7	RC01	Major	Large break LOCA
8	ED05E	C(BO)	Vital bus T21A fails
9	RP13A	C(RO)	Auto Phase A does not occur

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

** Removed because DC Cook operates turbine in manual for power changes

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __1___ Page _1_ of ___

Event Description: Normal – Unload and Secure DGCD per 02-OHP.4021.032.001CD

Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP to shutdown the DG and maintain overview of operations
	BO	Using Attachment 2 Step 4.4 Reduce diesel load to 1000 kW and hold for approximately 10 minutes As applicable, open the following diesel generator output breakers: T21D8 T21C3 Adjust diesel speed to 60 Hz Verify DG2CD START GEN & 69/4KV VOLTMETER SEL switch in - OFF Using Step 4.6 Verify the following breakers – OPEN, T21D8 T21C3 DGTCD Verify diesel UNLOADED for approximately 2 minutes

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __1___ Page _1_ of ___

Event Description: Normal – Unload and Secure DGCD per 02-OHP.4021.032.001CD

Time	Position	Applicant's Actions or Behavior
	BO	Stop DG2CD using ANY of the following methods: Place DG2CD Stop-Run Control switch to STOP Press Emergency trip pushbutton in Control Room Verify green target at DG2CD Stop-Run Control switch Complete Data Sheet No. 1 Independently verify the following control switches in NEUTRAL: DG2CD 4kV CB T21D8 DG2CD 4kV CB T21C3 Monitor boards
	RO	

Op-Test No.: 2001301 Scenario No.: 1 Event No.: 2 Page 1 of ___

Event Description: RCS Leak (10 gpm), Malfunction RC03, 10 gpm ramp over 10 minutes

Time	Position	Applicant's Actions or Behavior
	RO	Acknowledge annunciators for PZR and VCT. Recognize leak indications and check the following parameters: VCT level decreasing, PZR level decreasing, Charging flow increasing, Containment radiation levels increasing
	SRO	Enters procedure 02-OHP.4022.002.020 'EXCESSIVE REACTOR COOLANT LEAKAGE' and begins leak rate calculation
	SRO, RO, BO	Begins checks for leak location and indications
		Indications lead to leak inside of containment
	SRO	Determine to begin plant shutdown per 02-OHP.4021.001.003 'POWER REDUCTION'
	RO	Begin shutdown by boration
	BO	Begin Turbine shutdown in manual
	SRO	Refer to Tech Spec 3.4.6.2. a & .b (RCS leakage) LCO is 1 gpm unidentified and no pressure boundary leakage. Must be in Hot Standby in 6 hours.

RO Acknowledges Annunciator 207 Drop 99, Rx VESSEL HD LINE FLOW DETECTED.

SRO Directs entry into ARP 207 Drop 99 - no immediate actions, directs the following supplementary actions:
- Verify Rx hd vent valves closed
- checks containment leakage detection system indications
- Performs RCS leak test per 02-OHP 4030.STP.016, REACTOR COOLANT SYSTEM LEAK TEST
- Checks T.S. 3.4.6.2 and 3.4.12.1 to ensure compliance

SRO Determines there is ≈ 10 gpm leak,

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __3___ Page _1_ of ___

Event Description: Power decrease using boration

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure 02-OHP.4021.001.003 section 4
		Direct RO to select AUTO Rod Control Mode
	RO	Select AUTO Rod Control Mode on the Full Length Bank Selector Switch
	BO	Commence manual load reduction using the load-limiter or operating device
	RO	Use boration to maintain T_{AVE} (Add **XXX** gallons per shift turnover sheet)
	BO	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __4___ Page _1_ of ___

Event Description: East CCP fails on overcurrent, Malfunction CV13A

Time	Position	Applicant's Actions or Behavior
	RO	Recognize CCP breaker T21D7, RCP seal flow low alarm, letdown isolation, CCP pump E motor overload alarm (Panel 209 Drop 12).
	SRO	Direct RO to start 'W' CCP, investigate and determine cause of trip and refer to Tech Specs. 3.5.2.a (72 hour LCO)
	RO	Restore letdown per procedure 02-OHP.4021.003.001, section 4.1, 'Re-establishing Normal Letdown' • Place 2-QRV-302, cold letdown path select, in DIVERT • Verify charging >75 gpm • Verify letdown orifice valves closed • Verify CCW from letdown Hx outlet control valve OPEN • Adjust 2-QRV-301, letdown pressure control, to 50% • Open one of the letdown orifice valves • Adjust 2-QRV to maintain a nominal pressure of 160-350 psig • Place 2-QRV-301 in AUTO • Position control switch 2-QRV-303 to AUTO • Null 2-CRV-470 controller and place in AUTO
	BO	Monitor boards
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __5___ Page _1_ of ___

Event Description: Feedwater Pump DP controller failure, RX27, failure of DP controller to 25%

Time	Position	Applicant's Actions or Behavior
	BO	Recognize the low DP and shift the controller to manual and place the feed pump turbine speed controller in manual. Feedwater DP will then be the responsibility of the BO during the continuation of the shutdown
	SRO	Check the Tech Specs – none required
	RO	Monitor boards for changes due to FW changes
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __6___ Page _1_ of ___

Event Description: Centrifugal charging pump flow control valve failure, Malfunction CV12, valve fails at 10% open

Time	Position	Applicant's Actions or Behavior
	RO	Recognize that QRV-251 'Charging Pump Flow Controller" has failed. RCP seal flow low alarm, PZR level low, regenerative heat exchanger outlet temperature high
		Try to manually operate QRV-251
		Manually operate the charging pumps or shift to the PDP
	SRO	Check Tech Specs for charging Tech Specs. 3.5.2.a (This is second train of ECCS therefore 3.0.3 is applicable)
	BO	Stop ramp to minimize PZR level changes
	RO/BO	Match T_{AVE} and T_{REF} to minimize PZR level changes using rods or turbine
	SRO/RO/BO	Dispatch AO to investigate problem and contact maintenance for support
		02-OHP-4024-207 Thermal barrier alarms for RCPs on P 207 Drop 18, etc.

Restoring letdown

02 OHP 4021.003.001 Sec. 4.1 13

Remove Excess letdown Attachment 6

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'

Time	Position	Applicant's Actions or Behavior
	RO/SRO	Recognize indications of a LOCA, Loss of PZR level, increasing Charging flow, increasing containment pressure, humidity and temperature
	SRO	May direct manual reactor trip.
	BO	Turbine trip, electrical bus transfer occurs, vital bus T21A does not energize. (event 8)
	SRO	Begin 02-OHP.4023.E-0, 'Reactor Trip or Safety Injection'
	Crew	Crew perform immediate actions of E-0
	RO	Auto Phase A does not occur, manually initiate Phase A (event 9)
	Crew	Crew notes the following equipment not operating: 2S SI Pump W CCP W CS Pump W RHR Pump W ESW Pump W CCW Pump W AFW Pump

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'

Time	Position	Applicant's Actions or Behavior
	BO	Complete Attachment 'A' of E-0
	RO	Stop RCPs
	BO	Attempt to re-energize T21A using 02-OHP.4023.Sup.009 'Restoration of 4kV Buses from EP' - investigation reveals: A dropped overcurrent relay that can be reset Restore power to the bus per Attachment 'G' Step 6 • Check Panel 219, Drop 75 '4kV Bus T21A CB T21A9 Trip' annunciator CLEAR • Check Panel 219, Drop 88 'TR21A Differential Operated' annunciator CLEAR • Place T21A11, DG2AB supply to bus T21A, control switch in PULL TO LOCKOUT • Verify the following breakers OPEN WITH GREEN TARGET: • T21A9, Bus 2A supply to bus T21A, • T21A6, 4kV supply to TR21PHA

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: _7, 8, 9_ Page _1_ of ___

Event Description: Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%. Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A.

Time	Position	Applicant's Actions or Behavior

	BO	• Place the following control switches in PULL TO LOCKOUT:
		  • West MDAFW pump
		  • West CCP
		  • South SI pump
		  • West CTS pump
		  • West CCW pump
		  • West ESW pump
		• Close T21A12, 4kV EP Supply to Bus T21A
		• Restore loads as necessary while maintaining EP less than 42 Amps for One Unit or 78 Amps for Both Units

	SRO	Transition to E-1
	STA	Initiate monitoring of Critical Safety Function Status Tree
	SRO	Transition to FR.P-1
	RO	Reset SI Reset Containment Isolation Phase 'A' and 'B'
	SRO	Transition to E-1
		Termination of Scenario

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: _____ Page _1_ of ___ Event Description:		
Time	Position	Applicant's Actions or Behavior

Facility: DC COOK Scenario No.: 2 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 100% power. A tube leak on S/G #2 (~~5 gpm~~) requires a T.S. shutdown. East ~~EWS~~ ESW Pump is running BORON 1194 ppm 5 gpm

Turnover: Unit 1 is at 75%power, Unit 2 is at 100% power. A tube leak on S/G #2 requires a T.S. shutdown. Tech Spec 3.4.6.2.c limits leakage to < 1gpm or shutdown in 6 hours. ~~Shut down is per 12-GHP-4024 ST 139 Step 3.2~~ 4022 002 02 has been completed to step 9, leak rate has been confirmed by chemistry

Event No.	Malf. No.	Event Type*	Event Description
1		R	Decrease reactor power
2		N	Decrease turbine power
3	RX17F	I(BO)	S/G pressure transmitter fails high
4	RX05A	I(RO)	Pressurizer level channel fails low
5	RC11B	C(RO)	RCP #2 vibration high
6	RC23B	Major	Steam generator #2 tube rupture (400 gpm)
7	ZDI 101 & FMO 222 (OPEN) (XXXX)	C(BO)	East MDAFW throttle valve (FMO-222) will not close from the control room
8	RP20C ~~SW04B~~	C(BO)	K610B relay failure ~~Standby ESW~~ pumps ~~does~~ not start in automatic
9	RP10A &B	I(RO)	No automatic SI

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

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 1 & 2 Page 1 of ___

Event Description: Power reduction to comply with Tech Spec requirements

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure 02-OHP.4021.001.003 section 4
		Direct RO to select AUTO Rod Control Mode
	RO	Select AUTO Rod Control Mode on the Full Length Bank Selector Switch
	BO	Commence manual load reduction using the load-limiter or operating
	RO	Use boration to maintain T_{AVE}
	BO	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 3 Page 1 of ___

Event Description: Malfunction RX17F, 'Steam Generator pressure transmitter failure (MPP-222)' fails to 100%.

Time	Position	Applicant's Actions or Behavior
	BO	Recognize the failed transmitter by the indications: S/G #2 pressure indication failed high S/G #2 PORV opens
	SRO	Implement procedure 02-OHP.4022.013.012
	BO	Manually close S/G #2 PORV
	SRO	Recognize that there is a radioactive release in progress and check reportability requirements per procedure PMP-7030.001.001
	SRO	Trip bistables per attachment B-3 2-PS/526C (Loop 2 to loop 3 press SG2 low) 2-PS/526D (Loop 2 to loop 3 press SG3 low) Refer to Tech Specs 3.3.1.1, 3.3.2.1, & 3.3.3.1 (1hour LCO) Tech Specs 3.3.3.5 & 3.3.3.6 (30 day LCO)
	RO	Monitors primary plant

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 4 Page 1 of ___

Event Description: Malfunction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to 0%

Time	Position	Applicant's Actions or Behavior
	RO	Recognize level transmitter failure: • Pressurizer level indication low • Charging flow increase and QRV-251, 'Charging flow control valve' opens • Letdown isolates by closing QRV-112 at 17% • Pressurizer heaters de-energize
	SRO	Check Tech Specs –3.3.1.1 & 3.3.2.1 (1 hour LCO), Tech Specs 3.3.3.5, 3.3.3.5.1, & 3.3.3.6 (30 day LCO) Implement procedure 02-OHP.4022.013.010, 'Malfunction of Pressurizer Level Instrument'
	RO	Select non-failed channel as the controlling channel • Place PZR level control in manual • Place PZR level CTRL selector switch in channel 2 & 3 position

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __4__ Page _1_ of ___

Event Description: Malfunction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to 0%

Time	Position	Applicant's Actions or Behavior
	RO	Restore letdown per procedure 02-OHP.4021.003.001, section 4.1, 'Re-establishing Normal Letdown' • Place 2-QRV-302, cold letdown path select, in DIVERT • Verify charging >75 gpm • Verify letdown orifice valves closed • Verify CCW from letdown Hx outlet control valve OPEN • Adjust 2-QRV-301, letdown pressure control, to 50% • Open one of the letdown orifice valves • Adjust 2-QRV to maintain a nominal pressure of 160-350 psig • Place 2-QRV-301 in AUTO • Position control switch 2-QRV-303 to AUTO • Null 2-CRV-470 controller and place in AUTO When letdown temperature is stable, then place 2-QRV-302 in NORMAL Trip bistables per Attachment 'A' 2-LS/459A 9 (High Level Rx Trip) Hang caution tags on level CTRL selector and level REC selector switch
	BO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 5 Page 1 of ___

Event Description: Malfunction RC11B, 'Reactor coolant pump #2 high vibration'. Increases to 7 4 mils and then increase to 15 mils in 2 min 2 min (INSTANT)

Time	Position	Applicant's Actions or Behavior
	RO	Recognize indications of RCP HI vibration: • Annunciator 207, drop 52, 'RCP VIBRATION HIGH' –LIT
	SRO	Enters procedure 02-OHP.4022.002.001, 'Malfunction of a reactor coolant pump'
	RO	Verify that RCP#2 operating parameters are within limits Recognize indications of RCP HI-HI vibration: • Annunciator 207, Drop 51, 'RCP VIBRATION HI-HI' – LIT
	SRO	Go to step 16 and manually trips the reactor and instruct the RO to trip RCP#2. Transition to 02-OHP.4023.E-0, 'Reactor trip or safety injection'
	Crew	Perform immediate actions
	RO	Trip RCP#2

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6, 7, 8 & 9 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm. Malfunction (XXXXX), 'East MDAFW throttle valve (FMO-222) will not close from the CR. The West ESW pump does not start in automatic, malfunction ~~SW08B, 'Essential Service Water Pump Trip'. Malfunction RP10A&B, 'Failure~~ of Safety Injection to Actuate-Automatic', SI will actuate manually OK
RP20C, K610B relay failure

Time	Position	Applicant's Actions or Behavior
	RO	(Event 9) Recognize that SI has not actuated and is required per E-0 step and manually initiates SI
	Crew	Recognize SGTR in Step 7.b.3) level in S/G#2 increasing faster that the others ~~and by radiation monitors~~
	BO	Isolate AFW to affected S/G when level is > 13% • (Event 7) FMO-222 will not close from the Control Room • Either trip the East MDAFW pump or send an AO to manually close the valve
	~~BO~~ RO	Recognize that the ~~standby ESW~~ pumps did not start in automatic and manually start the pumps (B TRAIN SI ✓)
	BO	Implement Attachment 'A' of E-0
	RO	Stop RCPs ~~because~~ (1 of -) RCS pressure is < 1300 psig
	SRO	Transition to E-3, 'Steam Generator Tube Rupture'

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __6___ Page _1_ of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Identify Ruptured S/G as #2 by the following indications: • Unexpected rise in #2 narrow range level • High radiation on #2 sample • High radiation from #2 PORV monitor (2-MRA-2701)
	RO ~~or BO~~ BO	Isolate the ruptured SG: • Adjust the PORV controller setpoint to 1040 psig • Check PORV (2-MRV-223) CLOSED • Close steam supply (2-MCM-221) to TDAFW • Check blowdown (2-DCR-320) and sample valve (2-DCR-302) isolated • Place 2-DRV-407, SG stop valves drain valve in CLOSED • Trip SG stop valve (2-MRV-220) CLOSED • Verify dump valve (2-MRV-221 & 222) CLOSED
	~~BO~~	• Isolate feed flow to SG#2 when level is >13%
	~~RO~~	Check SG#2 pressure ~~400~~ >430 psig
	SRO/RO/BO	Initiate RCS Cooldown

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Determine core exit temperature required based on SG#2 pressure
	~~RO~~ RO/BO	Cooldown the RCS to the agreed temperature using the intact S/Gs at maximum rate: • If condenser available use condenser steam dumps • Use the PORV's from the intact S/Gs if condenser is not available Bypass steam dump low-low T_{AVE} interlock if dumping to condenser BLOCK STEAMLINE SI Stop the cooldown and maintain the desired RCS temperature
	~~BO~~ RO	Reset SI and Containment Isolation Phase A Establish instrument air to containment: • Check control air pressure >85 psig • Open control air to containment valves (2-XCR-100, 101, 102, & 103)
	RO	Stop RHR pumps if ~~RSC~~ RCS pressure is > 300psig Check SG#2 pressure stable ~~of~~ OR rising

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	RO	Check RCS subcooling based on core exit TCs > 56° F
	RO/BO	Depressurize RCS to minimize break flow and refill PZR: • If normal spray is available, then spray the PZR • If NOT available us the PORV Depressurize until: • RCS pressure less that SG#2 and PZR level > 19% • PZR level > 72% • RSC subcooling less than 36° F
	Crew	Stabilize plant **TERMINATE SCENARIO**

Facility: DC COOK Scenario No.: 2 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 100% power. A tube leak on S/G #2 (5 gpm) requires a T.S. shutdown. East EWS Pump is running

Turnover: Unit 1 is at 75%power, Unit 2 is at 100% power. A tube leak on S/G #2 requires a T.S. shutdown. Tech Spec 3.4.6.2.c limits leakage to < 1gpm or shutdown in 6 hours.

Event No.	Malf. No.	Event Type*	Event Description
1		R	Decrease reactor power
2		N	Decrease turbine ~~power~~ Load
3	RX17F	I(BO)	S/G pressure transmitter fails high (100)
4	RX05A	I(RO)	Pressurizer level channel fails low (0)
5	RC11B	C(RO)	RCP #2 vibration high (7 mils; 15 mils ↑ 2min ramp → INST.
E6 → 6	[4B] RC23B	Major	Steam generator #2 tube rupture (400 gpm)
Preset 7	2(I)101 ~~(XXXX)~~ FMO222 (open)	C(BO)	East MDAFW throttle valve (FMO-222) will not close from the control room
Preset 8	RC20C ~~SW02B~~	C(B)	'B' Train SI pump fail to start in auto ~~Standby ESW pump does not start in automatic~~
Preset 9	RP10A &B	I(RO)	No automatic SI (Train A/B)

5 mins to close
Override FMO222 Ø

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

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 1 & 2 Page 1 of ___

Event Description: Power reduction to comply with Tech Spec requirements

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure 02-OHP.4021.001.003 section 4
		Direct RO to select AUTO Rod Control Mode
	RO	Select AUTO Rod Control Mode on the Full Length Bank Selector Switch
	BO	Commence manual load reduction using the load-limiter or operating
	RO	Use boration to maintain T_{AVE}
	BO	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __3___ Page _1_ of ___

Event Description: Malfunction RX17F, 'Steam Generator pressure transmitter failure (MPP-222)' fails to 100%.

Time	Position	Applicant's Actions or Behavior
	BO	Recognize the failed transmitter by the indications: S/G #2 pressure indication failed high S/G #2 PORV opens
	SRO	Implement procedure 02-OHP.4022.013.012
	BO	Manually close S/G #2 PORV
	SRO	Recognize that there is a radioactive release in progress and check reportability requirements per procedure PMP-7030.001.001
	SRO	Trip bistables per attachment B-3 2-PS/526C (Loop 2 to loop 3 press SG2 low) 2-PS/526D (Loop 2 to loop 3 press SG3 low) Refer to Tech Specs 3.3.1.1, 3.3.2.1, & 3.3.3.1 (1hour LCO) Tech Specs 3.3.3.5 & 3.3.3.6 (30 day LCO)
	RO	Monitors primary plant

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __4___ Page _1_ of ___

Event Description: Malfunction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to 0%

Time	Position	Applicant's Actions or Behavior
	RO	Recognize level transmitter failure: • Pressurizer level indication low • Charging flow increase and QRV-251, 'Charging flow control valve' opens • Letdown isolates by closing QRV-112 at 17% • Pressurizer heaters de-energize
	SRO	Check Tech Specs –3.3.1.1 & 3.3.2.1 (1 hour LCO), Tech Specs 3.3.3.5, 3.3.3.5.1, & 3.3.3.6 (30 day LCO) Implement procedure 02-OHP.4022.013.010, 'Malfunction of Pressurizer Level Instrument'
	RO	Select non-failed channel as the controlling channel • Place PZR level control in manual • Place PZR level CTRL selector switch in channel 2 & 3 position

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __4__ Page _1_ of ___

Event Description: Malfunction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to 0%

Time	Position	Applicant's Actions or Behavior
	RO	Restore letdown per procedure 02-OHP.4021.003.001, section 4.1, 'Re-establishing Normal Letdown' • Place 2-QRV-302, cold letdown path select, in DIVERT • Verify charging >75 gpm • Verify letdown orifice valves closed • Verify CCW from letdown Hx outlet control valve OPEN • Adjust 2-QRV-301, letdown pressure control, to 50% • Open one of the letdown orifice valves • Adjust 2-QRV to maintain a nominal pressure of 160-350 psig • Place 2-QRV-301 in AUTO • Position control switch 2-QRV-303 to AUTO • Null 2-CRV-470 controller and place in AUTO When letdown temperature is stable, then place 2-QRV-302in NORMAL Trip bistables per Attachment 'A' 2-LS/459A 9 (High Level Rx Trip) Hang caution tags on level CTRL selector and level REC selector switch
	BO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 5 Page 1 of ___

Event Description: Malfunction RC11B, 'Reactor coolant pump #2 high vibration'. Increases to 7 mils and then increase to 15 mils

Time	Position	Applicant's Actions or Behavior
	RO	Recognize indications of RCP HI vibration: • Annunciator 207, drop 52, 'RCP VIBRATION HIGH' –LIT
	SRO	Enters procedure 02-OHP.4022.002.001, 'Malfunction of a reactor coolant pump'
	RO	Verify that RCP#2 operating parameters are within limits Recognize indications of RCP HI-HI vibration: • Annunciator 207, Drop 51, 'RCP VIBRATION HI-HI' – LIT
	SRO	Go to step 16 and manually trips the reactor and instruct the RO to trip RCP#2. Transition to 02-OHP.4023.E-0, 'Reactor trip or safety injection'
	Crew	Perform immediate actions
	RO	Trip RCP#2

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6, 7, 8 & 9 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm. Malfunction (XXXXX), 'East MDAFW throttle valve (FMO-222) will not close from the CR. The West ESW pump does not start in automatic, malfunction SW04B, 'Essential Service Water Pump Trip'. Malfunction RP10A&B, 'Failure of Safety Injection to Actuate-Automatic', SI will actuate manually

Time	Position	Applicant's Actions or Behavior
	RO	(Event 9) Recognize that SI has not actuated and is required per E-0 step and manually initiates SI
	Crew	Recognize SGTR in Step 7.b.3) level in S/G#2 increasing faster that the others and by radiation monitors
	BO	Isolate AFW to affected S/G when level is > 13% • (Event 7) FMO-222 will not close from the Control Room • Either trip the East MDAFW pump or send an AO to manually close the valve
	BO	Recognize that the standby ESW pump did not start in automatic and manually start the pump
	BO	Implement Attachment 'A' of E-0
	RO	Stop RCPs because RCS pressure is < 1300 psig
	SRO	Transition to E-3, 'Steam Generator Tube Rupture'

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Identify Ruptured S/G as #2 by the following indications: • Unexpected rise in #2 narrow range level • High radiation on #2 sample • High radiation from #2 PORV monitor (2-MRA-2701)
	RO	Isolate the ruptured SG: • Adjust the PORV controller setpoint to 1040 psig • Check PORV (2-MRV-223) CLOSED • Close steam supply (2-MCM-221) to TDAFW • Check blowdown (2-DCR-320) and sample valve (2-DCR-302) isolated • Place 2-DRV-407, SG stop valves drain valve in CLOSED • Trip SG stop valve (2-MRV-220) CLOSED • Verify dump valve (2-MRV-221 & 222) CLOSED
	BO	• Isolate feed flow to SG#2 when level is >13%
	RO	Check SG#2 pressure .430 psig
	SRO/RO	Initiate RCS Cooldown

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Determine core exit temperature required based on SG#2 pressure
	RO	Cooldown the RCS to the agreed temperature using the intact S/Gs at maximum rate: • If condenser available use condenser steam dumps • Use the PORV's from the intact S/Gs if condenser is not available Bypass steam dump low-low T_{AVE} interlock if dumping to condenser Stop the cooldown and maintain the desired RCS temperature
	BO	Reset SI and Containment Isolation Phase A Establish instrument air to containment: • Check control air pressure >85 psig • Open control air to containment valves (2-XCR-100, 101, 102, & 103)
	RO	Stop RHR pumps if RSC pressure is > 300psig Check SG#2 pressure stable of rising

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	RO	Check RCS subcooling based on core exit TCs > 56° F
	RO	Depressurize RCS to minimize break flow and refill PZR: • If normal spray is available, then spray the PZR • If NOT available us the PORV Depressurize until: • RCS pressure less that SG#2 and PZR level > 19% • PZR level > 72% • RSC subcooling less than 36° F
	Crew	Stabilize plant **TERMINATE SCENARIO**

Facility: DC COOK Scenario No.: 2 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 100% power. A tube leak on S/G #2 (5 gpm) requires a T.S. shutdown. East EWS Pump is running

Turnover: Unit 1 is at 75%power, Unit 2 is at 100% power. A tube leak on S/G #2 requires a T.S. shutdown. Tech Spec 3.4.6.2.c limits leakage to < 1gpm or shutdown in 6 hours.

Event No.	Malf. No.	Event Type*	Event Description
1		R	Decrease reactor power
2		N	Decrease turbine power
3	RX17F	I(BO)	S/G pressure transmitter fails high
4	RX05A	I(RO)	Pressurizer level channel fails low
5	RC11B	C(RO)	RCP #2 vibration high
6	RC23B	Major	Steam generator #2 tube rupture (400 gpm)
7	(XXXX)	C(BO)	East MDAFW throttle valve (FMO-222) will not close from the control room
8	SW04B	C(BO)	Standby ESW pump does not start in automatic
9	RP10A &B	I(RO)	No automatic SI

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

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 1 & 2 Page 1 of ___

Event Description: Power reduction to comply with Tech Spec requirements

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure 02-OHP.4021.001.003 section 4
		Direct RO to select AUTO Rod Control Mode
	RO	Select AUTO Rod Control Mode on the Full Length Bank Selector Switch
	BO	Commence manual load reduction using the load-limiter or operating
	RO	Use boration to maintain T_{AVE}
	BO	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 3 Page 1 of ___

Event Description: Malfunction RX17F, 'Steam Generator pressure transmitter failure (MPP-222)' fails to 100%. 2

Time	Position	Applicant's Actions or Behavior
	BO	Recognize the failed transmitter by the indications: S/G #2 pressure indication failed high S/G #2 PORV opens
	SRO	Implement procedure 02-OHP.4022.013.012
	BO	Manually close S/G #2 PORV
	SRO	Recognize that there is a radioactive release in progress and check reportability requirements per procedure PMP-7030.001.001
	SRO	Trip bistables per attachment B-3 2-PS/526C (Loop 2 to loop 3 press SG2 low) 2-PS/526D (Loop 2 to loop 3 press SG3 low) Refer to Tech Specs 3.3.1.1, 3.3.2.1, & 3.3.3.1 (1hour LCO) Tech Specs 3.3.3.5 & 3.3.3.6 (30 day LCO)
	RO	Monitors primary plant

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 4 Page 1 of ___

Event Description: Malfunction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to 0%

Time	Position	Applicant's Actions or Behavior
	RO	Recognize level transmitter failure: • Pressurizer level indication low • Charging flow increase and QRV-251, 'Charging flow control valve' opens • Letdown isolates by closing QRV-112 at 17% • Pressurizer heaters de-energize
	SRO	Check Tech Specs –3.3.1.1 & 3.3.2.1 (1 hour LCO), Tech Specs 3.3.3.5, 3.3.3.5.1, & 3.3.3.6 (30 day LCO) Implement procedure 02-OHP.4022.013.010, 'Malfunction of Pressurizer Level Instrument'
	RO	Select non-failed channel as the controlling channel • Place PZR level control in manual • Place PZR level CTRL selector switch in channel 2 & 3 position

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __4__ Page _1_ of ___

Event Description: Malfunction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to 0%

Time	Position	Applicant's Actions or Behavior
	RO	Restore letdown per procedure 02-OHP.4021.003.001, section 4.1, 'Re-establishing Normal Letdown' • Place 2-QRV-302, cold letdown path select, in DIVERT • Verify charging >75 gpm • Verify letdown orifice valves closed • Verify CCW from letdown Hx outlet control valve OPEN • Adjust 2-QRV-301, letdown pressure control, to 50% • Open one of the letdown orifice valves • Adjust 2-QRV to maintain a nominal pressure of 160-350 psig • Place 2-QRV-301 in AUTO • Position control switch 2-QRV-303 to AUTO • Null 2-CRV-470 controller and place in AUTO When letdown temperature is stable, then place 2-QRV-302in NORMAL Trip bistables per Attachment 'A' 2-LS/459A 9 (High Level Rx Trip) Hang caution tags on level CTRL selector and level REC selector switch
	BO	Monitor panels

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __5___ Page _1_ of ___

Event Description: Malfunction RC11B, 'Reactor coolant pump #2 high vibration'. Increases to 7 mils and then increase to 15 mils

Time	Position	Applicant's Actions or Behavior
	RO	Recognize indications of RCP HI vibration: • Annunciator 207, drop 52, 'RCP VIBRATION HIGH' –LIT
	SRO	Enters procedure 02-OHP.4022.002.001, 'Malfunction of a reactor coolant pump'
	RO	Verify that RCP#2 operating parameters are within limits Recognize indications of RCP HI-HI vibration: • Annunciator 207, Drop 51, 'RCP VIBRATION HI-HI' – LIT
	SRO	Go to step 16 and manually trips the reactor and instruct the RO to trip RCP#2. Transition to 02-OHP.4023.E-0, 'Reactor trip or safety injection'
	Crew	Perform immediate actions
	RO	Trip RCP#2

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6, 7, 8 & 9 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm. Malfunction (XXXXX), 'East MDAFW throttle valve (FMO-222) will not close from the CR. The West ESW pump does not start in automatic, malfunction SW04B, 'Essential Service Water Pump Trip'. Malfunction RP10A&B, 'Failure of Safety Injection to Actuate-Automatic', SI will actuate manually

Time	Position	Applicant's Actions or Behavior
	RO	(Event 9) Recognize that SI has not actuated and is required per E-0 step and manually initiates SI
	Crew	Recognize SGTR in Step 7.b.3) level in S/G#2 increasing faster that the others and by radiation monitors
	BO	Isolate AFW to affected S/G when level is > 13% • (Event 7) FMO-222 will not close from the Control Room • Either trip the East MDAFW pump or send an AO to manually close the valve
	BO	Recognize that the standby ESW pump did not start in automatic and manually start the pump
	BO	Implement Attachment 'A' of E-0
	RO	Stop RCPs because RCS pressure is < 1300 psig
	SRO	Transition to E-3, 'Steam Generator Tube Rupture'

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __6___ Page _1_ of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Identify Ruptured S/G as #2 by the following indications: • Unexpected rise in #2 narrow range level • High radiation on #2 sample • High radiation from #2 PORV monitor (2-MRA-2701)
	RO	Isolate the ruptured SG: • Adjust the PORV controller setpoint to 1040 psig • Check PORV (2-MRV-223) CLOSED • Close steam supply (2-MCM-221) to TDAFW • Check blowdown (2-DCR-320) and sample valve (2-DCR-302) isolated • Place 2-DRV-407, SG stop valves drain valve in CLOSED • Trip SG stop valve (2-MRV-220) CLOSED • Verify dump valve (2-MRV-221 & 222) CLOSED
	BO	• Isolate feed flow to SG#2 when level is >13%
	RO	Check SG#2 pressure .430 psig
	SRO/RO	Initiate RCS Cooldown

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Determine core exit temperature required based on SG#2 pressure
	RO	Cooldown the RCS to the agreed temperature using the intact S/Gs at maximum rate: • If condenser available use condenser steam dumps • Use the PORV's from the intact S/Gs if condenser is not available Bypass steam dump low-low T_{AVE} interlock if dumping to condenser Stop the cooldown and maintain the desired RCS temperature
	BO	Reset SI and Containment Isolation Phase A Establish instrument air to containment: • Check control air pressure >85 psig • Open control air to containment valves (2-XCR-100, 101, 102, & 103)
	RO	Stop RHR pumps if RSC pressure is > 300psig Check SG#2 pressure stable of rising

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	RO	Check RCS subcooling based on core exit TCs > 56° F
	RO	Depressurize RCS to minimize break flow and refill PZR: • If normal spray is available, then spray the PZR • If NOT available us the PORV Depressurize until: • RCS pressure less that SG#2 and PZR level > 19% • PZR level > 72% • RSC subcooling less than 36° F
	Crew	Stabilize plant **TERMINATE SCENARIO**

Facility: DC COOK Scenario No.: 2 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 100% power. A tube leak on S/G #2 (5 gpm) requires a T.S. shutdown. East EWS Pump is running

Turnover: Unit 1 is at 75%power, Unit 2 is at 100% power. A tube leak on S/G #2 requires a T.S. shutdown. Tech Spec 3.4.6.2.c limits leakage to < 1gpm or shutdown in 6 hours.

Event No.	Malf. No.	Event Type*	Event Description
1		R	Decrease reactor power
2		N	Decrease turbine power
3	RX17F	I(BO)	S/G pressure transmitter fails high
4	RX05A	I(RO)	Pressurizer level channel fails low
5	RC11B	C(RO)	RCP #2 vibration high
6	RC23B	Major	Steam generator #2 tube rupture (400 gpm)
7	(XXXX)	C(BO)	East MDAFW throttle valve (FMO-222) will not close from the control room
8	SW04B	C(BO)	Standby ESW pump does not start in automatic
9	RP10A &B	I(RO)	No automatic SI

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

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 1 & 2 Page 1 of ___

Event Description: Power reduction to comply with Tech Spec requirements

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure 02-OHP.4021.001.003 section 4
		Direct RO to select AUTO Rod Control Mode
	RO	Select AUTO Rod Control Mode on the Full Length Bank Selector Switch
	BO	Commence manual load reduction using the load-limiter or operating
	RO	Use boration to maintain T_{AVE}
	BO	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __3___ Page _1_ of ___

Event Description: Malfunction RX17F, 'Steam Generator pressure transmitter failure (MPP-222)' fails to 100%.

Time	Position	Applicant's Actions or Behavior
	BO	Recognize the failed transmitter by the indications: S/G #2 pressure indication failed high S/G #2 PORV opens
	SRO	Implement procedure 02-OHP.4022.013.012
	BO	Manually close S/G #2 PORV
	SRO	Recognize that there is a radioactive release in progress and check reportability requirements per procedure PMP-7030.001.001
	SRO	Trip bistables per attachment B-3 2-PS/526C (Loop 2 to loop 3 press SG2 low) 2-PS/526D (Loop 2 to loop 3 press SG3 low) Refer to Tech Specs 3.3.1.1, 3.3.2.1, & 3.3.3.1 (1hour LCO) Tech Specs 3.3.3.5 & 3.3.3.6 (30 day LCO)
	RO	Monitors primary plant

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 4 Page 1 of ___

Event Description: Malfunction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to 0%

Time	Position	Applicant's Actions or Behavior
	RO	Recognize level transmitter failure: • Pressurizer level indication low • Charging flow increase and QRV-251, 'Charging flow control valve' opens • Letdown isolates by closing QRV-112 at 17% • Pressurizer heaters de-energize
	SRO	Check Tech Specs –3.3.1.1 & 3.3.2.1 (1 hour LCO), Tech Specs 3.3.3.5, 3.3.3.5.1, & 3.3.3.6 (30 day LCO) Implement procedure 02-OHP.4022.013.010, 'Malfunction of Pressurizer Level Instrument'
	RO	Select non-failed channel as the controlling channel • Place PZR level control in manual • Place PZR level CTRL selector switch in channel 2 & 3 position

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __4__ Page _1_ of ___

Event Description: Malfunction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to 0%

Time	Position	Applicant's Actions or Behavior
	RO	Restore letdown per procedure 02-OHP.4021.003.001, section 4.1, 'Re-establishing Normal Letdown' • Place 2-QRV-302, cold letdown path select, in DIVERT • Verify charging >75 gpm • Verify letdown orifice valves closed • Verify CCW from letdown Hx outlet control valve OPEN • Adjust 2-QRV-301, letdown pressure control, to 50% • Open one of the letdown orifice valves • Adjust 2-QRV to maintain a nominal pressure of 160-350 psig • Place 2-QRV-301 in AUTO • Position control switch 2-QRV-303 to AUTO • Null 2-CRV-470 controller and place in AUTO When letdown temperature is stable, then place 2-QRV-302in NORMAL Trip bistables per Attachment 'A' 2-LS/459A 9 (High Level Rx Trip) Hang caution tags on level CTRL selector and level REC selector switch
	BO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 5 Page 1 of ___

Event Description: Malfunction RC11B, 'Reactor coolant pump #2 high vibration'. Increases to 7 mils and then increase to 15 mils

Time	Position	Applicant's Actions or Behavior
	RO	Recognize indications of RCP HI vibration: • Annunciator 207, drop 52, 'RCP VIBRATION HIGH' –LIT
	SRO	Enters procedure 02-OHP.4022.002.001, 'Malfunction of a reactor coolant pump'
	RO	Verify that RCP#2 operating parameters are within limits Recognize indications of RCP HI-HI vibration: • Annunciator 207, Drop 51, 'RCP VIBRATION HI-HI' – LIT
	SRO	Go to step 16 and manually trips the reactor and instruct the RO to trip RCP#2. Transition to 02-OHP.4023.E-0, 'Reactor trip or safety injection'
	Crew	Perform immediate actions
	RO	Trip RCP#2

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: _6, 7, 8 & 9_ Page _1_ of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm. Malfunction (XXXXX), 'East MDAFW throttle valve (FMO-222) will not close from the CR. The West ESW pump does not start in automatic, malfunction SW04B, 'Essential Service Water Pump Trip'. Malfunction RP10A&B, 'Failure of Safety Injection to Actuate-Automatic', SI will actuate manually

Time	Position	Applicant's Actions or Behavior
	RO	(Event 9) Recognize that SI has not actuated and is required per E-0 step and manually initiates SI
	Crew	Recognize SGTR in Step 7.b.3) level in S/G#2 increasing faster that the others and by radiation monitors
	BO	Isolate AFW to affected S/G when level is > 13% • (Event 7) FMO-222 will not close from the Control Room • Either trip the East MDAFW pump or send an AO to manually close the valve
	BO	Recognize that the standby ESW pump did not start in automatic and manually start the pump
	BO	Implement Attachment 'A' of E-0
	RO	Stop RCPs because RCS pressure is < 1300 psig
	SRO	Transition to E-3, 'Steam Generator Tube Rupture'

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __6___ Page _1_ of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Identify Ruptured S/G as #2 by the following indications: • Unexpected rise in #2 narrow range level • High radiation on #2 sample • High radiation from #2 PORV monitor (2-MRA-2701)
	RO	Isolate the ruptured SG: • Adjust the PORV controller setpoint to 1040 psig • Check PORV (2-MRV-223) CLOSED • Close steam supply (2-MCM-221) to TDAFW • Check blowdown (2-DCR-320) and sample valve (2-DCR-302) isolated • Place 2-DRV-407, SG stop valves drain valve in CLOSED • Trip SG stop valve (2-MRV-220) CLOSED • Verify dump valve (2-MRV-221 & 222) CLOSED
	BO	• Isolate feed flow to SG#2 when level is >13%
	RO	Check SG#2 pressure ≯430 psig
	SRO/RO	Initiate RCS Cooldown

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	SRO/RO	Determine core exit temperature required based on SG#2 pressure
	RO	Cooldown the RCS to the agreed temperature using the intact S/Gs at maximum rate: • If condenser available use condenser steam dumps • Use the PORV's from the intact S/Gs if condenser is not available Bypass steam dump low-low T_{AVE} interlock if dumping to condenser Stop the cooldown and maintain the desired RCS temperature
	BO	Reset SI and Containment Isolation Phase A Establish instrument air to containment: • Check control air pressure >85 psig • Open control air to containment valves (2-XCR-100, 101, 102, & 103)
	RO	Stop RHR pumps if RSC pressure is > 300psig Check SG#2 pressure stable of rising

Op-Test No.: 2001301_ Scenario No.: __2__ Event No.: __6___ Page _1_ of ___

Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.

Time	Position	Applicant's Actions or Behavior
	RO	Check RCS subcooling based on core exit TCs > 56° F
	RO	Depressurize RCS to minimize break flow and refill PZR: • If normal spray is available, then spray the PZR • If NOT available us the PORV Depressurize until: • RCS pressure less that SG#2 and PZR level > 19% • PZR level > 72% • RSC subcooling less than 36° F
	Crew	Stabilize plant **TERMINATE SCENARIO**

Facility: DC Cook Scenario No.: 3 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 80% power with the North heater drain pump secured, rods in auto.

Turnover: Maintain power at 80%, START THE NORTH HDP AND SECURE THE ~~MIDDLE~~ MIDDLE HDP.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Swap North and middle heater drain pump
2	NI~~09~~10B	I(RO)	Power range ~~detector~~ CHANNEL (NI-42) fails high
3		R	Power increase to restore power
4	RX23H	I(BO)	Steam generator #3 controlling level channel fails low
5	MS01C	Major	Steam line #3 break inside containment
6	RP03A &B	C(RO)	Reactor trip failure (ATWS)
7	RP09A	C(BO)	Feedwater isolation does not occur in automatic
8	FW48C	C(BO)	TDAFW pump does not start in auto
~~9~~	~~NI01B~~	~~C(RO)~~	~~Source range NI-32 does not automatically re-energize~~ **

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
** Failure not needed and does not contribute to evaluation

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 1 Page 1 of ___

Event Description: Swap North and middle heater drain pumps per procedure 02-OHP.4021.060.014, 'Operation of the Heater Drain Pump', Attachment 3.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct and monitor the BO to remove the middle heater drain pump from service and place the North heater drain pump in service
	BO	Verify the North heater drain pump is pre-warmed Place 2-CRV-252, 4A normal level control, controller in HAND and match the auto setpoint with the auto setpoint of the controller for 2-CRV-253, 4A or 4B normal level control Cycle 2-CRV-252 to ensure proper operation Place 2-CRV-253 controller in HAND Start the North heater drain pump Slowly close 2-CRV-253 WHILE slowly opening 2-CRV-252 to control heater 4A level WHEN 2-CRV-253 is CLOSED, then stop the middle heater drain pump Place 2-CRV-252 controller in AUTO Close 2-LPD-349N, warm-up bypass around2-CRV-255 Open 2-LPD-349M, warm-up bypass around 2-CRV-256
	RO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 2 & 3 Page 1 of ___

Event Description: Malfunction NI09B, 'Power Range Channel N42 Failure', fails to 0.5 milliamps.

Time	Position	Applicant's Actions or Behavior
	RO	Recognize the rods are inserting and takes the rods to MANUAL
	RO	Verify that the AFD is still within the operating band
	SRO	Implement OHP.4022.013.004, 'Power range malfunction'
	RO	Select N42 on the Rod Stop Bypass Selector
	RO/BO	Restore plant to equilibrium conditions REDUCE TURBINE LOAD TO MATCH T_{AVE} - T_{REF} WITHIN 2°F THEN PULL RODS TO MATCH T_{AVE} - T_{REF} (event 3) Remove N42 from service for the following: • Comparator channel defeat • Upper section detector current comparator defeat • Lower section detector current comparator defeat • Power mismatch bypass selector
	BO	Monitor panels
	SRO	Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip bistables)
	STA	Refer to PMI-4031 event #9 for the failed PR detector
	SRO	Trip bistable Per (Attachment B) within an hour of N42 failure • 2-TS/421C, 2-TS/421D (OTΔT trip and runback) • Disconnect plug P312 from jack at rear of 2-N-42 drawer or pull the control and instrument fuses

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 4 Page 1 of ___

Event Description: Malfunction RX23H, 'Steam Generator Level Transmitter (BLP-131) LT-539 Failure' on S/G #3 fails to 0%

Time	Position	Applicant's Actions or Behavior
	BO	Recognize S/G #3 level indicator failure: • LI-539 failed low • S/G water level low alarm • Feed flow increase • Actual S/G level increase Place the S/G level controller 1-FRV-230 in manual
	SRO	Implement 02-OHP.4022.013.013, 'Steam Generator Level Instrument Malfunction' Contact maintenance to trip bistables for failed instrument • 1-LS-539A (Loop 3 Hi-Hi Turbine Trip) • 1-LS-539B (Loop 3 Low-Low Level Rx Trip)
	SRO	Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip the channel), 3.3.2.1 (1 hour LCO to trip the channel), & 3.3.3.5 (restore in 30 days)
	BO	Restore plant to equilibrium conditions
	RO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP03A&B, 'Reactor Trip Failure', fails to trip, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	Crew	(Event 6) Recognize that the reactor did not trip and manually trip the reactor
	SRO	Enter E-0 and perform immediate actions Transition to FR.S-1
	RO	Manually insert control Rods
	BO	Manually actuate AMSAC
	BO	(Event 8) Recognize TDAFW pump is not running and is manually started. • Manually open the FMOs or the MDAFW pumps • Manually close the S/G blowdown isolation valves • Manually close the MDAFW pump test valves
	RO	Initiate Emergency Boration of RCS • Start both boric acid pumps in FAST • OPEN 2-QMO-420 and check > 44gpm flow Isolate Dilution paths Place both primary water pumps in OFF • CLOSE 2-QRV-500, primary water blender valve • Place 2-QRV-500demin bypass, to RC FILTER position

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP01A&B, 'Reactor Trip Failure', fails to trip Auto, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	BO	(Event 7) Recognize that feedwater isolation did not occur, manually close valves FMO-202 and ~~302~~ 203, Feedwater isolation valves
	Crew	Identify S/G #3 as faulted inside containment
	SRO	Recognize that a steam line isolation is required and manually trip closed all steamline isolation valves
	BO	Isolate S/G#3 as follows: • Check or close 2-FRV-230 and 2-FMO-203 (MFW) • Check or close 2-FMO-231 and 2-FMO-232 (AFW) • Check TDAFW steam supply , 2-MCM-231 closed • Check or close S/G blowdown closed, 2-DCR-330 • Check of close S/G sample closed, 2-DCR-303 • Place 2-DRV-407, S/G stop valves drain valve in close • Determine that the S/Gs are not ruptured
	SRO	Transition to E-0 and perform actions
	BO	Implement Attachment A
	SRO	Transition to E-2 'Faulted Steam Generator Isolation' -Note that task has already been accomplished.

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP01A&B, 'Reactor Trip Failure', fails to trip Auto, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	SRO	Transition to 02-OHP.4023.E-1, 'Loss of Reactor Coolant or Secondary Coolant'
		Or 02-OHP.4023.ES-1.1 'SI TERMINATION'
	RO	Reset SI
		Reset containment Phase A
	SRO	Direct Chemistry to sample S/Gs
		TERMINATE THE SCENARIO

Facility: DC Cook Scenario No.: 3 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 80% power with the North heater drain pump secured, rods in auto.

Turnover: Maintain power at 80%

Event No.	Malf. No.	Event Type*	Event Description
1		N	Swap North and middle heater drain pump
2	NI09B	I(RO)	Power range detector (NI-42) fails high
3		R	Power increase to restore power
4	RX23H	I(BO)	Steam generator #3 controlling level channel fails low
5	MS01C	Major	Steam line #3 break inside containment
6	RP03A &B	C(RO)	Reactor trip failure (ATWS)
7	RP09A	C(BO)	Feedwater isolation does not occur in automatic
8	FW48C	C(BO)	TDAFW pump does not start in auto
~~9~~	~~NI01B~~	~~C(RO)~~	~~Source range NI-32 does not automatically re-energize~~ **

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
** Failure not needed and does not contribute to evaluation

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 1 Page 1 of ___

Event Description: Swap North and middle heater drain pumps per procedure 02-OHP.4021.060.014, 'Operation of the Heater Drain Pump', Attachment 3.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct and monitor the BO to remove the middle heater drain pump from service and place the North heater drain pump in service
	BO	Verify the North heater drain pump is pre-warmed Place 2-CRV-252, 4A normal level control, controller in HAND and match the auto setpoint with the auto setpoint of the controller for 2-CRV-253, 4A or 4B normal level control Cycle 2-CRV-252 to ensure proper operation Place 2-CRV-253 controller in HAND Start the North heater drain pump Slowly close 2-CRV-253 WHILE slowly opening 2-CRV-252 to control heater 4A level WHEN 2-CRV-253 is CLOSED, then stop the middle heater drain pump Place 2-CRV-252 controller in AUTO Close 2-LPD-349N, warm-up bypass around2-CRV-255 Open 2-LPD-349M, warm-up bypass around 2-CRV-256
	RO	Monitor panels

Op-Test No.: 2001301_ Scenario No.: __3__ Event No.: __2 & 3___ Page _1_ of ___

Event Description: Malfunction NI09B, 'Power Range Channel N42 Failure', fails to 0.5 milliamps.

Time	Position	Applicant's Actions or Behavior
	RO	Recognize the rods are inserting and takes the rods to MANUAL
	RO	Verify that the AFD is still within the operating band
	SRO	Implement OHP.4022.013.004, 'Power range malfunction'
	RO	Select N42 on the Rod Stop Bypass Selector
	RO/BO	Restore plant to equilibrium conditions Remove N42 from service for the following: • Comparator channel defeat • Upper section detector current comparator defeat • Lower section detector current comparator defeat • Power mismatch bypass selector
	BO	Monitor panels
	SRO	Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip bistables)
	STA	Refer to PMI-4031 event #9 for the failed PR detector
	SRO	Trip bistable Per (Attachment B) within an hour of N42 failure • 2-TS/421C, 2-TS/421D (OTΔT trip and runback) • Disconnect plug P312 from jack at rear of 2-N-42 drawer or pull the control and instrument fuses

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 4 Page 1 of ___

Event Description: Malfunction RX23H, 'Steam Generator Level Transmitter (BLP-131) LT-539 Failure' on S/G #3 fails to 0%

Time	Position	Applicant's Actions or Behavior
	BO	Recognize S/G #3 level indicator failure: • LI-539 failed low • S/G water level low alarm • Feed flow increase • Actual S/G level increase Place the S/G level controller 1-FRV-230 in manual
	SRO	Implement 02-OHP.4022.013.013, 'Steam Generator Level Instrument Malfunction' Contact maintenance to trip bistables for failed instrument • 1-LS-539A (Loop 3 Hi-Hi Turbine Trip) • 1-LS-539B (Loop 3 Low-Low Level Rx Trip)
	SRO	Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip the channel), 3.3.2.1 (1 hour LCO to trip the channel), & 3.3.3.5 (restore in 30 days)
	BO	Restore plant to equilibrium conditions
	RO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP03A&B, 'Reactor Trip Failure', fails to trip, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	Crew	(Event 6) Recognize that the reactor did not trip and manually trip the reactor
	SRO	Enter E-0 and perform immediate actions Transition to FR.S-1
	RO	Manually insert control Rods
	BO	Manually actuate AMSAC
	BO	(Event 8) Recognize TDAFW pump is not running and is manually started. • Manually open the FMOs or the MDAFW pumps • Manually close the S/G blowdown isolation valves • Manually close the MDAFW pump test valves
	RO	Initiate Emergency Boration of RCS • Start both boric acid pumps in FAST • OPEN 2-QMO-420 and check > 44gpm flow Isolate Dilution paths Place both primary water pumps in OFF • CLOSE 2-QRV-500, primary water blender valve • Place 2-QRV-500demin bypass, to RC FILTER position

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP01A&B, 'Reactor Trip Failure', fails to trip Auto, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	BO	(Event 7) Recognize that feedwater isolation did not occur, manually close valves FMO-202 and 302, Feedwater isolation valves
	Crew	Identify S/G #3 as faulted inside containment
	SRO	Recognize that a steam line isolation is required and manually trip closed all steamline isolation valves
	BO	Isolate S/G#3 as follows: • Check or close 2-FRV-230 and 2-FMO-203 (MFW) • Check or close 2-FMO-231 and 2-FMO-232 (AFW) • Check TDAFW steam supply , 2-MCM-231 closed • Check or close S/G blowdown closed, 2-DCR-330 • Check of close S/G sample closed, 2-DCR-303 • Place 2-DRV-407, S/G stop valves drain valve in close • Determine that the S/Gs are not ruptured
	SRO	Transition to E-0 and perform actions
	BO	Implement Attachment A
	SRO	Transition to E-2 'Faulted Steam Generator Isolation' -Note that task has already been accomplished.

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP01A&B, 'Reactor Trip Failure', fails to trip Auto, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	SRO	Transition to 02-OHP.4023.E-1, 'Loss of Reactor Coolant or Secondary Coolant'
	RO	Reset SI Reset containment Phase A
	SRO	Direct Chemistry to sample S/Gs
		TERMINATE THE SCENARIO

Facility: DC Cook Scenario No.: 3 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Initial Conditions: 80% power with the North heater drain pump secured, rods in auto.

Turnover: Maintain power at 80%

Event No.	Malf. No.	Event Type*	Event Description
1		N	Swap North and middle heater drain pump
2	NI09B	I(RO)	Power range detector (NI-42) fails high
3		R	Power increase to restore power
4	RX23H	I(BO)	Steam generator #3 controlling level channel fails low
5	MS01C	Major	Steam line #3 break inside containment
6	RP03A &B	C(RO)	Reactor trip failure (ATWS)
7	RP09A	C(BO)	Feedwater isolation does not occur in automatic
8	FW48C	C(BO)	TDAFW pump does not start in auto
~~9~~	~~NI01B~~	~~C(RO)~~	~~Source range NI-32 does not automatically re-energize~~ **

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
** Failure not needed and does not contribute to evaluation

Op-Test No.: 2001301_ Scenario No.: __3__ Event No.: __1___ Page _1_ of ___

Event Description: Swap North and middle heater drain pumps per procedure 02-OHP.4021.060.014, 'Operation of the Heater Drain Pump', Attachment 3.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct and monitor the BO to remove the middle heater drain pump from service and place the North heater drain pump in service
	BO	Verify the North heater drain pump is pre-warmed Place 2-CRV-252, 4A normal level control, controller in HAND and match the auto setpoint with the auto setpoint of the controller for 2-CRV-253, 4A or 4B normal level control Cycle 2-CRV-252 to ensure proper operation Place 2-CRV-253 controller in HAND Start the North heater drain pump Slowly close 2-CRV-253 WHILE slowly opening 2-CRV-252 to control heater 4A level WHEN 2-CRV-253 is CLOSED, then stop the middle heater drain pump Place 2-CRV-252 controller in AUTO Close 2-LPD-349N, warm-up bypass around2-CRV-255 Open 2-LPD-349M, warm-up bypass around 2-CRV-256
	RO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 2 & 3 Page 1 of ___

Event Description: Malfunction NI09B, 'Power Range Channel N42 Failure', fails to 0.5 milliamps.

Time	Position	Applicant's Actions or Behavior
	RO	Recognize the rods are inserting and takes the rods to MANUAL
	RO	Verify that the AFD is still within the operating band
	SRO	Implement OHP.4022.013.004, 'Power range malfunction'
	RO	Select N42 on the Rod Stop Bypass Selector
	RO/BO	Restore plant to equilibrium conditions Remove N42 from service for the following: • Comparator channel defeat • Upper section detector current comparator defeat • Lower section detector current comparator defeat • Power mismatch bypass selector
	BO	Monitor panels
	SRO	TLS low PZR press. Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip bistables)
	STA	Refer to PMI-4031 event #9 for the failed PR detector
	SRO	Trip bistable Per (Attachment B) within an hour of N42 failure • 2-TS/421C, 2-TS/421D (OTΔT trip and runback) • Disconnect plug P312 from jack at rear of 2-N-42 drawer or pull the control and instrument fuses

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 4 Page 1 of ___

Event Description: Malfunction RX23H, 'Steam Generator Level Transmitter (BLP-131) LT-539 Failure' on S/G #3 fails to 0%

Time	Position	Applicant's Actions or Behavior
	BO	Recognize S/G #3 level indicator failure: • LI-539 failed low • S/G water level low alarm • Feed flow increase • Actual S/G level increase Place the S/G level controller 1-FRV-230 in manual
	SRO	Implement 02-OHP.4022.013.013, 'Steam Generator Level Instrument Malfunction' Contact maintenance to trip bistables for failed instrument • 1-LS-539A (Loop 3 Hi-Hi Turbine Trip) • 1-LS-539B (Loop 3 Low-Low Level Rx Trip)
	SRO	Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip the channel), 3.3.2.1 (1 hour LCO to trip the channel), & 3.3.3.5 (restore in 30 days)
	BO	Restore plant to equilibrium conditions
	RO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP03A&B, 'Reactor Trip Failure', fails to trip, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	Crew	(Event 6) Recognize that the reactor did not trip and manually trip the reactor
	SRO	Enter E-0 and perform immediate actions Transition to FR.S-1
	RO	Manually insert control Rods
	BO	Manually actuate AMSAC
	BO	(Event 8) Recognize TDAFW pump is not running and is manually started. • Manually open the FMOs or the MDAFW pumps • Manually close the S/G blowdown isolation valves • Manually close the MDAFW pump test valves
	RO	Initiate Emergency Boration of RCS • Start both boric acid pumps in FAST • OPEN 2-QMO-420 and check > 44gpm flow Isolate Dilution paths Place both primary water pumps in OFF • CLOSE 2-QRV-500, primary water blender valve • Place 2-QRV-500demin bypass, to RC FILTER position

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP01A&B, 'Reactor Trip Failure', fails to trip Auto, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	BO	(Event 7) Recognize that feedwater isolation did not occur, manually close valves FMO-202 and 302, Feedwater isolation valves
	Crew	Identify S/G #3 as faulted inside containment
	SRO	Recognize that a steam line isolation is required and manually trip closed all steamline isolation valves
	BO	Isolate S/G#3 as follows: • Check or close 2-FRV-230 and 2-FMO-203 (MFW) • Check or close 2-FMO-231 and 2-FMO-232 (AFW) • Check TDAFW steam supply , 2-MCM-231 closed • Check or close S/G blowdown closed, 2-DCR-330 • Check of close S/G sample closed, 2-DCR-303 • Place 2-DRV-407, S/G stop valves drain valve in close • Determine that the S/Gs are not ruptured
	SRO	Transition to E-0 and perform actions
	BO	Implement Attachment A
	SRO	Transition to E-2 'Faulted Steam Generator Isolation' -Note that task has already been accomplished.

PORV 233 closed

→ PORV MRV 233 closed

Op-Test No.: 2001301_ Scenario No.: __3__ Event No.: _5, 6, 7, & 8_ Page _1_ of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP01A&B, 'Reactor Trip Failure', fails to trip Auto, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	SRO	Transition to 02-OHP.4023.E-1, 'Loss of Reactor Coolant or Secondary Coolant'
	RO	Reset SI Reset containment Phase A
	SRO	Direct Chemistry to sample S/Gs
		TERMINATE THE SCENARIO

Facility: DC Cook Scenario No.: 3 Op-Test No.: 2001301

Examiners: _____ Operators: _____

[913]

Initial Conditions: 80% power with the North heater drain pump secured, rods in auto.

Turnover: Maintain power at 80%

Event No.	Malf. No.	Event Type*	Event Description
1		N	Swap North and middle heater drain pump
2	NI09B	I(RO)	Power range detector (NI-42) fails high (100) → B/S
3		R	Power increase to restore power RP - RPR 123
4	RX23H	I(BO)	Steam generator #3 controlling level channel fails low [0] RFP - RPR 124
5	MS01C	Major	Steam line #3 break inside containment (100) RFP RPR066 RFP RPR067
6	RP03A &B	C(RO)	Reactor trip failure (ATWS) → 3 min Delay after Call DMF RP03A/B
7	RP09A	C(BO)	Feedwater isolation does not occur in automatic
8	FW48C	C(BO)	TDAFW pump does not start in auto
~~9~~	~~NI01B~~	~~C(RO)~~	~~Source range NI-32 does not automatically re-energize~~ **

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
** Failure not needed and does not contribute to evaluation

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 1 Page 1 of ___

Event Description: Swap North and middle heater drain pumps per procedure 02-OHP.4021.060.014, 'Operation of the Heater Drain Pump', Attachment 3.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct and monitor the BO to remove the middle heater drain pump from service and place the North heater drain pump in service
	BO	Verify the North heater drain pump is pre-warmed Place 2-CRV-252, 4A normal level control, controller in HAND and match the auto setpoint with the auto setpoint of the controller for 2-CRV-253, 4A or 4B normal level control Cycle 2-CRV-252 to ensure proper operation Place 2-CRV-253 controller in HAND Start the North heater drain pump Slowly close 2-CRV-253 WHILE slowly opening 2-CRV-252 to control heater 4A level WHEN 2-CRV-253 is CLOSED, then stop the middle heater drain pump Place 2-CRV-252 controller in AUTO Close 2-LPD-349N, warm-up bypass around2-CRV-255 Open 2-LPD-349M, warm-up bypass around 2-CRV-256
	RO	Monitor panels

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 2 & 3 Page 1 of ___

Event Description: Malfunction NI09B, 'Power Range Channel N42 Failure', fails to 0.5 milliamps.

Time	Position	Applicant's Actions or Behavior
	RO	Recognize the rods are inserting and takes the rods to MANUAL
	RO	Verify that the AFD is still within the operating band
	SRO	Implement OHP.4022.013.004, 'Power range malfunction'
	RO	Select N42 on the Rod Stop Bypass Selector
	RO/BO	Restore plant to equilibrium conditions Remove N42 from service for the following: • Comparator channel defeat • Upper section detector current comparator defeat • Lower section detector current comparator defeat • Power mismatch bypass selector
	BO	Monitor panels
	SRO	Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip bistables)
	STA	Refer to PMI-4031 event #9 for the failed PR detector
	SRO	Trip bistable Per (Attachment B) within an hour of N42 failure • 2-TS/421C, 2-TS/421D (OTΔT trip and runback) ←2 • Disconnect plug P312 from jack at rear of 2-N-42 drawer or pull the control and instrument fuses

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 4 Page 1 of ___

Event Description: Malfunction RX23H, 'Steam Generator Level Transmitter (BLP-131) LT-539 Failure' on S/G #3 fails to 0%

Time	Position	Applicant's Actions or Behavior
	BO	Recognize S/G #3 level indicator failure: • LI-539 failed low • S/G water level low alarm • Feed flow increase • Actual S/G level increase Place the S/G level controller 1-FRV-230 in manual
	SRO	Implement 02-OHP.4022.013.013, 'Steam Generator Level Instrument Malfunction' Contact maintenance to trip bistables for failed instrument • 1-LS-539A (Loop 3 Hi-Hi Turbine Trip) • 1-LS-539B (Loop 3 Low-Low Level Rx Trip)
	SRO	Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip the channel), 3.3.2.1 (1 hour LCO to trip the channel), & 3.3.3.5 (restore in 30 days)
	BO	Restore plant to equilibrium conditions
	RO	Monitor panels

Op-Test No.: 2001301_ Scenario No.: __3__ Event No.: _5, 6, 7, & 8__ Page _1_ of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP03A&B, 'Reactor Trip Failure', fails to trip, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	Crew	(Event 6) Recognize that the reactor did not trip and manually trip the reactor
	SRO	Enter E-0 and perform immediate actions Transition to FR.S-1
	RO	Manually insert control Rods
	BO	Manually actuate AMSAC
	BO	(Event 8) Recognize TDAFW pump is not running and is manually started. • Manually open the FMOs or the MDAFW pumps • Manually close the S/G blowdown isolation valves • Manually close the MDAFW pump test valves
	RO	Initiate Emergency Boration of RCS • Start both boric acid pumps in FAST • OPEN 2-QMO-420 and check > 44gpm flow Isolate Dilution paths Place both primary water pumps in OFF • CLOSE 2-QRV-500, primary water blender valve • Place 2-QRV-500demin bypass, to RC FILTER position

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP01A&B, 'Reactor Trip Failure', fails to trip Auto, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	BO	(Event 7) Recognize that feedwater isolation did not occur, manually close valves FMO-201 and ~~302~~ 209; Feedwater isolation valves
	Crew	Identify S/G #3 as faulted inside containment
	SRO	Recognize that a steam line isolation is required and manually trip closed all steamline isolation valves
	BO	Isolate S/G#3 as follows: • Check or close 2-FRV-230 and 2-FMO-203 (MFW) • Check or close 2-FMO-231 and 2-FMO-232 (AFW) • Check TDAFW steam supply , 2-MCM-231 closed • Check or close S/G blowdown closed, 2-DCR-330 • Check of close S/G sample closed, 2-DCR-303 • Place 2-DRV-407, S/G stop valves drain valve in close • Determine that the S/Gs are not ruptured
	SRO	Transition to E-0 and perform actions
	BO	Implement Attachment A
	SRO	Transition to E-2 'Faulted Steam Generator Isolation' -Note that task has already been accomplished.

Op-Test No.: 2001301 Scenario No.: 3 Event No.: 5, 6, 7, & 8 Page 1 of ___

Event Description: Malfunction MS01C, 'Main Steam Line Break at Steam Generator Exit Before Flow Restrictor' at 100%, malfunction RP01A&B, 'Reactor Trip Failure', fails to trip Auto, malfunction RP09A, 'Failure of Feedwater Isolation Train A Trip to Occur', malfunction FW48C, 'TDAFW Pump Auto Start Failure' it will start in manual

Time	Position	Applicant's Actions or Behavior
	SRO	Transition to 02-OHP.4023.E-1, 'Loss of Reactor Coolant or Secondary Coolant'
	RO	Reset SI Reset containment Phase A
	SRO	Direct Chemistry to sample S/Gs
		TERMINATE THE SCENARIO

Facility: DC Cook Scenario No.: 4 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-921] 49% Power BOL, EMFP, MSRs ~~OUT~~, Xe ~~increasing~~. ~~Reserve AC power supply Transformer TR201AB is out of service for replacement of contaminated oil. Entered T.S. 3.8.1.1 about 8 hours ago. [IMF ED03A] {TAGOUT BKRs 12AB, 2A5 CS, and 2B4 CS – RF EDR11 RO and RF EDR13 RO}~~ West CCP out of service for seal replacement. Entered T.S. 3.5.2 about 12 hours ago.

Turnover: Power escalation in progress to 100%. Ready to place the West MFW pump in service. ~~Reserve Transformer TR201AB is out of service for oil replacement and expected back within 12 hours. T.S. surveillance 4.8.1.1.1.a to verify offsite power was done one hour ago.~~ Currently perform Step 4.63 of 02-OHP 4021.001.006, Power Escalation. ~~Performance of Step 4.53 will NOT be required, therefore N/A~~ step 4.61.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Power Escalation to 100% / Start West MFW pump {Perform Step 4.6.1}
2		R	Positive Reactivity change while diluting the RCS to maintain Tavg - Tref
3	RX19A [120]	I(RO)	Turbine impulse pressure instrument (MPC-253) fails HIGH
5	RX29 [1400]	I(BO)	Main feedwater discharge pressure (FPC-250) fails HIGH
4	RX11B [50]	C(BO)	SG #22 PORV controller fails OPEN (50%)
6	RC10B [20] RP10A/B	Major I(RO)	Small Break LOCA in containment (NO auto SI) – {400 gpm with 5 min ramp}
7	TC03	C(BO)	Main turbine fails to trip in automatic
8	~~RD0439~~ RD0414	~~C(RO)~~	TWO rods fail to drop (H14, G13)
9	CV13A	C(RO)	East CCP trips on overcurrent {NO CCP capability}

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

Op-Test No.: _____ Scenario No.: __4___ Event No.: __1/2__ Page _2_ of _9_
Event Description: Power increase to 100%; Start the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.006, Power Escalation, at step 4.63 ~~(Step 4.64 is complete)~~ • Raise power to approx. 60% and hold. • Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by diluting the RCS or raising control rods.
	BOP	Place the West MFW pump in service using Attachment 4 of 02-OHP 4021.055.003, at Step 4.6.12.

Op-Test No.: _____ Scenario No.: __4___ Event No.: __3__ Page _3_ of _9__

Event Description: Turbine impulse pressure instrument (MPC-253) fails HIGH

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis Failure => Rods move OUT in AUTO; Tref indicates HIGH ANN – Panel 211 Drop 20: Tave LO: Tave < Tref deviation
	SRO	Direct action per 02-OHP 4024.211 and 02-OHP 4022.013.016 Rod Control to MANUAL. AMSAC Bypass/Test switch in BYPASS/TEST. Steam Dump control in OFF. Verify compliance with T.S. 3.3.2.1 action: • Trip B/S within one hour. Trip bistables for 2-MPC-253.
	RO	Place Rod Control bank selector switch in MANUAL. Restore Tave to normal band. Place AMSAC Bypass/Test switch in BYPASS/TEST. Place Steam Dump control switch in OFF.
	BOP	Monitor secondary plant conditions. Perform actions as directed by the US: • Verify Bistable tripping on 2-SML-19E and 2-SML-17 • Hang Caution Tags on AMSAC and Steam Dump

Op-Test No.: _____ Scenario No.: __4___ Event No.: __4__ Page _4_ of _9__

Event Description: Main feedwater discharge pressure (FPC-250) fails HIGH

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Lowering MFP speed and SG level ANN – Panel 213 Drop 3/33: SG 1-2 Water Level LOW Dev. ANN - Panel 214 Drop 3/33: SG 3-4 Water level LOW Dev.
	SRO	Direct actions per Alarm Response Procedure Verify a Steam flow and Feed flow mismatch. Direct manual control of SG level controller, as required.
	BOP	Take MANUAL control of MFP Master Controller and stabalize unit. Verify SG water level control is maintaining programmed level.
	RO	Monitor primary plant conditions. Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __4___ Event No.: __5__ Page _5_ of _9__

Event Description: Steam Generator #22 PORV controller fails OPEN [50%]

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis event => Steam Flow/Feed Flow mismatch on #22 SG; Rods moving OUT in AUTO ANN – Panel 214 Drop 22: 2-MRV-223 OP or HSD2 Panel OVRD
	SRO	Direct actions per Annunciator Response Procedure Verify MRV-223 is CLOSED. Enter T.S. 3.3.3.1 Table 3.3-6 actions: • Declare Rad Monitor MRA-2701 Inoperable – 7 day LCO
	BOP	Take MANUAL control of MRV-223 and CLOSE the valve. Monitor SG levels and restore to normal band, as required.
	RO	Monitor primary plant parameters. Take action as directed by the US.

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _6_ of _9__

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of High Head Injection capability – East CCP trips.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => PZR level lowering / Charging flow rising ANN – Panel 208 Drop 4: PZR Level LOW Deviation Faillure of the Main Turbine to trip in AUTO. Failure of TWO control rod to insert.
	SRO	Direct actions per 02-OHP 4022.002.020 • Adjust Charging Flow to maintain 6 gpm to 12 gpm RCP seal injection • Isolate Letdown • Start Second CCP Enter T.S. 3.4.6.2 – Excessive RCS Leakage MANUAL reactor and MANUAL SI Enter 02-OHP 4023 E-0, Reactor Trip or Safety Injection
	RO	Adjust charging flow to maintain RCP seal injection Isolate Letdown Manually trip the reactor Manually insert SI
	BOP	Monitor Secondary parameters. Manually trip the turbine

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _7_ of _9__

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Action (Steps 1 – 4) Acknowledge MANUAL turbine trip required Continue in E-0 actions
	RO	Perform MANUAL Reactor Trip Report TWO stuck out rods [H14, G13] Perform MANUAL SI actuation Perform actions as directed by US:
	BOP	Perform MANUAL Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by US:

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _8_ of _9_

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-0: Verify operator actions Implement Attachment A Verify RCS is NOT Intact (Step 23) Transition to E-1, Loss of Reactor or Secondary Coolant. Direct actions per 02-OHP 4023.E-1: OK AT 1300 PSIG ~~Verify RCPs are stopped (tripped automatically)~~ Verify adequate RCS subcooling (> 36°F) Verify CTS pumps NOT running Verify EDGs should be STOPPED Direct Chemistry to initate Post Accident Sampling Transition to ES-1.2, Post LOCA C/D and Depressurization.
	RO/BOP	Perform actions as directed by the US: Stop the running EDGs

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _9_ of _9_

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.ES-1.2: Verify SI Reset and Phase A/B Reset Verify Control Air Established to Containment Initiate RCS cooldown to Cold Shutdown condition ~~Perform RCS depressurization to refill PZR~~ DEENERGIZE PZR HTRS
	RO	Perform actions as directed by the US: Reset SI and Phase A/B Monitor RCS Cooldown rate (< 100°F per hour)
	BOP	Perform actions as directed by the US: Establish Control Air to the Containment Establish RCS Cooldown using Steam Dumps **TERMINATE Scenario after establishment of C/D.**

Facility: DC Cook Scenario No.: 4 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-921] 49% Power BOL, EMFP, MSRs ~~OUT~~ Press weight, Xe Increasing. Reserve AC power supply Transformer TR201AB is out of service for replacement of contaminated oil. Entered T.S. 3.8.1.1 about 8 hours ago. [IMF ED03A] {TAGOUT BKRs 12AB, 2A5 CS, and 2B4 CS – RF EDR11 RO and RF EDR13 RO} West CCP out of service for seal replacement. Entered T.S. 3.5.2 about 12 hours ago.

Turnover: Power escalation in progress to 100%. Ready to place the West MFW pump in service. ~~Reserve Transformer TR201AB is out of service for oil replacement and expected back within 12 hours. T.S. surveillance 4.8.1.1.1.a to verify offsite power was done one hour ago.~~ Currently perform Step 4.63 of 02-OHP 4021.001.006, Power Escalation. Performance of Step 4.53 will NOT be required, therefore N/A step 4.61.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Power Escalation to 100% / Start West MFW pump {Perform Step 4.6.16}
2		R	Positive Reactivity change while diluting the RCS to maintain Tavg - Tref
3	RX19A [120]	I(RO)	Turbine impulse pressure instrument (MPC-253) fails HIGH (B/S → See Sheet)
4	RX29 [1400]	I(BO)	Main feedwater discharge pressure (FPC-250) fails HIGH Ramp 3:00 mins
5	RX11B [50]	C(BO)	SG #22 PORV controller fails OPEN (50%)
6	RC10B [20] RP10A/B	Major I(RO)	Small Break LOCA in containment (NO auto SI) – {400 gpm with 5 min ramp}
7	TC03	C(BO)	Main turbine fails to trip in automatic
8	RD0439 RD0414	C(RO)	TWO rods fail to drop (H14, G13)
9	CV13A	C(RO)	East CCP trips on overcurrent {NO CCP capability}

Preset → RP10A/B
Preset
Preset
Preset

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

YFXCVR17 0 2DI101CLPV

Op-Test No.: _____ Scenario No.: __4___ Event No.: __1/2__ Page _2_ of _9_
Event Description: Power increase to 100%; Start the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.006, Power Escalation, at step 4.63 (Step 4.64 is complete) • Raise power to approx. 60% and hold. • Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by diluting the RCS or raising control rods.
	BOP	Place the West MFW pump in service using Attachment 4 of 02-OHP 4021.055.003, at Step 4.6.12.

Op-Test No.: _____ Scenario No.: __4___ Event No.: __3__ Page _3_ of _9__

Event Description: Turbine impulse pressure instrument (MPC-253) fails HIGH

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis Failure => Rods move OUT in AUTO; Tref indicates HIGH ANN – Panel 211 Drop 20: Tave LO: Tave < Tref deviation
	SRO	Direct action per 02-OHP 4024.211 and 02-OHP 4022.013.016 Rod Control to MANUAL. AMSAC Bypass/Test switch in BYPASS/TEST. Steam Dump control in OFF. Verify compliance with T.S. 3.3.2.1 action: • Trip B/S within one hour. Trip bistables for 2-MPC-253. FS-512B – RPR Ø21 FS-522B – RPR Ø27 PS-505A – RXR Ø1 PS-505C – RXR Ø3
	RO	Place Rod Control bank selector switch in MANUAL. Restore Tave to normal band. Place AMSAC Bypass/Test switch in BYPASS/TEST. Place Steam Dump control switch in OFF.
	BOP	Monitor secondary plant conditions. Perform actions as directed by the US: • Verify Bistable tripping on 2-SML-19E and 2-SML-17 • Hang Caution Tags on AMSAC and Steam Dump

Op-Test No.: _____ Scenario No.: __4___ Event No.: __4__ Page _4_ of _9__

Event Description: Main feedwater discharge pressure (FPC-250) fails HIGH

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Lowering MFP speed and SG level ANN – Panel 213 Drop 3/33: SG 1-2 Water Level LOW Dev. ANN - Panel 214 Drop 3/33: SG 3-4 Water level LOW Dev.
	SRO	Direct actions per Alarm Response Procedure Verify a Steam flow and Feed flow mismatch. Direct manual control of SG level controller, as required.
	BOP	Take MANUAL control of MFP Master Controller and stabalize unit. Verify SG water level control is maintaining programmed level.
	RO	Monitor primary plant conditions. Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __4___ Event No.: __5__ Page _5_ of _9__

Event Description: Steam Generator #22 PORV controller fails OPEN [50%]

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis event => Steam Flow/Feed Flow mismatch on #22 SG; Rods moving OUT in AUTO ANN – Panel 214 Drop 22: 2-MRV-223 OP or HSD2 Panel OVRD
	SRO	Direct actions per Annunciator Response Procedure Verify MRV-223 is CLOSED. Enter T.S. 3.3.3.1 Table 3.3-6 actions: • Declare Rad Monitor MRA-2701 Inoperable – 7 day LCO
	BOP	Take MANUAL control of MRV-223 and CLOSE the valve. Monitor SG levels and restore to normal band, as required.
	RO	Monitor primary plant parameters. Take action as directed by the US.

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _6_ of _9__

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of High Head Injection capability – East CCP trips.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => PZR level lowering / Charging flow rising ANN – Panel 208 Drop 4: PZR Level LOW Deviation Faillure of the Main Turbine to trip in AUTO. Failure of TWO control rod to insert.
	SRO	Direct actions per 02-OHP 4022.002.020 • Adjust Charging Flow to maintain 6 gpm to 12 gpm RCP seal injection • Isolate Letdown • Start Second CCP Enter T.S. 3.4.6.2 – Excessive RCS Leakage MANUAL reactor and MANUAL SI Enter 02-OHP 4023 E-0, Reactor Trip or Safety Injection
	RO	Adjust charging flow to maintain RCP seal injection Isolate Letdown Manually trip the reactor Manually insert SI
	BOP	Monitor Secondary parameters. Manually trip the turbine

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _7_ of _9__

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Action (Steps 1 – 4) Acknowledge MANUAL turbine trip required Continue in E-0 actions
	RO	Perform MANUAL Reactor Trip Report TWO stuck out rods [H14, G13] Perform MANUAL SI actuation Perform actions as directed by US:
	BOP	Perform MANUAL Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by US:

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _8_ of _9_

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-0: Verify operator actions Implement Attachment A Verify RCS is NOT Intact (Step 23) Transition to E-1, Loss of Reactor or Secondary Coolant. Direct actions per 02-OHP 4023.E-1: Verify RCPs are stopped (tripped automatically} Verify adequate RCS subcooling (> 36°F) Verify CTS pumps NOT running Verify EDGs should be STOPPED Direct Chemistry to initate Post Accident Sampling Transition to ES-1.2, Post LOCA C/D and Depressurization.
	RO/BOP	Perform actions as directed by the US: Stop the running EDGs

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _9_ of _9_

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.ES-1.2: Verify SI Reset and Phase A/B Reset Verify Control Air Established to Containment Initiate RCS cooldown to Cold Shutdown condition Perform RCS depressurization to refill PZR
	RO	Perform actions as directed by the US: Reset SI and Phase A/B Monitor RCS Cooldown rate (< 100°F per hour)
	BOP	Perform actions as directed by the US: Establish Control Air to the Containment Establish RCS Cooldown using Steam Dumps
		TERMINATE Scenario after establishment of C/D.

Facility: DC Cook Scenario No.: 4 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-921] 49% Power BOL, EMFP, MSRs OUT, Xe Increasing. ~~Reserve AC power supply Transformer TR201AB is out of service for replacement of contaminated oil.~~ Entered T.S. 3.8.1.1 about 8 hours ago. [IMF ED03A] {TAGOUT BKRs 12AB, 2A5 CS, and 2B4 CS – RF EDR11 RO and RF EDR13 RO} West CCP out of service for seal replacement. Entered T.S. 3.5.2 about 12 hours ago.

Turnover: Power escalation in progress to 100%. Ready to place the West MFW pump in service. ~~Reserve Transformer TR201AB is out of service for oil replacement and expected back within 12 hours. T.S. surveillance 4.8.1.1.1.a to verify offsite power was done one hour ago.~~ Currently perform Step 4.63 of 02-OHP 4021.001.006, Power Escalation. Performance of Step 4.53 will NOT be required, therefore N/A step 4.61.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Power Escalation to 100% / Start West MFW pump {Perform Step 4.6.16}
2		R	Positive Reactivity change while diluting the RCS to maintain Tavg - Tref
3	RX19A [120]	I(RO)	Turbine impulse pressure instrument (MPC-253) fails HIGH
4	RX29 [1400]	I(BO)	Main feedwater discharge pressure (FPC-250) fails HIGH
5	RX11B [50]	C(BO)	SG #22 PORV controller fails OPEN (50%)
6	RC10B [20] RP10A/B	Major I(RO)	Small Break LOCA in containment (NO auto SI) – {400 gpm with 5 min ramp}
7	TC03	C(BO)	Main turbine fails to trip in automatic
8	RD0439 RD0414	C(RO)	TWO rods fail to drop (H14, G13)
9	CV13A	C(RO)	East CCP trips on overcurrent {NO CCP capability}

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

Op-Test No.: _____ Scenario No.: __4___ Event No.: __1/2__ Page _2_ of _9_
Event Description: Power increase to 100%; Start the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.006, Power Escalation, at step 4.63 (Step 4.64 is complete) • Raise power to approx. 60% and hold. • Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by diluting the RCS or raising control rods.
	BOP	Place the West MFW pump in service using Attachment 4 of 02-OHP 4021.055.003, at Step 4.6.12.

Op-Test No.: _____ Scenario No.: __4___ Event No.: __3__ Page _3_ of _9__

Event Description: Turbine impulse pressure instrument (MPC-253) fails HIGH

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis Failure => Rods move OUT in AUTO; Tref indicates HIGH ANN – Panel 211 Drop 20: Tave LO: Tave < Tref deviation
	SRO	Direct action per 02-OHP 4024.211 and 02-OHP 4022.013.016 Rod Control to MANUAL. AMSAC Bypass/Test switch in BYPASS/TEST. Steam Dump control in OFF. Verify compliance with T.S. 3.3.2.1 action: • Trip B/S within one hour. Trip bistables for 2-MPC-253.
	RO	Place Rod Control bank selector switch in MANUAL. Restore Tave to normal band. Place AMSAC Bypass/Test switch in BYPASS/TEST. Place Steam Dump control switch in OFF.
	BOP	Monitor secondary plant conditions. Perform actions as directed by the US: • Verify Bistable tripping on 2-SML-19E and 2-SML-17 • Hang Caution Tags on AMSAC and Steam Dump

Op-Test No.: _____ Scenario No.: __4___ Event No.: __4__ Page _4_ of _9__

Event Description: Main feedwater discharge pressure (FPC-250) fails HIGH

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Lowering MFP speed and SG level ANN – Panel 213 Drop 3/33: SG 1-2 Water Level LOW Dev. ANN - Panel 214 Drop 3/33: SG 3-4 Water level LOW Dev.
	SRO	Direct actions per Alarm Response Procedure Verify a Steam flow and Feed flow mismatch. Direct manual control of SG level controller, as required.
	BOP	Take MANUAL control of MFP Master Controller and stabalize unit. Verify SG water level control is maintaining programmed level.
	RO	Monitor primary plant conditions. Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __4___ Event No.: __5__ Page _5_ of _9__

Event Description: Steam Generator #22 PORV controller fails OPEN [50%]

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis event => Steam Flow/Feed Flow mismatch on #22 SG; Rods moving OUT in AUTO ANN – Panel 214 Drop 22: 2-MRV-223 OP or HSD2 Panel OVRD
	SRO	Direct actions per Annunciator Response Procedure Verify MRV-223 is CLOSED. Enter T.S. 3.3.3.1 Table 3.3-6 actions: • Declare Rad Monitor MRA-2701 Inoperable – 7 day LCO
	BOP	Take MANUAL control of MRV-223 and CLOSE the valve. Monitor SG levels and restore to normal band, as required.
	RO	Monitor primary plant parameters. Take action as directed by the US.

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _6_ of _9__

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of High Head Injection capability – East CCP trips.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => PZR level lowering / Charging flow rising ANN – Panel 208 Drop 4: PZR Level LOW Deviation Faillure of the Main Turbine to trip in AUTO. Failure of TWO control rod to insert.
	SRO	Direct actions per 02-OHP 4022.002.020 • Adjust Charging Flow to maintain 6 gpm to 12 gpm RCP seal injection • Isolate Letdown • Start Second CCP Enter T.S. 3.4.6.2 – Excessive RCS Leakage MANUAL reactor and MANUAL SI Enter 02-OHP 4023 E-0, Reactor Trip or Safety Injection
	RO	Adjust charging flow to maintain RCP seal injection Isolate Letdown Manually trip the reactor Manually insert SI
	BOP	Monitor Secondary parameters. Manually trip the turbine

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _7_ of _9__

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Action (Steps 1 – 4) Acknowledge MANUAL turbine trip required Continue in E-0 actions
	RO	Perform MANUAL Reactor Trip Report TWO stuck out rods [H14, G13] Perform MANUAL SI actuation Perform actions as directed by US:
	BOP	Perform MANUAL Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by US:

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _8_ of _9_

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck ~~out requiring emergency boration per 02-OHP 4023.ES-0.1 Step~~ 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-0: Verify operator actions Implement Attachment A Verify RCS is NOT Intact (Step 23) Transition to E-1, Loss of Reactor or Secondary Coolant. Direct actions per 02-OHP 4023.E-1: ~~Verify~~ Stop when RCS press < 1300 psig RCPs are ~~stopped (tripped automatically)~~ Verify adequate RCS subcooling (> 36°F) Verify CTS pumps NOT running Verify EDGs should be STOPPED Direct Chemistry to initate Post Accident Sampling Transition to ES-1.2, Post LOCA C/D and Depressurization.
	RO/BOP	Perform actions as directed by the US: Stop the running EDGs

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _9_ of _9_

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.ES-1.2: Verify SI Reset and Phase A/B Reset Verify Control Air Established to Containment Initiate ~~RCS cooldown to Cold Shutdown~~ condition ~~Perform~~ RCS depressurization to refill PZR delete PZR HTRS
	RO	Perform actions as directed by the US: Reset SI and Phase A/B Monitor RCS Cooldown rate (< 100°F per hour)
	BOP	Perform actions as directed by the US: Establish Control Air to the Containment Establish RCS Cooldown using Steam Dumps **TERMINATE Scenario after establishment of C/D.**

Facility: DC Cook Scenario No.: 4 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-921] 49% Power BOL, EMFP, MSRs OUT, Xe Increasing. Reserve AC power supply Transformer TR201AB is out of service for replacement of contaminated oil. Entered T.S. 3.8.1.1 about 8 hours ago. [IMF ED03A] {TAGOUT BKRs 12AB, 2A5 CS, and 2B4 CS – RF EDR11 RO and RF EDR13 RO} West CCP out of service for seal replacement. Entered T.S. 3.5.2 about 12 hours ago.

Turnover: Power escalation in progress to 100%. Ready to place the West MFW pump in service. Reserve Transformer TR201AB is out of service for oil replacement and expected back within 12 hours. T.S. surveillance 4.8.1.1.1.a to verify offsite power was done one hour ago. Currently perform Step 4.63 of 02-OHP 4021.001.006, Power Escalation. Performance of Step 4.53 will NOT be required, therefore N/A step 4.61.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Power Escalation to 100% / Start West MFW pump {Perform Step 4.6.16}
2		R	Positive Reactivity change while diluting the RCS to maintain Tavg - Tref
3	RX19A [120]	I(RO)	Turbine impulse pressure instrument (MPC-253) fails HIGH
4	RX29 [1400]	I(BO)	Main feedwater discharge pressure (FPC-250) fails HIGH
5	RX11B [50]	C(BO)	SG #22 PORV controller fails OPEN (50%)
6	RC10B [20] RP10A/B	Major I(RO)	Small Break LOCA in containment (NO auto SI) – {400 gpm with 5 min ramp}
7	TC03	C(BO)	Main turbine fails to trip in automatic
8	RD0439 RD0414	C(RO)	TWO rods fail to drop (H14, G13)
9	CV13A	C(RO)	East CCP trips on overcurrent {NO CCP capability}

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

Op-Test No.: _____ Scenario No.: __4___ Event No.: __1/2__ Page _2_ of _9_
Event Description: Power increase to 100%; Start the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.006, Power Escalation, at step 4.63 (Step 4.64 is complete) • Raise power to approx. 60% and hold. • Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by diluting the RCS or raising control rods.
	BOP	Place the West MFW pump in service using Attachment 4 of 02-OHP 4021.055.003, at Step 4.6.12.

Op-Test No.: _____ Scenario No.: __4___ Event No.: __3__ Page _3_ of _9__

Event Description: Turbine impulse pressure instrument (MPC-253) fails HIGH

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis Failure => Rods move OUT in AUTO; Tref indicates HIGH ANN – Panel 211 Drop 20: Tave LO: Tave < Tref deviation
	SRO	Direct action per 02-OHP 4024.211 and 02-OHP 4022.013.016 Rod Control to MANUAL. AMSAC Bypass/Test switch in BYPASS/TEST. Steam Dump control in OFF. Verify compliance with T.S. 3.3.2.1 action: • Trip B/S within one hour. Trip bistables for 2-MPC-253.
	RO	Place Rod Control bank selector switch in MANUAL. Restore Tave to normal band. Place AMSAC Bypass/Test switch in BYPASS/TEST. Place Steam Dump control switch in OFF.
	BOP	Monitor secondary plant conditions. Perform actions as directed by the US: • Verify Bistable tripping on 2-SML-19E and 2-SML-17 • Hang Caution Tags on AMSAC and Steam Dump

Op-Test No.: _____ Scenario No.: __4___ Event No.: __4__ Page _4_ of _9__

Event Description: Main feedwater discharge pressure (FPC-250) fails HIGH

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Lowering MFP speed and SG level ANN – Panel 213 Drop 3/33: SG 1-2 Water Level LOW Dev. ANN - Panel 214 Drop 3/33: SG 3-4 Water level LOW Dev.
	SRO	Direct actions per Alarm Response Procedure Verify a Steam flow and Feed flow mismatch. Direct manual control of SG level controller, as required.
	BOP	Take MANUAL control of MFP Master Controller and stabalize unit. Verify SG water level control is maintaining programmed level.
	RO	Monitor primary plant conditions. Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __4___ Event No.: __5__ Page _5_ of _9__

Event Description: Steam Generator #22 PORV controller fails OPEN [50%]

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis event => Steam Flow/Feed Flow mismatch on #22 SG; Rods moving OUT in AUTO ANN – Panel 214 Drop 22: 2-MRV-223 OP or HSD2 Panel OVRD
	SRO	Direct actions per Annunciator Response Procedure Verify MRV-223 is CLOSED. Enter T.S. 3.3.3.1 Table 3.3-6 actions: • Declare Rad Monitor MRA-2701 Inoperable – 7 day LCO
	BOP	Take MANUAL control of MRV-223 and CLOSE the valve. Monitor SG levels and restore to normal band, as required.
	RO	Monitor primary plant parameters. Take action as directed by the US.

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _6_ of _9__

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of High Head Injection capability – East CCP trips.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => PZR level lowering / Charging flow rising ANN – Panel 208 Drop 4: PZR Level LOW Deviation Faillure of the Main Turbine to trip in AUTO. Failure of TWO control rod to insert.
	SRO	Direct actions per 02-OHP 4022.002.020 • Adjust Charging Flow to maintain 6 gpm to 12 gpm RCP seal injection • Isolate Letdown • Start Second CCP Enter T.S. 3.4.6.2 – Excessive RCS Leakage MANUAL reactor and MANUAL SI Enter 02-OHP 4023 E-0, Reactor Trip or Safety Injection
	RO	Adjust charging flow to maintain RCP seal injection Isolate Letdown Manually trip the reactor Manually insert SI
	BOP	Monitor Secondary parameters. Manually trip the turbine

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _7_ of _9__

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Action (Steps 1 – 4) Acknowledge MANUAL turbine trip required Continue in E-0 actions
	RO	Perform MANUAL Reactor Trip Report TWO stuck out rods [H14, G13] Perform MANUAL SI actuation Perform actions as directed by US:
	BOP	Perform MANUAL Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by US:

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _8_ of _9_

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-0: Verify operator actions Implement Attachment A Verify RCS is NOT Intact (Step 23) Transition to E-1, Loss of Reactor or Secondary Coolant. Direct actions per 02-OHP 4023.E-1: Verify RCPs are stopped (tripped automatically) Verify adequate RCS subcooling (> 36°F) Verify CTS pumps NOT running Verify EDGs should be STOPPED Direct Chemistry to initate Post Accident Sampling Transition to ES-1.2, Post LOCA C/D and Depressurization.
	RO/BOP	Perform actions as directed by the US: Stop the running EDGs

Op-Test No.: _____ Scenario No.: __4__ Event No.: _6/7/8__ Page _9_ of _9_

Event Description: Small Break LOCA in containment with NO auto SI available. Reactor trip required. Failure of the Main Turbine to AUTO trip. TWO control rods are stuck out requiring emergency boration per 02-OHP 4023.ES-0.1 Step 6, IAW 02-OHP 4021.005.007. Loss of East CCP due to an overload trip.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.ES-1.2: Verify SI Reset and Phase A/B Reset Verify Control Air Established to Containment Initiate RCS cooldown to Cold Shutdown condition Perform RCS depressurization to refill PZR
	RO	Perform actions as directed by the US: Reset SI and Phase A/B Monitor RCS Cooldown rate (< 100°F per hour)
	BOP	Perform actions as directed by the US: Establish Control Air to the Containment Establish RCS Cooldown using Steam Dumps
		TERMINATE Scenario after establishment of C/D.

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

Facility: DC Cook Scenario No.: 5 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-922] 55% Power, ~~E~~OL, Xe ~~Increasing.~~ M equal. Power reduction in progress. Blend in Line for CVCS

Turnover: Unit is stable at 55% power and continuing a power reduction to take the unit off line. All preparations have been completed to take the West MFW pump off line per 02-OHP 4021.055.004. Currently performing Step 4.9.2 of 02-OHP 4021.001.003, Power Reduction. ATT 2

Event No.	Malf. No.	Event Type*	Event Description
1		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
2		N	Power Reduction to 0% / Stop West MFW pump
3	CV16A [0]	I(RO)	VCT level instrument (QLC-451) fails LOW (5% indicated)
4	RX20G [0]	I(BO)	Steam flow channel (MFC-140)fails LOW (Controlling) [5 sec Ramp]
5	~~RC17C [10]~~ RFP RCRM [10]	C(RO)	Pressurizer PORV (NRV-153) leaking (requires isolation) – ~~5% open {ORV Panel 208 Drop 23 OFF}~~
6	~~OVR~~ RC16 [100]	C(RO)	~~PORV Block valve begins to leak (Rx trip required) [ZLO101NMO153{RED} OFF / {GRN} ON // ZLI101NMO153 OPEN]~~
E6 → 7	RC23D [60]	Major	Steam Generator #4 tube rupture (600 gpm {60%} – ramp over 300 sec)
E6 → 8	MS06D [80]	C(BO)	Steam Generator safety valve (SV2B-4) opens – 80%
	~~(E6)~~		

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

ISD ⇒ RCVNMO153 / RCV URV153 SET = .1

Op-Test No.: _____ Scenario No.: _5__ Event No.: __1 / 2__ Page _2_ of ___

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction. • Lower power to approx. 30% and hold. • Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.
	RO	Maintain Tave – Tref mismatch within band (+ 1.0) by borating the RCS or raising control rods.
	BOP	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: __5__ Event No.: __3__ Page _3_ of ___

Event Description: VCT level instrument (QLC-451) fails LOW

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => QLC-451 level at 5% ANN – Panel 209 Drop 49: VCT Level Low
	SRO	Direct actions per 02-OHP 4022.013.017 Verify QLC-451 failed low Enter T.S. 3.1.2.2 action – One hour to trip B/S Perform Att A to trip Bistables
	RO	Secure Auto MAKEUP mode Maintain VCT level (452) > 14% with manual Makeup • Verify Bistable LS-112B is tripped (No Trip => Fail to 0%)
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __4__ Page _4_ of ___

Event Description: Steam flow channel (MFC-140) fails LOW (Controlling)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Levels Lowering ANN – Panel 214 Drop 42: SG 24 FW Flow HIGH ANN - Panel 214 Drop 33: SG 24 Level LOW Dev.
	SRO	Direct actions per 02-OHP 4022.013.014 Verify SG 24 level is stable or trending to 44%. Enter T.S. 3.3.1.1 action – One hour to trip B/S Use Att D-1 to trip bistables. • 2-FS/542B: 2-SML-19E Drop 67 • 2-FS/540A: Panel 214 Drop 42 • 2-FS/540B: 2-SML-19C Drop41
	BOP	Take MANUAL control of FRV-240 and restore level to program • Place SF selector switch (2-FS-542C) in CH 2 position • Place SG 24 level control in NULL then AUTO Verify Bistables are tripped.
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __5__ Page _5_ of ___

Event Description: Pressurizer PORV (NRV-153) leak by (requires isolation) – 5% open

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Discharge Pipe Temp rising ANN – Panel 208 Drop 24: PZR PORV DISCH TEMP HIGH ANN - Panel 208 Drop 45: ACCOUSTIC MONITOR FLOW DET
	SRO	Direct actions per 02-OHP 402.002.009 Verify isolation of leaking ALL PORVs Determine leaking PORV {NRV-153} Enter T.S. 3.4.11 action – One hour to Close leaking PORV's block valve
	RO	Close ALL PZR PORV Block valves Monitor PRT status Isolate leaking PORV {NRV-153} – Close NMO-153 Place Caution Tags on NMO-153 control switch
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __6___ Page _6_ of ___

Event Description: PORV Block valve {NMO-153} leakage (unisolable - Rx trip required);

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Rising Discharge Piping Temp ANN – Panel 208 Drop 45: Reflash
	SRO	Direct actions per 02-OHP 4022.002.020 Determine leak within the capacity of two CCPs Enter T.S. 3.4.6.2. action for excessive leakage Initiate a unit shutdown per 02-OHP 4021.001.003
	RO	Take MANUAL control of charging to maintain PZR level Verify leak on PZR PORV line {NMO-153} Perform boration for power reduction to maintain Tave-Tref within band (± 1.0)
	BOP	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _7_ of ___

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Blowdown Rad Monitor Alarm / Lowering PZR level with increased charging. ANN – Panel 238 Drop 12: R19 SG Blowdown Sampling
	SRO	Direct actions per 02-OHP 4022.002.020 and 02-OHP 4022.002.021: Verify isolation of SG Blowdown Transfer Auxiliary Loads to Unit 1 Verify unable to maintain PZR level with ONE CCP • Direct a MANUAL Reactor Trip and SI • Enter 02-OHP 4023.E-0 actions
	RO	Report inability to maintain PZR level with ONE CCP Perform a MANUAL Reactor Trip Perform a MANUAL SI actuation Perform actions as directed by the US:
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _8_ of ___

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Steam Flow on #24 SG PORV
	SRO	Direct actions per 02-OHP 4023.E-0 Verify Immediate Action (Steps 1 – 4) Verify CTS NOT required Verify adequate AFW flow Implement Attachment A Verify PZR PORVs and Sprays closed – NRV/NMO-153 leaking • Transition to E-1 may ~~occur~~ Should at this point
	RO	Verify Reactor Trip Verify SI initiation Perform actions as directed by the US
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US Identify/Report Steam Flow on #24 SG to environment

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _9_ of ___

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-1: Verify RCPs should NOT be stopped Verify SG Pressure Boundaries are NOT Intact Transition to E-2, Faulted SG Isolation Direct actions per 02-OHP 4023.E-2: Isolate the #24 SG 2 — Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR Direct actions per 02-OHP 4023.E-3: Isolate AFW to #24 SG Transition to ECA-3.1, SGTR with Loss of Reactor Coolant
	RO	Perform actions as directed by the US Reset SI and Phase A/B Trip ALL PZR heaters
	BOP	Perform actions as directed by the US Close ~~#24~~ All SG Stop Valves Verify FW Isolation Close AFW valves to #24 SG (2-FMO 241/242) **TERMINATE Scenario upon establishment of C/D.**

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

Facility: DC Cook Scenario No.: 5 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives: 2 HTR DRPS

Initial Conditions: [IC-922] ~~58~~ 55 % Power, ~~EOL~~, ~~Xe Increasing~~. Power reduction in progress. 1303 BORON

Turnover: Unit is stable at ~~58~~ 55 % power and continuing a power reduction to take the unit off line. All preparations have been completed to take the West MFW pump off line per 02-OHP 4021.055.004. Currently performing Step 4.9 of 02-OHP 4021.001.003, Power Reduction.

ATTACHMENT 2

Event No.	Malf. No.	Event Type*	Event Description
1		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
2		N	Power Reduction to 0% / Stop West MFW pump
3	CV16A [0]	I(RO)	VCT level instrument (QLC-451) fails LOW (5% indicated)
4	RX20G [0]	I(BO)	Steam flow channel (MFC-140)fails LOW (Controlling)
5	RC17C [5]	C(RO)	Pressurizer PORV (NRV-153) leaking (requires isolation) – 5% open {ORV Panel 208 Drop 28 OFF}
6	~~OVR~~	C(RO)	SMALL BREAK LOCA 300 GPM 5 MIN RAMP ~~PORV Block valve begins to leak~~ (Rx trip required) ~~[ZLO101NMO153{RED} OFF / {GRN} ON // ZLI101NMO153-OPEN]~~
7	RC23D [60]	Major	Steam Generator #4 tube rupture (600 gpm {60%} – ramp over 300 sec)
8	MS06D [80]	C(BO)	Steam Generator safety valve (SV2B-4) opens – 80%

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

Op-Test No.: _____ Scenario No.: _5__ Event No.: __1 / 2__ Page _2_ of _9__

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction. • ~~Lower power to approx. 30% and hold.~~ CONTINUE POWER REDUCTION • ~~Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.~~
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by borating the RCS or raising control rods.
	BOP	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: __5__ Event No.: __3__ Page _3_ of _9__

Event Description: VCT level instrument (QLC-451) fails LOW

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => QLC-451 level at 5% ANN – Panel 209 Drop 49: VCT Level Low
	SRO	Direct actions per 02-OHP 4022.013.017 Verify QLC-451 failed low Enter T.S. 3.1.2.2 action – One hour to trip B/S Perform Att A to trip Bistables
	RO	Secure Auto MAKEUP mode Maintain VCT level (452) > 14% with manual Makeup Verify Bistable LS-112B is tripped
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __4__ Page _4_ of _9__

Event Description: Steam flow channel (MFC-140) fails LOW (Controlling)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Levels Lowering ANN – Panel 214 Drop 42: SG 24 FW Flow HIGH ANN - Panel 214 Drop 33: SG 24 Level LOW Dev.
	SRO	Direct actions per 02-OHP 4022.013.014 Verify SG 24 level is stable or trending to 44%. Enter T.S. 3.3.1.1 action – One hour to trip B/S Use Att D-1 to trip bistables. 3,3,2,1 • 2-FS/542B: 2-SML-19E Drop 67 • 2-FS/540A: Panel 214 Drop 42 • 2-FS/540B: 2-SML-19C Drop41
	BOP	Take MANUAL control of FRV-240 and restore level to program • Place SF selector switch (2-FS-542C) in CH 2 position • Place SG 24 level control in NULL then AUTO Verify Bistables are tripped.
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __5__ Page _5_ of _9__

Event Description: Pressurizer PORV (NRV-153) leak by (requires isolation) – 5% open

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Discharge Pipe Temp rising ANN – Panel 208 Drop 24: PZR PORV DISCH TEMP HIGH ANN - Panel 208 Drop 45: ACCOUSTIC MONITOR FLOW DET
	SRO	Direct actions per 02-OHP 402.002.009 Verify isolation of leaking ALL PORVs Determine leaking PORV {NRV-153} Enter T.S. 3.4.11 action – One hour to Close leaking PORV's block valve
	RO	Close ALL PZR PORV Block valves Monitor PRT status Isolate leaking PORV {NRV-153} – Close NMO-153 Place Caution Tags on NMO-153 control switch
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __6___ Page _6_ of _9__

Event Description: ~~PORV Block valve (NMO-153) leakage (unisolable - Rx trip required);~~ OK RCS SBLOCA 300 GPM

Time	Position (LIG)	STEAM SPACE BREAK Applicant's Actions or Behavior
	Crew	Diagnosis the event => ~~Rising Discharge Piping Temp~~ ANN – ~~Panel 208 Drop 45. Reflash~~
	SRO	Direct ~~actions~~ per 02-OHP 4022.002.020 Determine ~~leak~~ within the capacity of two CCPs Enter T.S. 3.4.6.2 ~~action~~ for excessive leakage Initiate a ~~unit~~ shutdown per ~~02-OHP 4021.001.003~~
	RO	~~Take MANUAL control~~ of charging to maintain ~~PZR~~ level Verify leak on PZR ~~PORV line~~ {NMO-153} ~~Perform boration~~ for power reduction to maintain Tave-Tref within band (± 1.0)
	BOP	~~Monitor~~ secondary plant conditions Reduce Turbine Load ~~MANUALLY~~ Perform ~~actions~~ as directed by ~~the~~ US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _7_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis ~~the event~~ => Blowdown Rad Monitor Alarm / Lowering PZR level with increased charging. ANN – Panel 238 ~~Drop 12~~: R19 SG Blowdown Sampling
	SRO	Direct actions per 02-OHP 4022.002.020 and 02-OHP 4022.002.021: Verify isolation of SG Blowdown Transfer Auxiliary Loads to Unit 1 Verify unable to maintain PZR level with ONE CCP after E-0 • Direct a MANUAL Reactor Trip and SI • Enter 02-OHP 4023.E-0 actions
	RO	Report inability to maintain PZR level with ONE CCP Perform a MANUAL Reactor Trip Perform a MANUAL SI actuation Perform actions as directed by the US:
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _8_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Steam Flow on #24 SG PORV
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Action (Steps 1 – 4) Verify CTS NOT required Verify adequate AFW flow Implement Attachment A Verify PZR PORVs and Sprays closed – NRV/NMO-153 leaking • Transition to E-1 should occur at this point
	RO	Verify Reactor Trip Verify SI initiation Perform actions as directed by the US
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US Identify/Report Steam Flow on #24 SG to environment

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _9_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-1: Verify RCPs should NOT be stopped Verify SG Pressure Boundaries are NOT Intact Transition to E-2, Faulted SG Isolation Direct actions per 02-OHP 4023.E-2: Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR Direct actions per 02-OHP 4023.E-3: Isolate AFW to #24 SG Transition to ECA-3.1, SGTR with Loss of Reactor Coolant
	RO	DIRECT ACTIONS PER ECA 3.1 Perform actions as directed by the US Reset SI and Phase A/B ~~Trip ALL PZR heaters~~ OK OPEN AIR TO CNTMT DO NOT ESTABLISH FEED TO RUPTURED S/G
	BOP	Perform actions as directed by the US ~~Close ALL SG Stop Valves~~ ~~Verify FW Isolation~~ DONE ~~Close AFW valves to #24 SG (2-FMO-241/242)~~ ~~TRANSITION TO ECA 3.1~~ **TERMINATE Scenario upon establishment of C/D.**

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

Facility: DC Cook Scenario No.: 5 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-922] 55% Power, EOL, Xe Increasing. Power reduction in progress.

Turnover: Unit is stable at 55% power and continuing a power reduction to take the unit off line. All preparations have been completed to take the West MFW pump off line per 02-OHP 4021.055.004. Currently performing Step 4.9 of 02-OHP 4021.001.003, Power Reduction.

Event No.	Malf. No.	Event Type*	Event Description
1		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
2		N	Power Reduction to 0% / Stop West MFW pump
3	CV16A [0]	I(RO)	VCT level instrument (QLC-451) fails LOW (5% indicated)
4	RX20G [0]	I(BO)	Steam flow channel (MFC-140)fails LOW (Controlling)
5	RC17C [5]	C(RO)	Pressurizer PORV (NRV-153) leaking (requires isolation) – 5% open {ORV Panel 208 Drop 23 OFF}
6	OVR	C(RO)	PORV Block valve begins to leak (Rx trip required) [ZLO101NMO153{RED} OFF / {GRN} ON // ZLI101NMO153 OPEN]
7	RC23D [60]	Major	Steam Generator #4 tube rupture (600 gpm {60%} – ramp over 300 sec)
8	MS06D [80]	C(BO)	Steam Generator safety valve (SV2B-4) opens – 80%

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

Op-Test No.: _____ Scenario No.: _5__ Event No.: __1 / 2__ Page _2_ of _9__

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction. • Lower power to approx. 30% and hold. • Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by borating the RCS or raising control rods.
	BOP	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1. - start lube oil & control oil pumps - speed controller to manual & dp - increase E pump & W pumps - secure pump.

Op-Test No.: _____ Scenario No.: __5__ Event No.: __3__ Page _3_ of _9__

Event Description: VCT level instrument (QLC-451) fails LOW

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => QLC-451 level at 5% ANN – Panel 209 Drop 49: VCT Level Low
	SRO	Direct actions per 02-OHP 4022.013.017 (VCT Lvl Malf) Verify QLC-451 failed low Enter T.S. 3.1.2.2 action – One hour to trip B/S Perform Att A to trip Bistables
	RO	Secure Auto MAKEUP mode Maintain VCT level (452) > 14% with manual Makeup Verify Bistable LS-112B is tripped
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __4__ Page _4_ of _9__

Event Description: Steam flow channel (MFC-140) fails LOW (Controlling)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Levels Lowering ANN – Panel 214 Drop 42: SG 24 FW Flow HIGH ANN - Panel 214 Drop 33: SG 24 Level LOW Dev.
	SRO	Direct actions per 02-OHP 4022.013.014 Verify SG 24 level is stable or trending to 44%. Enter T.S. 3.3.1.1 action – One hour to trip B/S Use Att D-1 to trip bistables. • 2-FS/542B: 2-SML-19E Drop 67 • 2-FS/540A: Panel 214 Drop 42 • 2-FS/540B: 2-SML-19C Drop41 T.S. 3.3.2.1 1hr LCO
	BOP	Take MANUAL control of FRV-240 and restore level to program • Place SF selector switch (2-FS-542C) in CH 2 position • Place SG 24 level control in NULL then AUTO Verify Bistables are tripped.
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __5__ Page _5_ of _9__

Event Description: Pressurizer PORV (NRV-153) leak by (requires isolation) – 5% open

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Discharge Pipe Temp rising ANN – Panel 208 Drop 24: PZR PORV DISCH TEMP HIGH ANN - Panel 208 Drop 45: ACCOUSTIC MONITOR FLOW DET
	SRO	Direct actions per 02-OHP 402.002.009 Verify isolation of leaking ALL PORVs Determine leaking PORV {NRV-153} Enter T.S. 3.4.11 action – One hour to Close leaking PORV's block valve T.S. 3.3.3.8 ~~3.4.11~~ 3.4.9
	RO	Close ALL PZR PORV Block valves Monitor PRT status Isolate leaking PORV {NRV-153} – Close NMO-153 Place Caution Tags on NMO-153 control switch
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __6___ Page _6_ of _9__

Event Description: PORV Block valve {NMO-153} leakage (unisolable - Rx trip required);

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Rising Discharge Piping Temp ANN – Panel 208 Drop 45: Reflash
	SRO	Direct actions per 02-OHP 4022.002.020 Determine leak within the capacity of two CCPs Enter T.S. 3.4.6.2. action for excessive leakage Initiate a unit shutdown per 02-OHP 4021.001.003
	RO	Take MANUAL control of charging to maintain PZR level Verify leak on PZR PORV line {NMO-153} Perform boration for power reduction to maintain Tave-Tref within band (± 1.0)
	BOP	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _7_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Blowdown Rad Monitor Alarm / Lowering PZR level with increased charging. ANN – Panel 238 Drop 12: R19 SG Blowdown Sampling
	SRO	Direct actions per 02-OHP 4022.002.020 and 02-OHP 4022.002.021: Verify isolation of SG Blowdown Transfer Auxiliary Loads to Unit 1 Verify unable to maintain PZR level with ONE CCP • Direct a MANUAL Reactor Trip and SI • Enter 02-OHP 4023.E-0 actions
	RO	Report inability to maintain PZR level with ONE CCP Perform a MANUAL Reactor Trip Perform a MANUAL SI actuation Perform actions as directed by the US:
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _8_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Steam Flow on #24 SG PORV
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Action (Steps 1 – 4) Verify CTS NOT required Verify adequate AFW flow Implement Attachment A Verify PZR PORVs and Sprays closed – NRV/NMO-153 leaking • Transition to E-1 should occur at this point
	RO	Verify Reactor Trip Verify SI initiation Perform actions as directed by the US
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US Identify/Report Steam Flow on #24 SG to environment

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _9_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-1: Verify RCPs should NOT be stopped Verify SG Pressure Boundaries are NOT Intact Transition to E-2, Faulted SG Isolation Direct actions per 02-OHP 4023.E-2: Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR Direct actions per 02-OHP 4023.E-3: Isolate AFW to #24 SG Transition to ECA-3.1, SGTR with Loss of Reactor Coolant
	RO	Perform actions as directed by the US ~~Reset~~ SI and Phase A/B Trip ALL PZR heaters open FH to contain / check Rad monitors
	BOP	Perform actions as directed by the US Close ALL SG Stop Valves Verify FW Isolation Close AFW valves to #24 SG (2-FMO 241/242) **TERMINATE Scenario upon establishment of C/D.**

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

Facility: DC Cook Scenario No.: 5 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-922] 55% Power, EOL, Xe Increasing. Power reduction in progress.

Turnover: Unit is stable at 55% power and continuing a power reduction to take the unit off line. All preparations have been completed to take the West MFW pump off line per 02-OHP 4021.055.004. Currently performing Step 4.9 of 02-OHP 4021.001.003, Power Reduction.

Event No.	Malf. No.	Event Type*	Event Description
1		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
2		N	Power Reduction to 0% / Stop West MFW pump
3	CV16A [0]	I(RO)	VCT level instrument (QLC-451) fails LOW (5% indicated)
4	RX20G [0]	I(BO)	Steam flow channel (MFC-140)fails LOW (Controlling)
5	RC17C [5]	C(RO)	Pressurizer PORV (NRV-153) leaking (requires isolation) – 5% open {ORV Panel 208 Drop 23 OFF}
6	OVR	C(RO)	PORV Block valve begins to leak (Rx trip required) [ZLO101NMO153{RED} OFF / {GRN} ON // ZLI101NMO153 OPEN]
7	RC23D [60]	Major	Steam Generator #4 tube rupture (600 gpm {60%} – ramp over 300 sec)
8	MS06D [80]	C(BO)	Steam Generator safety valve (SV2B-4) opens – 80%

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

Op-Test No.: _____ Scenario No.: _5__ Event No.: __1 / 2__ Page _2_ of _9__

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction. • Lower power to approx. 30% and hold. • Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by borating the RCS or raising control rods.
	BOP	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: __5__ Event No.: __3__ Page _3_ of _9__

Event Description: VCT level instrument (QLC-451) fails LOW

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => QLC-451 level at 5% ANN – Panel 209 Drop 49: VCT Level Low
	SRO	Direct actions per 02-OHP 4022.013.017 Verify QLC-451 failed low Enter T.S. 3.1.2.2 action – One hour to trip B/S Perform Att A to trip Bistables
	RO	Secure Auto MAKEUP mode Maintain VCT level (452) > 14% with manual Makeup Verify Bistable LS-112B is tripped
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __4__ Page _4_ of _9__

Event Description: Steam flow channel (MFC-140) fails LOW (Controlling)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Levels Lowering ANN – Panel 214 Drop 42: SG 24 FW Flow HIGH ANN - Panel 214 Drop 33: SG 24 Level LOW Dev.
	SRO	Direct actions per 02-OHP 4022.013.014 Verify SG 24 level is stable or trending to 44%. Enter T.S. 3.3.1.1 action – One hour to trip B/S Use Att D-1 to trip bistables. • 2-FS/542B: 2-SML-19E Drop 67 • 2-FS/540A: Panel 214 Drop 42 • 2-FS/540B: 2-SML-19C Drop41
	BOP	Take MANUAL control of FRV-240 and restore level to program • Place SF selector switch (2-FS-542C) in CH 2 position • Place SG 24 level control in NULL then AUTO Verify Bistables are tripped.
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __5__ Page _5_ of _9__

Event Description: Pressurizer PORV (NRV-153) leak by (requires isolation) – 5% open

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Discharge Pipe Temp rising ANN – Panel 208 Drop 24: PZR PORV DISCH TEMP HIGH ANN - Panel 208 Drop 45: ACCOUSTIC MONITOR FLOW DET
	SRO	Direct actions per 02-OHP 402.002.009 Verify isolation of leaking ALL PORVs Determine leaking PORV {NRV-153} Enter T.S. 3.4.11 action – One hour to Close leaking PORV's block valve
	RO	Close ALL PZR PORV Block valves Monitor PRT status Isolate leaking PORV {NRV-153} – Close NMO-153 Place Caution Tags on NMO-153 control switch
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __6___ Page _6_ of _9__

Event Description: PORV Block valve {NMO-153} leakage (unisolable - Rx trip required);

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Rising Discharge Piping Temp ANN – Panel 208 Drop 45: Reflash
	SRO	Direct actions per 02-OHP 4022.002.020 Determine leak within the capacity of two CCPs Enter T.S. 3.4.6.2. action for excessive leakage Initiate a unit shutdown per 02-OHP 4021.001.003
	RO	Take MANUAL control of charging to maintain PZR level Verify leak on PZR PORV line {NMO-153} Perform boration for power reduction to maintain Tave-Tref within band (± 1.0)
	BOP	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _7_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Blowdown Rad Monitor Alarm / Lowering PZR level with increased charging. ANN – Panel 238 Drop 12: R19 SG Blowdown Sampling
	SRO	Direct actions per 02-OHP 4022.002.020 and 02-OHP 4022.002.021: Verify isolation of SG Blowdown Transfer Auxiliary Loads to Unit 1 Verify unable to maintain PZR level with ONE CCP • Direct a MANUAL Reactor Trip and SI • Enter 02-OHP 4023.E-0 actions
	RO	Report inability to maintain PZR level with ONE CCP Perform a MANUAL Reactor Trip Perform a MANUAL SI actuation Perform actions as directed by the US:
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _8_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Steam Flow on #24 SG PORV
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Action (Steps 1 – 4) Verify CTS NOT required Verify adequate AFW flow Implement Attachment A Verify PZR PORVs and Sprays closed – NRV/NMO-153 leaking • Transition to E-1 should occur at this point
	RO	Verify Reactor Trip Verify SI initiation Perform actions as directed by the US
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US Identify/Report Steam Flow on #24 SG to environment

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _9_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-1: Verify RCPs should NOT be stopped Verify SG Pressure Boundaries are NOT Intact Transition to E-2, Faulted SG Isolation Direct actions per 02-OHP 4023.E-2: Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR Direct actions per 02-OHP 4023.E-3: Isolate AFW to #24 SG Transition to ECA-3.1, SGTR with Loss of Reactor Coolant
	RO	Perform actions as directed by the US Reset SI and Phase A/B Trip ALL PZR heaters
	BOP	Perform actions as directed by the US Close ALL SG Stop Valves Verify FW Isolation Close AFW valves to #24 SG (2-FMO 241/242) **TERMINATE Scenario upon establishment of C/D.**

Appendix D Scenario Outline Form ES-D-1

Facility: DC Cook Scenario No.: 5 Op-Test No.: 2001301

Examiners: Operators:

Objectives:

Initial Conditions: [IC-922] 55% Power, EOL, Xe Increasing. Power reduction in progress.

Turnover: Unit is stable at 55% power and continuing a power reduction to take the unit off line. All preparations have been completed to take the West MFW pump off line per 02-OHP 4021.055.004. Currently performing Step 4.9 of 02-OHP 4021.001.003, Power Reduction.

Event No.	Malf. No.	Event Type*	Event Description
1		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
2		N	Power Reduction to 0% / Stop West MFW pump
3	CV16A [0]	I(RO)	VCT level instrument (QLC-451) fails LOW (5% indicated)
4	RX20G [0]	I(BO)	Steam flow channel (MFC-140)fails LOW (Controlling)
5	RC17C [5]	C(RO)	Pressurizer PORV (NRV-153) leaking (requires isolation) – 5% open {ORV Panel 208 Drop 23 OFF}
6	OVR	C(RO)	PORV Block valve begins to leak (Rx trip required) [ZLO101NMO153{RED} OFF / {GRN} ON // ZLI101NMO153 OPEN]
7	RC23D [60]	Major	Steam Generator #4 tube rupture (600 gpm {60%} – ramp over 300 sec)
8	MS06D [80]	C(BO)	Steam Generator safety valve (SV2B-4) opens – 80%

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

Op-Test No.: _____ Scenario No.: _5__ Event No.: __1 / 2__ Page _2_ of _9__

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction. • Lower power to approx. 30% and hold. • Implement Reactivity Management Program – PMI 4015, 3.7.3, and OHI 4000, 4.2.
	RO	Maintain Tave – Tref mismatch within band (+ 1.0) by borating the RCS or raising control rods.
	BOP	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: __5__ Event No.: __3__ Page _3_ of _9__

Event Description: VCT level instrument (QLC-451) fails LOW

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => QLC-451 level at 5% ANN – Panel 209 Drop 49: VCT Level Low
	SRO	Direct actions per 02-OHP 4022.013.017 Verify QLC-451 failed low Enter T.S. 3.1.2.2 action – One hour to trip B/S Perform Att A to trip Bistables
	RO	Secure Auto MAKEUP mode Maintain VCT level (452) > 14% with manual Makeup Verify Bistable LS-112B is tripped
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __4__ Page _4_ of _9__

Event Description: Steam flow channel (MFC-140) fails LOW (Controlling)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Levels Lowering ANN – Panel 214 Drop 42: SG 24 FW Flow HIGH ANN - Panel 214 Drop 33: SG 24 Level LOW Dev.
	SRO	Direct actions per 02-OHP 4022.013.014 Verify SG 24 level is stable or trending to 44%. Enter T.S. 3.3.1.1 action – One hour to trip B/S Use Att D-1 to trip bistables. • 2-FS/542B: 2-SML-19E Drop 67 • 2-FS/540A: Panel 214 Drop 42 • 2-FS/540B: 2-SML-19C Drop41
	BOP	Take MANUAL control of FRV-240 and restore level to program • Place SF selector switch (2-FS-542C) in CH 2 position • Place SG 24 level control in NULL then AUTO Verify Bistables are tripped.
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __5__ Page _5_ of _9__

Event Description: Pressurizer PORV (NRV-153) leak by (requires isolation) – 5% open

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Discharge Pipe Temp rising ANN – Panel 208 Drop 24: PZR PORV DISCH TEMP HIGH ANN - Panel 208 Drop 45: ACCOUSTIC MONITOR FLOW DET ANN - Panel 208 Drop 23: PZR PORV 2-NRV- 153 OPEN
	SRO	Direct actions per 02-OHP 402.002.009 Verify isolation of leaking ALL PORVs Determine leaking PORV {NRV-153} Enter T.S. 3.4.11 action – One hour to Close leaking PORV's block valve
	RO	Close ALL PZR PORV Block valves Monitor PRT status Isolate leaking PORV {NRV-153} – Close NMO-153 Place Caution Tags on NMO-153 control switch
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __6___ Page _6_ of _9__

Event Description: PORV Block valve {NMO-153} leakage (unisolable - Rx trip required);

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Rising Discharge Piping Temp ANN – Panel 208 Drop 45: Reflash
	SRO	Direct actions per 02-OHP 4022.002.020 Determine leak within the capacity of two CCPs Enter T.S. 3.4.6.2. action for excessive leakage Initiate a unit shutdown per 02-OHP 4021.001.003
	RO	Take MANUAL control of charging to maintain PZR level Verify leak on PZR PORV line {NMO-153} Perform boration for power reduction to maintain Tave-Tref within band (± 1.0)
	BOP	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _7_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Blowdown Rad Monitor Alarm / Lowering PZR level with increased charging. ANN – Panel 238 Drop 12: R19 SG Blowdown Sampling
	SRO	Direct actions per 02-OHP 4022.002.020 and 02-OHP 4022.002.021: Verify isolation of SG Blowdown Transfer Auxiliary Loads to Unit 1 Verify unable to maintain PZR level with ONE CCP • Direct a MANUAL Reactor Trip and SI • Enter 02-OHP 4023.E-0 actions
	RO	Report inability to maintain PZR level with ONE CCP Perform a MANUAL Reactor Trip Perform a MANUAL SI actuation Perform actions as directed by the US:
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _8_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Steam Flow on #24 SG PORV
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Action (Steps 1 – 4) Verify CTS NOT required Verify adequate AFW flow Implement Attachment A Verify PZR PORVs and Sprays closed – NRV/NMO-153 leaking • Transition to E-1 should occur at this point
	RO	Verify Reactor Trip Verify SI initiation Perform actions as directed by the US
	BOP	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US Identify/Report Steam Flow on #24 SG to environment

Op-Test No.: _____ Scenario No.: __5__ Event No.: __7/8__ Page _9_ of _9__

Event Description: Steam generator #4 tube rupture (600 gpm) – 60% ramped; SG Safety Valve (SV2B-4) fails open – 80% after reactor trip. Ruptured and Faulted SG requiring entry into E-3/ECA 3.1.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per 02-OHP 4023.E-1: Verify RCPs should NOT be stopped Verify SG Pressure Boundaries are NOT Intact Transition to E-2, Faulted SG Isolation Direct actions per 02-OHP 4023.E-2: Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR Direct actions per 02-OHP 4023.E-3: Isolate AFW to #24 SG Transition to ECA-3.1, SGTR with Loss of Reactor Coolant
	RO	Perform actions as directed by the US Reset SI and Phase A/B Trip ALL PZR heaters
	BOP	Perform actions as directed by the US Close ALL SG Stop Valves Verify FW Isolation Close AFW valves to #24 SG (2-FMO 241/242) **TERMINATE Scenario upon establishment of C/D.**

Facility: DC Cook Scenario No.: 6 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-923] ~~58~~ 55% Power, 2MFP, MSR In, ~~Xe Increasing~~. East MDAFW pump OOS. [IRF FWR61 RO]; Unit 1 is in Mode 6 with its CTS drained [T.S. 3.7.1.2 entry – 7 day LCO]

Turnover: Stable at ~~58~~ 55% power preparing to reduce power to 0%. (RODS ARE IN AUTO) The East MDAFW pump has been out of service to perform motor replacement for 73 hours. The unit is shutting down and the reactor must be in Mode 3 within the next 4 hours. Unit 1 is in Mode 6 with fuel being off-loaded. Currently in Step 4.9 of 02-OHP 4031.001.003, Power Reduction.

Event No.	Malf. No.	Event Type*	Event Description
1 2		N	Reduce Turbine load and Stop the West main feedwater pump
2 3		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
3 4	ZDI101QRV421 CLOSE	C(RO)	Normal boric acid control valve {QRV-421} fails closed (0)
4 (1)	RX02C [650]	I(RO)	RCS T_{hot} instrument (NTP-131) fails HIGH
5	RX26A [~~100~~ (40)]	I(BO)	East main feedwater pump speed controller fails ~~40% HIGH~~ (in AUTO) RAMP 15 MINUTES
6	FW05A FW46B FW52C	Major	Trip of East MFP and Loss of ALL Feedwater TDAFW PUMP STEAM BINDING
7	EG10A	C(BO)	Diesel Generator AB fails to start in AUTO (clear after 30 sec)
8	ED05E	C(BO)	Bus T21A fails to re-energize
9	RX14A [0]	C(RO)	Steam dump master controller fails, Dumps must be open from individual controller

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

Op-Test No.: _____ Scenario No.: __6__ Event No.: __1 / 2__ Page _2_ of _7_

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by borating the RCS or inserting control rods.
	BOP	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: __6__ Event No.: __3__ Page _3_ of _7_

Event Description: Normal Boric Acid control valve fails CLOSED during boration.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Failure to Borate Normally ANN – Panel 209 Drop 39: BA Flow Deviation
	SRO	Direct actions per 02-OHP 4021.005.001: Enter T.S. 3.1.2.2 – Boration Path Continue power reduction with control rods
	RO	~~Take MANUAL control of Makeup and secure lineup~~ FOLLOW UP ON TROUBLE SHOOTING & HOW TO BORATE – – TRY TO RESTART BORATION –
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6__ Event No.: __4__ Page _4_ of _7_

Event Description: RCS T_{hot} instrument (NTP-131) for Loop 3 fails HIGH {TE-431A}

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => ANN – Panel 211 Drop 6: Tave High ANN - Panel 211 Drp 15: Tave/Tref Deviation Various other ANN alarms
	SRO	Direct actions per 02-OHP 4022.013.007 Initiate 02-OHP 4030.STP.021: Event Initiated Surveillance Enter T.S. 3.3.1.1 action – One hour to trip B/S Perform Att C for Bistable tripping
	RO	Take MANUAL control of control rods Minimize Tave-Tref deviation Defeat Loop 3 Tave, Delta T, and Recorder Verify bistables tripped per Att C.
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6__ Event No.: __5__ Page _5_ of _7_

Event Description: East Main Feed pump speed controller fails ~~HIGH~~ LOW (40) WITH 15 MINUTE RAMP. (in AUTO)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Level LOW deviation; FW Flow lowering ANN – Panel 213 Drop 3/33: SG 1-2 Water Level LOW Dev ANN – Panel 214 Drop 3/33: SG 3-4 Water Level LOW Dev
	SRO	Direct actions per Alarm Response Procedure Manual control of SG Level as required to stabilize level
	BOP	Take MANUAL control of MFP and stabilize unit
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6___ Event No.: __6/7/8/9__ Page _6_ of _7_

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Trip of ONLY running MFP TURBINE DRIVEN AFW TRIPS
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Actions (Steps 1 – 4) Transition to ES-0.1 (SI NOT required) GO TO FR-H.1 S/G LEVEL < 137" (NR) (SEE NEXT PAGE)
	RO	Perform actions as directed by the US Verify Reactor Trip Verify SI NOT required
	BOP	Perform actions as directed by the US Verify Turbine Trip Verify Power to AC Emergency Buses

Op-Test No.: _____ Scenario No.: __6___ Event No.: __6/7/8/9__ Page _7_ of _7__

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => No AFW Feed available Transition to FR-H.1 required upon entry into ES-0.1
	SRO	Direct actions per 02-OHP 4023.FR-H.1: Verify Secondary Heat Sink is required Verify Bleed and Feed is NOT required (at least 2 S/G WR > 15%) Verify AFW Flow NOT available to any SG Stop ALL RCPs Verify Condensate System IN service Verify Feedwater Flow NOT available Depressurize ONE SG to less than 230 psig (only if MFW flow not established) Verify Condensate aligned to feed SG Transition to E-1
	RO	Perform actions as directed by the US Stop ALL RCPs Actuate SI as required (not necessary) Reset SI and Phase A isolation
	BOP	Perform actions as directed by the US (open FW isol. valves open circuit 115) Dump Steam to condenser at MAXIMUM rate from ONE SG Align Condensate to feed through MFW pump (if MFW not established)

Facility: DC Cook Scenario No.: 6 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives

Initial Conditions: [IC-923] 58% Power, 2MFP, MSR In, Xe Increasing. East MDAFW pump OOS. [IRF FWR61 RO] — Unit 1 in Mode 5 with CST desired. [T.S. 3.7.1.2] 7 days (Rods in AUTO)

Turnover: Stable at 58% power preparing to reduce power to 0%. The East MDAFW pump has been out of service to perform motor replacement for 73 hours. The unit is shutting down and the reactor must be in Mode 3 within the next 4 hours. Unit 1 is in Mode 6 with fuel being off-loaded. Currently in Step 4.9 of 02-OHP 4031.001.003, Power Reduction.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Reduce Turbine load and Stop the West main feedwater pump
2		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
3(1)	RX02C [650]	I(RO)	RCS T_{hot} instrument (NTP-131) fails HIGH
4(5)	RX26A [100] [0]	I(BO)	East main feedwater pump speed controller fails HIGH (in AUTO) (30 secs) Low
5(3)	ZDI101QRV421 CLOSE	C(RO)	Normal boric acid control valve {QRV-421} fails closed (0)
6	FW05A FW46B EC FW52C EC	Major	Trip of East MFP and Loss of ALL Feedwater TDAFW Pump steam Bound West MDAFW Pump trip
7	EG10A	C(BO)	Diesel Generator AB fails to start in AUTO (clear after 30 sec)
8	ED05E	C(BO)	Bus T21A fails to re-energize
9	RX14A [0]	C(RO)	Steam dump master controller fails, Dumps must be open from individual controller

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

H.1 Action
- 10R RPR147 Removed (2-RPSX-A ckt 4 Fuse)
- 10R RPR148 Removed (2-RPSX-B ckt 4 Fuse)

do from list → update fwvfmo252 1

Op-Test No.: _____ Scenario No.: _____ Event No.: __1 / 2__ Page _1_ of ___

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by borating the RCS or inserting control rods.
	BOP	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: _____ Event No.: __3__ Page _2_ of ___

Event Description: RCS T_{hot} instrument (NTP-131) for Loop 3 fails HIGH {TE-431A}

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => ANN – Panel 211 Drop 6: Tave High ANN - Panel 211 Drp 15: Tave/Tref Deviation Various other ANN alarms
	SRO	Direct actions per 02-OHP 4022.013.007 Initiate 02-OHP 4030.STP.021: Event Initiated Surv. Perform Att C for Bistable tripping T.S. 3.3.1.1. Action
	RO	Take MANUAL control of control rods Minimize Tave-Tref deviation Defeat Loop 3 Tave, Delta T, and Recorder Verify bistables tripped per Att C.
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: _____ Event No.: __4__ Page _3_ of ___

Event Description: East Main Feed pump speed controller fails HIGH (in AUTO)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Level Deviation, RW ↓ Low Level Dev. all 4 (?)
	SRO	Direct actions per AAP
	BOP	Take MANUAL control of MFP and stabalize unit
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: _____ Event No.: __5__ Page _4_ of ___

Event Description: Normal Boric Acid control valve fails CLOSED during boration.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Perform to observe ~~ARP~~ Panel 209, Pg 39 : BA Flow Deviation Alarm
	SRO	Direct actions per 4021.005.001, Named M/A and ARP T.S 3.1.2.2 (?)
	RO	Take MANUAL control of Makeup and secure L/A
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: _____ Event No.: __6/7/8/9__ Page _7_ of ___

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => ~~AND~~
		→ ES.01, 1: [illegible] H.1 (2nd)
	SRO	Direct actions per
	E-0; Step 4 FR-H.1; Step 4 E-1;	
	BOP	Perform actions as directed by the US FWO-201/204 Bkrs - MFP 101 FWO 201 Bkrs - MFP 101 FWO 204
	RO	Perform actions as directed by the US

(X) Lost MFP Vacuum no [illegible] use.

None → FWO 202/203 open (cons flow)

+ RO Bkr for FWO 210, 212, 213, 214
- Step 2 of H.1 (?)

Facility: DC Cook Scenario No.: 6 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-923] 58% Power, ~~2MFP~~, ~~MSR~~ In, Xe Increasing. East MDAFW pump OOS. [IRF FWR61 RO]; Unit 1 is in Mode ~~5~~ 6 with its CTS drained [T.S. 3.7.1.2 entry – 7 day LCO]

Turnover: Stable at 58% power preparing to reduce power to 0%. The East MDAFW pump has been out of service to perform motor replacement for 73 hours. ~~The unit is shutting down~~ and the reactor must be in Mode 3 within the next 4 hours. Unit 1 is in Mode 6 with fuel being off-loaded. Currently in Step 4.9 of 02-OHP 4031.001.003, Power Reduction.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Reduce Turbine load and Stop the West main feedwater pump
2 3		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
3 4	ZDI101QRV421 CLOSE	C(RO)	Normal boric acid control valve {QRV-421} fails closed (0)
4 2	RX02C [650]	I(RO)	RCS T_{hot} instrument (NTP-131) fails HIGH
5	RX26A [100]	I(BO)	East main feedwater pump speed controller fails HIGH (in AUTO)
6	FW05A FW46B FW52C	Major	Trip of East MFP and Loss of ALL Feedwater
7	EG10A	C(BO)	Diesel Generator AB fails to start in AUTO (clear after 30 sec)
8	ED05E	C(BO)	Bus T21A fails to re-energize
9	RX14A [0]	C(RO)	Steam dump master controller fails, Dumps must be open from individual controller

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

Op-Test No.: _____ Scenario No.: __6__ Event No.: __1 / 2__ Page _2_ of _7_

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction.
	RO	Maintain Tave – Tref mismatch within band (+ 1.0) by borating the RCS or inserting control rods.
	BOP	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: __6__ Event No.: __3__ Page _3_ of _7_

Event Description: Normal Boric Acid control valve fails CLOSED during boration.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Failure to Borate Normally ANN – Panel 209 Drop 39: BA Flow Deviation
	SRO	Direct actions per 02-OHP 4021.005.001: Enter T.S. 3.1.2.2 – Boration Path Continue power reduction with control rods
	RO	Take MANUAL control of Makeup and secure lineup * Borate alt method to borate
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6__ Event No.: __4__ Page _4_ of _7_

Event Description: RCS T_{hot} instrument (NTP-131) for Loop 3 fails HIGH {TE-431A}

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => ANN – Panel 211 Drop 6: Tave High ANN - Panel 211 Drp 15: Tave/Tref Deviation Various other ANN alarms
	SRO	Direct actions per 02-OHP 4022.013.007 Initiate 02-OHP 4030.STP.021: Event Initiated Surveillance Enter T.S. 3.3.1.1 action – One hour to trip B/S Perform Att C for Bistable tripping
	RO	Take MANUAL control of control rods Minimize Tave-Tref deviation Defeat Loop 3 Tave, Delta T, and Recorder Verify bistables tripped per Att C.
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6__ Event No.: __5__ Page _5_ of _7_

Event Description: East Main Feed pump speed controller fails HIGH (in AUTO)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Level LOW deviation; FW Flow lowering ANN – Panel 213 Drop 3/33: SG 1-2 Water Level LOW Dev ANN – Panel 214 Drop 3/33: SG 3-4 Water Level LOW Dev
	SRO	Direct actions per Alarm Response Procedure Manual control of SG Level as required to stabilize level
	BOP	Take MANUAL control of MFP and stabilize unit
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6___ Event No.: __6/7/8/9__ Page _6_ of _7_

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Trip of ONLY running MFP
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Actions (Steps 1 – 4) Transition to ES-0.1 (SI NOT required) Red Path – FR-H.1
	RO	Perform actions as directed by the US Verify Reactor Trip Verify SI NOT required
	BOP	Perform actions as directed by the US Verify Turbine Trip Verify Power to AC Emergency Buses

Op-Test No.: _____ Scenario No.: __6___ Event No.: __6/7/8/9__ Page _7_ of _7__

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => No AFW Feed available Transition to FR-H.1 required upon entry into ES-0.1
	SRO	Direct actions per 02-OHP 4023.FR-H.1: Verify Secondary Heat Sink is required Verify Bleed and Feed in NOT required Verify AFW Flow NOT available to any SG Stop ALL RCPs Verify Condensate System IN service Verify Feedwater Flow NOT available Depressurize ONE SG to less than 230 psig Verify Condensate aligned to feed SG (SG 1&4) Transition to E-1
	RO	Perform actions as directed by the US Stop ALL RCPs Actuate SI as required (lockout both SI + both RH pumps) Reset SI and Phase A isolation close Blowdown iso Valves closed
	BOP	Perform actions as directed by the US Dump Steam to condenser at MAXIMUM rate from ONE SG Align Condensate to feed through MFW pump

FRV manual 0% demand

disable MF pump trips use West MFP

open ckt Bkrs Back Panels.

Facility: DC Cook Scenario No.: 6 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-923] 58% Power, 2MFP, MSR In, Xe Increasing. East MDAFW pump OOS. [IRF FWR61 RO]; Unit 1 is in Mode 5 with its CTS drained [T.S. 3.7.1.2 entry – 7 day LCO]

Turnover: Stable at 58% power preparing to reduce power to 0%. The East MDAFW pump has been out of service to perform motor replacement for 73 hours. The unit is shutting down and the reactor must be in Mode 3 within the next 4 hours. Unit 1 is in Mode 6 with fuel being off-loaded. Currently in Step 4.9 of 02-OHP 4031.001.003, Power Reduction.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Reduce Turbine load and Stop the West main feedwater pump
2		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
3	ZDI101QRV421 CLOSE	C(RO)	Normal boric acid control valve {QRV-421} fails closed (0)
4	RX02C [650]	I(RO)	RCS T_{hot} instrument (NTP-131) fails HIGH
5	RX26A [100]	I(BO)	East main feedwater pump speed controller fails HIGH (in AUTO)
6	FW05A FW46B FW52C	Major	Trip of East MFP and Loss of ALL Feedwater
7	EG10A	C(BO)	Diesel Generator AB fails to start in AUTO (clear after 30 sec)
8	ED05E	C(BO)	Bus T21A fails to re-energize
9	RX14A [0]	C(RO)	Steam dump master controller fails, Dumps must be open from individual controller

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

Op-Test No.: _____ Scenario No.: __6__ Event No.: __1 / 2__ Page _2_ of _7_

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction.
	RO	Maintain Tave – Tref mismatch within band (+ 1.0) by borating the RCS or inserting control rods.
	BOP	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: __6__ Event No.: __3__ Page _3_ of _7_

Event Description: Normal Boric Acid control valve fails CLOSED during boration.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Failure to Borate Normally ANN – Panel 209 Drop 39: BA Flow Deviation
	SRO	Direct actions per 02-OHP 4021.005.001: Enter T.S. 3.1.2.2 – Boration Path Continue power reduction with control rods
	RO	Take MANUAL control of Makeup and secure lineup
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6__ Event No.: __4__ Page _4_ of _7_

Event Description: RCS T_{hot} instrument (NTP-131) for Loop 3 fails HIGH {TE-431A}

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => ANN – Panel 211 Drop 6: Tave High ANN - Panel 211 Drp 15: Tave/Tref Deviation Various other ANN alarms
	SRO	Direct actions per 02-OHP 4022.013.007 Initiate 02-OHP 4030.STP.021: Event Initiated Surveillance Enter T.S. 3.3.1.1 action – One hour to trip B/S Perform Att C for Bistable tripping
	RO	Take MANUAL control of control rods Minimize Tave-Tref deviation Defeat Loop 3 Tave, Delta T, and Recorder Verify bistables tripped per Att C.
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6__ Event No.: __5__ Page _5_ of _7_

Event Description: East Main Feed pump speed controller fails HIGH (in AUTO)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Level LOW deviation; FW Flow lowering ANN – Panel 213 Drop 3/33: SG 1-2 Water Level LOW Dev ANN – Panel 214 Drop 3/33: SG 3-4 Water Level LOW Dev
	SRO	Direct actions per Alarm Response Procedure Manual control of SG Level as required to stabilize level
	BOP	Take MANUAL control of MFP and stabilize unit
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6___ Event No.: __6/7/8/9__ Page _6_ of _7_

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Trip of ONLY running MFP
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Actions (Steps 1 – 4) Transition to ES-0.1 (SI NOT required)
	RO	Perform actions as directed by the US Verify Reactor Trip Verify SI NOT required
	BOP	Perform actions as directed by the US Verify Turbine Trip Verify Power to AC Emergency Buses

Op-Test No.: _____ Scenario No.: __6___ Event No.: __6/7/8/9__ Page _7_ of _7__

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => No AFW Feed available Transition to FR-H.1 required upon entry into ES-0.1
	SRO	Direct actions per 02-OHP 4023.FR-H.1: Verify Secondary Heat Sink is required Verify Bleed and Feed in NOT required Verify AFW Flow NOT available to any SG Stop ALL RCPs Verify Condensate System IN service Verify Feedwater Flow NOT available Depressurize ONE SG to less than 230 psig Verify Condensate aligned to feed SG Transition to E-1
	RO	Perform actions as directed by the US Stop ALL RCPs Actuate SI as required Reset SI and Phase A isolation
	BOP	Perform actions as directed by the US Dump Steam to condenser at MAXIMUM rate from ONE SG Align Condensate to feed through MFW pump

Facility: DC Cook Scenario No.: 6 Op-Test No.: 2001301

Examiners: _____ Operators: _____

Objectives:

Initial Conditions: [IC-923] 58% Power, 2MFP, MSR In, Xe Increasing. East MDAFW pump OOS. [IRF FWR61 RO]; Unit 1 is in Mode 5 with its CTS drained [T.S. 3.7.1.2 entry – 7 day LCO]

Turnover: Stable at 58% power preparing to reduce power to 0%. The East MDAFW pump has been out of service to perform motor replacement for 73 hours. The unit is shutting down and the reactor must be in Mode 3 within the next 4 hours. Unit 1 is in Mode 6 with fuel being off-loaded. Currently in Step 4.9 of 02-OHP 4031.001.003, Power Reduction.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Reduce Turbine load and Stop the West main feedwater pump
2		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
3	ZDI101QRV421 CLOSE	C(RO)	Normal boric acid control valve {QRV-421} fails closed (0)
4	RX02C [650]	I(RO)	RCS T_{hot} instrument (NTP-131) fails HIGH
5	RX26A [100]	I(BO)	East main feedwater pump speed controller fails HIGH (in AUTO)
6	FW05A FW46B FW52C	Major	Trip of East MFP and Loss of ALL Feedwater
7	EG10A	C(BO)	Diesel Generator AB fails to start in AUTO (clear after 30 sec)
8	ED05E	C(BO)	Bus T21A fails to re-energize
9	RX14A [0]	C(RO)	Steam dump master controller fails, Dumps must be open from individual controller

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

Op-Test No.: _____ Scenario No.: __6__ Event No.: __1 / 2__ Page _2_ of _7_

Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduction.
	RO	Maintain Tave – Tref mismatch within band (± 1.0) by borating the RCS or inserting control rods.
	BOP	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Op-Test No.: _____ Scenario No.: __6__ Event No.: __3__ Page _3_ of _7_

Event Description: Normal Boric Acid control valve fails CLOSED during boration.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Failure to Borate Normally ANN – Panel 209 Drop 39: BA Flow Deviation
	SRO	Direct actions per 02-OHP 4021.005.001: Enter T.S. 3.1.2.2 – Boration Path Continue power reduction with control rods
	RO	Take MANUAL control of Makeup and secure lineup
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6__ Event No.: __4__ Page _4_ of _7_

Event Description: RCS T_{hot} instrument (NTP-131) for Loop 3 fails HIGH {TE-431A}

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => ANN – Panel 211 Drop 6: Tave High ANN - Panel 211 Drp 15: Tave/Tref Deviation Various other ANN alarms
	SRO	Direct actions per 02-OHP 4022.013.007 Initiate 02-OHP 4030.STP.021: Event Initiated Surveillance Enter T.S. 3.3.1.1 action – One hour to trip B/S Perform Att C for Bistable tripping
	RO	Take MANUAL control of control rods Minimize Tave-Tref deviation Defeat Loop 3 Tave, Delta T, and Recorder Verify bistables tripped per Att C.
	BOP	Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6__ Event No.: __5__ Page _5_ of _7_

Event Description: East Main Feed pump speed controller fails HIGH (in AUTO)

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => SG Level LOW deviation; FW Flow lowering ANN – Panel 213 Drop 3/33: SG 1-2 Water Level LOW Dev ANN – Panel 214 Drop 3/33: SG 3-4 Water Level LOW Dev
	SRO	Direct actions per Alarm Response Procedure Manual control of SG Level as required to stabilize level
	BOP	Take MANUAL control of MFP and stabilize unit
	RO	Monitor primary plant conditions Perform actions as directed by the US

Op-Test No.: _____ Scenario No.: __6___ Event No.: __6/7/8/9__ Page _6_ of _7_

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Trip of ONLY running MFP
	SRO	Direct actions per 02-OHP 4023.E-0: Verify Immediate Actions (Steps 1 – 4) Transition to ES-0.1 (SI NOT required)
	RO	Perform actions as directed by the US Verify Reactor Trip Verify SI NOT required
	BOP	Perform actions as directed by the US Verify Turbine Trip Verify Power to AC Emergency Buses

Op-Test No.: _____ Scenario No.: __6___ Event No.: __6/7/8/9__ Page _7_ of _7__

Event Description: Loss of ALL Feedwater – requires use of condensate feed to establish heat sink. DG 2AB fails to AUTO start (manual start available after 30 sec). Loss of Bus T21A. Steam Dump master controller fails to 0 requiring manual operation.

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => No AFW Feed available Transition to FR-H.1 required upon entry into ES-0.1
	SRO	Direct actions per 02-OHP 4023.FR-H.1: Verify Secondary Heat Sink is required Verify Bleed and Feed in NOT required Verify AFW Flow NOT available to any SG Stop ALL RCPs Verify Condensate System IN service Verify Feedwater Flow NOT available Depressurize ONE SG to less than 230 psig Verify Condensate aligned to feed SG Transition to E-1
	RO	Perform actions as directed by the US Stop ALL RCPs Actuate SI as required Reset SI and Phase A isolation
	BOP	Perform actions as directed by the US Dump Steam to condenser at MAXIMUM rate from ONE SG Align Condensate to feed through MFW pump