SIMULATOR SCENARIOS AS PRESENTED TO AND REVIEWED BY FACILITY

EXAM REVIEW COMMENT SHEETS INCLUDED.

Appendix	D		Scenario Outline	Form ES-D-1
Facility: _	DC Cook		_ Scenario No.:1 Op-Test No.: _2001	301
Examine	rs:		Operators:	
	[9	<u>"</u> 7		
Initial Co	<u> </u>	7	er, The East RHR pump is OOS for a motor bearin	g repair and
is expect	ed back in	10 hours (21 hours of 72 hours) Tech Spec 3.5.2.d	
Turnover	. STP 02	7 CD has i	ust been completed and the diesel generator is re-	ady to be Need
shut dow	<u>n and unlo</u>	aded. A 20	O MW power decrease has been requested by the	System M
<u>Dispatch</u>	e r . Both ur	nits are at 1	100% power. The East CCP is in service.	
Event	Malf.	Event	Event	
No.	No.	Type*	Description	
1		N	Unload and secure the CD D/G for the completion	on of the STP
2	RCO3	Minor	Small break LOCA (10 gpm)	
** #	7007	C(BO)	As a Turbine begins load decrease auto EH con	trol fails -
3		R	Power decrease using boration	
46) A	CVISA	C(RO)	East CCP fails on overcurrent	
5(2)	RX27	I(BO)	Feedwater flow controller fails low	
~ 1	CV12			au . 7
-02/4		I(RO)	Charging pump flow controller fails low [104]	- 1
7	RC01A	Major Rads 4 C(BO)	Large break LOCA [75%] 5:00 Rung	2
8	ED05E	C(BO)	7214 Pails to Clar in Vital bus T214 fails ZADO GOG RAZ	and the Co
9	RP13A	C(RO)	Auto Phase A does not occur	-
		-	•	

^{&#}x27; (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

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

Appendix D	Operator Actions	Form ES-D-2

		Scenario No.:1_ Event No.:1 Page _1_ of
Evenio	escription: <u>Norr</u>	nal – 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
		operations
	ВО	Using Attachment 2 Step 4.4
		Reduce diesel load to 1000 kW and hold for approximately
		10 minutes
		10 minutes
		As applicable, open the following diesel generator output
		breakers:
		T21D8
		T21C3
		Adjust discal around to 60 Uz
		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
j		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
	ВО	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
	RO	Monitor boards

Op-Test No.: <u>2001301</u> Scenario No.: <u>__1</u> Event No.: <u>__2</u> Page _1_ of ___

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

annunciators for PZR and VCT. ak indications and check the following VCT level decreasing, PZR level decreasing, increasing, Containment radiation levels dure 02-OHP.4022.002.020 'EXCESSIVE DOLANT LEAKAGE' and begins leak rate s for leak location and indications ad to leak inside of containment
VCT level decreasing, PZR level decreasing, increasing, Containment radiation levels dure 02-OHP.4022.002.020 'EXCESSIVE OOLANT LEAKAGE' and begins leak rate is for leak location and indications
OOLANT LEAKAGE' and begins leak rate
ad to leak inside of containment
begin plant shutdown per 02- 1.003 'POWER REDUCTION'
wn by boration
shutdown in manual
Spec 3.4.6.2. a & .b (RCS leakage)
unidentified and no pressure boundary It be in Hot Standby in 6 hours.

Op-Test No.: <u>2001301</u> Scenario No.: <u>__1</u> Event No.: <u>__3</u> Page _1_ of ___

Event Description: Power decrease using boration

Time	Position	Applicant's Actions or Behavior			
Time	SRO Direct power reduction using procedure				
	Sho				
		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			
	во	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)			
	во	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003			
		•			

Op-Test No.: <u>2001301</u> Scenario No.: <u>__1</u> Event No.: <u>__4</u> Page _1_ of ___

Event Description: <u>East CCP fails on overcurrent, Malfunction CV13A</u>

	•	
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
	во	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
Op 100(110 <u>2001001</u> _		- '		_5	1 490 _ 1_ 01

Event Description: <u>Feedwater Pump DP controller failure</u>, RX27, failure of DP controller to <u>25%</u>

	· · · · · · · · · · · · · · · · · · ·	
Time	Position	Applicant's Actions or Behavior
	ВО	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
Op 1001110 <u>2001001</u>		. ' —			1 ugc _1_ 01

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

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)
	во	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/B O	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: <u>Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%.</u>

<u>Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'</u>

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.
	во	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.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>7, 8, 9</u> Page _1_ of ___

Event Description: <u>Large break LOCA</u>, <u>Malfunction RC01 'RCS cold leg loop rupture' at 75%</u>. <u>Malfunction ED05E 'Loss of 4160 V Bus T21A'</u>, <u>Malfunction RP13A 'Failure of containment</u>

isolation	Phase A to acti	uate automatically, Train A'
Time	Position	Applicant's Actions or Behavior
	ВО	Complete Attachment 'A' of E-0
	RO	Stop RCPs
	во	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.: <u>2001301</u> Scenario No.: <u>_1</u> Event No.: <u>_7, 8, 9</u> Page _1_ of ___

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

Time	Position	Applicant's Actions or Behavior
	ВО	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

	No.: <u>2001301</u> escription:	Scenario No.:1_ Event No.: Page _1_ of
Time	Position	Applicant's Actions or Behavior
	!	

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Scenario Outline

Form ES-D-1

Facility:	DC Cook		_ Scenario No.:1 Op-Test No.: _2001301	
Examine	rs:	•	Operators:	
Initial Co	nditions:	100% nowe	er, The East RHR pump is OOS for a motor bearing repair and	
is expect	ed back in	10 hours (2	21 hours of 72 hours) Tech Spec 3.5.2.d	
		40 —	21 hours of 72 hours) Tech Spec 3.5.2.d 1 q 00 kw Pen STEP 4.26.11 of ATTACHAENT AT A DOKE PEN STEP 4.26.11 OF APENWOOLK FOR STEP COL STP	
_	New Contraction	- 15	ust been completed and the diesel generator is ready to be	
shut dow	:/ SIP.02	7.CD nas i	ust been completed and the diesel generator is ready to be	ENGLA
Dispateh	er. Both ur	nits are at 1	100% power. The East CCP is in service.	
			REDUCTION IN TO START	
Event	Malf.	Event		
No.	No.	Type*	Event Description	
1		N	Unload and secure the CD D/G for the completion of the STP	
2	RCO3	Minor	Small break LOCA (19 gpm) 30 (gpm)	
**		C(BO)	As a Turbine begins load decrease auto EH control fails	
BI 43	1./-	R	Power decrease using boration	
(4) 64	6V124	C(RO)	East CCP fails on oversturont	
D 3 6	RX27	I(BO)	Feedwater flow controller fails low	
5	CV12	-t(RO)	Charging pump flow controller fails low Plane in G	K
7	RC01	Major	Large break LOCA	3 799
8 OK	ED05E	C(BO)	Vital bus T21A fails (E61215) from after trans	· • / /
9 9	RP13A	C(RO)	Auto Phase A does not occur	

June 2000

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^{* (}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	
			4030-STP-027 CD	

		Scenario No.:1 Event No.:1 Page _1_ of uo30 -s7P-027 cio nal – Unload and Secure DGCD per 02-OHP.4 021.032.0016D _
Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP to shutdown the DG and maintain overview of operations
	ВО	Using Attachment 2 Step 4.426.1/
	4	Reduce diesel load to 1000 kW and hold for approximately 10 minutes
ام	7	As applicable, open the following diesel generator output breakers:
20 pl		T21D8 T21C3
		Adjust diesel speed to 60 Hz
		Verify DG2CD START GEN & 69/4KV VOLTMETER SEL switch in - OFF
		Using Step 4.6 26 112 Verify the following breakers – OPEN,
		T2108- D62CD 4KV CB T 21C23
		D GTCD
		Verify diesel UNLOADED for approximately 2 minutes

Op-Test No.: <u>2001301</u>	Scenario No.: _	_1	Event No.: _	_1	Page _1_ of
Event Description: Norr	nal – Unload and	Secu	ire DGCD pe	r 02-OHP.402	1.032.001CD

Time	Position	Applicant's Actions or Behavior
Time	Position 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
	·	

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 FON LEAK RATE Enters procedure 02-OHP.4022.002.020 'EXCESSIVE REACTOR COOLANT LEAKAGE' and begins leak rate calculation PUT IN STEPS FON THIS PROCED W. SRO, RO, 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	Time Position	Applicant's Actions or Behavior
parameters: VCT level decreasing, PZR level decreasing, Charging flow increasing, Containment radiation levels increasing STP.016 FON LEAK RATE SRO Enters procedure 02-OHP.4022.002.020 'EXCESSIVE REACTOR COOLANT LEAKAGE' and begins leak rate calculation PUT IN STEPS FON THIS PROCED OF SRO, RO, 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' Let January 1021.003 RO Begin shutdown by boration	RO	Acknowledge annunciators for PZR and VCT.
SRO Enters procedure 02-OHP.4022.002.020 'EXCESSIVE REACTOR COOLANT LEAKAGE' and begins leak rate calculation Out in STEPS FOR THIS PROCED WITH STEPS FOR THE PROCED WITH		parameters: VCT level decreasing, PZR level decreasing, Charging flow increasing, Containment radiation levels increasing
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	SRO	Enters procedure 02-OHP.4022.002.020 'EXCESSIVE REACTOR COOLANT LEAKAGE' and begins leak rate
RO Begin shutdown by boration	SRO, RO,	Begins checks for leak location and indications
RO Begin shutdown by boration	во	Indications lead to leak inside of containment 4021.603.00
3	SRO	Determine to begin plant shutdown per 02- OHP.4021.001.003 'POWER REDUCTION' Let day
BO Begin Turbine shutdown in manual	RO	Begin shutdown by boration
	ВО	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.	SRO	LCO is 1 gpm unidentified and no pressure boundary

Op-Test No.: 2001301_	Scenario No.:	1	Event No.: 3	Page 1 of	
-		_ •		i ago i oi	

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
	во	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)
	во	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003
	į	

Op-Test No.: 2001301_ Scenario No.: __1__ Event No.: __4__ Page _1_ of __ SHAFT SHEAR Event Description: East CCP Time Position Applicant's Actions or Behavior Recognize CCP breaker T21D7 RCP seal flow low alarm, RO 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) LOCKOUT 'S' CCP 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 mov & vent 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, Dispatch AO to investigate problem and contact maintenance BO for support

Op-Test No.: <u>2001301</u> Scenario No.:1 Event No.:5 Page _1_ of							
Event Do 25% 50%	escription: <u>Feed</u>	water Pump DP controller failure, RX27, failure of DP controller to					
Time	Position	Position Applicant's Actions or Behavior					
	ВО	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.: <u>2001301</u>	Scenario No.:1 Event No.:6 Page _1_ of						
	Event Description: Centrifugal charging pump flow control valve failure, Malfunction CV12, valve fails at 40% 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 Class of the charging pumps or shift to the PDP Thrallo QRV-200 to	ما					
	SRO	Check Tech Specs for charging Tech Specs. 3.5.2.a (This is second train of ECCS therefore 3.0.3 is applicable)						
	во	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/B O	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
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Event Description: <u>Large break LOCA</u>, <u>Malfunction RC01 'RCS cold leg loop rupture' at 75%</u>. <u>Malfunction ED05E 'Loss of 4160 V Bus T21A'</u>, <u>Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A'</u>

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.
	во	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	<u>, 9 </u>	_1.	_ of	
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Event Description: <u>Large break LOCA</u>, <u>Malfunction RC01 'RCS cold leg loop rupture' at 75%</u>. <u>Malfunction ED05E 'Loss of 4160 V Bus T21A'</u>, <u>Malfunction RP13A 'Failure of containment</u>

isolation Phase A to actuate automatically, Train A'							
Time	Position	Applicant's Actions or Behavior					
	ВО	Complete Attachment 'A' of E-0					
	RO	Stop RCPs					
	во	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.: <u>2001301</u>	_ Scenario No.: _	_1	Event No.: _7, 8, 9_	Page _1_ of
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Event Description: <u>Large break LOCA</u>, <u>Malfunction RC01 'RCS cold leg loop rupture' at 75%</u>. <u>Malfunction ED05E 'Loss of 4160 V Bus T21A'</u>, <u>Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A.</u>

Time	Position	Applicant's Actions or Behavior
	ВО	 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.: <u>2001301</u> Scenario No.:1_ Event No.: Page _1_ of					
Event D	escription:					
Time	Position	Applicant's Actions or Behavior				
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Appendix D	Scenario Outline	Form ES-D-1

Facility: _	DC Cook		Scenario No.:1 Op-Test No.: _2001301
Examine	rs:		Operators:
			· · · · · · · · · · · · · · · · · · ·
Initial Co	nditions:	100% powe	er, The East RHR pump is OOS for a motor bearing repair and 21 hours of 72 hours) Tech Spec 3.5.2.d
	eu buon	TO HOUSE (21 Hours of 72 Hours) Team open 6.5.2.4
shut dow	n and unlo	aded. A 20	just been completed and the diesel generator is ready to be 00 MW power decrease has been requested by the System
			100% power. The East CCP is in service.
	T	1	
Event	Malf.	Event	Event
No.	No.	Type*	Description
1		N	Unload and secure the CD D/G for the completion of the STP
2	RCO3	Minor	Mrs leak Small b reak LOCA (10 gpm)
**		C(BO)	As a Turbine begins load-decrease auto-EH-control fails
3		R	Power decrease using boration
Ala	CV13A	C(RO)	East CCP fails on overcurrent Shaft shear.
BAN (RX27	I(BO)	Feedwater flow controller fails low
800 \$	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
		1	1

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

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

Appendix D	Operator Actions	Form ES-D-2

Op-Test	No.: <u>2001301</u>	Scenario No.:1_ Event No.:1 Page _1_ of				
Event D	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				
	во	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.: <u>2001301</u>	Scenario No.:1_ Event No.:1 Page _1_ of
Event D	escription: <u>Norr</u>	mal - Unload and Secure DGCD per 02-OHP.4021.032.001CD
	1	
Time	Position	Applicant's Actions or Behavior
	во	Stop DG2CD using ANY of the following methods:
		Place DG2CD Stop-Run Control switch to STOP
<u> </u>		Press Emergency trip pushbutton in Control Room
 	!	
	!	Verify green target at DG2CD Stop-Run Control switch
: 		Complete Data Shoot No. 1
		Complete Data Sheet No. 1
		Independently verify the following control switches in
		NEUTRAL:
		DOCOD 4137 OD TO4 DO
		DG2CD 4kV CB T21D8
		DG2CD 4kV CB T21C3
		Monitor boards
	RO	
		Í
		·
J	i	

Op-Test No.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>2</u> Page <u>1</u>	Op-Test No.: 2001301_	Scenario No.: _	_1	Event No.:2	Page _1_ of _
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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
	во	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
	во	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.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>3</u> Page <u>1</u> of ___

Event Description: Power decrease using boration

Time	Position	Applicant's Actions or Behavior
	SRO	Direct power reduction using procedure
	1	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
	во	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)
	во	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___

Sheet 5 Lear

Event Description: East CCP fails on overcurrent, Malfunction CV13A Page _1_ of ____

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
	ВО	Monitor boards
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Op-Test No.: <u>2001301</u>	Scenario No.:1_	Event No.:5	5	Page _1_ of

Event Description: <u>Feedwater Pump DP controller failure</u>, RX27, failure of DP controller to <u>25%</u>

Time	Position	Applicant's Actions or Behavior
	ВО	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

On Toot No . 0001001	Caanaria Na .	4	E N	^	D 4 (
Op-Test No.: 2001301_	Scenario No.:	!	Event No.:	ь	Page 1 of	

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

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)
	во	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/B O	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.
	ВО	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.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>7, 8, 9</u> Page <u>1</u> of ___

Event Description: <u>Large break LOCA</u>, <u>Malfunction RC01</u> 'RCS cold leg loop rupture' at 75%. <u>Malfunction ED05E</u> 'Loss of 4160 V Bus T21A', <u>Malfunction RP13A</u> 'Failure of containment

isolation Phase A to actuate automatically, Train A'

isolation	Friase A to acti	uate automatically, Irain A'
Time	Position	Applicant's Actions or Behavior
	ВО	Complete Attachment 'A' of E-0
	RO	Stop RCPs
	во	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
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Event Description: <u>Large break LOCA</u>, <u>Malfunction RC01</u> 'RCS cold leg loop rupture' at 75%. <u>Malfunction ED05E</u> 'Loss of 4160 V Bus T21A', <u>Malfunction RP13A</u> 'Failure of containment isolation Phase A to actuate automatically, <u>Train A</u>.

Time	Position	Applicant's Actions or Behavior	
	ВО	 Applicant's Actions or Behavior 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			
		·			

W. Neil

Appendix D			Scenario Outline	Form ES-D-
Facility:	DC Cook		Scenario No.:1 (Op-Test No.: <u>2001301</u>
Examine	rs:		Operators:	3
	-		·	
		t ·		
Initial Co	nditions: _ ted back in	100% powers (er, The East RHR pump is OO 21 hours of 72 hours) Tech S	S for a motor bearing repair and pec 3.5.2.d
Turnove	r: STP 02	7 CD has	ust been completed and the d	iesel generator is ready to be
shut dow	<u>n and unlo</u>	aded. A 20	00 MW power decrease has be 100% power. The East CCP is	een requested by the System
	er. Douru	illo ale at	100% power. The East CCP is	s in service.
Event	Malf.	Cyant		
No.	No.	Event Type*		Event scription
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 de	crease auto-EH-control fails
3		R	Power decrease using borat	ion
4	CV13A	C(RO)	East CCP fails on overcurre	nt
5	RX27	I(BO)	Feedwater flow controller fai	Is low
6	CV12	I(RO)	Charging pump flow controll	er 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 occu	r
			•	

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

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

Appendix D	Operator Actions	Form ES-D-2
	0,00,000,000	

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	
	во	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.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>1</u> Page <u>1</u> of <u> </u>					
Event Description: Normal – Unload and Secure DGCD per 02-OHP.4021.032.001CD					
Time	Position	Applicant's Actions or Behavior			
	во	Stop DG2CD using ANY of the following methods:			
	ŧ	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:			
		NEOTIGE.			
		DG2CD 4kV CB T21D8			
		DG2CD 4kV CB T21C3			
		Monitor boards			
	RO				
	·				

Op-Test No.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>2</u> Page <u>1</u> 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.
	1	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
	во	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
ţ	ВО	Begin Turbine shutdown in manual
.\ .	SRO	Refer to Tech Spec 3.4.6.2. a & .b (RCS leakage)
ت و سدست دی موجود مستوسستان و حس		LCO is 1 gpm unidentified and no pressure boundary leakage. Must be in Hot Standby in 6 hours.
And the second s		

Actinopleages Augustiator 207 Drop 99, Rx VESSEL

HD LINE FLOW DETECTED.

Directs entry into ARP 207 Drop 99 - no immediate
actions, directs the following supplementary actions:

- Verify Rx hd vent values closed

- checks containment lakage detection system indications

Page 4 of 122

NUREG-1021, Revision 8

Page 4 of 122 NUREG-1021, Revision 8
- Performs RCS leak test per 02-040 4030, STP. 016;
REACTOR COOLANT SYSTEM LEAK TEST
- Checks T.S.3:4.6.2 and 3.4.12.1 to ensure compliance

Determines there is \$ 10 year lack.

June 2000

Ro

SRO

SRO

Op-Test No.: <u>2001301</u> 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
	во	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)
	ВО	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003

Op-Test No.: <u>2001301</u>	Scenario No.:1_	Event No.:4	Page _1_ of

Event Description: <u>East CCP fails on overcurrent, Malfunction CV13A</u>

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
	ВО	Monitor boards
	SRO, RO, BO	Dispatch AO to investigate problem and contact maintenance for support

Event Description: <u>Feedwater Pump DP controller failure</u>, RX27, failure of DP controller to <u>25%</u>

Time	Position	Applicant's Actions or Behavior
	ВО	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.: <u>2001301</u> Scenario No.: <u>__1</u> Event No.: <u>__6</u> 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)
	во	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/B O	Dispatch AO to investigate problem and contact maintenance for support
		0Z - OHP - 4024-207
		Thrush barrier alarms for RCPs on 7 207 Drop 18, etc.
		l l

Restoring letdown O2047 4021,003.001 Sec. 41 13
Remove Excess let bound Attachment 6

Page _1_ of ___ Op-Test No.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>7</u>, 8, 9

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.
	во	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.: <u>2001301</u> Scenario No.: <u>1</u> Event No.: <u>7, 8, 9</u> Page _1_ of ___

Event Description: <u>Large break LOCA</u>, <u>Malfunction RC01</u> 'RCS cold leg loop rupture' at 75%. <u>Malfunction ED05E</u> 'Loss of 4160 V Bus T21A', <u>Malfunction RP13A</u> 'Failure of containment

isolation	n Phase A to actuate automatically, Train A'		
Time	Position	Applicant's Actions or Behavior	
	ВО	Complete Attachment 'A' of E-0	
	RO	Stop RCPs	
	ВО	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: <u>Large break LOCA, Malfunction RC01 'RCS cold leg loop rupture' at 75%.</u>

<u>Malfunction ED05E 'Loss of 4160 V Bus T21A', Malfunction RP13A 'Failure of containment isolation Phase A to actuate automatically, Train A.</u>

	· · · · · · · · · · · · · · · · · · ·	
Time	Position	Applicant's Actions or Behavior
	ВО	 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		
	ł			

Appendix D	Scenario Outline	Form ES-D-1

Facility: _	DC COOK		Scenario No.: 2 Op-Test No.: 2001301		
Examine	Examiners:Operators:				
			25 1/0 - 10 - 10 - 10 - 10 - 10 - 10 - 10		
			25 gpd/or curse		
Initial Co	nditions: <u>10</u> S Pump is	00% power.	. A tube leak on S/G #2 (5 gpm) requires a T.S. shutdown.		
Es	W				
			er, Unit 2 is at 100% power. A tube leak on S/G #2 requires a l.6.2.c limits leakage to < 1gpm or shutdown in 6 hours.		
1.0. 3114	A	л орес о	4022,002 Promis been complete	Tel .	
_500	of down	n is	to ster 9 leak rate has been cent		
	<u> </u>	Ī		vme	
Event No.	Malf. No.	Event Type*	Description Event		
NO.	INO.				
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			control room		
8	RP20C SW04B	C(BO)	Standby ESW pumpsdoes 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
	во	Commence manual load reduction using the load-limiter or operating
	RO	Use boration to maintain T _{AVE}
	ВО	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003
	·	

Appendix D	Operator Actions	Form ES-D-2

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
	ВО	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
	во	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)
	RO	Tech Specs 3.3.3.5 & 3.3.3.6 (30 day LCO) Monitors primary plant

Op-Test No.: <u>2001301</u> Scenario No.: <u>2</u> Event No.: <u>4</u> Page <u>1</u> of				
Event Do	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.: <u>2001301</u>	Scenario No.:2_ Event No.:4_ Page _1_ of			
Event D 0%	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 Varify above 75 and 75.			
		Verify charging >75 gpm			
		Verify letdown orifice valves closed			
		Verify CCW from letdown Hx outlet control valve OPEN Addition COPY COAL Late Incompany and the SOA			
		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			
	во	Monitor panels			

Op-Test	t No.: <u>2001301</u> _	Scenario No.: 2 Event No.: 5 Page 1 of
Event D	escription: Malf	unction RC11B, 'Reactor coolant pump #2 high vibration'. Increases to
🌠 mils a	nd then increase	unction RC11B, 'Reactor coolant pump #2 high vibration'. Increases to e to 15 mils
49	install	(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 SW3115, 'Essentjal Service Water Pump Trip'. Malfunction RP10A&B, 'Failure of Safety Injection to Actuate-Automatic', SI will actuate manually

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
	во	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'	BTRAIN ST \\ Recognize that the \frac{standby ESW}{start the pump \(\frac{s}{start} \)
	ВО	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.: <u>2001301</u> Scenario No.: <u>2</u> Event No.: <u>6</u> Page <u>1</u> of ___

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

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 on go	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 Isolate feed flow to SG#2 when level is >13% Check SG#2 pressure

Op-Test No.: 2001301 Scenario No.: 2 Event No.: 6 Page 1 of				
Event D Malfunc	Event Description: Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.			
Time	Time Position Applicant's Actions or Behavior			
	SRO/RO	Determine core exit temperature required based on SG#2 pressure		
	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 Stock STEAMLINE ST. Stop the cooldown and maintain the desired RCS temperature		
	BE RD	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 \mathbb{RSC} pressure is > 300psig \mathbb{RCS}		
	·	Check SG#2 pressure stable ∉ rising <i>bR</i>		

Appendix D	Operator Actions	Form ES-	D-2
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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**

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Scenario Outline

Form ES-D-1

Facility:	Facility: <u>DC COOK</u>		r: _DC COOK Scenario No.:2 Op-Test No.: _2001301		
Examine	rs:	W 1380	Operators:		
	nditions: <u>10</u> S Pump is		. A tube leak on S/G #2 (5 gpm) requires a T.S. shutdown.		
Turnove	r: <u>Unit 1 is a</u>	at 75%pow	er, Unit 2 is at 100% power. A tube leak on S/G #2 requires a 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 (ເພ)	_	
4	RX05A	I(RO)	Pressurizer level channel fails low (O)	_	
5	RC11B	C(RO)	RCP #2 vibration high (7 mils + 15 mils + 2057.	_	
6	RC23B	Major	Steam generator #2 tube rupture (400 gpm)		
7	201101 -(XXXX) FM0222 (0	C(BO)	East MDAFW throttle valve (FMO-222) will not close from the control room	Sains to	
8	SCLOC	C(BO)	Control room B' Total St pun fail to France in Acro Standby ESW pump does not start in automatic	Close Uparre FAUVPMO	
9	RP10A &B	I(RO)	No automatic SI (つメジェ ト/B)	FAUUTANO	

Preset

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

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Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.: <u>2001301</u> Scenario No.: <u>2</u> Event No.: <u>1 & 2</u> Page <u>1</u> of ___

Event Description: Power reduction to comply with Tech Spec requirements

	1	
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
	ВО	Commence manual load reduction using the load-limiter or
		operating
	RO	Use boration to maintain T _{AVE}
		· · · · · · · · · · · · · · · · · · ·
	во	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003
		•

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	1 01111 23-21-2

Op-Test No.: 2001301_	Scenario No.:2_	Event No.: 3	Page <u>1</u> of

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

Time	Position	Applicant's Actions or Behavior
	ВО	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
	ВО	Manually close S/G #2 PORV
	000	
	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

On-Test	No : 2001301	Scenario No.: 2 Event No.: 4 Page 1 of		
Event D		unction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to		
0%	1	Г		
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'		
	D0			
	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 		
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Op-Tes	No.: <u>2001301</u>	Scenario No.:2_ Event No.:4_ Page _1_ of			
Event D 0%	escription: <u>Malfu</u>	unction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to			
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			
	во	Monitor panels			

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: 2001301_	Scenario No.: 2	Event No.: 5	Page <u>1</u> of
Op 100(110): <u>2001001</u> _			1 ago _ <u></u> _ 01

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

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 safinjection'			
	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		
	во	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 manually close the valve			
	во	Recognize that the standby ESW pump did not start in automatic and manually start the pump		
	во	Implement Attachment 'A' of E-0		
	RO	Stop RCPs because RCS pressure is < 1300 psig		
	SRO	Transition to E-3, 'Steam Generator Tube Rupture'		

Appendix D	Operator Actions	Form ES-D-2
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Op-Test	t No.: <u>2001301</u>	Scenario No.: 2 Event No.: 6 Page 1 of				
		m generator #2 tube rupture occurs when reactor trip occurs, eam 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 Class steem symble (2-MCM-804) to TDAFM				
		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				
	ВО	• Isolate feed flow to SG#2 when level is >13%				
,		rectate food flow to Gail When level to 2 1070				
	RO	Check SG#2 pressure .430 psig				
	SRO/RO	Initiate RCS Cooldown				
		1				

Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.: <u>2001301</u> Scenario No.: <u>2</u> Event No.: <u>6</u> Page <u>1</u> of ___

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

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		
	во	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		

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: 2001301_	Scenario No.:	2	Event No.:6	Page _1_ of
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Event Description: <u>Steam generator #2 tube rupture occurs when reactor trip occurs, Malfunction RC23B, 'Steam generator tube rupture' at 400 gpm.</u>

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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.					
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 valv	ve (FMO-222) will not close from the	
8	SW04B	C(BO)	Standby ESW pump does	s not start in automatic	
9	RP10A &B	I(RO)	No automatic SI		
				•	

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

Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.: <u>2001301</u> Scenario No.: <u>2</u> Event No.: <u>1 & 2</u> Page <u>1</u> of ___

Event Description: Power reduction to comply with Tech Spec requirements

<u></u>		
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
	во	Commence manual load reduction using the load-limiter or operating
	RO	Use boration to maintain T _{AVE}
	ВО	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003
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Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: <u>2001301</u> Scenario No.: <u>2</u> Event No.: <u>3</u> Page <u>1</u> of ____

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

<u></u>		
Time	Position	Applicant's Actions or Behavior
	ВО	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
	ВО	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

		Scenario No.: 2 Event No.: 4 Page 1 of
0%	escription: <u>Malfu</u>	unction RX05A, 'Pressurizer level transmitter failure (LT-459)' fails to
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
		·
		•

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
	во	Monitor panels

Appendix D	Operator Actions	Form ES-D-2
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Event Description: <u>Malfunction RC11B</u>, '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
	во	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
	ВО	Recognize that the standby ESW pump did not start in automatic and manually start the pump
	во	Implement Attachment 'A' of E-0
	RO	Stop RCPs because RCS pressure is < 1300 psig
	SRO	Transition to E-3, 'Steam Generator Tube Rupture'

Appendix D Operator Actions Form ES F			
Appendix b Operator Actions 1 offit E3-L	pendix D	Operator Actions	Form ES-D-2

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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
	ВО	 Isolate feed flow to SG#2 when level is >13%
	RO	Check SG#2 pressure .430 psig
· · · · · · · · · · · · · · · · · · ·	SRO/RO	Initiate RCS Cooldown
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Appendix D	Operator Actions	Form ES-D-2
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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
	во	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

Appendix D	Operator Actions	Form ES-D-2
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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
		·

Appendix D	Scenario Outline	Form ES-D-1

Facility:	DC COOK	(Scenario No.: 2 Op-Test No.: 2001301					
Examine	Examiners:Operators:							
	Initial Conditions: 100% power. A tube leak on S/G #2 (5 gpm) requires a T.S. shutdown.							
Turnovei	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

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
	во	Commence manual load reduction using the load-limiter or operating
	RO	Use boration to maintain T _{AVE}
	ВО	Maintain Main Generator parameters throughout use of this procedure using 02-OHP.4021.059.001 and 02-OHP.4021.080.003
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Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: 2001301	Scenario No.:	2	Event No.:	3	Page _1_ of
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Event Description: <u>Malfunction RX17F, 'Steam Generator pressure transmitter failure (MPP-222)' fails to 100%.</u>

Time	Position	Applicant's Actions or Behavior
	ВО	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
	во	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

F							
Op-Test	Op-Test No.: <u>2001301</u> Scenario No.: <u>2</u> Event No.: <u>4</u> Page <u>1</u> 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 					
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Op-Test	No.: <u>2001301</u> _	Scenario No.:2_ Event No.:4_ Page _1_ of					
Event D 0%	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					
	ВО	Monitor panels					

Appendix D	Operator Actions	Form ES-D-2
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Event Description: Malfunction RC11B, 'Reactor coolant pump #2 high vibration'. Increases to 7 mils and then increase to 15 mils

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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
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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
	во	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
	ВО	Recognize that the standby ESW pump did not start in automatic and manually start the pump
	ВО	Implement Attachment 'A' of E-0
	RO C	Stop RCPs because RCS pressure is < 1300 psig
	SRO	Transition to E-3, 'Steam Generator Tube Rupture'

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: 2001301	Scenario No.:	2	Event No.:6	Page _1_ of
op . oot. to.: <u>2001001</u>		<u>–</u>	- VCIIL IVO	1 aye _1_ 01

Time	Position	Applicant's Actions or Behavior		
	SRO/RO	Identify Ruptured S/G as #2 by the following indications:		
İ		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 		
	во	 Isolate feed flow to SG#2 when level is >13% 		
	RO	Check SG#2 pressure 430 psig		
	SRO/RO	Initiate RCS Cooldown		

Appendix D	Operator Actions	Form ES-D-2

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 [A Policy of the P		
		Bypass steam dump low-low T _{AVE} interlock if dumping to condenser		
		Stop the cooldown and maintain the desired RCS temperature		
	во	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		

Appendix D	Operator Actions	Form ES-D-2

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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
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Appendix D	Scenario Outline	E0rm ES-13-1
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Facility: DC Cook			Scenario No.:3 Op-Test No.: _2001301					
Examine	ers:		Operators:					
Initial Co	onditions: _{	30% power	with the North heater drain pump secured, rods in auto.					
Turnove	r: <u>Maintai</u>	n power at かんき 片	80% START THE WORTH HDP AND SECUL					
Event No.	Malf. No.	Event Type*	Event Description					
1		N	Swap North and middle heater drain pump					
2	<i>10</i> NI 09 В	I(RO)	CHคุมฟัย 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,
** Failure not needed and does not contribute to evaluation (M)ajor

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: 2001301_	Scenario No.:	3	Event No.: 1	Page _1_ of
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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		
	во	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 <u>WHILE</u> 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		
		•		

Event Description: <u>Malfunction NI09B</u>, '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: TO MATCH TAUS Comparator channel defeat Upper section detector current comparator defeat Lower section detector current comparator defeat Power mismatch bypass selector	
	во	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 (OT∆T trip and runback) Disconnect plug P312 from jack at rear of 2-N-42 drawer or pull the control and instrument fuses 	

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: 2001301	Scenario No.: _	3_	Event No.:4	Page <u>1</u> of
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Event Description: Malfunction RX23H, 'Steam Generator Level Transmitter (BLP-131) LT-539 Failure' on S/G #3 fails to 0%

	T	
Time	Position	Applicant's Actions or Behavior
	ВО	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)
	ВО	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
	во	Manually actuate AMSAC
	во	 (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

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	
	ВО	(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	
	ВО	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	
	во	Implement Attachment A	
	SRO	Transition to E-2 'Faulted Steam Generator Isolation' -Note that task has already been accomplished.	

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
TITLE	SRO	Transition to 02-OHP.4023.E-1, 'Loss of Reactor Coolant or Secondary Coolant'
	RO	62 02-04P. 4023. E5-1:1 SI TERMINAT Reset SI
		Reset containment Phase A
	SRO	Direct Chemistry to sample S/Gs
		TERMINATE THE SCENARIO

Appendix D	Scenario Outline	Form FS-D-1
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Facility:	DC Cook		Scenario No.:3 Op-Test No.: _2001301		
Examine	Examiners:Operators:				
		· · · · · · · · · · · · · · · · · · ·			
Initial Co	onditions: _{	80% powe	with the North heater drain pump secured, rods in auto.		
Turnove	r: <u>Maintai</u>	n 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

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: <u>2001301</u> _	Scenario No.: 3	Event No.: 1	Page _1_ of
Op : 00t 110:: <u>2001001</u> _	<u> </u>		1 4gc 01

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
e	во	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 <u>WHILE</u> 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
		•

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

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
	во	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 (OT∆T trip and runback)
		Disconnect plug P312 from jack at rear of 2-N-42 drawer or pull the control and instrument fuses
	·	·

Appendix D	Operator Actions	Form ES-D-2

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 Implement 02-OHP.4022.013.013, 'Steam Generator Level **SRO** 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) Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip the channel), SRO 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 Monitor panels RO

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

	T T	
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
	ВО	Manually actuate AMSAC
	ВО	 (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
	ВО	(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
	во	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
	ВО	Implement Attachment A
	SRO	Transition to E-2 'Faulted Steam Generator Isolation' -Note that task has already been accomplished.

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Appendix D	Operator Actions	Form ES-D-2

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
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		•
		•

Facility: DC Cook			_ Scenario No.:3 Op-Test No.: _2001301			
Examiners:			Operators:			
Initial Co	Initial Conditions: 80% power with the North heater drain pump secured, rods in auto.					
Turnovo	Turnover: _Maintain power at 80%_					
- Turriove	i. <u>iviairitai</u>	ii powei at	00 /6			
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

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: 2001301_	Scenario No.: 3	Event No.: 1	Page _1_ of
	<u> </u>		1 490

Event Description: <u>Swap North and middle heater drain pumps per procedure 02-OHP.4021.060.014</u>, '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
	ВО	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 <u>WHILE</u> 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
	. ,	

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

millam	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		
	во	Monitor panels		
	SRO	TIS Jow PAR 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 (OT∆T trip and runback) Disconnect plug P312 from jack at rear of 2-N-42 drawer or pull the control and instrument fuses 		
	L	L.		

Appendix D	Operator Actions	Form ES-D-2

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 Implement 02-OHP.4022.013.013, 'Steam Generator Level SRO 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) Refer to Tech Specs 3.3.1.1 (1 hour LCO to trip the channel), **SRO** 3.3.2.1 (1 hour LCO to trip the channel), & 3.3.3.5 (restore in 30 days) Restore plant to equilibrium conditions BO Monitor panels RO

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
	ВО	Manually actuate AMSAC
	во	 (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

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
	ВО	(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
	во	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
	200	Check or close S/G blowdown closed, 2-DCR-330
	133	 Check of close S/G sample closed, 2-DCR-303
	Cur	Place 2-DRV-407, S/G stop valves drain valve in close
		 Place 2-DRV-407, S/G stop valves drain valve in close Determine that the S/Gs are not ruptured Transition to E-0 and perform actions
	SRO	Transition to E-0 and perform actions
	во	Implement Attachment A
	SRO	Transition to E-2 'Faulted Steam Generator Isolation' -Note that task has already been accomplished.

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Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	FUIII E3-D-Z

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

Appendix D	Scenario Outline	Form ES-D-

Facility:	DC Cook		Scenario No.:3 Op-Test No.: _2001301	
Examine	ers:		Operators:	
	<u> </u>	3		
Initial Co	~		with the North heater drain pump secured, rods in auto.	
Turnove	r: <u>Maintai</u>	n power at	80%	
	r			
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 (١٥٠)	<i>3/s</i>
3		R	Power increase to restore power	RPR123
4	RX23H	I(BO)	Steam generator #3 controlling level channel fails low.	POR 124
5	MS01C	Major	Steam line #3 break inside containment ((00)	Rer Rera
6	RP03A &B	C(RO)	Reactor trip failure (ATWS) -> 3 miss Doly afen Call DMF RIOSA/3	APP RPRO
7	RP09A	C(BO)	Feedwater isolation does not occur in automatic	
8	FW48C	C(BO)	TDAFW pump does not start in auto	
9	N I01B	C(RO)	Source range NI-32 does not automatically re-energize **	
		}	·	
-				

^{* (}N)ormal, (R)eactivity, (I)nstrument, (C)omponent,

** Failure not needed and does not contribute to evaluation (M)ajor

Appendix D	Operator Actions	Form ES-D-2

On Teat No. 0004004 Coment No. 0 Frant No. 4	
Op-Test No.: <u>2001301</u> Scenario No.: <u>3</u> Event No.: <u>1</u> Page <u>1</u>	∩f

Event Description: <u>Swap North and middle heater drain pumps per procedure 02-OHP.4021.060.014</u>, '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
	во	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
1		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 <u>WHILE</u> 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
		•
1	1	

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

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

	<u> </u>	
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
	ВО	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

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: <u>2001301</u> Scenario No.: <u>3</u> Event No.: <u>4</u> Page <u>1</u> 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
	ВО	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
į.		
	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)
	во	Restore plant to equilibrium conditions
	RO	Monitor panels

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
	во	Manually actuate AMSAC
	во	(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

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

	т	
Time	Position	Applicant's Actions or Behavior
	ВО	(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
	во	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
	ВО	Implement Attachment A
	SRO	Transition to E-2 'Faulted Steam Generator Isolation' -Note that task has already been accomplished.

Appendix D	Operator Actions	Form ES-D-2

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

Appendi	X D		Scenario Outline Form ES-D-1			
Facility	acility: DC Cook Scenario No.: 4 Op-Test No.: 2001301					
Examiners:			Operators:			
Objecti	ves:		01 1317 RELIACED IN SERVICE.			
Objectives: BORON 1317 BEING PLACED IN SERVICE. 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.						
powers	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					
1 2BACC	DE EDD44 D	O ANN DE	EDD 12 DO) West CCD out of convice for seel			
replace	ement. Entered T	.S. 3.5.2 al	bout 12 hours ago.			
<u>Turnov</u>	<u>er:/Power escal</u>	ation in pro	ogress to 100%. Ready to place the West MFW pump in			
service	. Reserve Trans	t ormer I R	201AB is out of service for oil replacement and expected ance 4.8.1.1.1.a to verify offsite power was done one hour			
age: C	urrently 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, • 02-049-4021.055.00			
102-01 MSR	18-4021.051	T 4	ATTACULY STEP 4.6 13 PEA 1. 11 AS BEEN 20 MINUT			
Event	— 378, 4.1. Malf. No.		(Event			
No.		Type*	Coma Description 19			
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			
\$	RX29 [1400]	I(BO)	Main feedwater discharge pressure (FPC-250) fails HIGH			
너	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	RD04 39 RD0414	€(RO)	T <u>WO</u> 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
02-04P-4021.001.006
POWER ESCALATION DATA SHEETS 3 AND 9 NEED

Appendix D	Operator Actions	Form ES-D-2

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.
	ВОР	Place the West MFW pump in service using Attachment 4 of 02-OHP 4021.055.003, at Step 4.6.12.

Appendix D	Operator Actions	Form ES-D-2
		UUULG-D-2

Op-Test No.: Scenario No.:4 Event No.:3_ Page _3_ of	_9
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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.
	ВОР	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

Appendix D	Operator Actions	Form ES-D-2
		<u> </u>

Op-Test No.:	Scenario No.:	_4	Event No.:4	1	Page _4_	of 9
		- '		-	· ~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.
	ВОР	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:

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	FUIII ES-D-Z

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
	ВОР	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.

Appendix D	Operator Actions	Form FS-D-2
	— QEIAM AGMIS	1011113-0-2

Op-Test No.: ____ Scenario No.: __4_ Event No.: _6/7/8_ Page _6_ of _9__

<u>Event Description</u>: 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
	ВОР	Monitor Secondary parameters. Manually trip the turbine

Op-Test No.:	Scenario No.:4	Event No.: 6/7/8	Page _7_ of _9
op 1000110	Occide 140		1 ago _/ _ 01 _0_

<u>Event Description</u>: 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:
	ВОР	Perform MANUAL Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by US:

Form ES-D-2

	Op-Test No.:	Scenario No.: _	4	Event No.: _6/7/8	_ Page _	_8_	of .	9
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<u>Event Description</u>: 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 stepped 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
•		

Appendix D

Operator Actions

Form ES-D-2

June 2000

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NUREG-1021, Revision 8

Op-Test No.:	Scenario No.:	4	Event No.: _	6/7/8	Page	9	of	9

<u>Event Description</u>: 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 Reform RCS depressurization to refill PZB DEENSLIZE PER HTRS
	RO	Perform actions as directed by the US: Reset SI and Phase A/B Monitor RCS Cooldown rate (< 100°F per hour)
	ВОР	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.

Appendi	k D		Scenario	Outline		Form ES-D-
Facility	_DC Cook	s	cenario No.: _	4	Op-Test No.: _2	2001301
Examin	ers:			Ope	rators:	
Objecti	ves:				2 .	
powers Entered 2B4 CS	Initial Conditions: [IC-921] 49% Power BOL, EMFP, MSRs کاتل , 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.					
service back w ago. C	<u>Turnover</u> : 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.					t and expected is done one hour
Event No.	Malf. No.	Event Type*	Event Description			
1		N	Power Esca {Perform Ste		100% / Start West	MFW pump
2		R	Positive Rea		nange while diluting	the RCS to
3	RX19A [120]	I(RO)	Turbine impo	ulse pres	sure instrument (M	IPC-253), fails
47	RX29 [1400]	I(BO)	1		narge pressure (FP	
5 ¥	RX11B [50]	C(BO)		-	oller fails OPEN (50	
6	RC10B [20] RP10A/B	Major I(RO)	Small Break gpm with 5 n		n containment (NO	auto SI) - {400
7	TC03	C(BO)	Main turbine	fails to t	rip in automatic	
8	RD0439 RD0414	C(RO)	TWO rods fa	ail to drop	o (H14, G13)	
1	İ	ı	l .			

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

C(RO)

June 2000

NUREG-1021, Revision 8

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East CCP trips on overcurrent {NO CCP capability}

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: ____ Scenario No.: __4__ Event No.: __1/2__ Page _2_ of _9_ <u>Event Description</u>: 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.
	ВОР	Place the West MFW pump in service using Attachment 4 of 02-OHP 4021.055.003, at Step 4.6.12.

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Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.:	Scenario No.:	4	Event No.:	3	Page _3	of	9
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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	FS-512B - RPR 621 FS-512B - RPR 621 FS-512B - RPR 621 PS-512B - RPR 63 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.
	ВОР	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

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.:	Scenario No.:4	Event No.:4	Page _4_ of _9
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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.
	ВОР	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:

Appendix D	Operator Actions	Form ES-D)-2

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
	вор	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.
,		

Appendix D	Operator Actions	Form FS-D-2
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Op-Test No.: Scenario No.:4_ E	Event No.: _6/7/8	Page _6_ of _9
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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
	ВОР	Monitor Secondary parameters. Manually trip the turbine

Op-Test No.:	Scenario No.:4_	_ Event No.: _6/7/8	Page _7_ of _9
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<u>Event Description</u>: 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:
	ВОР	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	_
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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

Appendix D

Operator Actions

Form ES-D-2

Op-Test No.:	Scenario No.:	4	Event No.: 6/7/8	Page	9	of	9

<u>Event Description</u>: 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)
	ВОР	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-
Facility: _DC Cook_	_ Scenario No.:4	Op-Test No.: _2001301
Examiners:	Op	perators:
Objectives:		
Initial Conditions: [IC-921] 49%	% Power BOL, EMFP, M	SRs OUT, Xe Increasing. Reserve AC

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.

<u>Turnover</u>: 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

Appendix D	Operator Actions	Form ES-D-2

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.
	ВОР	Place the West MFW pump in service using Attachment 4 of 02-OHP 4021.055.003, at Step 4.6.12.

Appendix D	Operator Actions	Form ES-D-2

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
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	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.
	ВОР	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

Appendix D	Operator Actions	Form ES-D-2
	Obcidior Actions	<u> </u>
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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.
	ВОР	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:

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.:	Scenario No.: _	_4	Event No.:	5	Page _5_ of _9	9
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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
	ВОР	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.

Appendix D	Operator Actions	Eastern EO D (
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Op-Test No.:	Scenario No.:4	Event No.: 6/7/8	Page _6_ of _9

<u>Event Description</u>: 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
	ВОР	Monitor Secondary parameters. Manually trip the turbine

Op-Test No.:	Scenario No.: _	_4	Event No.:	_6/7/8	Page _7_ of _9_
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<u>Event Description</u>: 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:
	ВОР	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_
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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 <u>02-OHP 4023.E-0</u> : 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 stepped (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

Appendix D

Operator Actions

Form ES-D-2

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Op-Test No.:	Scenario No.:	4	Event No.: 6/7/8	Page _9_ of _9

<u>Event Description</u>: 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 Rerform RCS depressurization to refill PZR July 12 L JH25
	RO	Perform actions as directed by the US: Reset SI and Phase A/B Monitor RCS Cooldown rate (< 100°F per hour)
.*	ВОР	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-
Facility: DC Cook	Scenario No.: 4	Op-Test No.: <u>2001301</u>
Examiners:	Оре	erators:
Objectives:		

<u>Initial Conditions</u>: [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.

<u>Turnover</u>: 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

Appendix D	Operator Actions	Form ES-D-2
AUDEROIX D	Operator Actions	

Op-Test No.: ____ Scenario No.: __4__ Event No.: __1/2__ Page _2_ of _9_ <u>Event Description</u>: 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.
	ВОР	Place the West MFW pump in service using Attachment 4 of 02-OHP 4021.055.003, at Step 4.6.12.

Appendix D	Operator Astions	E EO D 0
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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.
	ВОР	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

A D		
Appendix D	Operator Actions	Form ES-D-2

Op-Test No.:	Scenario No.: _	_4	Event No.: _	_4	Page _4_ of _9	9	

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

	<u> </u>	
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.
	ВОР	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:

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	

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
	ВОР	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.

Appendix D	Operator Actions	Form FS-D-2
Approximate Land	— Operator actions	

Op-Test No.:	Scenario No.:4	Event No.: 6/7/8	Page _6_ of _9

<u>Event Description</u>: 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
	ВОР	
		Monitor Secondary parameters. Manually trip the turbine

Op-Test No.: Scenario No.: _	_4	Event No.: _	_6/7/8	Page _7_	_ of _9	Э
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<u>Event Description</u>: 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:
	вор	Perform MANUAL Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by US:

Form ES-D-2

Op-Test No.: Scenario No.:4 Event No.: _6/7/8 Page _8_ of _9	Op-Test No.:	Scenario No.: 4	Event No.: 6/7/8	Page	8 of	9
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<u>Event Description</u>: 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)
RO/BOP	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.
HO/BOP	Perform actions as directed by the US: Stop the running EDGs

Appendix D

Operator Actions

Form ES-D-2

June 2000

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Op-Test No.:	Scenario No.: _	4	Event No.: _6/7/8	Page .	_9_	of .	_9_

<u>Event Description</u>: 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)
	ВОР	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
	Examine	rs:		Operators:	
	Objective	es:			
	Initial Co	nditions: [l	C-922] 55	M equal. % Power, FOL, Xe Increasing. Power reduction to	tion in progress.
	line. All	preparation	ns have be- rently perfo	when the step in the step is a power reduction to the step in the	ff line per 02-OHP
	Event No.	-Malf. No.	Event Type*	Event Description	
	1		R	Negative Reactivity change while borating maintain Tave - Tref control.	the RCS to
	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)
٥٥	1 5	RFP RCL	C(RO)	Pressurizer PORV (NRV-153) leaking (req 5% open (ORV Panel 208 Drop 23 OFF)	uires isolation) –
	6 6 [0]	Residen	C(RO) 기	PORV Block valve begins to leak (Rx trip + [ZLO101NMO153{RED} OFF / {GRN} ON OPEN]	
?6 _	⁷	RC23D [60]	Major	Steam Generator #4 tube rupture (600 gpn over 300 sec)	
6-	8	MS06D [80]	C(BO)	Steam Generator safety valve (SV2B-4) op	pens – 80%
		(45)			

(50 -> REUNMO157 / RCV NRU153 SET = 1

Appendix	D
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Form ES-D-2

Op-Test No.:	Scenario No.: _5	Event No.:1 / 2	Page _2_ of
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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.
	ВОР	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Appendix D	Operator Actions	Form ES-D-2

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 <u>02-OHP 4022.013.017</u> 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 - 02)
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	Form ES-D-2

	Op-Test No.:	Scenario No.:5_	Event No.:4	Page _4_ of
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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 <u>02-OHP 4022.013.014</u> 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
	ВОР	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

Appendix D		Operator Actions	Form ES-D-2
		cenario No.:5_ Event No.:5_ Page _5_ of _	
Time	Position	Applicant's Actions or Behavior	
	Crew	Diagnosis the event => Discharge Pipe Temp rising ANN - Panel 208 Drop 24: PZR PORV DISCH TEM ANN - Panel 208 Drop 45: ACCOUSTIC MONITOR	
	SRO -	Direct actions per <u>02-OHP 402.002.009</u> Verify isolation of leaking ALL PORVs Determine leaking PORV {NRV-153} Enter T.S. 3.4.11 action – One hour to Close leaking block valve	PORV's
	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	
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US	
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Appendix	D

Form FS-D-2

Op-Test No.:	Scenario No.:	5	Event No.: 6	Page _6_ of
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Event Description: PORV Block valve {NMO-153} leakage (unisolable - Rx trip required);

	1	
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
	RÖ	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)
	ВОР	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform actions as directed by the US

Appendix D	Operator Actions	Form FS-D-2
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Op-Test No.:	Scenario No.: _	_5	Event No.:	7/8	Page _7_ of
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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:
	ВОР	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:

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Form ES-D-2

Op-Test No.:	Scenario No.: _	5	Event No.: _	7/8	Page _8_ of
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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 at this point
	RO	Verify Reactor Trip Verify SI initiation Perform actions as directed by the US
	вор	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

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Form ES-D-2

Op-Test No.:	Scenario No.:	5	Event No.: _	_7/8	Page _9_ of
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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 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
	ВОР	Perform actions as directed by the US Close ASG 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-		
Facility:	DC Cook		Scenario No.:5 Op-Test No.:	_2001301		
Examine	ers:		Operators:			
Objective	es:	L91	55 1303 BORON 2 HTR	DRP5		
Initial Co	onditions: [IC-922].5 \$	% Power, EOL , Xe Increasing . Power redu	iction in progress.		
4021.05	preparatior	is nave be	% power and continuing a power reduction on completed to take the West MFW pumperming Step 4.9 of 02-OHP 4021.001.003,	off line per 02-OHP		
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 LO	W (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 (re 5% open {ORV Panel 208 Drop 2 8 OFF	ι' . ΄		
6	OVR	C(RO)	PORV-Block valve begins to leak (Rx trip [ZLO191NMO153{RED} OFF / {GRN} OF OPEN]	n Smin RAM!		
7	RC23D [60]	Major	Steam Generator #4 tube rupture (600 grover 300 sec)	om {60%} – ramp		

Steam Generator safety valve (SV2B-4) opens – 80%

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

C(BO)

MS06D [80]

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Appendix D	Operator Actions	Form ES-D-

Op-Test No.:	Scenario No.: _5	Event No.:1 / 2	Page _2_ of _9
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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 Held. Continue Power. • 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.
	ВОР	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.:	Scenario No.: _	_5	Event No.:3		Page _3_ of _9
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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 <u>02-OHP 4022.013.017</u> 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
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	Form ES-D-

Op-Test No.:	Scenario No.:	5	Event No.:	4	Page _4	_ of _	_9
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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
	ВОР	 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

Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.:	Scenario No.: _	5	Event No.:	5	Page _5_ of _9
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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 <u>02-OHP 402.002.009</u> 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
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

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Operator Actions Form ES-D-2

	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); RCS SBLOCA 300 GPM —				
Time	Position	5734m 5 PACE BRAAKApplicant's Actions or Behavior			
	Crew	Diagnosis the event => Rising Discharge Piping Femp 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)			
	ВОР	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform aetions as directed by the US			

ns Form ES-D-2
:7/8 Page _7_ of _9 (600 gpm) – 60% ramped; SG Safety uptured and Faulted SG requiring entry
t's Actions or Behavior
owdown Rad Monitor Alarm / Lowering narging. : R19 SG Blowdown Sampling
down Unit 1 ZR level with ONE CCP tor Trip and SI actions
PZR level with ONE CCP or Trip ation by the US:
ncy Buses by the US:
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Form ES-D-2

	Op-Test No.:	Scenario No.:5_	Event No.:7/8	Page _8_ of _9
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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
	ВОР	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

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	Form ES-D-2

O	o-Test No.:	Scenario No.: _	5	Event No.:	7/8	Page _9_ of _9
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Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per <u>02-OHP 4023.E-1</u> : Verify RCPs should NOT be stopped Verify SG Pressure Boundaries are NOT Intact Transition to E-2, Faulted SG Isolation
		Direct actions per <u>02-OHP 4023.E-2</u> : Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR
		Direct actions per <u>02-OHP 4023.E-3</u> : 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 ALE PZR heaters OK OPEW AIR TO COTTON
	вор	DO NOT SSTABLISH FEED TO RUPTURED S/G- Perform actions as directed by the US Close ALL SG Stop Valves Verify FW Isolation DONE Close AEW valves to #24 SG (2-FMO 241/242) TERMINATE Scenario upon establishment of C/D.

Appendix D	Scenario Outline	e Form ES-	D-
Facility: DC Cook	Scenario No : 5	Op-Test No : 2001301	

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

Examiners: _____ Operators: ____

Objectives:

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

<u>Turnover:</u> 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.	Maif. 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

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Form ES-D-2

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.
	ВОР	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1. Short line of of control of pups. Sheed control to mannel 4 dp increase t E pups of I W pump. Scence pump.

Appendix	¢D	: Operator Actions Form FS-D-2
		cenario No.:5 Event No.:3 Page _3_ of _9
Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => QLC-451 level at 5% ANN - Panel 209 Drop 49: VCT Level Low Depth Material Company (1988)
	SRO	Direct actions per <u>02-OHP 4022.013.017</u> (<u>VCT wsl</u> <u>Malf</u>) 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
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	Form ES-D-2
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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
	ВОР	 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

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: Scenario No	.:5	Event No.:5	Page _5_ o	of _9
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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
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	 Form ES-D-2

Op-Test No.:	Scenario No.:5	5	Event No.:	6	Page _6_ of _9)
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Event Description: PORV Block valve (NMO-153) leakage (unisolable - Rx trip required);

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)
ВОР	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform actions as directed by the US
	Crew SRO

Appendix D	Operator Actions	Form FS-D-2

Op-Test No.:	Scenario No.: _	5	Event No.:	7/8	Page _7_ of _9_	

<u></u>		
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:
	ВОР	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:

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Form ES-D-2

Op-Test No.:	Scenario No.: _	_5	Event No.: _	7/8	Page _8_ of _9
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Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Steam Flow on #24 SG PORV
	SRO	Direct actions per <u>02-OHP 4023.E-0</u> : 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
	ВОР	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

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	Form ES-D-2

Op-Test No.:	Scenario No.:	_5	Event No.: _	_7/8	Page _9_ of _9
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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 <u>02-OHP 4023.E-2</u> : Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR
		Direct actions per <u>02-OHP 4023.E-3</u> : 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 If So Contain to the Real montains
	ВОР	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-
Facility: DC Cook	Scenario No.:5	Op-Test No.: _2001301_
Examiners:	Opera	tors:
Objectives:		
Initial Conditions: [IC-922] 55	% Power, EOL, Xe Increasin	g. Power reduction in progress.

<u>Turnover:</u> 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.

	7		
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

Appendix D	Operator Actions	Form ES-D-
Appendix D	Operator Actions	Form ES-I

Op-Test No.:	Scenario No.: 5	Event No.:1 / 2	Page _2_ of _9_
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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.
	ВОР	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.
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Appendix D	Operator Actions	Form ES-D-2
	Operator Actions	LVIII ES-D-Z

Op-Test No.:	Scenario No.:5_	Event No.:3	Page _3_ of _9
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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 <u>02-OHP 4022.013.017</u> 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
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.:	Scenario No.:5	Event No.:	_4	Page _4_ of _9
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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
·	ВОР	 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

Appendix D	, v)	Operator Actions	400 14	Form ES-D-2
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Op-Test No.:	Scenario No.:	5	Event No.: _	_5	Page _	_5_ c	of _9_	
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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
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	45°0.50	Form ES-D-2
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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)
	ВОР	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform actions as directed by the US

Appendix D	Operator Actions	Form FS-D-2

Op-Test No.: _____ Scenario No.: __5_ Event No.: __7/8_ Page _7_ of _9__

<u>Event Description</u>: 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:
	ВОР	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:

Appendix D

Operator Actions

Form ES-D-2

Op-Test No.:	Scenario No.: _	_5_	Event No.:7/8	Page _8_ of _9
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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 <u>02-OHP 4023.E-0</u> : 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
	ВОР	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

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	Form ES-D-2

Op-Test No.:	Scenario No.: _	_5	Event No.:7	7/8	Page _9_ c	of 9
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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.

	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 <u>02-OHP 4023.E-2</u> : Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR
		Direct actions per <u>02-OHP 4023.E-3</u> : 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
	ВОР	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 ()		Scenario Outline	Form ES-D-	
Facility: DC Cook			Scenario No.:5 Op-Test	No.: _2001301	
Examine	rs:		Operators:		
Objective	es:				
Initial Co	nditions: [l	C-922] 55%	Power, EOL, Xe Increasing. Power	reduction in progress.	
line. Ali r	reparation	s have bee	% power and continuing a power redu in completed to take the West MFW p rming Step 4.9 of 02-OHP 4021.001.0	oump off line per 02-OHP	
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 Wes	t MFW pump	
3	CV16A [0]	I(RO)	VCT level instrument (QLC-451) fai	ls LOW (5% indicated)	
4	RX20G	I(BO)	Steam flow channel (MFC-140)fails LOW (Controlling)		
5	RC17C	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		
7	RC23D [60]	Major	Steam Generator #4 tube rupture (600 gpm {60%} – ramp over 300 sec)		

Steam Generator safety valve (SV2B-4) opens – 80%

C(BO)

MS06D [80]

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

Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.:	Scenario No.:	5	Event No ·	1/2	Page _2_ of _9
Op-168(No.:	Scenario No		Eventivo	_ 1 / ~	1 agez_ 010

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.
	ВОР	Stop the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

Appendix D		Operator Actions	Form ES-D-2
,		enario No.:5_ Event No.:3_ Page _3_ of _ level instrument (QLC-451) fails LOW	_9
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 <u>02-OHP 4022.013.017</u> 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	
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US	

Appendix D	Operator Actions	40 W	Form ES-D-2

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 <u>02-OHP 4022.013.014</u> 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 leve • Place SF selector switch (2-FS-542C) in CH 2 po • 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

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Appendix D	•	Operator Actions	Form FS-D-2
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Op-Test No.:	Scenario No.: _	_5	Event No.:	5	Page _5_ 0	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: PZRPORV J-NRV- 153 DPEN
	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
	вор	Monitor secondary plant conditions Perform actions as directed by the US

Appendix	D	Operator Actions Form ES-D-2				
•	Op-Test No.: Scenario No.:5_ Event No.:6 Page _6_ of _9 <u>Event Description</u> : 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)				
	ВОР	Monitor secondary plant conditions Reduce Turbine Load MANUALLY Perform actions as directed by the US				

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Appendix D		Operator Actions	Form FS-D-2
Event [Valve (<u>Description</u> : Stea		e _7_ of _9 amped; SG Safety ed SG requiring entry
Time	Position	Applicant's Actions or Beha	vior
	Crew	Diagnosis the event => Blowdown Rad Monit	or Alarm / Lowering

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L	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:	
		ВОР	Verify Turbine Trip Verify Power to AC Emergency Buses Perform actions as directed by the US:	

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Operator Actions

Form ES-D-2

Op-Test No.:	Scenario No.:5_	Event No.:7/8	Page _8_ of _9
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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.

Position	Applicant's Actions or Behavior				
Crew	Diagnosis the event => Steam Flow on #24 SG PORV				
SRO	Direct actions per <u>02-OHP 4023.E-0</u> : 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				
вор	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				
	Crew				

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	Form ES-D-2

	Op-Test No.:	Scenario No.:5	Event No.:7/8	Page _9_ of _9
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<u>Event Description</u>: 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.

	1	
Time	Position	Applicant's Actions or Behavior
	SRO	Direct actions per <u>02-OHP 4023.E-1</u> : Verify RCPs should NOT be stopped Verify SG Pressure Boundaries are NOT Intact Transition to E-2, Faulted SG Isolation
		Direct actions per <u>02-OHP 4023.E-2</u> : Close ALL SG Stop Valves Determine Secondary Radiation NOT normal Transition to E-3, SGTR
		Direct actions per <u>02-OHP 4023.E-3</u> : 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
	вор	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
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Scenario Outline

Form ES-D-1

Facility: <u>DC Cook</u>	Scenario No.:6	Op-Test No.: <u>2001301</u>
Examiners:	Operators:	

Objectives:

Initial Conditions: [IC-923] 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% 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
>	12		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)
•	461)	RX02C [650]	I(RO)	RCS T _{hot} instrument (NTP-131) fails HIGH
	5	RX26A [180] 40)	I(BO) 40	East main feedwater pump speed controller fails vHIGH (in AUTO) RAMP 15 m ルルチをら
	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

Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.:	Scenario No.:	_6	Event No.:	1/2	Page _2_ of _7_
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Event Description: Power Reduction to 0% and Stop the West MFW pump.

Time	Position	Applicant's Actions or Behavior
71110	1 03/110/1	Applicant's Actions of Denavior
	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.
	ВОР	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.

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Operator Actions

Form ES-D-2

Op-Test No.: ____ Scenario No.: __6_ Event No.: __3_ Page _3_ of _7_

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

<u> </u>	1	
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 <u>02-OHP 4021.005.001</u> : 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 TROBABLE SHOOTING HOW TO BORATE - TRY TO RESTART BORATION -
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	Form ES-D-2
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Op-Test No.: ____ Scenario No.: __6_ Event No.: __4_ Page _4_ of _7_

 $\underline{\text{Event Description}}\text{: RCS T}_{\text{hot}}\text{ instrument (NTP-131) for Loop 3 fails HIGH \{TE-431A\}}$

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.
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: ____ Scenario No.: __6_ Event No.: __5__ Page _5_ of _7_

		LOW (40) WITH 15 MIN
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
	ВОР	Take MANUAL control of MFP and stabilize unit
	RO	Monitor primary plant conditions Perform actions as directed by the US

Appendix D	· · · · · · · · · · · · · · · · · · ·	Operator Actions	Form FS-D-2
		MEIGIN AUDIN	

Op-Test No.: ____ Scenario No.: __6__ Event No.: __6/7/8/9_ Page _6_ of _7_

<u>Event Description</u>: 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.

<u></u>	,	The second secon
Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => Trip of ONLY running MFP TURBINE DRIVEN AFW TRIPS
	SRO	Direct actions per <u>02-OHP 4023.E-0</u> : Verify Immediate Actions (Steps 1 – 4) Transition to ES-0.1 (SI NOT required)
		GO TO FR-HI 5/6 LEVEL 21396NI (522 NEXT PAGE)
	RO	Perform actions as directed by the US Verify Reactor Trip Verify SI NOT required
	ВОР	Perform actions as directed by the US Verify Turbine Trip Verify Power to AC Emergency Buses

tions Form ES-D-
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Op-Test No.:	Scenario No.:	6	Event No.:	6/7/8/9	Page _7_ of _7
Operest No.	Ocenano No	.~		_0,,,,,,,,	' ~9~ _' _ ~'

<u>Event Description</u>: 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-8.1 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 at Least 2 5/c well 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 MEWOUS	Denform actions as directed by the US _ OPEN FW TSOC. UPLOTED OPEN CIRCUIT . II ! 5 Dump Steam to condenser at MAXIMUM rate from ONE SG Align Condensate to feed through MFW pump	.UES

	· · · · · · · · · · · · · · · · · · ·					
Facility	: DC Cook	Scena	ario No.:6 Op-Test No.: _2001301_			
Examir	ners:		Operators:			
Objecti	ves	٠				
Turnov has bee	Initial Conditions: [IC-923] 58% Power, 2MFP, MSR In, Xe Increasing. East MDAFW pump OOS. [IRF FWR61 RO] — UNT 1 in Mode 5 with (ST daine). [IC-9. 3.7.1.2] 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.	Maif. 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(X) I	RX02C [650]	I(RO)	RCS T _{hot} instrument (NTP-131) fails HIGH			
4(5)	RX26A (100) (の)	I(BO)	East main feedwater pump speed controller fails HIGH (in AUTO) (30 mins)			
5(3)	ZDI101QRV421 CLOSE	C(RO)	Normal boric acid control valve {QRV-421} fails closed (0)			
6	FW05A FW46B £ ¢ FW52C £ ¢	Major	Trip of East MFP and Loss of ALL Feedwater To Afra Any Steam Band wasse MD Afra Any ruip			
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 C・フ	C(RO)	Steam dump master controller fails, Dumps must be open from individual controller			

(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (2-RPSX-A CET 4 Fuze) (2-RPSX-B CET 4 Fuse) IOR RPR 147 Removed

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open from individual controller

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Appendix	Form ES-D-2				
Op-Test No.: Scenario No.: Event No.:1 / 2 Page _1 Event Description: Power Reduction to 0% and Stop the West MFW pump.					
Time	ne Position Applicant's Actions or Behavior				
	SRO	Direct actions in 02-OHP 4021.001.003, Power Reduct	tion.		
	RO	Maintain Tave – Tref mismatch within band (+ 1.0) by to RCS or inserting control rods.	borating the		
	ВОР	Secure the West MFW pump using Attachment 2 of 02 4021.055.004 starting at Step 4.1.	:-OHP		

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	Form ES-D-

Op-Test No.:	Scenario No.:	Event No.:3	Page _2_ of

Event Description: RCS Thot 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././.
	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.
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D Operator Actions				
Op-Test No.: Scenario No.: Event No.:4_ Page _3_ of <u>Event Description</u> : East Main Feed pump speed controller fails HIGH (in AUTO)				
Position	Applicant's Actions or Behavior			
Crew	Diagnosis the event => Land Dairin, PW J AND Low Love Dec. 24 4-?			
SRO	Direct actions per ARP			
ВОР	Take MANUAL control of MFP and stabalize unit			
RO	Monitor primary plant conditions Perform actions as directed by the US			
	No.: Scention: East Position Crew SRO BOP	No.: Scenario No.: Event No.:4 Page _3_ of _ escription: East Main Feed pump speed controller fails HIGH (in AUTO) Position		

Appendix D			Operator Actions Form ES-D-2
			enario No.: Event No.:5_ Page _4_ of nal Boric Acid control valve fails CLOSED during boration.
	Time	Position	Applicant's Actions or Behavior
		Crew	Diagnosis the event => Parlow to become ANT-Parl 209 Ag 39: St Plan Derivery Alam
		SRO	Direct actions per 4021. 2005.001, Name Mu and ART
		RO	Take MANUAL control of Makey med secure 2/u

BOP

Monitor secondary plant conditions Perform actions as directed by the US

Op-Test No	. :	
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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
Desired of the second	Mary 2000	SRO SAN FR-H.	Diagnosis the event => AND RS.O(,()) Direct actions per
		ВОР	Perform actions as directed by the US
		•	Funo-201/204 BIENS - MIT 101 FM0 201 BIENS - MIT 101 FM0 204
		RO	Perform actions as directed by the US

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+ RO BKR IN 740 218, 212, 213, 214 - Sup & of H./ ?

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 8 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.

11			
Event No.	Malf. No.	Event Type*	Event Description
1		N	Reduce Turbine load and Stop the West main feedwater pump
23		R	Negative Reactivity change while borating the RCS to maintain Tave - Tref control.
84	ZDI101QRV421 CLOSE	C(RO)	Normal boric acid control valve {QRV-421} fails closed (0)
MZ	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
		Steam dump master controller fails, Dumps must be open from individual controller	

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

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	TOTHLODE

Op-Test No.: Scer	nario 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.	
	ВОР	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.	

Appendix D	Operator Actions	Form ES-D-2
Appendix D	Operator Actions	FORM E2-D-2

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 * Joule all mothous to be beaute	
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US	

Appendix D	Operator Actions	4.50	Form ES-D-2

Op-Test No.: ____ Scenario No.: __6_ Event No.: __4_ Page _4_ of _7_

Event Description: RCS That 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.	
	вор	Monitor secondary plant conditions Perform actions as directed by the US	

Appendix	D	Operator Actions Code Form ES-D-	
,		enario No.:6 Event No.:5 Page _5_ of _7_ Main Feed pump speed controller fails HIGH (in AUTO)	
Time	Time Position Applicant's Actions or Behav		
	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	
	ВОР	Take MANUAL control of MFP and stabilize unit	
	RO	Monitor primary plant conditions Perform actions as directed by the US	
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Appendix D	Or	perator Actions	2.85.87.47	Form FS-D-2
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Op-Test No.:	Scenario No.:	_6	Event No.:	_6/7/8/9	Page_	_6_	of _	_7_

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

Appendix E

Operator Actions

Form ES-D-2

			· ·
Op-Test No.:	Scenario No.:6	Event No.:6/7/8/9	Page _7_ of _7

Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => No AFW Feed available Transition to FR-\$.1 required upon entry into ES-0.1 H
	,	
	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) Transition to E-1 Assalt MF PMF
	RO Ma	Perform actions as directed by the US Stop ALL RCPs Actuate SI as required (lock out & SI + both RH purps) Reset SI and Phase A isolation Close Blowdow 150 bluer 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

Facility: DC Cook	Scenario No.:6	Op-Test No.: <u>2001301</u>
Examiners:	Operators:	
Objectives:	•	

<u>Initial Conditions</u>: [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]

<u>Turnove</u>r: 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

Appendix D Operator Actions Form ES			
Typeralize Detailed Actions	endix D_	Operator Actions	Form ES-D-2

Op-Test No.:	Scenario No.:	6	Event No.:1 / 2	Page _2_ of _7_
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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.
	ВОР	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.
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Op-Test No.: 5	Scenario No.:6	Event No.:3	Page _3_ of _7_
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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 <u>02-OHP 4021.005.001</u> : Enter T.S. 3.1.2.2 – Boration Path Continue power reduction with control rods
	RO	Take MANUAL control of Makeup and secure lineup
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.: ____ Scenario No.: __6_ Event No.: __4_ Page _4_ of _7_

Event Description: RCS That 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.
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	 Operator Actions	J. Hilliam	 Form ES-D-2
	 		

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
	ВОР	Take MANUAL control of MFP and stabilize unit
	RO	Monitor primary plant conditions Perform actions as directed by the US
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Appendix	D	Operator Actions Form FS-D-2
Event D heat sin	<u>escription</u> : Loss k. DG 2AB fails	enario No.:6 Event No.:6/7/8/9 Page _6_ of _7_ of ALL Feedwater – requires use of condensate feed to establish to AUTO start (manual start available after 30 sec). Loss of Bus aster 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 <u>02-OHP 4023.E-0</u> : 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 Power to AC Emergency Buses

Verify Turbine Trip

Appendix D	Operator Actions	Form ES-D-2
Appendix B	operator retions	20 2

Op-Test No.:	Scenario No.:	6	Event No.:	6/7/8/9	Page _7_ of _7_	
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Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => No AFW Feed available Transition to FR-€.1 required upon entry into ES-0.1 H
	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
	ВОР	Perform actions as directed by the US Dump Steam to condenser at MAXIMUM rate from ONE SG Align Condensate to feed through MFW pump

Appendix D	Α	aa	en	dix	D
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Scenario Outline

Form ES-D-1

Facility: DC Cook	Scenario No.:6	Op-Test No.: _2001301_	
Examiners:	Operators:		
Objectives:			•

<u>Initial Conditions</u>: [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]

<u>Turnove</u>r: 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

	•	
Appendix D	Operator Actions	 Form ES-D-2

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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.

	Event Description. Tower reduction to 070 and otop the vvest will vv 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.		
	ВОР	Secure the West MFW pump using Attachment 2 of 02-OHP 4021.055.004 starting at Step 4.1.		
		·		
		·		

Appendix D	Operator Actions	Form ES-D-2

Op-Test No.:	Scenario No.	:6	Event No.:3	Page _3_ of _7_

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

T:	Danisia	Analisanda Astana an Daharian
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 <u>02-OHP 4021.005.001</u> : Enter T.S. 3.1.2.2 – Boration Path Continue power reduction with control rods
	RO	Take MANUAL control of Makeup and secure lineup
	ВОР	Monitor secondary plant conditions Perform actions as directed by the US

Appendix D	Operator Actions	秦 公安	Form ES-D-2
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Op-Test No.: ____ Scenario No.: __6_ Event No.: __4_ Page _4_ of _7_

Event Description: RCS Thot 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

Appendix D	Operator Actions	表明科验 (Form ES-D-2

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
	ВОР	Take MANUAL control of MFP and stabilize unit
	RO	Monitor primary plant conditions Perform actions as directed by the US

Appendix	D	Operator Actions Form FS-D-2
Event Description: Loss heat sink. DG 2AB fails		enario No.:6 Event No.:6/7/8/9 Page _6_ of _7_ of ALL Feedwater – requires use of condensate feed to establish to AUTO start (manual start available after 30 sec). Loss of Bus ster 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 <u>02-OHP 4023.E-0</u> : 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
	вор	Perform actions as directed by the US Verify Turbine Trip Verify Power to AC Emergency Buses

Appendix D	Operator Actions	Form ES-D-
Appendix D	Operator Actions	

Op-Test No.:	Scenario No.: 6	Event No.:6/7/8/9	Page _7_ of _7
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Time	Position	Applicant's Actions or Behavior
	Crew	Diagnosis the event => No AFW Feed available Transition to FR-\$.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
	вор	Perform actions as directed by the US Dump Steam to condenser at MAXIMUM rate from ONE SG Align Condensate to feed through MFW pump