

Facility: Limerick      Scenario No.: 1      Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: 4% power, Reactor Startup in progress, "1B" EHC pump blocked for maintenance

Turnover: A Reactor Startup is in progress with GP-2, Normal Plant Startup completed up to and including step 3.4.15. Reactor power is approximately 4%. RCIC is operating for ST-6-049-230-1, RCIC Pump Valve and Flow Test, and RT-6-049-701-1 (step 4.4.30) should be completed within the next hour. "1B" EHC pump is blocked for maintenance, and will be out of service until a new pressure compensator arrives tomorrow. The bypass valve jack is being used to ensure partial bypass valve opening for feedwater stability per GP-2 step 3.3.20.4. The crew must continue power ascension to achieve 4 bypass valves open in preparation for main turbine startup. Control Rod movement is per the Control Rod Move Sheets, with Sequence Step Number 14, Rod Group 8, Control Rod 26-43 the next rod to withdraw (12-48).

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R (RO/ CRS)	Withdraw control rods until 4 bypass valves open
2	Override FIC46-1R600 flow controller pot to 0	I (RO/ CRS)	CRD flow controller fails downscale in AUTO
3	MED280B	I (ALL)	Loss of 1BY160 due to underfrequency trip of a series supply breaker (TS)
4	MRD016F	C (RO/ CRS)	Control Rod 22-35 inadvertently scrams (TS)
5	MRC465 (0-100%)	M (ALL)	Steam Leak from RCIC piping
5	MRC464A MRC464B	C (PRO/ CRS)	RCIC isolation valves fail to close
5	MAD141D	C (PRO/ CRS)	"1E" SRV fails to open
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

# I. SIMULATOR OPERATOR INSTRUCTIONS

## A. INITIAL SIMULATOR SETUP

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	<ul style="list-style-type: none"> <li>■ Prepare Simulator per TQ-AA-106-0301, Simulator Training Practices Job Aid</li> </ul>
	<ul style="list-style-type: none"> <li>■ Reset Simulator to IC-51</li> </ul>
	<ul style="list-style-type: none"> <li>■ Take out of FREEZE and ensure the following:               <ul style="list-style-type: none"> <li>- Reactor power is approximately 4%</li> <li>- "1B" EHC pump handswitch is in Pull-To-Lock</li> <li>- An INFO tag is hung on the "1B" EHC pump handswitch with the following information:                   <p style="text-align: center;">"1B EHC PUMP OUT OF SERVICE FOR PRESSURE COMPENSATOR REPLACEMENT"</p> </li> <li>- GP-2 completed up to and including step 3.4.15 is available at the TRIP table</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>■ Load Scenario "ILT05-1" from floppy disk labeled "2005 ILT Scenario Files" using A: drive and ensure the following malfunctions are loaded:               <ul style="list-style-type: none"> <li>♦ MED280B, active 12 minutes the first time the WITHDRAW pushbutton is depressed (trigger 1)</li> <li>♦ MRD016F for rod 22-35, active 6 minutes after HS-57-191B is taken to BYPASS (trigger 2)</li> <li>♦ MRC464A, active immediately</li> <li>♦ MRC464B, active immediately</li> <li>♦ MRC465, active 12 minutes after trigger 2, with a severity of 100% and a ramp time of 5 minutes</li> <li>♦ MAD141D, active immediately</li> <li>♦ Override 42-12605/CS for "1B" EHC pump indicating lamps is "ALLOFF", active immediately</li> <li>♦ Override FIC46-1R600 for CRD flow controller setpoint is "0", active 10 minutes after trigger 1</li> <li>♦ Annunciators 006 FIRE E1L, E3U, G3L are overridden "OFF", active immediately</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>■ Reset any annunciators that should not be present</li> </ul>

**B. INSTRUCTIONS FOR SIMULATOR OPERATOR****EVENT 1: Withdraw control rods until 4 bypass valves open**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ Ensure trigger 1 activates when WITHDRAW pushbutton used for the first time, and timers are running. If trigger 1 does not activate as expected, then manually activate trigger 1.</li> </ul>

**EVENT 2: CRD flow controller fails downscale in AUTO**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If requested to investigate failure of "1B" CRD flow control valve, report that the valve looks like it's closed, and there's no indication of anything abnormal at the flow control valve.</li> </ul>

**EVENT 3: Loss of 1BY160**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If Equipment Operator / Floor Supervisor are contacted for investigation, wait 5 minutes then report to the crew that there is an underfrequency trip on one of the series supply breakers in the inverter room.</li> <li>■ When the PRO places HS-57-191B to BYPASS, ensure trigger 2 activates and timers start for malfunctions as appropriate.</li> </ul>

**EVENT 4: Control Rod 22-35 inadvertently scrams**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If asked to investigate at the HCU for 22-35, wait 4 minutes then report to the crew that the "A" side fuse for the scram pilot valves has blown.</li> <li>■ If Reactor Engineering contacted for 22-35 scram, respond that a recovery plan and ReMA will be developed and brought to the MCR as soon as it's ready.</li> </ul>

**EVENT 5: Steam leak from RCIC piping**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If asked to investigate alarm at 1AC208, wait 4 minutes then report to the crew RCIC room temperature as indicated on the Simulator Instructor Console T-103 Temperature screen.</li> <li>■ If asked to perform T-290, wait 5 minutes then report to the crew RCIC room and 309 room temperatures as indicated on the Simulator Instructor Console T-103 Temperature screen. Provide updates of temperatures as requested by the crew.</li> </ul>

**EVENT 6: RCIC isolation valves fail to close**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If asked to attempt to close the RCIC isolation valves locally, report that the contactor will not seal in at the breaker for either isolation valve.</li> <li>■ If asked to manually close the outboard isolation valve at the actual valve location, report that environmental conditions don't permit access to the actual valve location.</li> </ul>

**EVENT 7: "1E" SRV fails to open**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ Respond to request for assistance as appropriate.</li> </ul>

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Scenario No.   1  Event No.:   1  

Event Description: Withdraw control rods until 4 bypass valves open

Time	Position	Applicant's Actions or Behavior
	CRS	Direct the RO to withdraw control rods until 4 bypass valves are open
	RO	Withdraw rods in accordance with RWM startup sequence sheets
	PRO	Peer check all control rod movements

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Scenario No. 1Event No.: 2

Event Description: CRD flow controller fails downscale in AUTO

Time	Position	Applicant's Actions or Behavior
	RO	Recognize failure of CRD flow controller and report the failure to the CRS.
	CRS	Direct RO to place the CRD flow controller to MANUAL and attempt to open the flow control valve.
	RO	Place CRD flow controller to MANUAL and open the valve to establish normal CRD parameters.
	RO/PRO	Contact personnel outside MCR to investigate failure of the CRD Flow Control Valve in AUTO.

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Scenario No. 1Event No.: 3

Event Description: Loss of 1BY160 (TS)

Time	Position	Applicant's Actions or Behavior
	PRO	Reference ARCs for annunciators 122 D12, F-4 (1B RPS & UPS STATIC INVERTER TROUBLE) and 123 D14, F-5 (1B APRM UPS INVERTER TROUBLE), and recognize loss of 1BY160 bus
	RO	Recognize no actual scram condition exists and <u>DO NOT</u> manually scram the reactor
	CRS	Enter E-1BY160
	RO	Reference ARC for 111 RECIRC G-3 and monitor Recirculation pump temperatures on BOP DAS monitor using S43.0.D
	CRS	Direct PRO/RO to contact EO/FSV to investigate the cause of the loss of 1BY160
	CRS	Enter ON-113, Loss of RECW
	CRS	Direct the PRO to bypass and restore RECW, DWCW, and PCIG per E-1BY160 steps 2.3 through 2.5. <i>NOTE: The crew may also elect to perform step 2.6 to bypass and restore air-to-gas blocks and vents, even though instrument air is not currently backing up instrument gas.</i>
	PRO	Bypass and restore RECW per E-1BY160 step 2.3
	PRO	Bypass and restore DWCW per E-1BY160 step 2.4
	PRO	Bypass and restore PCIG per E-1BY160 step 2.5
	RO	Recognize Recirculation pump temperatures are returning to normal after DWCW flow is restored
	CRS	Enter T.S. LCO 3.6.3 for inoperable PCIVs following performance of isolation bypasses per E-1BY160 and recognize per ACTION a that within 4 hours must either restore inoperable valves to OPERABLE status, or isolate each affected penetration by use of at least one deactivated automatic valve secured in the isolation position, or isolate each affected penetration by use of at least one closed manual valve or blind flange. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
	RO	Contact EO/FSV to investigate loss of 1BY160 using S94.9.B.

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Scenario No. 1Event No.: 4

Event Description: Control Rod 22-35 inadvertently scrams (TS) / Manual Reactor Scram

Time	Position	Applicant's Actions or Behavior
	RO	Reference ARC for annunciator 108 REACTOR, F-4, (ROD DRIFT)
	RO	Recognize control rod 22-35 has scrammed (Blue light lit on full core display) and the rod is at position 00.
	CRS	Enter ON-104, Control Rod Problems
	RO/PRO	Contact EO/FSV to investigate scram of control rod 22-35.
	CRS	Reference TS 3.1.3.1 for Control Rod Operability and determine appropriate action is b.2
	CRS	Recognize reactor power is less than 10% rated thermal power and the RWM is not latched
	CRS	Recognize ON-104 Attachment 3 requires a manual reactor scram
	CRS	Direct the RO to manually scram the reactor
CT	RO	Place Reactor Mode Switch to SHUTDOWN
	RO	Insert SRM/IRMs
	CRS	Enter T-101 if RPV level drops below 12.5 inches; Enter T-100 if RPV level does not drop below 12.5 inches.
	RO	Verify all control rods fully inserted
	CRS	Direct manually tripping the main turbine
	PRO	Trip the main turbine and ensure generator lockout
	CRS	Direct the RO to maintain RPV level 12.5 to 54 inches using feedwater
	RO	Verify feedwater aligns to startup level control
	CRS	Provide directions to maintain RPV pressure within a band



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Scenario No. 1Event No.: 5

Event Description: Steam leak from RCIC piping / RCIC isolation valves fail to close/"1E"  
SRV fails to open

	PRO	Reference ARC for 004 VENT window A-2, "A REAC ENCL HVAC PANEL 1AC208 TROUBLE"
	PRO	Dispatch an EO to 1AC208 to investigate the trouble alarm
	RO	Reference ARC for 107 REACTOR window F-5, "DIV 1 STEAM LEAK DET SYS HI TEMP/TROUBLE"
	CRS	Enter T-103, Secondary Containment Control
	CRS	Direct RO/PRO to read RPV level and pressure only on PAMS, FZ level, and EQ PMS parameters
	RO/PRO	Use only PAMS, FZ level, and EQ PMS parameters for values when reporting RPV level and pressure to the CRS
	CRS	Direct T-290, Instrumentation Available for T-103/SAMP-2
	CRS	When report received of RCIC room high temperature, direct isolation of RCIC per T-250
	CRS	Direct RO/PRO to perform T-291 for RPV level effects
	RO/PRO	Use T-291 to determine that RPV level instruments being used are not affected by the high RCIC temperatures
	PRO	Attempt to close RCIC isolation valves HV-49-1F007 and HV-49-1F008
	PRO	Recognize failure of RCIC isolation valves to close
	RO	Request assistance from EO/FSV/WWM in closing RCIC isolation valves
	CRS	Recognize approaching MSO in 2 <sup>nd</sup> area per T-103 Table SCC-2 and direct RO to fully open all bypass valves
	RO	Use bypass valve jack to open bypass valves
	CRS	Recognize 2 areas in Table SCC-2 exceeding MSO temperature and enter T-112, Emergency Blowdown
	CRS	Direct opening all 5 ADS valves
CT	PRO	Place all 5 ADS valve handswitches to OPEN
	PRO	Recognize "1E" SRV fails to open and report to CRS
	CRS	Direct PRO to open non-ADS SRVs until a total of 5 SRVs are open

Op-Test No. _____	Scenario No. <u>  1  </u>	Event No.: <u>  5  </u>
Event Description: Steam leak from RCIC piping / RCIC isolation valves fail to close/"1E" SRV fails to open		
	PRO	Open an additional SRV until a total of 5 SRVs are open
	RO/PRO	Control injection into the RPV and stabilize RPV level

## Termination Point:

The scenario will be terminated when the following criteria are met:

1. An Emergency Blowdown has been performed per T-112, Emergency Blowdown, and RPV level has been stabilized

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Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
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Initial Conditions: 100% power, #3 APRM is inoperable and bypassed

Turnover: Reactor power is 100%. #3 APRM is inoperable and bypassed. I&C has been contacted to begin troubleshooting. The crew is directed to perform ST-6-001-761-1, Main Turbine Bypass Valve Exercising.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (ALL)	Perform ST-6-001-761-1
2	MCW483B MCW485A	I (ALL)	"1B" RECW pump trips, "1A" RECW pump fails to auto start (TS)
3	MED263D	I (PRO/ CRS)	D14 Bus Lockout relay fails, Loss of D14 Bus (TS)
4	MRR433B MRR434B	C (ALL)	"1B" Reactor Recirculation Pump seal failure (TS)
5	MRR441 (0-50 gpm)	C (ALL)	Leakage past "1B" Reactor Recirculation loop isolation valves
5	MRR440B	M (ALL)	"1B" Reactor Recirculation piping break
5	MRH171B	C (ALL)	"1B" RHR pump trip
5	MRH174C	C (PRO/ CRS)	"1C" RHR LPCI injection valve fails to close after it opens

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

# I. SIMULATOR OPERATOR INSTRUCTIONS

## A. INITIAL SIMULATOR SETUP

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	<ul style="list-style-type: none"> <li>■ Prepare Simulator per TQ-AA-106-0301, Simulator Training Practices Job Aid</li> </ul>
	<ul style="list-style-type: none"> <li>■ Reset Simulator to IC-50</li> </ul>
	<ul style="list-style-type: none"> <li>■ Take out of FREEZE and ensure the following:               <ul style="list-style-type: none"> <li>- Reactor power is 100%</li> <li>- #3 APRM is bypassed using the joystick on 10C603</li> <li>- A blue Equipment Status Tag is hung on the APRM bypass joystick with the following information:                   <p style="margin-left: 40px;">Equipment: #3 APRM ETT# (A/R): R0286435 SYSTEM: 074 UNIT: 1 DATE: 1/10/04 POSITION/CONDITION: BYPASS AUTHORIZED BY: Art Star HUNG BY: AJS REASON: "#3 APRM BYPASSED DUE TO BEING INOPERABLE"</p> </li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>■ Load Scenario "ILT05-2" from floppy disk labeled "2005 ILT Scenario Files" using A: drive and ensure the following malfunctions are loaded:               <ul style="list-style-type: none"> <li>• MPR006B, active immediately</li> <li>• MCW485A, active immediately</li> <li>• MCW483B, active 5 minutes after trigger 1(depressing bypass valve test pb)</li> <li>• MED263D, active 10 minutes after trigger 1</li> <li>• MRR433B, active 18 minutes after trigger 1</li> <li>• MRR434B, active 22 minutes after trigger 1</li> <li>• MRR441, active 30 minutes after trigger 1, with a severity of 50 gpm and a ramp time of 4 minutes</li> <li>• MRR440B, active 6 minutes after trigger 2 (mode switch to S/D), with a severity of 3% and a ramp time of 25 minutes</li> </ul> </li> </ul>

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	<ul style="list-style-type: none"> <li>• MRH171B, active 3 seconds after trigger 3 (RHR pump start)</li> <li>• MRH174C, active 10 seconds after trigger 4 (HV-51-1F017C starts to open)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Reset any annunciators that should not be present</li> </ul>

## B. INSTRUCTIONS FOR SIMULATOR OPERATOR

### EVENT 1: Perform ST-6-001-761-1, Main Turbine Bypass Valve Exercising

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ Ensure trigger 1 activates when Bypass Valve Test pushbutton used for the first time, and timers are running. If trigger 1 does not activate as expected, then manually activate trigger 1.</li> </ul>

### EVENT 2: "1B" RECW pump trip, and failure of "1A" RECW pump to auto start

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If requested to investigate the trip of the "1B" RECW pump, report that everything looks okay at the pump. The breaker for the "1B" RECW pump has tripped due to thermal overload. If asked to investigate the failure of "1A" RECW pump to auto start, report that a TRT will be generated to troubleshoot.</li> </ul>

### EVENT 3: D14 Bus Lockout relay fails / Loss of D14 Bus

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If EO/FSV are contacted for investigation, report to the crew that the Lockout relay is tripped for the D14 bus. <b>NOTE: If the crew attempts to contact personnel outside the MCR using the plant page, do not respond.</b></li> </ul>

**EVENT 4: "1B" Reactor Recirculation pump seal failure / Leakage past the closed "1B" RRP isolation valves**

✓	<b>MALFUNCTION / REMOTE FUNCTION / REPORT</b>
	■ Respond to requests for assistance as appropriate

**EVENT 5: "1B" Reactor Recirculation piping break / "1B" RHR pump trip / "1C" RHR LPCI injection valve fails to close after it opens**

✓	<b>MALFUNCTION / REMOTE FUNCTION / REPORT</b>
	<ul style="list-style-type: none"><li>■ If requested to perform SE-10-1, RHRSW radiation monitor resets, and Area Radiation Monitor resets, then load the appropriate scenario files from Ops Training Scenarios/Remotes folder. When timers time out, report to the MCR that actions are complete.</li><li>■ If EO/FSV are contacted for investigation, report to the crew that "1B" RHR pump breaker has tripped due to overcurrent on all three phases.</li><li>■ If EO/FSV are contacted to investigate HV51-1F017C, report to the crew that everything at the valve and the breaker for the valve appear normal.</li></ul>

Op-Test No. \_\_\_\_\_

Scenario No.   2  Event No.:   1  

Event Description: Perform ST-6-001-761-1

Time	Position	Applicant's Actions or Behavior
	CRS	Direct the PRO to perform ST-6-001-761-1
	PRO	Perform ST-6-001-761-1
	RO	During performance of ST-6-001-761-1, monitor reactivity transient as each bypass valve is opened, and ensure reactor power and pressure are stable before the next valve is tested.

Op-Test No. \_\_\_\_\_

Scenario No.   2  Event No.:   2  

Event Description: "1B" RECW pump trip / "1A" RECW pump fails to auto start

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize trip of the "1B" RECW pump and failure of the "1A" RECW pump to auto start
	CRS	Enter ON-113 and direct the PRO to manually start the "1A" RECW pump
	PRO	Manually start "1A" RECW pump
	RO	Reference ARC for annunciator 112 CLEANUP, G-2, and recognize "1A" RWCU pump trip. Inform CRS of required TS entry for SR 4.4.4
	CRS	Reference TS SR 4.4.4 and recognize sampling required every 4 hours due to conductivity recorder out of service per SR 4.4.4.c.1
	PRO	Dispatch EO/FSV to investigate trip of "1B" RECW pump and failure of "1A" RECW pump to auto start
	RO	Contact Chemistry for Reactor water sampling to meet TS SR 4.4.4
	RO	Contact EO to ensure RWCU filter/demins are on the hold pumps



Op-Test No. \_\_\_\_\_

Scenario No.   2  Event No.:   3  

Event Description: D14 Bus Lockout relay fails, Loss of D14 Bus (TS)

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize loss of D14 4KV bus
	CRS	Enter E-D14 procedure
	CRS	Refer to E-D144-R-E, E-D144-H, E-D144, and E-D144-C-B
	RO	Dispatch EO/FSV to investigate loss of D14 bus
	RO	Dispatch EO to perform running check of D14 D/G
	PRO	Recognize trip of the "1B" Drywell Chiller and report to the CRS
	CRS	Direct PRO to place "1A" Drywell Chiller in service
	PRO	Start "1A" Drywell Chiller
	CRS	Reference TS LCO 3.8.3.1 and recognize that (per ACTION a) all Unit 1 Division 4 buses must be re-energized within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
	PRO	Recognize Div 4 RHR and Div 4 Core Spray inoperable
	RO	Verify "1A" or "1B" FPC pump running
	PRO	Verify "1A" Instrument Air Compressor running
	PRO	Verify "1A" RECW pump running
	CRS	Enter SE-12, Loss of Communications for loss of plant page capability

Op-Test No. \_\_\_\_\_

Scenario No.   2  Event No.:   4  

Event Description: "1B" Reactor Recirculation Pump seal failures

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize failure of #1 seal on "1B" Reactor Recirculation Pump
	PRO	Reference ARC for 112 CLEANUP A-1, "1B RECIRC PUMP SEAL STAGE HI/LO FLOW"
	CRS	Refer to TS 3.4.3.2 for Reactor Coolant system leakage
	PRO	Recognize failure of #2 seal on "1B" Reactor Recirculation Pump
	PRO	Reference ARC for 112 CLEANUP A-2, "1B RECIRC PUMP SEAL LEAKAGE HI FLOW"
	RO	Recognize rising drywell pressure
	CRS	Enter OT-101, High Drywell Pressure
	PRO	Ensure Drywell Cooling is maximized and containment inerting is not in progress
	CRS	Direct PRO to perform OT-101 section 3.4 to secure "1B" Reactor Recirculation Pump
	PRO	Trip "1B" Reactor Recirculation Pump
	PRO	Close HV-43-1F031B, HV-46-115B, and HV-43-1F023B to isolate the "1B" Reactor Recirculation Pump
	RO	Peer check handswitch manipulations for securing "1B" Reactor Recirculation Pump to ensure correct pump is being secured and isolated.
	RO	Recognize drywell pressure turns after isolation of the "1B" Reactor Recirculation Pump

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Scenario No. 2Event No.: 5

Event Description: Leakage past the "1B" Reactor Recirculation Pump isolation valves / Reactor Recirculation system piping break

	RO/CRS	Recognize drywell pressure begins to rise again several minutes after isolation of the Reactor Recirculation pump
	CRS	Direct RWCU isolation per OT-101 section 3.10.3
	PRO	Isolate RWCU per OT-101 section 3.10.3
	CRS	Direct plant shutdown per GP-4, Rapid Plant Shutdown to Hot Shutdown
	PRO	Transfer house loads per S91.6.B
	PRO	Runback "1A" Reactor Recirculation Pump to minimum
	RO	Manually scram the reactor when core flow less than 50%
	RO	Place Reactor Mode Switch to SHUTDOWN
	CRS	Enter T-101, RPV Control when RPV level drops below 12.5 inches
	RO	Insert SRMs/IRMs
	RO	Verify all control rods full in and report to the CRS
	CRS	Direct PRO to trip the Main Turbine
	PRO	Trip the Main Turbine and ensure Generator Lockout
	CRS	Reenter T-101 and enter T-102, Primary Containment Control when drywell pressure exceeds 1.68 psig
	PRO	Recognize HPCI start at 1.68 psig and report to the CRS
	CRS	Direct the PRO to minimize HPCI injection
	PRO	Place HPCI flow controller to MANUAL and lower speed until injection to the RPV is stopped, while maintaining HPCI speed above 2200 RPM.
	CRS	When drywell temperature is above 145 deg. F, direct PRO to maximize drywell cooling, bypassing isolation using GP-8.5
	PRO	Bypass and restore drywell cooling using GP-8.5
	CRS	Direct RO to maintain RPV level 12.5 – 54 inches using feedwater/condensate
	RO	Verify feedwater aligns to startup level control
	RO	Maintain RPV level in band 12.5 – 54 inches, or inform CRS if out of

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Scenario No. 2Event No.: 5

Event Description: Leakage past the "1B" Reactor Recirculation Pump isolation valves / Reactor Recirculation system piping break

		band
	CRS	Provide RPV pressure control directions to RO, including a pressure control band
	RO	Maintain RPV pressure in band, or inform CRS if out of band
	CRS	Direct PRO to spray the suppression pool per T-225 using RHR before Suppression Pool pressure reaches 7.5 psig
	PRO	Spray the suppression pool per T-225
	CRS	Direct drywell spray per T-225 when on safe side of the Drywell Spray Initiation Limit Curve (Curve PC/P-2)
	CRS	Recognize on the unsafe side of the Pressure Suppression Pressure Curve (Curve PC/P-3)
	CRS	Enter T-112, Emergency Blowdown
	CRS	Direct the RO and PRO to prevent uncontrolled condensate and/or ECCS injection
	CRS	Direct the PRO to open 5 ADS valves
CT	PRO	Place handswitches for all 5 ADS valves to "OPEN"
	RO/PRO	Recognize LOCA signal and reenergize instrument buses per SE-10
	RO	Ensure uncontrolled condensate injection does not occur
	PRO	Take control of low pressure ECCS systems as required to prevent uncontrolled injection
	RO	Contact EO/FSV to perform shunt trip resets, RHRSW rad monitor resets and ARM resets per SE-10-1.
	CRS	Provide level control directions to RO or PRO with either condensate or low pressure ECCS
CT	PRO	Spray the drywell per T-225
	RO/PRO	Control RPV level in band, or inform CRS if out of band

**Termination Point:**

The scenario will be terminated when the following criteria are met:

1. An Emergency Blowdown has been performed per T-112, Emergency Blowdown, and RPV level has been stabilized

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Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

Initial Conditions: 100% power, "1K" SRV tailpipe temperature is elevated, and is being monitored using RT-6-041-230-1, MSRV Tailpipe Temperature Data Monitoring.

Turnover: Reactor power is 100%. "1K" SRV tailpipe temperature is elevated, and is being monitored using RT-6-041-230-1. Current temperature is 217 deg. F. The crew is required to perform ST-6-047-200-1, SDV Valve Exercise Test.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N (ALL)	Perform ST-6-047-200-1
1	MCR414C	C (RO/ CRS)	Scram discharge volume drain valve XV47-1F181 fails closed/ SDV High Level (TS)
2	MRM019A	I (PRO/ CRS)	U/1 RHRSW Radiation Monitor fails inoperable (TS)
3	MVI234A	I (RO/ CRS)	Reactor Pressure Instrument fails high
4	MRD556	M (ALL)	ATWS – Control Rods fail to scram (Hydraulic Lock)
4	MSL559	C (RO/ CRS)	SLC piping rupture
4	MEH104B	I (ALL)	EHC Turbine Load Set runs back to minimum
4	MEH108	C (ALL)	Main Turbine Bypass Valves fail closed

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

# I. SIMULATOR OPERATOR INSTRUCTIONS

## A. INITIAL SIMULATOR SETUP

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	<ul style="list-style-type: none"> <li>■ Prepare Simulator per TQ-AA-106-0301, Simulator Training Practices Job Aid</li> </ul>
	<ul style="list-style-type: none"> <li>■ Reset Simulator to IC-50</li> </ul>
	<ul style="list-style-type: none"> <li>■ Take out of FREEZE and ensure the following:               <ul style="list-style-type: none"> <li>- Reactor power is 100%</li> <li>- "1K" SRV tailpipe temperature is approximately 217 deg. F. and stable</li> <li>- Ensure two stopwatches (with current cal stickers) are available</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>■ Load Scenario "ILT05-3" from floppy disk labeled "2005 ILT Scenario Files" using A: drive and ensure the following malfunctions are loaded:               <ul style="list-style-type: none"> <li>• MCR414C, active immediately when the SDV vent and drain valve test is performed (trigger 1)</li> <li>• Annunciator 107 REACTOR C-3 to "ON", 5 minutes after trigger 1</li> <li>• MRM019A to 0, active 11 minutes after trigger 1</li> <li>• MVI234A, active 18 minutes after trigger 1</li> <li>• MRD556, active immediately</li> <li>• MSL559, active 3 minutes after Reactor Mode Switch placed in SHUTDOWN (trigger 2)</li> <li>• MEH104B, active 15 minutes after trigger 2</li> <li>• MEH108, active 20 minutes after trigger 2 with a ramp time of 10 minutes</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>■ Reset any annunciators that should not be present</li> </ul>

**B. INSTRUCTIONS FOR SIMULATOR OPERATOR**

**EVENT 1: Perform ST-6-047-200-1, SDV Valve Exercise Test / Scram discharge volume drain valve XV47-1F181 fails closed/ SDV High Level**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ Ensure trigger 1 activates when SDV test pushbuttons are depressed. If trigger 1 does not activate as expected, then manually activate trigger 1.</li> <li>■ If EO/FSV requested to investigate failure of XV47-1F181, report that the valve operator has an air leak. The FIN team will be contacted to try to repair the air line to the valve. If asked to manually open the valve, report that the handwheel spins freely, but does not operate the valve.</li> <li>■ If EO/FSV requested to report SDV level from the AER, wait 4 minutes, then report that all four SDV level indicators are reading 14% and look like their rising very slowly.</li> </ul>

**EVENT 2: RHRSW Radiation Monitor fails downscale**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If EO/FSV are contacted for investigation, report to the crew that the Unit 1 RHRSW radiation monitor indicates downscale in the Aux. Equipment Room.</li> </ul>

**EVENT 3: Reactor pressure instrument PT42-N078A fails high**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If EO/FSV are contacted for investigation, report to the crew that RPV pressure instrument PT42-N078A indicates upscale in the Aux. Equipment Room.</li> <li>■ If asked which AER panel PT42-N078A is on, report that it is on 10C609</li> </ul>



**EVENT 4: ATWS / SLC piping rupture / EHC Load Set runback to minimum /  
Main Turbine Bypass Valves fail closed**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If asked to perform T-221, wait 11 minutes, then toggle remote function RTR051 to bypass, then report T-221 complete in the Unit 1 AER.</li> <li>■ If asked to perform T-217: <ul style="list-style-type: none"> <li>■ Wait 12 minutes, then toggle remote functions RTR181 and RTR 303 to bypass. Call the MCR and report that T-217 steps 4.1.1 through 4.1.6 are complete and this notification is being made per step 4.1.7.</li> <li>■ If requested to perform draining of SDV per steps 4.1.11 through 4.1.13, toggle remote function RTR192, then call the MCR and report that SDV draining is in progress.</li> <li>■ Three minutes after reporting that SDV draining is in progress, call the MCR and report that all four SDV level indicators in the AER are indicating less than 62%.</li> <li>■ If requested to stop draining the SDV and pull jumpers to initiate a reactor scram, then perform the following <u>in this sequence</u>: <ol style="list-style-type: none"> <li>1. Toggle remote function RTR192 to NORMAL</li> <li>2. Insert malfunction MRP029D</li> <li>3. Remove malfunction MRD556</li> <li>4. Toggle remote function RTR181 to NORMAL</li> <li>5. Wait 20 seconds, then remove malfunction MRP029D</li> <li>6. Call the MCR and report that the jumpers have been removed per steps 4.2.2 through 4.2.5</li> </ol> </li> </ul> </li> <li>■ If asked to perform T-251, wait 5 minutes, then call the MCR and ask them to confirm that HV-55-1F006 is closed. After the MCR reports the valve is closed, then toggle remote function RTR309 to "OPEN", then notify the MCR that T-251 is complete on Unit 1.</li> <li>■ If asked to perform T-270 in the AER, then load scenario T-270 Terminate and Prevent with seven minute time delay from Ops Training Scenarios/Remotes folder. When timers time out, report to the MCR that T-270 is complete in the Unit 1 AER.</li> <li>■ If asked to perform SE-10-1 shunt trip resets, RHRSW radiation monitor resets, and Area Radiation Monitor resets, then load the appropriate scenario files from Ops Training Scenarios/Remotes folder. When timers time out, report to the MCR that actions are complete.</li> <li>■ Respond as appropriate for other requests for assistance.</li> </ul>

Op-Test No. \_\_\_\_\_

Scenario No.   3  Event No.:   1  

Event Description: Perform ST-6-047-200-1, SDV Valve Exercise Test

Time	Position	Applicant's Actions or Behavior
	CRS	Direct the RO and PRO to Perform ST-6-047-200-1, SDV Valve Exercise Test
	RO/PRO	Obtain two stop watches and coordinate the starting of the stop watches with the depressing of both TEST pushbuttons
	RO/PRO	Recognize that XV47-1F181 fails to reopen
	RO/PRO	Notify CRS of failure of XV47-1F181
	CRS	Enter TS 3.1.3.1 for inoperable SDV drain valve and determine per ACTION d. that the inoperable valve must be restored to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
	RO/PRO	Contact EO/FSV to monitor SDV level indicators in the AER
	RO	Reference ARC for 107 REACTOR C-3, SCRAM DISCH VOLUME NOT DRAINED
	CRS	Enter OT-105, Scram Discharge Volume High Level
	RO/PRO	Request EO/FSV to investigate XV47-1F181
	CRS	Direct EO/FSV to attempt to manually open XV47-1F181

Op-Test No. \_\_\_\_\_

Scenario No.   3  Event No.:   2  

Event Description: RHRSW Radiation Monitor fails downscale

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize failure of Unit 1 RHRSW Radiation Monitor downscale
	RO	Reference ARC for 011 SERV WTR B, C-4, RHRSW RAD MONITOR HI-HI / INOP / DNSCL
	CRS	Reference ODCM Section 3.2, recognize ACTION 101 is required.

Op-Test No. \_\_\_\_\_

Scenario No. 3Event No.: 3

Event Description: Reactor pressure instrument PT42-N078A fails high

Time	Position	Applicant's Actions or Behavior
	RO	Recognize and report to the CRS that the Reactor Hi Press Trip annunciator has alarmed, and no half scram has been generated
	RO	Use multiple indications to validate that actual RPV pressure is not above the RPS scram setpoint.
	PRO	Reference ARCs for annunciator 107 G-1 "REACTOR HI PRESS TRIP"
	CRS	Enter OT-117, RPS Failures
	RO/PRO	Determine which instrument has caused the Reactor Hi Press Trip alarm
	CRS	Direct the RO to attempt to insert a half-scram on the "A" RPS side
	RO	Manually arm and depress the A1 or A2 RPS manual pushbutton
	RO	Recognize that a half-scram was not generated
	CRS	Direct the RO to attempt to insert a half-scram using the "A" RPS manual pushbutton that was not used for the first attempt
	RO	Manually arm and depress the A2 or A1 RPS manual pushbutton
	RO	Recognize that a half-scram was not generated
	CRS	Direct RO to manually scram the reactor
	RO	Place the reactor mode switch in "SHUTDOWN"

Op-Test No. \_\_\_\_\_

Scenario No. 3Event No.: 4

Event Description: ATWS / SLC piping rupture / EHC Load Set runback to minimum / Main Turbine Bypass Valves fail closed

Time	Position	Applicant's Actions or Behavior
	RO	Recognize no control rod motion, and report to the CRS
	CRS	Enter T-101, RPV CONTROL due to scram condition with power above 4%
	RO	Place reactor mode switch in "SHUTDOWN"
	RO	Insert SRMs/IRMs
	CRS	Direct RRCS initiation
	RO	Manually initiate RRCS
	CRS	Direct PRO to runback both Reactor Recirculation pumps to minimum
	PRO	Runback both Reactor Recirculation pumps to minimum
	CRS	Direct trip of both Reactor Recirculation pumps
	PRO	Trip both Reactor Recirculation pumps
	CRS	Direct the RO to manually insert control rods and bypass RWM as necessary
	RO	Insert control rods manually with RWM bypassed
	CRS	Direct performance of T-217, RPS/ARI Reset and Backup Method of Draining Scram Discharge Volume
CT	RO	Perform T-217 with EO to insert all control rods (rod insertion will actually occur later)
	RO	After SLC initiation, recognize SLC is not injecting to the RPV
	CRS	Direct the RO to secure all three SLC pumps
	RO	Manually secure all three SLC pumps
	CRS	Direct performance of T-209 to inject SLC
	CRS	Enter T-117, LEVEL/POWER CONTROL
	CRS	Direct auto ADS inhibited
CT	PRO	Inhibit auto ADS
	CRS	Direct performance of T-221 to maintain MSIVs open

Op-Test No. \_\_\_\_\_

Scenario No. 3Event No.: 4

Event Description: ATWS / SLC piping rupture / EHC Load Set runback to minimum / Main Turbine Bypass Valves fail closed

Time	Position	Applicant's Actions or Behavior
	CRS	Direct performance of T-270 to terminate and prevent injection to reduce RPV level to below -50 inches
CT	PRO/RO	Perform T-270 to terminate and prevent HPCI, RHR, Core Spray injection (PRO) and Condensate/Feedwater (RO)
	CRS	Provide direction to the RO to reinject as necessary to maintain RPV level in a band that is above -129 and at or below -50 inches
	RO	Reinject with condensate/feedwater to maintain RPV level in band as directed by CRS
	CRS	Direct performance of T-251, Establish a HPCI Injection Flowpath Via Feedwater Only
	RO	Recognize RPV pressure rising and report to CRS
	CRS	Direct PRO to control pressure using SRVs between 990-1096 psig
	RO	Recognize Main Turbine trip
	RO	Recognize Bypass Valves failing closed and notify PRO/CRS
	CRS	Enter T-102, Primary Containment Control when suppression pool temperature exceeds 95 deg. F.
	PRO	Recognize suppression pool temperature at or above 110 deg. F.
	CRS	Direct performance of T-270 to terminate and prevent injection
CT	PRO/RO	Perform T-270 to terminate and prevent HPCI, RHR, Core Spray injection (PRO) and Condensate/Feedwater (RO)
	CRS	Direct RO to reinject when RPV level is below -161, or SRV is closed and DW pressure is <1.68 psig, or power is <4%, or SP temperature is less than 110 deg F.
	RO	Reinject with condensate/feedwater to maintain RPV level in band as directed by the CRS
	RO	Recognize control rods inserted following performance of T-217
	CRS	Exit T-117, LEVEL/POWER CONTROL
	CRS	Re-enter T-101, RPV CONTROL, RC/L leg
	CRS	Give RO a level band above the top of active fuel (>-161 inches)
	RO	Restore RPV level above -161 inches

**Termination Point:**

The scenario will be terminated when the following criteria are met:

1. All control rods are fully inserted
2. RPV level is being maintained above the top of active fuel

Facility: Limerick      Scenario No.: 4      Op-Test No.: \_\_\_\_\_

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

Initial Conditions: 83% power, ST-6-052-232-1, B Loop Core Spray Pump, Valve and Flow Test is in progress.

Turnover: Reactor power is 83% following a rod pattern adjustment. Reactor Engineering is completing a ReMA. Power restoration will resume within the next hour. ST-6-052-232-1, B Loop Core Spray Pump, Valve and Flow Test is in progress and has been completed up to and including step 4.7.21. "1D" Core Spray pump has been running for 20 minutes of its required 45 minutes for step 4.7.22.

Event No.	Malf. No.	Event Type*	Event Description
1	MVI231 B	I (ALL)	RPV instrument line break, XV42-1F045B closes causing Division 2 LOCA signal (TS)
1	MHP452 MHP453	C (PRO/ CRS)	HPCI Injection valves will fail to reopen after initial isolation/trip of HPCI
2	MSW489B	C (PRO/ CRS)	"0B" ESW Pump trip (TS)
3	Override HS05-102C to close	C (ALL)	"1C" Condensate Pump Discharge Valve strokes closed due to a short in the control switch
3	MRR507A	I (PRO/ CRS)	"1A" Reactor Recirculation MG Set fails to runback
4	MFW252B (0-100%)	M (ALL)	Feedwater line rupture inside Primary Containment
4	Override HS41-1F032B to fail "as-is"	C (ALL)	"B" Feedwater line isolation valve fails to close
4	MAD146B MAD146E	C (PRO/ CRS)	"1K" SRV opens
5	MAD151D	C (PRO/ CRS)	"1E" SRV downcomer leak
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			



# I. SIMULATOR OPERATOR INSTRUCTIONS

## A. INITIAL SIMULATOR SETUP

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	<ul style="list-style-type: none"> <li>■ Prepare Simulator per TQ-AA-106-0301, Simulator Training Practices Job Aid</li> </ul>
	<ul style="list-style-type: none"> <li>■ Reset Simulator to IC-52</li> </ul>
	<ul style="list-style-type: none"> <li>■ Take out of FREEZE and ensure the following:               <ul style="list-style-type: none"> <li>- Reactor power is approximately 83%</li> <li>- "1D" Core Spray pump is operating in full flow test through HV52-1F015B</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>■ Load Scenario "ILT05-1" from floppy disk labeled "2005 ILT Scenario Files" using A: drive and ensure the following malfunctions are loaded:               <ul style="list-style-type: none"> <li>• MVI231B, active 3 minutes after trigger 1 (manually activated)</li> <li>• MSW489B active 5 minutes after start of "0B" ESW pump (trigger 2)</li> <li>• MHP452, active 1 minute after HPCI manual isolation pushbutton depressed (trigger 3)</li> <li>• MHP453, active 1 minute after trigger 3</li> <li>• MRR507A, active immediately</li> <li>• MRR506A, active immediately after "1C" Condensate pump trip (trigger 4)</li> <li>• MFW252B (100%), active 30 minutes after trigger 1 with a ramp time of 4 minutes</li> <li>• MRR441 (300 gpm), active 30 minutes after trigger 1 with a ramp time of 3 minutes</li> <li>• MAD146B, active 40 minutes after trigger 1</li> <li>• MAD146E, active 40 minutes after trigger 1</li> <li>• Override HS05-102C ("1C" Cond pump handswitch) to "CLOSE", active 17 minutes after trigger 1</li> <li>• Override HS41-1F032B (Feedwater Line B Reactor Inlet Valve) to "ALLOFF", active immediately</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>■ Reset any annunciators that should not be present</li> </ul>

**B. INSTRUCTIONS FOR SIMULATOR OPERATOR**

**EVENT 1: RPV instrument line break, closure of XV42-1F045B / HPCI  
Injection valves will fail to reopen after initial isolation/trip of HPCI**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If asked to investigate excess flow check valve panel 10C218, wait 4 minutes, then report that XV42-1F045B is indicating closed.</li> <li>■ If asked to investigate the failure of the HPCI injection valves to reopen, report that the contactors will not seal in at the breaker for either valve. If asked to open the valves manually, report that the valves are stuck and cannot be opened.</li> </ul>

**EVENT 2: "0B" ESW Pump trip**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If requested to investigate failure of "0B" ESW pump, report that the pump breaker has an overcurrent trip flag up on the "C" phase</li> </ul>

**EVENT 3: "1C" Condensate Pump discharge valve strokes closed due to a short in the control switch / "1A" Reactor Recirculation Pump MG set fails to runback**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ Respond as appropriate to requests for assistance</li> </ul>

**EVENT 4: Feedwater line rupture inside Primary Containment / "B"  
Feedwater line isolation valve fails to close / "1K" SRV opens**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ If requested to support closure of HV41-1F032B, wait 5 minutes, then report that all attempts to close the valve have been unsuccessful. Electrical and Mechanical Maintenance personnel have been contacted and are working on the problem.</li> <li>■ If requested to support start of "1B" CRD pump for T-240, report that there is a significant oil leak on the "1B" CRD pump. If the crew decides to start the pump anyway, wait one minute after pump start, then insert malfunction MCR412B and report the pump has tripped</li> <li>■ If requested to pull fuses for "1K" SRV per OT-114, wait until RPV pressure is 700 psig, then toggle remote function RAD213 to "OUT", then remove malfunctions MAD146B and MAD146E. Call the MCR and inform them that the fuses have been removed for the "1K" SRV per OT-114.</li> <li>■ Respond as appropriate to requests for assistance</li> </ul>

**EVENT 5: "1E" SRV downcomer leak**

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	<ul style="list-style-type: none"> <li>■ Respond as appropriate for requests for assistance</li> </ul>

Op-Test No. \_\_\_\_\_

Scenario No. 4Event No.: 1

Event Description: RPV instrument line break, closure of XV42-1F045B / HPCI Injection valves will fail to reopen after initial isolation/trip of HPCI

Time	Position	Applicant's Actions or Behavior
	RO/PRO	Recognize excess flow check valve actuated and reference ARC for annunciator 112 CLEANUP, E-5 EXCESS FLOW CHECK VALVE OPERATED PANEL C218
	PRO	Recognize HPCI is injecting
	RO	Recognize power rise and take immediate operator action to reduce reactor power below initial pre-transient power level
	CRS	Direct PRO to secure HPCI injection
	PRO	Either manually isolate HPCI using manual isolation pushbutton, or minimize HPCI injection by placing HPCI flow controller to MANUAL and reducing HPCI pump speed until injection is stopped, with HPCI speed still above 2200 rpm.
	PRO	Reclose D12 instrument bus breaker 52-20224/CS per SE-10
	PRO	Recognize "1B" RHR pump and "1B" Core Spray pump are running
	CRS	Direct PRO to secure "1B" RHR pump and "1B" Core Spray pump
	RO	Send an EO/FSV to investigate at panel 10C218
	RO	Send an EO to perform Division 2 shunt trip resets per SE-10-1, reset RHRSW rad monitor, and reset RE ARMs
	RO	Send an EO to reset RDCS inop
	RO	Send an EO to perform running checks of D12 D/G
	CRS	Reference TS LCO 3.6.3 and TRM Table 3.6.3-1 to determine that per LCO 3.6.3 ACTION b.2 within 4 hours the excess flow check valve line must be isolated (this is met by the valve being closed) and the associated instrument declared inoperable, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

Op-Test No. \_\_\_\_\_

Scenario No. 4Event No.: 2

Event Description: "0B" ESW Pump trip

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize trip of the "0B" ESW pump
	PRO	Recognize D12 D/G running without cooling water
	CRS	Direct PRO to start "0D" ESW pump or secure D12 D/G
	PRO	Start "0D" ESW pump or secure D12 D/G
	RO	Contact EO/FSV to investigate trip of the "0B" ESW pump
	CRS	Reference TS LCO 3.7.1.2 and determine that "B" loop of ESW is not operable, and per ACTION A.1 the "0B" ESW pump must be restored to OPERABLE status within 45 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

Op-Test No. \_\_\_\_\_

Scenario No. 4Event No.: 3

Event Description: "1C" Condensate Pump Discharge Valve strokes closed due to a short in the control switch / "1A" Reactor Recirculation MG Set fails to runback

Time	Position	Applicant's Actions or Behavior
	RO	Recognize "1C" Condensate Pump discharge valve is stroking closed and that the pump will trip when the valve is fully closed
	RO	Recognize trip of "1C" Condensate Pump
	PRO	Recognize "1A" Reactor Recirculation Pump MG set failed to automatically runback following condensate pump trip
	CRS	Direct PRO to manually runback "1A" Reactor Recirculation Pump MG set to match "1B" Reactor Recirculation Pump MG set speed (approximately 42%)
	CRS	Enter OT-104, Unexpected/Unexplained Positive or Negative Reactivity Insertion
	CRS	Request the RO to print out a Control Rod Position Report
	RO	Print out a Control Rod Position Report and determine all control rods are in their expected positions
	CRS	Reference GP-5 Appendix 3, section 3.1, Response to Unintentional Drop in Power
	RO/PRO	Contact WWM/EO/FSV to investigate failure of "1A" Reactor Recirculation Pump MG set to automatically runback
	RO/PRO	Contact WWM/EO/FSV to investigate inadvertent closure of "1C" Condensate Pump discharge valve

Op-Test No. \_\_\_\_\_

Scenario No. 4Event No.: 4

Event Description: Feedwater line rupture inside Primary Containment / "B" Feedwater line isolation valve fails to close / "1K" SRV Opens

Time	Position	Applicant's Actions or Behavior
	RO/PRO	Recognize rising drywell pressure
	RO	Manually scram the reactor, or recognize reactor scram and place Reactor Mode Switch in SHUTDOWN
	CRS	Enter T-101, RPV Control when RPV level drops below 12.5 inches or drywell pressure exceeds 1.68 psig
	RO	Insert SRMs/IRMs
	RO	Verify all control rods full in and report to the CRS
	CRS	Direct PRO to trip the Main Turbine
	PRO	Trip the Main Turbine and ensure Generator Lockout
	CRS	Reenter T-101 if appropriate and enter T-102, Primary Containment Control when drywell pressure exceeds 1.68 psig
	RO	Recognize high feedwater flow at pressure below RPV pressure
	PRO	Recognize RCIC flow with discharge pressure below RPV pressure
	RO/PRO	Report feedwater line break to the CRS
	CRS	Direct RO to close HV41-1F032B
	RO	Attempt to close HV41-1F032B and report to the CRS the failure of the valve to close
	RO/PRO	Request assistance from WWM/EO/FSV to close HV41-1F032B
	CRS	When drywell temperature is above 145 deg. F, direct PRO to maximize drywell cooling, bypassing isolation using GP-8.5
	PRO	Bypass and restore drywell cooling using GP-8.5
	CRS	Direct the PRO to restore HPCI to service
	PRO	Recognize HPCI injection valves fail to reopen
	PRO	Contact WWM/EO/FSV for assistance in opening HPCI injection valves locally
	CRS	Direct the PRO to secure HPCI to minimize inventory loss
	PRO	Isolate HPCI

Op-Test No. \_\_\_\_\_

Scenario No. 4Event No.: 4

Event Description: Feedwater line rupture inside Primary Containment / "B" Feedwater line isolation valve fails to close / "1K" SRV Opens

Time	Position	Applicant's Actions or Behavior
	CRS	Direct RO to maximize CRD injection per T-240
	RO	Contact EO to support maximizing CRD injection per T-240
	CRS	Direct RO to inject SLC
	RO	Manually start all three SLC pumps
	CRS	Provide RPV pressure control directions to RO, including a pressure control band
	RO	Maintain RPV pressure in band, or inform CRS if out of band
	RO/PRO	Recognize "1K" SRV inadvertently opens
	CRS	Enter OT-114, Inadvertent Opening of a Relief Valve
	CRS	Direct closing the MSIVs prior to exceeding 100 deg/hr cooldown
	PRO	Close the MSIVs when directed by the CRS
	CRS	Direct fuses removed for "1K" SRV per OT-114
	CRS	Direct PRO to spray the suppression pool per T-225 using RHR before Suppression Pool pressure reaches 7.5 psig
	PRO	Spray the suppression pool per T-225 using RHR
	RO/PRO	Recognize "1K" SRV closed and report to the CRS
	CRS	Recognize RPV level cannot be maintained above -161 and enter T-111, Level Restoration
	CRS	Direct PRO to place 2 RHR/CS subsystems in service
	PRO	Start RHR/CS pumps as requested by the CRS
	CRS	Direct all low pressure ECCS subsystems aligned to the reactor before reaching -161 inches RPV level
	PRO	Realign all low pressure ECCS subsystems for injection before reaching -161 inches RPV level
	PRO	Report to the CRS when RPV level is at the top of active fuel (-161")
	CRS	Enter T-112, Emergency Blowdown
	CRS	Direct the PRO to open 5 ADS valves
CT	PRO	Place handswitches for all 5 ADS valves to "OPEN"



Op-Test No. \_\_\_\_\_

Scenario No. 4Event No.: 4

Event Description: Feedwater line rupture inside Primary Containment / "B" Feedwater line isolation valve fails to close / "1K" SRV Opens

Time	Position	Applicant's Actions or Behavior
	PRO	Recognize "1K" SRV did not open due to it's fuses being pulled
	CRS	Direct PRO to open non-ADS SRVs until a total of 5 SRVs are open
	PRO	Open an additional SRV until a total of 5 SRVs are open

Op-Test No. _____		Scenario No. <u>4</u>	Event No.: <u>5</u>
Event Description: "1E" SRV downcomer leak			
	RO/PRO	Recognize rapid rise in drywell pressure	
	CRS	Recognize suppression pool pressure is above drywell pressure	
	PRO	Ensure ECCS injection and report to the CRS when RPV level is above -161 inches.	
	RO/PRO	Recognize LOCA signal and reenergize instrument buses per SE-10	
	RO	Contact EO/FSV to perform shunt trip resets, RHRSW rad monitor resets and ARM resets per SE-10-1.	
	CRS	Provide level control directions to RO or PRO with low pressure ECCS	
	CRS	Direct Suppression Pool Spray per T-225	
	PRO	Spray the Suppression Pool per T-225	
	CRS	Direct drywell spray per T-225 when on safe side of the Drywell Spray Initiation Limit Curve (Curve PC/P-2)	
CT	PRO	Spray the drywell per T-225	
	RO/PRO	Control RPV level in band, or inform CRS if out of band	

## Termination Point:

The scenario will be terminated when the following criteria are met:

1. An Emergency Blowdown has been performed per T-112, Emergency Blowdown, and RPV level has been stabilized