

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
6	MRC464A MRC464B	C (PRO/ CRS)	RCIC isolation valves fail to close
7	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:  <div style="text-align: center;">"1B EHC PUMP OUT OF SERVICE FOR PRESSURE COMPENSATOR REPLACEMENT"</div> </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 HSS-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> </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 HSS-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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Event Description: Withdraw control rods until 4 bypass valves are 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 <ul style="list-style-type: none"><li>- Select control rod</li><li>- Depress WITHDRAW and CONTINUOUS WITHDRAW until control rod is at desired location</li></ul>
	PRO	Peer check all control rod movements

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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 in MANUAL and attempt to open the flow control valve
	RO	Place CRD flow controller in MANUAL
	RO	Depress OPEN on CRD Flow Controller 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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Event Description: Loss of 1BY160 (TS)

Time	Position	Applicant's Actions or Behavior
	PRO	Reference ARC for annunciator 122 D12, F-4 (1B RPS & UPS DIST. PNL TROUBLE)
	PRO	Reference ARC for annunciator 123 D14, F-5 (1B APRM UPS INVERTER TROUBLE)
	PRO	Recognize loss of 1BY160 panel
	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 (1A/1B RECIRC PUMP MOTOR HI TEMP)
	RO	Monitor Recirculation Pump Motor 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 the following systems per E-1BY160 steps 2.3 through 2.5: <ul style="list-style-type: none"> <li>- RECW</li> <li>- DWCW</li> <li>- PCIG</li> </ul> <p><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></p>
	PRO	Bypass and restore RECW per E-1BY160 step 2.3 <ul style="list-style-type: none"> <li>- Place HS-13-113 in BYPASS</li> <li>- Place HS-13-108 to OPEN</li> </ul>

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Event Description: Loss of 1BY160 (TS)

Time	Position	Applicant's Actions or Behavior
	PRO	Bypass and restore DWCW per E-1BY160 step 2.4 <ul style="list-style-type: none"><li>- Place HS-87-115 in BYPASS</li><li>- Place HS-87-128 to OPEN</li><li>- Place HS-87-122 to OPEN</li></ul>
	PRO	Bypass and restore PCIG per E-1BY160 step 2.5 <ul style="list-style-type: none"><li>- Place HS-59-129B to CLOSE</li><li>- Place HS-59-102 to CLOSE</li><li>- Place HSS-57-191B in BYPASS</li><li>- Place HS-59-129B to OPEN</li><li>- Place HS-59-102 to OPEN</li></ul>
	RO	Recognize Recirculation Pump Motor 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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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 T.S. 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, RPV Control, IF RPV level drops below +12.5 inches
	CRS	Enter T-100, SCRAM/SCRAM Recovery, 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
	PRO	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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Event Description: Steam leak from RCIC piping / RCIC isolation valves fail to close

Time	Position	Applicant's Actions or Behavior
	PRO	Reference ARC for 004 VENT, A-2 (A REAC ENCL HVAC PANEL 1AC208 TROUBLE)
	RO/PRO	Dispatch an EO to 1AC208 to investigate the trouble alarm
	RO	Reference ARC for 107 REACTOR, 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	Use only PAMS, FZ level, and EQ PMS parameters for values when reporting RPV level and pressure to the CRS
	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	Place keylock switch for RCIC isolation valve HV-49-1F007 to CLOSE
	PRO	Place keylock switch for RCIC isolation valve HV-49-1F008 to CLOSE
	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
	CRS	Direct RO to fully open all bypass valves per T-101, step RC/P-6
	RO	Depress Bypass Valve Jack OPEN pushbutton to open bypass valves

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Event Description: Steam leak from RCIC piping / RCIC isolation valves fail to close

Time	Position	Applicant's Actions or Behavior
	CRS	Recognize 2 areas in Table SCC-2 exceeding MSO temperature and enter T-112, Emergency Blowdown
	CRS	Direct RO/PRO to prevent uncontrolled injection with Condensate and ECCS
	CRS	Direct opening all 5 ADS valves
CT	PRO	Place all 5 ADS valve handswitches to OPEN

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Event Description: "1E" SRV fails to open

Time	Position	Applicant's Actions or Behavior
	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
	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: \_\_\_\_\_

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)
2	MHP452 MHP453	C (PRO/ CRS)	HPCI Injection valves will fail to reopen after initial isolation/trip of HPCI
3	MSW489B	C (PRO/ CRS)	"0B" ESW Pump trip (TS)
4	Override HS05-102C to close	C (ALL)	"1C" Condensate Pump Discharge Valve strokes closed due to a short in the control switch
5	MRR507A	I (PRO/ CRS)	"1A" Reactor Recirculation MG Set fails to runback
6	MFW252B (0-100%)	M (ALL)	Feedwater line rupture inside Primary Containment
7	Override HS41-1F032B to fail "as-is"	C (ALL)	"B" Feedwater line isolation valve fails to close
8	MAD146B MAD146E	C (PRO/ CRS)	"1K" SRV opens
9	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 87%</li> <li>- "1D" Core Spray pump is operating in full flow test through HV-52-1F015B</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>■ Load Scenario "ILT05-4" 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>• MAD151D (50%), active immediately before blowdown on trigger 5 (manually activated)</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 "FAIL ALL 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: RPV instrument line break, closure of XV-42-1F045B**

✓	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 XV-42-1F045B 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> <li>■ If asked to perform SE-10-1 shunt trip resets for Div 2, 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 asked to reset RDCS in Aux Equipment Room, wait 5 minutes then select RESET from RDCS remote functions and report to the MCR that RDCS has been reset.</li> </ul>

**EVENT 2: HPCI Injection valves will fail to reopen after initial isolation/Trip of HPCI**

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

**EVENT 3: "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 4: "1C" Condensate Pump discharge valve strokes closed due to a short in the control switch**

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

**EVENT 5: "1A" Reactor Recirculation Pump MG set fails to runback**

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

**EVENT 6: Feedwater line rupture inside Primary Containment**

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

**EVENT 7: "B" Feedwater line isolation valve fails to close**

✓	<b>MALFUNCTION / REMOTE FUNCTION / REPORT</b>
	■ If requested to support closure of HV-41-1F032B, 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. Respond as appropriate for requests for assistance



**EVENT 8: "1K" SRV opens**

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

**EVENT 9: "1E" SRV downcomer leak**

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

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Event Description: RPV instrument line break, closure of XV-42-1F045B / 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	Enter OT-104, Unexpected/Unexplained Positive or Negative Reactivity Insertion
	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
	PRO	Place "1B" RHR pump control switch to STOP
	PRO	Place "1B" Core Spray pump control switch to STOP
	RO	Send an EO/FSV to investigate at panel 10C218
	PRO	Recognize RWCU trip
	CRS	Reference T.S. LCO 3.4.4 and recognize Surveillance Requirement 4.4.4 requires reactor coolant sampling every 4 hours
	CRS/RO	Contact Chemistry to perform conductivity sampling every 4 hours
	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 check of D12 D/G

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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
	CRS	Reference T.S. 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.

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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	Place "0D" ESW pump control switch to START or place D12 D/G control switch to STOP
	RO	Contact EO/FSV to investigate trip of the "0B" ESW pump
	CRS	Reference T.S. 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.

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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%)
	PRO	Depress LOWER pushbutton for "1A" Reactor Recirculation Pump speed controller until speed matches "1B" Recirc Pump 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

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

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
	PRO	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 HV-41-1F032B
	RO	Attempt to close HV-41-1F032B and report to the CRS the failure of the valve to close
	RO/PRO	Request assistance from WWM/EO/FSV to close HV-41-1F032B
	CRS	When drywell temperature is above 145 deg. F, direct PRO to maximize drywell cooling, bypassing isolation using GP-8.5, Isolation Bypass of Crucial Systems

Op-Test No. \_\_\_\_\_ Scenario No. 4 Event No.: 6 and 7 (cont'd) Page 6 of 10

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

Time	Position	Applicant's Actions or Behavior
	PRO	Bypass and restore drywell cooling using GP-8.5 <ul style="list-style-type: none"> <li>- Verify DWCW Head Tank HI/LO Alarm in "NORMAL" using PMS POINT G532</li> <li>- Place HS-87-115 in BYPASS</li> <li>- Place HS-87-116 in BYPASS</li> <li>- Place HS-87-128 to OPEN</li> <li>- Place HS-87-122 to OPEN</li> </ul>
	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
	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

Op-Test No. \_\_\_\_\_ Scenario No. 4 Event No.: 8 Page 7 of 10

"1K" SRV Opens

Time	Position	Applicant's Actions or Behavior
	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 rate
	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 <ul style="list-style-type: none"> <li>- Start "1A" or "1B" RHR pump</li> <li>- Throttle open HV-51-1F024A(B) to establish flow 8,000 to 8,500 gpm</li> <li>- Open HV-51-1F027A(B)</li> </ul> Start RHRSW <ul style="list-style-type: none"> <li>- Open HV-51-1F014A(B)</li> <li>- Throttle open HV-51-1F068A(B) for 20 seconds</li> <li>- Ensure A/C(B/D) Spray Pond Unit Cooler Fan in service</li> <li>- Start A(B) or C(D) RHRSW pump</li> <li>- Throttle HV-51-1F068A(B) without exceeding 11,000 gpm on FI-51-1r602A(B) while maintaining pump discharge pressure 75-85 psig on PI-12-001A(B)-1</li> <li>- Close HV-C-51-1F048A(B)</li> </ul>
	RO/PRO	Recognize "1K" SRV closed and report to the CRS
	CRS	Recognize RPV level cannot be maintained above -161 inches and enter T-111, Level Restoration
	CRS	Direct auto ADS inhibited
	PRO	Place both divisions auto ADS switches in "INHIBIT"
	CRS	Direct PRO to place 2 RHR/CS subsystems in service



Op-Test No. \_\_\_\_\_ Scenario No. 4 Event No.: 8 (cont'd) Page 8 of 10

"1K" SRV Opens

Time	Position	Applicant's Actions or Behavior
	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"
	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. 4 Event No.: 9 Page 9 of 10

Event Description: "1E" SRV downcomer leak

Time	Position	Applicant's Actions or Behavior
	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 using RHR <ul style="list-style-type: none"> <li>- Start "1A" or "1B" RHR pump</li> <li>- Throttle open HV-51-1F024A(B) to establish flow 8,000 to 8,500 gpm</li> <li>- Open HV-51-1F027A(B)</li> </ul> Start RHRSW <ul style="list-style-type: none"> <li>- Open HV-51-1F014A(B)</li> <li>- Throttle open HV-51-1F068A(B) for 20 seconds</li> <li>- Ensure A/C(B/D) Spray Pond Unit Cooler Fan in service</li> <li>- Start A(B) or C(D) RHRSW pump</li> <li>- Throttle HV-51-1F068A(B) without exceeding 11,000 gpm on FI-51-1R602A(B) while maintaining pump discharge pressure 75-85 psig on PI-12-001A(B)-1</li> <li>- Close HV-C-51-1F048A(B)</li> </ul>
	CRS	Direct drywell spray per T-225 when on safe side of the Drywell Spray Initiation Limit Curve (Curve PC/P-2)

Op-Test No. \_\_\_\_\_ Scenario No. 4 Event No.: 9 (cont'd) Page 10 of 10

Event Description: "1E" SRV downcomer leak

Time	Position	Applicant's Actions or Behavior
CT	PRO	Spray the drywell per T-225 <ul style="list-style-type: none"> <li>- Start "1B" or "1A" RHR pump</li> <li>- Trip Recirc Pumps</li> <li>- Place all 16 Drywell Cooler Fan switches to OFF</li> <li>- Verify High Drywell Pressure and LOCA signals exist</li> <li>- Throttle open HV-51-1F024B(A) to establish flow 9,250 to 10,500 gpm</li> <li>- Open HV-51-1F021B(A)</li> <li>- Verify "Safe to Spray" with CRS</li> <li>- Throttle open HV-51-1F016B(A) and throttle close HV-51-1F024B(A) to maintain 9,250 to 10,500 gpm</li> <li>- Monitor drywell pressure</li> </ul> Start RHRSW <ul style="list-style-type: none"> <li>- Open HV-51-1F014B(A)</li> <li>- Throttle open HV-51-1F068B(A) for 20 seconds</li> <li>- Ensure B/D(A/C) Spray Pond Unit Cooler Fan in service</li> <li>- Start B(D) or D(C) RHRSW pump</li> <li>- Throttle HV-51-1F068B(A) without exceeding 11,000 gpm on FI-51-1R602B(A) while maintaining pump discharge pressure 75-85 psig on PI-12-001B(A)-1</li> <li>- Close HV-C-51-1F048B(A)</li> </ul>
	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