

MT-ILT-27E (2015 ILT NRC Scenario 1) Rev. 0

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: MONTICELLO**SEG #** ILT-SS-27E**SEG TITLE:** 2015 ILT NRC SCENARIO 1**REV. #** 0**PROGRAM:** INITIAL LICENSE TRAINING**#:** MT-ILT**COURSE:** NRC SIMULATOR EVALUATION**#:** N/A**TOTAL TIME:** 45-90 MINUTES

Additional site-specific signatures may be added as desired.

Developed by:	_____	_____
	<i>Instructor</i>	<i>Date</i>
Reviewed by:	_____	_____
	<i>Instructor</i> (<i>Simulator Scenario Development Checklist.</i>)	<i>Date</i>
Validated by:	_____	_____
	<i>Validation Lead Instructor</i> (<i>Simulator Scenario Validation Checklist.</i>)	<i>Date</i>
Approved by:	_____	_____
	<i>Training Supervision</i>	<i>Date</i>

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<p>Event 1</p> <p>Booth Operator</p> <p>Booth Operator</p> <p>Booth Operator</p> <p>Booth Operator</p> <p>Booth Operator</p>	<p>1. <u>SHIFT RUNNING RBCCW PUMPS</u></p> <p>a. Respond as RBO that you are standing by at the RBCCW pumps</p> <p>b. Respond as RBO that the #12 RBCCW pump suction and discharge valves are fully open</p> <p>c. Respond as RBO that the #12 RBCCW pump is operating normally</p> <p>d. When directed by the BOP to close the #11 RBCCW pump discharge valve, INSERT MANUAL TRIGGER 1. When ramp is complete, immediately notify the BOP that the #11 RBCCW pump discharge valve is CLOSED</p> <p>e. When directed to OPEN the #11 RBCCW pump discharge valve, INSERT MANUAL TRIGGER 3 and verify the valve opens. Once OPEN, notify the BOP that the discharge valve for #11 RBCCW pump is OPEN</p>	<p>CRS</p> <p>BOP CR208.102</p> <p>BOP</p> <p>BOP</p> <p>BOP</p> <p>BOP</p> <p>BOP</p> <p>BOP</p>	<p>Directs BOP to Transfer RBCCW to #12 RBCCW Pump IAW B.02.05-05.E.1</p> <p>Directs RBO to be stationed by the RBCCW pumps</p> <p>Directs RBO to verify suction and discharge valves for #12 RBCCW pump are fully open (Step 5)</p> <p>BOP starts #12 RBCCW pump from C-06</p> <p>Directs RBO to locally check pump and motor performance of #12 RBCCW pump</p> <p>Directs RBO to slowly CLOSE discharge valve on #11 RBCCW pump and then immediately secures the pump</p> <p>Directs RBO to fully open the discharge valve for #11 RBCCW pump</p> <p>Reports to the CRS that the #12 RBCCW pump is running and that #11 RBCCW pump is secured</p> <p>Places #11 RBCCW pump in auto-standby</p>
<p>Event 2</p> <p>Booth Operator</p>	<p>2. <u>#11 CRD PUMP TRIP</u></p> <p>a. When directed by the Lead Evaluator, insert MANUAL TRIGGER 5 and verify CH08A & C-05-B26 activate:</p> <p>Key Parameter Response: CRDH pressures and flows lower</p> <p>Key Expected Alarms: 5-B-25 (CRD Pump 3-16A Breaker Tripped), 5-B-17 (Charging Water Lo Press)</p>	<p>SS315.102 CR200.147</p> <p>OATC</p>	<p>Responds to annunciators and notifies CRS of the CRD pump trip</p>

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<p>Booth Operator</p> <p>Booth Operator</p> <p>Booth Operator</p>	<p><u>Automatic Actions:</u> None</p> <p>b. As Out-Plant Operator(s), wait one minute and respond as follows:</p> <p>1) RBO – No apparent cause for the trip and #12 is running normally.</p> <p>2) TBO - Breaker is tripped on overcurrent</p> <p>c. Acknowledge any investigation / notification requests to Engineering, Maintenance and Plant Management.</p>	<p>CRS</p> <p>OATC</p> <p>OATC</p> <p>OATC</p> <p>BOP</p>	<p>Direct / Perform C.4-B.01.03.A (Loss Of CRD Pump Flow)</p> <p>Starts 12 CRD Pump</p> <p>Verifies CRDH parameters are restored</p> <p>Monitors and controls system pressures and flows and adjust as necessary per B.01.03</p> <p>Initiates investigation</p>
<p>Event 3</p> <p>Booth Operator</p>	<p>3. <u>STUCK OPEN “G” SRV</u></p> <p>a. When directed by the Lead Evaluator, Insert Manual Trigger 7 and verify Malfunction AP01G goes active.</p> <p><u>Key Parameter Response:</u> C-03 Amber light for G SRV will be ON. MWe and B steam line flow will lower</p> <p><u>Key Expected Alarms:</u> 5-A-46 (SRV OPEN)</p> <p><u>Auto Actions:</u> None</p>	<p>BOP</p> <p>BOP</p> <p>CR200.154 BOP</p> <p>BOP</p>	<p>Implement C.4-B.03.03.A (Stuck Open Relief Valve)</p> <ul style="list-style-type: none"> Place handswitch 2E-S4G for SRV “G” in OPEN and then return to the normal position. Place handswitch 2E-S4G for SRV “G” in CLOSE. On C-253D, Place HS-S3B in BYPASS

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Booth Operator	3 seconds after the OATC takes the #12 Recirc Pump to lower, VERIFY EVENT TRIGGER 9 goes active and APO1G is deleted. This will cause SRV "G" to CLOSE.	BOP CRS SS315.109 SS315.159 OATC CR200.203	<ul style="list-style-type: none"> On C-253D, VERIFY HS-S43 in Off. Direct Rapid Power Reduction C.4-F when the SRV fails to close Reduces recirculation flow as needed
Booth Operator	<p>b. Acknowledge any investigation / notification requests to Engineering, Maintenance and Plant Management.</p> <p>NOTE: If SRV left open long enough, the crew may place Torus cooling in service.</p>	CRS SS299.354 CR299.356	<p>Evaluates TS 3.3.6.3 (LLS INST) as NOT MET with the switch in OFF (Div 1) and Div 2 circuits bypassed.</p> <ul style="list-style-type: none"> Condition A applies which requires the channels to be restored within 72 hours <p>May also evaluate TS 3.6.1.5 (LLS Valves) & TRM 3.4.4 (SRVs) as NOT MET</p> <ul style="list-style-type: none"> Determines that Conditions A applies which requires the valve be restored in 14 days
Event 4 Booth Operator	<p>4. <u>Oil leak on 2R / Emergency transfer to 1R</u></p> <p>a. When directed by the Lead Examiner, insert Manual Trigger 11 and verify C-08-B01, 2TR Trouble goes active</p> <p><u>Key Parameter Response:</u> None</p> <p><u>Key Expected Alarms:</u> 8-B-01 (No. 2R XFMR TROUBLE)</p> <p><u>Auto Actions:</u> None</p> <p>NOTE: The following cue must make it clear that it is imperative to do the emergency transfer operation.</p>	BOP	<ul style="list-style-type: none"> Clears all personnel from area near 2R Verify that 2R Voltages appear normal Dispatch an operator to check the 2R transformer or request security to observe 2R transformer with cameras

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Booth Operator	b. Role Play the dispatched operator or as security if called: Wait 2 minutes and then report that a steady stream of oil is gushing out of 2R and a large pool of oil has already formed	CRS BOP CR262.133	<ul style="list-style-type: none"> Relay information about the oil leak to the CRS <p>Directs performance of B.09.06-05.E.1 (Transfer of Plant Buses From 2R to 1R – Emergency Method)</p> <p>Performs emergency closed bus transfer from 2R to 1R</p> <ul style="list-style-type: none"> Makes plant page to clear all personnel from vicinity of 2R Bus 13 <ul style="list-style-type: none"> Place 152-302/CS to CLOSE Place 152-301/CS to TRIP
Booth Operator	NOTE: Verify the BOP has opened the knife switch on C-31. If not, then DO NOT open 3N4 with the following actions.		<ul style="list-style-type: none"> Bus 14 <ul style="list-style-type: none"> Place 152-402/CS to CLOSE Place 152-401/CS to TRIP Bus 11 <ul style="list-style-type: none"> Place 152-107/CS to CLOSE Place 152-101/CS to TRIP Bus 12 <ul style="list-style-type: none"> Place 152-207/CS to CLOSE Place 152-201/CS to TRIP Open knife switch 16 on panel C-31
Booth Operator	c. Role Play the equipment operator dispatched to open 3N4 as necessary. Wait 10 minutes and:		<ul style="list-style-type: none"> Open 3N4 34.5KV Circuit Breaker

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	1) Activate Manual Trigger 13 2) Verify Remote Function ED06, 3N4 Local operation, to OPEN	CRS SS299.358 CR299.358	<ul style="list-style-type: none"> As time allows dispatch an operator to 4 kV rooms to reset relay flags Notify the System Dispatcher (TSO) of the Transfer to the 1R Transformer Evaluates LCO 3.8.1 as NOT met <ul style="list-style-type: none"> Condition A is applicable
Booth Operator	d. Role Play as necessary to inform the crew that another operator will be called in to perform OSP-MSC-0542		<ul style="list-style-type: none"> Required Action A.1: Initiate SR 3.8.1.1 (OSP-MSC-0542), Weekly Breaker Alignment, Indicated Power Availability, and Voltage to AC & DC Power Distribution Checks) within 1 hour Required Action A.2: Declare required features INOP within 24 hours when redundant feature is INOP – This action is N/A for these conditions. Required Action A.3: Restore an Offsite Circuit within 72 hours Make notifications for the LCO Entry.
Booth Operator	e. For notifications, Role Play Single Point of Contact and plant support personnel as necessary	CRS	May also evaluate TLCO 3.8.1 as NOT met, however, the LCO 3.8.1 actions are more limiting.
Event 5	5. <u>STUCK OPEN “G” SRV</u>		
Booth Operator	a. When directed by the Lead Evaluator, Insert Manual Trigger 15 and verify Malfunction AP01G goes active. <u>Key Parameter Response:</u> C-03 Amber light for G SRV will be ON. MWe and B steam line flow will lower <u>Key Expected Alarms:</u> 5-A-46 (SRV OPEN)		

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CT-6	<p><u>Auto Actions:</u> None</p> <p>Instructor/Evaluator Note: AOP Immediate actions have already been completed and will not be re-performed.</p> <p>When an SRV is stuck open and can <u>NOT</u> be closed then insert a manual reactor scram prior to reaching 110°F bulk torus water temperature.</p>	<p>CRS SS315.109 SS315.159</p> <p>OATC CR200.203</p> <p>OATC</p>	<p>Direct Rapid Power Reduction C.4-F when the SRV fails to close</p> <p>REDUCEs recirculation flow as needed</p> <p>When the G SRV remains open, direct a manual scram of the reactor</p> <ul style="list-style-type: none"> When directed, manually scrams the reactor
Booth Operator	<p>6. <u>IMMEDIATE REACTOR SHUTDOWN</u></p> <p>a. When the Mode switch is placed in SHUTDOWN verify Event Trigger 17 goes active. This will close the stuck open SRV and initiate the Torus leak.</p> <p>The OATC may address the stuck rod before proceeding with the remaining C.4.A actions (See Event 7).</p>	<p>CRS SS315.164</p> <p>OATC CR200.208</p> <p>CRS SS315.101</p> <p>OATC CR200.146</p> <p>OATC</p>	<p>May direct reactor scram or an Immediate Reactor Shutdown IAW C.4.K (Immediate Reactor Shutdown)</p> <ul style="list-style-type: none"> May reduce Recirc Flow to minimum Depresses pushbuttons for REACTOR SCRAM A and B <p>Supervises response to a Reactor Scram</p> <p>C.4-A (Reactor Scram) actions:</p> <ul style="list-style-type: none"> Place Mode Switch in SHUTDOWN. Verifies all Control Rods are inserted to or beyond position 04 and notices 1 Rod remains full out Provides scram script to CRS and reports EOP entry condition RPV level less than 9"

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			<ul style="list-style-type: none">Controls Reactor water level between +11-46". When reactor water level starts to increase:<ul style="list-style-type: none">Place CV-6-13 Manual Loading Station Low Flow Valve in AUTO set between 15 and 20 inchesClose both Main FW Reg ValvesVerify CV-6-13 is closed when RPV level reaches +15 to +20 inches
		OATC	<ul style="list-style-type: none">Monitor Reactor Power<ul style="list-style-type: none">Insert SRM and IRM detectors.Switch recorders from APRM to IRM.Range down on IRMs as necessary.Verify SDV Vent and Drain Valves closed.Verify Recirc pumps have runback to minimum speedVerify RPS power supplies are availablePlace DISCH VOL ISOL TEST switch in ISOLVerify the REACTOR MODE switch in SHUTDOWNPlace SDV HIGH WATER LEVEL BYPASS in BYPASSReset the Scram using the SCRAM RESET switchReset the Rod Drift alarmsEvacuate personnel from the RB Floor and Equipment Drain Tank Room

			<ul style="list-style-type: none"> • When all scram valves are CLOSED place the DISCH VOL ISOL TEST switch in NORM • Verify the SDV Vent and Drain Valves open • Verify the accumulators recharge
	<p><u>NOTE:</u> The remaining BOP actions may not be taken based on the Torus level priority.</p>	BOP	<ul style="list-style-type: none"> • When Annunciator 5-B-30 (Disch Volume Tank Not Drained) and 5-B-21 (Disch Volume Water Level Scram Trip) IS RESET, Place SDV HIGH WATER LEVEL BYPASS in NORMAL <p>Starts performance of Part B of C.4.A</p> <ul style="list-style-type: none"> • Announce over the plant paging system that a Reactor Scram has occurred. • Open Main Generator output breakers 8N7 & 8N8. • Trip the Main Turbine. • Verify the Generator Field Breaker Open. • Start the Turbine Aux Oil Pump. • Verify Turbine Exhaust Hood Sprays in service. • Check the Turbine Stop Valves CLOSED • Start the Turbine Bearing Lift Pumps (P-64A-F) • Verify Main Steam Pressure Control or Low-Low Set is controlling Reactor Pressure. • At C-25, Place the POST SCRAM switch in ON and verify all available Drywell Recirculation Fans are operating • Verify 4500 gpm through each operating Feed Pump

			<ul style="list-style-type: none"> Verify Vapor Extractor and Auxiliary Oil Pump running on any non-operating Feed Pump
Event 6 Booth Operator	<p>7. UNISOLABLE TORUS LEAK</p> <ol style="list-style-type: none"> Verify Event Trigger 17 is active and verify Malfunction PC05 at 100%. <p>Key Parameter Response: Torus Level on LI-2996 (C-04) or PLR 7251A/B (C-03) lowering</p> <p>Key Expected Alarms: 6-B-9/10 (High Water Level In RHR Rooms) 4-B-4 (Torus Hi-Low Level), 4-B-19/24 (Torus Vacuum Breakers Open) and 5-A-49 (Radwaste Trouble)</p> <p>Auto Actions: Torus to Drywell Vacuum breakers begin to cycle</p> <p>NOTE: It takes ~19 minutes to reach -3.3 ft which is the decision point for a Reactor Scram and Emergency depressurization</p> <p>8. UNISOLABLE TORUS LEAK/ EOP 1300 ACTIONS</p> <p>NOTE: The RHR Room water Level is never reported as having reached Max Safe Level (15 inches) and the timeline of local reports allows the Torus water level to be the critical parameter.</p>	BOP OATC	<ul style="list-style-type: none"> Respond to annunciators Notify Rad Protection that a harsh environment or increase radiation environment may exist in the RHR rooms and that entry is required
Booth Operator	<ol style="list-style-type: none"> Role Play in-plant operator. When dispatched, WAIT 2 MINUTES then report that the water level is approximately 8 inches in both RHR rooms. 	BOP OATC	<ul style="list-style-type: none"> Dispatches an operator to investigate
Booth Operator			<ul style="list-style-type: none"> Receive the report from the plant and relay the information to the CRS.

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Booth Operator	<p>NOTE: Torus Level can be monitored on Insight File pct112.</p> <p>b. Role Play in-plant operator. If asked to report the source of the leak, WAIT UNTIL Torus Water Level is -1 feet, then report that the Leak is unisolable from a weld at the ring header in Bay 4.</p> <p>9. <u>UNISOLABLE TORUS LEAK/ EOP 1200 ACTIONS</u></p> <p>NOTE: It takes approximately 3 minutes to reach -4 inches Torus water level</p>	<p>CRS</p> <p>BOP OATC</p> <p>CRS</p> <p>SS304.194</p> <p>BOP</p> <p>CRS</p>	<ul style="list-style-type: none"> • Reports EOP 1300 Entry Condition of RHR Room water levels above 0 inches. <p>Enters and directs actions from EOP1300 Secondary Containment Control</p> <ul style="list-style-type: none"> • Verify the Reactor Bldg Floor drain Sump Pump is running • Attempt to identify and isolate the source of the water <p>Monitor Area Water Levels approach to Max Safe</p> <p>Respond to 4-B-4, (Suppression Water Level Hi/Low)</p> <ul style="list-style-type: none"> • Check LI-2996 on C-04 or PLR-7251A/B on C-03 • Identifies and reports the lowering trend • Reports EOP 1200 Entry Condition when Torus water level (Narrow Range) is < -4 inches • Monitors and reports Torus water level throughout <p>Enters and directs actions from EOP-1200 (Primary Containment Control)</p>
Booth Operator	<p>a. Role Play the out-plant operator if assigned to perform C.5-3401: Wait 2 minutes and report that he must find boots as PPE for the water on the floor.</p>	<p>SS314.115</p> <p>BOP CR314.119</p>	<ul style="list-style-type: none"> • Directs performance of C.5-3401 (Torus Water Level Makeup) • May direct an in-plant operator to perform C.5-3401 steps for Core Spray and RHR. (May choose not to perform due to safety concerns) • Verifies the HPCI CST Suction, MO-2063 Open

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CT 26	<p>10. <u>EMERGENCY DEPRESSURIZATION</u></p> <p>When torus water level can <u>NOT</u> be maintained above -3.3', then scram and execute <u>EMERGENCY DEPRESSURIZATION</u> per C.5-2002.</p>	<p>CRS</p> <p>CRS</p> <p>CRS</p>	<ul style="list-style-type: none"> • Opens the HPCI Pump Minimum Flow Valve CV-2065 • Verifies the RCIC CST Suction, MO-2102 Open • Opens the RCIC Pump Minimum Flow Valve CV-2104 <p>CRS May anticipate Blowdown per a C.5-1100 Override Statement and direct RPV pressure be lowered using the Turbine Bypass Valves</p> <p>When it is determined that Torus Water Level can <u>NOT</u> be maintained above -3.3 ft, Blowdown and enter EOP 2002.</p> <ul style="list-style-type: none"> • Recognizes when Torus Water Level can <u>NOT</u> be maintained above -3.3 ft • Enters and directs EOP-2002 (Blowdown) • Verifies Torus level > -5.9 ft. • Directs that 3 ADS SRVs be opened
Event 7	<p>11. <u>CONTROL ROD 14-27 FAILS TO INSERT</u></p> <p><u>Key Parameter Response:</u> Control Rod remains at position 48 and RWM indicates one rod still out.</p>	<p>BOP</p> <p>CR304.145</p> <p>BOP</p>	<p>If directed to ANTICIPATE BLOWDOWN and lower RPV pressure using the Turbine Bypass Valves</p> <ul style="list-style-type: none"> • At C-07, places PRESS REG OVERRIDE in OPEN until both Bypass valves are open <p>Perform Emergency Depressurization</p> <ul style="list-style-type: none"> • When directed by CRS, place 3 ADS SRVs to OPEN and verifies they have opened • Monitor RPV Pressure and Level

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Booth Operator	<p><u>Key Expected Alarms:</u> None</p> <p><u>Auto Actions:</u> None</p> <p>a. Role Play the Reactor Bldg Operator as necessary and, as requested wait 1 minute and insert MANUAL TRIGGER 19 to close CRD-14</p>	OATC	<ul style="list-style-type: none"> Identifies that Rod 14-27 did not fully insert Informs the CRS and performs actions to insert Control Rod 14-27
Booth Operator	<p>1) Verify REMOTE FUNCTION CH22 goes active to close CRD-14</p>		<ul style="list-style-type: none"> May reset the scram and insert the control rod <ol style="list-style-type: none"> Direct an out-plant operator to manually close CRD-14
Booth Operator	<p>b. If the OATC places the ROD MOVEMENT CONTROL switch to ROD IN to insert Rod 14-27, verify EVENT TRIGGER 21 goes active and MALFUNCTION CH02_058 DELETES.</p>		<ul style="list-style-type: none"> Bypass the RWM Select and insert the full out rod
Booth Operator	<p>c. If the OATC uses EMERG ROD IN to insert Rod 14-27, verify EVENT TRIGGER 23 goes active and MALFUNCTION CH02_058 DELETES.</p>		
	<p>12. <u>SCENARIO TERMINATION</u></p> <p>a. The scenario may be terminated when actions are taken to insert the control rods and an Emergency Depressurization has been performed.</p> <p>b. The scenario may be also terminated at the discretion of lead instructor/evaluator</p> <p>c. End the scenario by placing the simulator in FREEZE.</p>	<p>Crew</p> <p>Crew</p>	<ul style="list-style-type: none"> Remain in simulator for potential questions from evaluator. No discussion of scenario or erasing of procedure marking is allowed.

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: MONTICELLO**SEG #** ILT-SS-28E**SEG TITLE:** 2015 ILT NRC SCENARIO 2**REV. #** 0**PROGRAM:** INITIAL LICENSE TRAINING**#:** MT-ILT**COURSE:** NRC SIMULATOR EVALUATION**#:** N/A**TOTAL TIME:** 45-90 MINUTES

Additional site-specific signatures may be added as desired.

Developed by:	_____	_____
	<i>Instructor</i>	<i>Date</i>
Reviewed by:	_____	_____
	<i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	<i>Date</i>
Validated by:	_____	_____
	<i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	<i>Date</i>
Approved by:	_____	_____
	<i>Training Supervision</i>	<i>Date</i>

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
1	<p>1. <u>PLACE THE 2ND MFRV IN SERVICE AND REACTOR WATER LEVEL CONTROL IN 3 ELEMENT CONTROL</u></p>	<p>CRS</p> <p>BOP CR259.103</p>	<p>Directs BOP to place the 2nd MFRV in service 2167 (PLANT STARTUP) and B.05.07-05.D.4 REMAINING B MAIN FW REG VALVE CV-6-1 SERVICE)</p> <ul style="list-style-type: none"> Verifies MO-1134 is OPEN. Verifies MTS-6-84B bias (vertical scale) is ZERO Using MTS-6-84B, OPENS CV-6-12B Monitors Vessel level and FW flow as CV-6-12B OPENS When MTS-6-84B output (horizontal scale) demand signal (vertical scale), then places 84B in AUTO.
2	<p>2. <u>RBM B FAILS UPSCALE</u></p> <p>a. When directed by the lead evaluator, Insert MANUAL TRIGGER 1 and verify NI17B activates.</p> <p><u>Key Parameter Response:</u> RBM B indicates upscale</p> <p><u>Key Expected Alarms:</u> 5-A-3 (ROD WITHDRAW BLOCK), 5-A-43 (RBM DOWNSCALE/TROUBLE), 5-A-51 (RBM HI/INOP)</p> <p><u>Auto Actions:</u> Rod Withdraw Block</p>	OATC	
		CRS	<ul style="list-style-type: none"> Takes action IAW 5-A-51 (RBM HI/INO Presses the Trip Status softkey and Co softkey to determine source of INOP tri Determines equipment failure is a Critic Fault Bypasses RBM B using Joystick 7B-S2 <p>Evaluates LCO 3.3.2.1-A as still MET</p>

SCENARIO TIME-LINE:

	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
Q		SS299.351 CR299.353	<ul style="list-style-type: none"> Condition A is still met because the pla below the limit specified in the COLR.
t 3 TH	<p>3. <u>VESSEL FLANGE SEAL LEAK</u></p> <p>a. When directed by the lead evaluator, Insert MANUAL TRIGGER 3.</p> <p>b. Verify C-04-A35 MALFUNCTION (Annunciator) goes active:</p> <p>Key Parameter Response: None</p> <p>Key Expected Alarms: 4-A-35 (VESSEL FLANGE SEAL LEAK)</p> <p>Auto Actions: None.</p> <p>c. When CV-2369 is placed in OPEN, verify Event Trigger 29 activates. This will delete the Vessel Flange Seal Leak alarm after a 2 minute delay.</p>	BOP BOP	<p>Responds to annunciator and reports to the CR</p> <p>Places CV-2369 in OPEN</p> <p>Alarm will clear after 2 minutes and 1 minute la 2369 is placed back in the closed position.</p>
TH	d. Acknowledge as Plant Technical Staff the receipt of the annunciator.		Notifies Plant Technical Staff of the receipt of t annunciator
t 4 TH	<p>4. <u>CONTROL ROD 18-19 DRIFTS OUT</u></p> <p>When directed by the Lead Evaluator, insert MANUAL TRIGGER 5 and verify 03-S72-02 activates for 2 seconds and CH01_034 activates.</p> <p>Key Parameter Response: Control Rod 18-19 drifting out</p> <p>Key Expected Alarms: 5-A-27 (ROD DRIFT)</p> <p>Automatic Actions: None</p> <p>a. Once the OATC holds the Rod Insert switch to IN for 5 seconds, verify the control rod drift malfunction CH01_034 deletes.</p> <p>b. As the Reactor Building Operator; when directed to isolate and/or disarm Control Rod 26-27, wait 3 minutes, insert Manual Trigger 7 and report that the control rod is isolated and/or disarmed.</p>	OATC CR200.226 SS315.167 CRS/ BOP	<p>Acknowledges the alarm and informs the CRS Rod 18-19 is drifting out.</p> <p>Enters C.4-B.01.03.C (CONTROL ROD DRIFT</p> <ul style="list-style-type: none"> Places Rod Select Power Switch to OF to ON Reselects Control Rod 18-19 and inser position 00 May hold the Rod Insert Switch to IN or <p>Directs the Reactor Building Operator to hydra isolate and/or electrically disarm HCU 18-19 IA 05.G.2 (HYDRAULIC CONTROL UNIT ISOLA</p>

SCENARIO TIME-LINE:

	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
		CRS SS299.349 CR299.351	Evaluates LCO 3.1.3-C as NOT MET <ul style="list-style-type: none"> Action C.1: Fully insert control rod with Action C.2: Disarm CRD within 4 hours
t 5 TH	<p>5. <u>12 STATOR WATER COOLING PUMP TRIP WITH REACTOR SCRAM</u></p> <p>a. When directed by the lead evaluator, INSERT MANUAL TRIGGER 9 and verify EG02B activates.</p> <p><u>Key Parameter Response:</u> Loss of Stator Water Cooling</p> <p><u>Key Expected Alarms:</u> 8-A-17 (NO. 1 GENERATOR COOLING WTR FAILURE)</p> <p><u>Auto Actions:</u> Turbine Generator Runback. An automatic scram will occur if both Main Turbine Bypass Valves go full open due to the Runback.</p>	<p>BOP</p> <p>SS315.126</p> <p>CR200.171</p> <p>OATC CR200.166 SS315.164</p> <p>OATC SS315.101 CR200.146</p>	<p>Announces that a complete loss of Stator Water has occurred.</p> <p>Enters procedure C.4-B.06.02.04.A (STATOR WATER FAILURE).</p> <p>Recommends that a Manual Reactor Scram be</p> <p>Inserts a manual Reactor scram.</p> <p>Takes actions IAW C.4-A (Reactor Scram) PA</p> <ul style="list-style-type: none"> Place Mode Switch in SHUTDOWN. <ul style="list-style-type: none"> Verify all Control Rods are inserted beyond position 04. Provides scram script to CRS. Report within 9" EOP entry condition. Controls Reactor water level between 18 and 20 inches. When RPV water level starts to rise <ul style="list-style-type: none"> Place CV-6-13 Manual Loading Valve Low Flow Valve in AUTO set between 18 and 20 inches Close both Main FW Reg Valves Close MO-1133 and MO-1134 Feedwater Line Block valves

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
			<ul style="list-style-type: none"> ○ Verify CV-6-13 is closed when reaches +15 to +20 inches • Monitor Reactor Power <ul style="list-style-type: none"> ○ Insert SRM and IRM detectors. ○ Switch recorders from APRM to
	<p>NOTE: The remaining ATC actions in C.4-A may NOT be performed depending on when the SDV leak is recognized.</p> <p>NOTE: The remaining BOP actions in C.4-A may NOT be performed depending on when the SDV leak is recognized.</p>	BOP	<ul style="list-style-type: none"> ○ Range down on IRMs as neces • Verify SDV Vent and Drain Valves clos • Verify Recirc Pumps have run back to Takes actions IAW C.4-A (Reactor Scram) PA • Plant page that a Reactor Scram has o • Open Main Generator output breakers • Trip the Main Turbine. • Verify the Generator Field Breaker Ope • Start the Turbine Aux Oil Pump. • Verify Turbine Exhaust Hood Sprays in • Start the Turbine Bearing Lift Pumps • Verify Main Steam Pressure Control or Set is controlling Reactor Pressure. • At C-25, Place the POST SCRAM switc and verify all available Drywell Recircul are operating • Verify 3300 gpm through each operatin Pump • Verify Auxiliary Oil Pump running on an operating Feed Pump
			<ul style="list-style-type: none"> • Verify 3000 gpm through each operatin Condensate Pump
t 6	<p>10. <u>SDV Vent and Drain Valve Failure to Isolate</u></p> <p>a. The malfunctions for SDV vent and drain valve failures, CH22A and CH22B, are inserted during the initial setup.</p>		

SCENARIO TIME-LINE:

	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
	<p><u>Key Parameter Response:</u> Scram Discharge Volume Vents and Drains remain open</p> <p><u>Key Expected Alarms:</u> 3-B-56 (HIGH AREA TEMP STEAM LEAK), 4-A-11 (REACTOR BUILDING HI RADIATION)</p> <p><u>Auto Actions:</u> None</p> <p><u>NOTE:</u> It takes approximately 4 minutes for area A-11, West CRD HCU, to reach Max Safe Rad levels (1R/hr). It takes an additional 4 minutes for the second area, A-15 Reactor Bldg Drain Tank, to reach Max Safe (1R/hr).</p>	<p>Crew SS304.196 SS304.239</p> <p>CR304.105 CR304.153</p>	<ul style="list-style-type: none"> The BOP will respond to annunciators & to the CRS EOP 1300 Entry Conditions <p>Perform the actions of EOP-1300 (Secondary Containment Control)</p> <ul style="list-style-type: none"> Directs evacuation of area or entire rea building. Reports Reactor Building radiation leve temperatures are rising Keeps the CRS informed of Secondary Containment parameter values and tre
4	<p><u>NOTE:</u> The SDV isolation valves will NOT be able to be reset due to a malfunction on the SDV high level bypass circuitry.</p> <p>When a primary system is discharging into the secondary containment through an unisolable break, perform an Emergency Depressurization per C.5-2002 when max safe operating values are exceeded in two or more areas.</p>	<p>OATC</p> <p>CRS</p> <p>CRS</p> <p>Crew SS304.198 CR314.101</p> <p>CRS</p> <p>BOP</p> <p>CRS</p>	<ul style="list-style-type: none"> Attempts to manually close SDV isolation <p>Enters EOP-1300 (Secondary Containment Co</p> <ul style="list-style-type: none"> Direct isolation of the SDV Monitors Secondary Containment para Recognizes when 2 area radiation leve exceeded Max Safe <ul style="list-style-type: none"> Enters and directs EOP-2002 (Blowdov Verifies Torus level > -5.9 ft. Directs that 3 ADS SRVs be opened <p>Perform Emergency Depressurization</p> <p>Enters EOP-1300 (Secondary Containment Co</p>

SCENARIO TIME-LINE:

	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
DS	When two or more ADS valves fail to open when Emergency Depressurization is required, open additional SRVs until a total of three SRVs are open.	BOP	<ul style="list-style-type: none"> • Directs opening of all 3 ADS SRVs. • Recognizes that C & D SRVs failed to open. • Opens additional SRVs until a total of 3 SRVs are open.
OR	8. <u>SCENARIO TERMINATION</u> The scenario may be terminated when Emergency Depressurization has been performed. The scenario may be also terminated at the discretion of lead instructor/evaluator End the scenario by placing the simulator in FREEZE .	Crew: Crew:	<ul style="list-style-type: none"> • Remain in simulator for potential questions from instructor/evaluator. • No discussion of scenario or erasing of previous marking is allowed.

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: MONTICELLO**SEG #** ILT-SS-29E**SEG TITLE:** 2015 ILT NRC SCENARIO 3**REV. #** 0**PROGRAM:** INITIAL LICENSE TRAINING**#:** MT-ILT**COURSE:** NRC SIMULATOR EVALUATION**#:** N/A**TOTAL TIME:** 45-90 MINUTES

Additional site-specific signatures may be added as desired.

Developed by:	_____	_____
	<i>Instructor</i>	<i>Date</i>
Reviewed by:	_____	_____
	<i>Instructor</i> (<i>Simulator Scenario Development Checklist.</i>)	<i>Date</i>
Validated by:	_____	_____
	<i>Validation Lead Instructor</i> (<i>Simulator Scenario Validation Checklist.</i>)	<i>Date</i>
Approved by:	_____	_____
	<i>Training Supervision</i>	<i>Date</i>

NOTE: Table may be modified as needed to include all scenario time-line items

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 1	<p>1. <u>RESTORE RCIC SUCTION TO THE CSTS</u></p> <p><u>Optional:</u> This normal evolution has been validated as an optional event. If the BOP operator does not need a normal evolution, this event may be omitted from the scenario.</p> <p><u>NOTE:</u> Based on initial conditions, this TS has already been entered for restoring the suction to the CSTs</p> <p><u>NOTE:</u> Without an automatic transfer signal, MO-2102 must be manually opened.</p>	<p>CRS</p> <p>BOP CR217.111</p> <p>CRS</p>	<p>May perform refocus brief</p> <p>Performs B.02.03-05.G.2 (MANUAL SWITCHOVER OF RCIC SUCTION FROM THE TORUS TO THE CONDENSATE STORAGE TANKS).</p> <ul style="list-style-type: none"> • Verifies Torus level <+2" and CST level >2'8" • Notifies CRS to evaluate TS 3.5.3 for RCIC • Concurrently closes MO-2100 and MO-2101 • Once dual indication is observed on MO-2100 & MO-2101, opens MO-2102 manually. • Verifies closed MO-2100 and MO-2101 • Notifies CRS to exit TS 3.5.3 <p>Exits TS 3.5.3 for RCIC</p>
Event 2 BOOTH INST	<p>2. <u>IN-SERVICE CRD FLOW CONTROL VALVE FAILS</u></p> <p>a. When directed by the lead instructor, insert Manual Trigger 1 and verify CH07B goes active</p> <p><u>Key Parameter Response:</u> Reduced CRD cooling water flow</p> <p><u>Key Expected Alarm:</u> 5-B-41 (CRD HI TEMPERATURE)</p> <p><u>NOTE:</u> It will take three minutes for the alarm to come in.</p> <p><u>Auto Actions:</u> None</p>	OATC	Responds to annunciator and informs CRS

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	<p>b. If directed to investigate CRD temperatures, wait 2 minutes and report that many CRD temperatures are rising and that CRD 26-15 is in alarm. The highest reading temperature is 255°F.</p>	CRS	<p>Sends Reactor Building Operator to investigate CRD temperature recorder. Recognizes CRD FCV failure</p> <p>Directs performance of B.01.03-05.E.4 (PLACING THE STANDBY CRD FLOW CONTROL VALVE INTO SERVICE)</p>
	<p>c. When directed to report to the CRD FCV station to support shift of FCV, WAIT 1 minute and report you are standing by.</p> <p>d. When directed to OPEN CRD-18-2 and CRD-16-2, WAIT 1 minute then use Manual Trigger 3 to modify REMOTE FUNCTION CH17 to OPEN and report this action to the Control room.</p>	OATC CR201.111	<p>Coordinates with Reactor Building Operator (RBO) and performs the following:</p> <ul style="list-style-type: none"> • Directs RBO to OPEN CRD-18-2 & CRD-16-2 • Places CRD Flow Controller in MANUAL • Closes CV-3-19A with the flow controller • Places the CRD Flow Selector to the B position • Slowly opens CV-3-19B to 55-58 gpm • Places CRD Flow Control in auto • Closes CRD-16-1 & CRD-18-1
BOOTH INST	<p>e. When directed to CLOSE CRD-16-1 and CRD-18-1, WAIT 1 minute, then use Manual Trigger 5 to modify REMOTE FUNCTION CH16 to CLOSE and report this action to the Control room</p> <p>f. If directed to report CRD temperatures, report all alarms are clear and all temperatures are lowering to normal.</p>		<ul style="list-style-type: none"> • Acknowledge annunciator 5-B-41 clear and informs Shift Supervision.

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 3 BOOTH INST	3. <u>RCIC STEAM LEAK WITH GROUP 5 FAILURE</u> a. When directed by the Lead Examiner, insert Manual Trigger 7 and verify RC07 activates <u>Key Parameter Response:</u> Rising temperatures and radiation levels in the RCIC room <u>Key Expected Alarms:</u> 4-A-11 (REACTOR BUILDING HI RADIATION), 3-B-56 (HIGH AREA TEMP STEAM LEAK) @ 130°F <u>Auto Actions:</u> Group 5 Isolation (Disabled)	BOP	Monitors and reports rising RCIC area temperatures and radiation level. <ul style="list-style-type: none"> May direct the RBO to investigate the leak.
BOOTH INST	b. If sent as the RBO to investigate the steam leak, wait one minute and report that it appears there is a steam leak coming from the vicinity of MO-2078.	CRS SS315.106 SS315.116 BOP CR200.151 CR200.161	Enters C.4-B.02.04.A (STEAM LEAKS OUTSIDE PRIMARY CONTAINMENT) <ul style="list-style-type: none"> Evacuates RCIC room or entire Reactor Building Enters C.5-1300 (SECONDARY CONTAINMENT CONTROL) and directs isolation of RCIC (Group 5)
BOOTH INST	c. When MO-2075 is closed, verify Event Trigger 29 activates. This will delete the RCIC leak (RC07)		Enters C.4-B.04.01.E (PRIMARY CONTAINMENT ISOLATION – GROUP 5)
BOOTH INST	d. If directed as the RBO to provide status after RCIC isolation valves have been shut, state that	CRS SS299.353	Closes MO-2075 and MO-2076 Evaluates TS LCO 3.5.3 Condition A as NOT MET <ul style="list-style-type: none"> Action A.1 – Verify HPCI operable immediately

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	there is NO steam flow noise and steam is clearing from the room.	CR299.355	<ul style="list-style-type: none"> Action A.2 – Restore RCIC within 14 days
Event 4 BOOTH INST	<p>4. <u>INADVERTENT ADS TIMER INITIATION</u></p> <p><u>Optional:</u> This event has been validated as an optional event. If the BOP/CRS does not need an Instrument Malfunction/Tech Spec call, this event may be omitted from the scenario.</p> <p>a. When directed by the lead evaluator, Insert Manual Trigger 9 verify AP07 activates.</p> <p><u>Key Parameter Response:</u> 107 second timer initiates</p> <p><u>Key Expected Alarms:</u> 3-A-25 (AUTO BLOWDOWN TIMER ACTIVATED)</p> <p><u>Auto Actions:</u> None</p> <p>NOTE: With the Inhibit switches in INHIBIT the ADS system is non-functional. CRS should not wait the 1 hour as allowed by LCO 3.3.5.1.</p>	<p>BOP</p> <p>SS315.160</p> <p>CR200.204</p> <p>CRS</p> <p>SS299.351</p> <p>CR299.353</p>	<p>Announces alarm</p> <p>Enters C.4-G (INADVERTENT ECCS INITIAION)</p> <ul style="list-style-type: none"> Verifies alarm and timer initiation is inadvertent Places ADS Inhibit Switched to INHIBIT <p>Evaluates TS LCO 3.3.5.1 Condition G as NOT MET</p> <ul style="list-style-type: none"> Action G.1 – Declare ADS valves inoperable in 1 hour Action G.2 – Restore to operable in 96 hours <p>Evaluates TS LCO 3.5.1 L&M as NOT MET</p> <ul style="list-style-type: none"> Action M – Mode 3 in 12 hours / Mode 4 in 36 hours

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 5 BOOTH INST	<p>5. MAIN TURBINE VIBRATIONS</p> <p>a. When directed by the Lead Examiner, insert Manual Trigger 11 and verify TU03A/B/C activates.</p> <p>Key Parameter Response: Rising vibrations on Main Turbine shaft bearings 1, 2 and 3.</p> <p>Key Expected Alarms: 7-B-33 (TURBINE VIBRATION HIGH)</p> <p>Auto Actions: None</p> <p>NOTE: Lowering Reactor power will NOT be successful in reducing turbine vibration.</p>	<p>BOP</p> <p>CRS SS315.159</p> <p>OATC CR200.203</p>	<p>Follows ARP 7-B-33 (TURBINE VIBRATION HIGH)</p> <ul style="list-style-type: none"> If power reduction is necessary then perform C.4-F (Rapid Power Reduction) If sustained Turbine-Generator vibration levels approach 15 Mils, then reduce recirculation flow to minimum, initiate a manual reactor scram and manually trip the Turbine <p>Directs C.4-F (Rapid Power Reduction)</p> <ul style="list-style-type: none"> Lowers reactor power by lowering recirc flow in an attempt to mitigate turbine vibrations.
BOOTH INST	<p>6. CONTINUED VIBRATIONS – REACTOR SCRAM</p> <p>NOTE: When the Mode switch is placed in SHUTDOWN, verify EVENT TRIGGER 28 activates TC02 tripping the turbine and TU03A/B/C turbine vibrations ramp to 0%.</p>	<p>CRS SS315.164</p> <p>OATC CR200.208</p>	<p>Directs a reactor scram IAW C.4.K (Immediate Reactor Shutdown)</p> <p>Depresses pushbuttons for REACTOR SCRAM A and B and places the Mode Switch in SHUTDOWN</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>7. <u>Hydraulic ATWS</u></p> <p><u>NOTE:</u> The CRS may wait to direct this action as time permits.</p> <p><u>NOTE:</u> The CRS may wait to direct this action during the Level Leg actions.</p>	<p>OATC</p> <p>CRS SS304.213 SS304.201 SS304.244 CR314.129 CR314.104</p> <p>BOP</p> <p>SS314.111 CR314.115</p> <p>SS314.108 CR314.112</p>	<p>Provides a Scram Report</p> <ul style="list-style-type: none"> Reactor Scram, Mode Switch is in Shutdown, all rods are <u>NOT</u> in, Reactor power is >4%, EOP Entry <p>Enters EOP 1100 RPV Control, transitions to EOP 2007, Failure to Scram, and directs the following:</p> <ul style="list-style-type: none"> ○ Inhibit ADS ○ C.5-3301 (Defeat MSIV Low-Low Level Isolation) <ul style="list-style-type: none"> ○ Places 4 Key switches to BYPASS on C-15 and C-17. ○ C.5-3205 (Prevent Core Spray injection) <ul style="list-style-type: none"> - Place the A & B CS INJECTION BYPASS Switches to BYPASS - Close MO-1751 (1752) Injection Outboard - Place A and B CS Pump switches to PTL - Close MO-1753 (1754) Injection Inboard

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
CT-48	<p>8. <u>Hydraulic ATWS Power Leg Actions</u></p> <p>During failure to scram conditions with a critical reactor, insert control rods using one or more methods contained within C.5-3101 to achieve reactor shutdown under all conditions.</p> <p><u>NOTE:</u> ARI will NOT work for this scenario.</p> <p><u>NOTE:</u> C.5-3101 Part C and/or Part D may be performed. If only one part is performed, the actions from the other part are not applicable</p>	<p>OATC CR314.105</p>	<ul style="list-style-type: none"> Performs C.5-3101 (Alternate Rod Insertion)
	<p><u>NOTE:</u> C.5-3101 Part C and/or Part D may be performed. If only one part is performed, the actions from the other part are not applicable</p>	<p>SS314.101</p> <p>CR212.105</p> <p>OATC</p>	<ul style="list-style-type: none"> Verifies Recirc pumps are at minimum speed and trips the pumps Arms and Actuates A/B ATWS and determines if ARI is having success. <p><u>Performs PART C (INCREASE COOLING WATER DIFFERENTIAL PRESSURE AND USE RMCS)</u></p> <ul style="list-style-type: none"> Bypasses RWM Verifies 12 CRD pump is running Fully open the CRD Flow Control Valve <ul style="list-style-type: none"> Place FC 3-301 in MAN Adjust output of FC 3-301 to 100% Opens MO-3-20 (Drive Pressure to CRD) Directs Reactor Building Operator to CLOSE CRD-168, CRD-79-1 & CRD-79-2 When control rods no longer drift in, Drive rods using RMCS
BOOTH INST	<p>a. When requested to close CRD-168, activate Manual Trigger 13 and verify CH34 goes active. Wait 1 minute and report it as closed.</p>		

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			Establish Drive Pressure as high as possible below 400 psig by one or more of the following:
BOOTH INST BOOTH INST	b. If requested to close CRD-14, activate Manual Trigger 15 and verify CH22 is modified to 0 .		<ul style="list-style-type: none"> ○ Throttle closed the CRD Flow Control Valve ○ Throttle closed Open MO-3-20 Drive Pressure to CRD ○ Directs the Reactor Bldg Operator to CLOSE CRD-14 to raise drive pressure
BOOTH INST	<p>NOTE: C.5-3101 Part C and/or Part D may be performed. If only one part is performed, the actions from the other part are not applicable</p> <p>c. When requested to deenergize the ARI valves insert Manual Trigger 17, this modifies RR18 is to Open. Wait 1 minute and report the ATWS 125 VDC Breakers Open.</p> <p>NOTE: These contacts are modeled in the simulator. The jumpers are included with the C.5-3101 procedure.</p>		<ul style="list-style-type: none"> • Select and insert rods in non-peripheral core regions with few or no rods inserted • Attempt to achieve a “Black and White” pattern <p><u>Performs PART D (RESCRAM CONTROL RODS)</u></p> <ul style="list-style-type: none"> • Evacuate personnel from the RB 896’ Floor and the Equipment Drain tank Room • Directs the in-Plant operator to deenergize the ATWS 125 VDC Valves by opening D-21 & D-11.
BOOTH INST	d. If requested to open CRD-14, modify Remote Function CH22 is to Open , wait 1 minute and report CRD-14 Open.		<ul style="list-style-type: none"> • Installs jumpers to bypass all automatic scram signals in C-15 & C-17 • Resets the scram • Directs the Reactor Bldg Operator to open CRD-14 • Verifies SDV Vent and drain valves Open

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	NOTE: This may take up to 7 minutes.		<ul style="list-style-type: none"> When Annunciator C-05-B-21 clears, closes the SDV vent and drain valves
BOOTH INST	e. IF THE SCRAM IS RESET and a Manual Reactor Scram is inserted for Part D, INSERT MANUAL TRIGGER 19 to deleted CH16 allowing the control rods to insert.		<ul style="list-style-type: none"> Inserts a Manual Reactor Scram Verifies all control rods fully inserted and informs the CRS
BOOTH INST	<p>9. SBLC Initiation Problems</p> <p>NOTE: Event Triggers 28 or 29 will auto activate to clear the trip on the second SBLC pump that is started.</p> <p>a. If #11 SBLC is attempted to be started first, verify Event Trigger 27 goes True and SL01B deletes after 1 second so #12 SBLC pump will start.</p> <p>b. If #12 SBLC is attempted to be started first, verify Event Trigger 26 goes True and SL01A deletes after 1 second so #11 SBLC pump will start.</p> <p>Key Parameter Response: Selected pump Green light stays on and Red light stays off, SBLC discharge pressure remains at 0 psig</p> <p>Key Expected Alarms: None</p> <p>Auto Actions: RWCU isolates and pumps trip ONLY when the second pump starts.</p>	<p>CRS</p> <p>OATC CR211.106</p>	<p>Directs SBLC initiation before Torus temp reaches 110°F using the SBLC Hard Card, B.03.05-05.G.1 (SBLC Manual Initiation)</p> <p>Places 11A-S1 SBLC System Selector Switch to SYS 1 or SYS 2 and recognizes that the first pump fails to start.</p> <ul style="list-style-type: none"> Starts the other SBLC pump Verifies the RWCU Pumps trip and the Group 3 isolation valves close. Verifies SBLC Pump running light is ON and, discharge pressure is slightly higher than RPV pressure with SBLC Tank level decreasing.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
CT-46	10. <u>Hydraulic ATWS Level Leg Actions</u> During failure to scram conditions with reactor power above 4%, terminate and prevent injection from all sources except SBLC, RCIC, and CRD until level lowers to at least -33".	CRS	Verify needed auto actions Identifies that power >4% & RPV level above -33" and directs Terminate and Prevent actions
		BOP CR314.112	<ul style="list-style-type: none"> Prevents injection from Condensate & Feedwater by placing the FRV Controllers in Manual and closing the Reg Valves
		BOP	<ul style="list-style-type: none"> Prevents injection form HPCI by placing the Aux Oil Pump in PTL
		CRS	<ul style="list-style-type: none"> Prevents LPCI injection as follows Open Knife switches (C-03): 10A-S31A/B Verify LPCI OBD Valves are closed, MO-2012/13 Lets level drop until <ul style="list-style-type: none"> Power is <4% or All SRVs stay closed and DW pressure is < 1.84 psig or RPV Level reaches -126 inches Records final level and sets level band
	For level control, the CRS should direct condensate and feedwater injection re-established and used to maintain level in the desired band.		<ul style="list-style-type: none"> Uses Condensate & Feedwater as necessary to maintain established level band.

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	11. <u>Hydraulic ATWS Pressure Leg Actions</u>	CRS/ BOP	<ul style="list-style-type: none"> Stabilize RPV pressure below 1056 psig using the one remaining Bypass Valve and/or SRVs (LL-SET)
	12. <u>(PRIMARY CONTAINMENT CONTROL)</u> NOTE: Based on Crew priorities and Torus water temperature EOP-1200 actions may be taken.	BOP CRS BOP	Monitor Primary Containment Parameters <ul style="list-style-type: none"> If Torus Water Temperature exceeds 90°F, notify the CRS of the EOP C.5-1200 entry condition. Enters EOP C.5-1200 Primary (Containment Control) <ul style="list-style-type: none"> Directs start of all available Torus Cooling Starts all available Torus Cooling IAW the Hard Card. <ul style="list-style-type: none"> Verify CV-1728 (1729), RHR HX SW Outlet, controller set at 20%. START No 11(12) and/or No 13(14) RHRSW pumps as needed. Adjust flow for ~3500 gpm per pump using CV-1728 (CV-1729). Verify 11(12) and/or 13 (14) RHR pumps running. Partially OPEN MO-2008 (2009), Torus Cooling Inj/Test Inboard, by holding handswitch in OPEN position for 8 seconds. Give MO-2006 (2007) an OPEN signal by momentarily placing RHR Div 1 Disch to Torus Otbd handswitch 10A-S14A (B) to OPEN.
			<ul style="list-style-type: none"> THROTTLE OPEN MO-2008 (2009) to provide ~4000 gpm per pump.

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SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	When control rods are being inserted using Part C AND when directed by the Lead Examiner, INSERT MANUAL TRIGGER 19 to deleted CH16 allowing the control rods to insert.		<ul style="list-style-type: none"> • CLOSE MO-2002 (2003), HX Bypass. • Verify V-AC-5(4), A(B) RHR RM COOLER in operation.
	13. <u>SCENARIO TERMINATION</u> <p>a. The scenario may be terminated as follows:</p> <ol style="list-style-type: none"> 1) Actions are being taken to insert control Rods or ALL rods are inserted. 2) RPV level and pressure are stable in the directed bands. 		
	<p>b. The scenario may be also terminated at the discretion of lead instructor/evaluator</p> <p>c. End the scenario by placing the simulator in FREEZE.</p>	<p>Crew</p> <p>Crew</p>	<ul style="list-style-type: none"> • Remain in simulator for potential questions from evaluator. • No discussion of scenario or erasing of procedure marking is allowed.

	<h2 style="margin: 0;">SIMULATOR EXERCISE GUIDE (SEG)</h2>
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SITE: MONTICELLO**SEG #** ILT-SS-30E**SEG TITLE:** 2015 ILT NRC SCENARIO 4**REV. #** 0**PROGRAM:** INITIAL LICENSE TRAINING**#:** MT-ILT**COURSE:** NRC SIMULATOR EVALUATION**#:** N/A**TOTAL TIME:** 45-90 MINUTES

Additional site-specific signatures may be added as desired.

Developed by:	<div style="border-bottom: 1px solid black; height: 1.2em; margin-bottom: 2px;"></div> <i>Instructor</i>	<div style="border-bottom: 1px solid black; height: 1.2em; margin-bottom: 2px;"></div> <i>Date</i>
Reviewed by:	<div style="border-bottom: 1px solid black; height: 1.2em; margin-bottom: 2px;"></div> <i>Instructor</i> <i>(Simulator Scenario Development Checklist.)</i>	<div style="border-bottom: 1px solid black; height: 1.2em; margin-bottom: 2px;"></div> <i>Date</i>
Validated by:	<div style="border-bottom: 1px solid black; height: 1.2em; margin-bottom: 2px;"></div> <i>Validation Lead Instructor</i> <i>(Simulator Scenario Validation Checklist.)</i>	<div style="border-bottom: 1px solid black; height: 1.2em; margin-bottom: 2px;"></div> <i>Date</i>
Approved by:	<div style="border-bottom: 1px solid black; height: 1.2em; margin-bottom: 2px;"></div> <i>Training Supervision</i>	<div style="border-bottom: 1px solid black; height: 1.2em; margin-bottom: 2px;"></div> <i>Date</i>

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
<p>1</p> <p>TH</p> <p>OR</p> <p>TH</p>	<p>1. <u>EXERCISE MAIN TURBINE BYPASS VALVES</u></p> <p>Optional: This normal evolution has been validated as an optional event. If the BOP/CRS does not need a Normal Evolution/Tech Spec call, this event may be omitted from the scenario.</p> <p>a. Acknowledge report of changing radiological conditions.</p> <p>NOTE: Depending on how long BV-1 is OPEN; the receipt of 5-B-32 (Main Steam Line Leakage) will be expected based on difference in total steam flow and steam flow to the turbine.</p> <p>b. Acknowledge BV-2 failure as Operations Management.</p>	<p>BOP</p> <p>BOP</p> <p>CRS</p>	<p>Performs Test OSP-TRB-0570 (EXERCISE MAIN TURBINE BYPASS VALVES)</p> <p>Notifies RP of changing radiological conditions</p> <p>Notifies CRS to enter TS 3.7.7.A</p> <p>Cycles BV-1 by performing the following:</p> <ul style="list-style-type: none"> • Selects BV-1 with BYPASS VALVE TEST • Presses BYPASS VALVE TEST pushbutton • Times and records valve travel to the OPEN position (15-25 seconds) and generator gross load • Releases BYPASS VALVE TEST pushbutton • Times and records valve travel to the CLOSED position (15-25 seconds) • Returns BYPASS VALVE TEST switch to OFF <p>Cycles BV-2 by performing the following:</p> <ul style="list-style-type: none"> • Selects BV-2 with BYPASS VALVE TEST • Presses BYPASS VALVE TEST pushbutton • Times and records valve travel to the OPEN position (15-25 seconds) and generator gross load • Notifies CRS that BV-2 will NOT open <p>Instructs BOP to stop test and reevaluates TS</p> <ul style="list-style-type: none"> • Enters Condition A • Required Action A.1 – Restore BV-2 to normal within 2 hours.
<p>2</p> <p>TH</p>	<p>2. <u>#11 RBCCW PUMP TRIP</u></p> <p>Optional: This event has been validated as an optional event. If the BOP does not need a component malfunction, this event may be omitted from the scenario.</p> <p>a. When directed by the Lead Examiner, insert MANUAL TRIGGER 1</p>		

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
TH	<p>1) Verify the following Malfunction goes active: SW01A, #11 RBCCW Pump Trip</p> <p>Key Parameter Response: #11 RBCCW Pump trips and the Standby #12 RBCCW Pump fails to auto start.</p> <p>Key Expected Alarms: 6-B-32 (RBCCW LOW DISCH PRES)</p> <p>Automatic Actions: None</p> <p>b. When notified to investigate, wait 2 minutes and report as the Outplant operator that the breaker for #11 RBCCW pump has tripped on overcurrent and that there is an acrid odor near the breaker.</p> <p>c. Depending on how rapidly the BOP starts #12 RBCCW Pump, RWCU may or may not isolate on high temperature.</p> <p>d. If notified, acknowledge the report.</p> <p>NOTE: This SEG is NOT validated for RWCU restoration.</p> <p>Once the Loss of RBCCW actions are taken and at the discretion of the lead evaluator, MOVE ON TO THE NEXT EVENT.</p>	<p>BOP CR200.152</p> <p>CRS SS315.107</p>	<p>Takes action IAW C.4-B.02.05A (LOSS OF R</p> <ul style="list-style-type: none"> Verify a RBCCW pump is running <ul style="list-style-type: none"> Notifies that #12 RBCCW Pump auto start and manually starts t Notifies Reactor Building and/or Turbine Operator(s) to investigate the cause of Notifies Engineering and/or Maintenance of failure of 11 RBCCW Pump and the failure of RBCCW Pump to auto start. Verifies RWCU isolates on high temperature <p>Notifies Ops Management and performs crew</p>
3 TH	<p>3. 11 RECIRC PUMP LOCKOUT</p> <p>a. When directed by the Lead Examiner, insert MANUAL TRIGGER 3, and verify RR05A activates.</p> <p>Key Parameter Response: Loss of flow in the A Recirc Loop and Reactor power lowering.</p> <p>Key Expected Alarms: 4-C-1 (RECIRC A LOCKOUT)</p> <p>Automatic Actions: None</p> <p>b. When contacted as engineering, maintenance or plant management, state that the appropriate investigations and/or notifications will be initiated.</p>	<p>BOP</p>	<p>Takes actions IAW C.4-B.01.04.A (TRIP OF C RECIRC PUMP)</p> <ul style="list-style-type: none"> Notifies CRS Closes 11 Recirc Pump Discharge valve After 5 minutes, re-opens 11 Recirc Pump Discharge Valve

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
	<p>NOTE: Based on validation, the crew should decide to lower power to approximately 45-50%.</p>	<p>OATC</p> <p>CRS</p>	<p>Takes actions IAW C.4-B.05.01.02.A (CONTROL RODS NEUTRON FLUX OSCILLATIONS)</p> <ul style="list-style-type: none"> Determines plant is operating in the Unanalyzed Region of the P-F map <p>Takes action IAW C.4-F (RAPID POWER REDUCITON)</p> <ul style="list-style-type: none"> Inserts control rods to exit Unanalyzed Region <p>Evaluates TS LCO 3.4.1 as NOT met.</p> <ul style="list-style-type: none"> Condition A applies for mismatched Rods 24 hours to match flows or establish stable operations.
4	<p>4. RMCS NORMAL ROD INSERTION FAILURE</p> <p>a. When the OATC attempts to insert the second control rod, the Rod Insert Switch will fail to respond. Verify Event Trigger 25 (03-S72-01) activates when the second control rod (34-31) is selected.</p> <p>Key Parameter Response: No indicating light response from the directional solenoid valves or CRDH.</p> <p>Key Expected Alarms: None</p> <p>Auto Actions: None</p> <p>NOTE: The crew is also allowed to use EMERG ROD IN based on entry into C.4-F (RAPID POWER REDUCITON). These procedures may NOT be used.</p>	OATC	<p>B.01.03-05.H.1 (INOPERABLE CONTROL ROD)</p> <p>If the Control Rod is NOT at position 00, then insert the control rod using the following:</p> <ul style="list-style-type: none"> Place Rod Out Notch Override Switch in EMERG ROD IN. <p>B.05.05-05.H.1 (RMCS FAILURE)</p> <ul style="list-style-type: none"> If RMCS failure detected and normal rod capability is lost then place Rod Out Notch Override Switch in EMERG ROD IN.
5	<p>5. 12 RECIRC PUMP LOCKOUT</p> <p>When directed by the Lead Examiner, insert MANUAL TRIGGER 5, and verify RR05B activates.</p> <p>Key Parameter Response: Loss of flow in the B Recirc Loop and Reactor power lowering.</p>		

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
	<p><u>Key Expected Alarms:</u> 4-C-2 (RECIRC B LOCKOUT)</p> <p><u>Automatic Actions:</u> None</p>		
TH	<p>a. Verify Event Trigger 29 goes active when the Mode switch is placed in SHUTDOWN. This will initiate the following:</p> <ol style="list-style-type: none"> 1) Trip of RFPs after 5 and 10 second delays. Verify FW16A & B activate. 2) A small break LOCA on a 2 minute ramp after a 2 minute delay. Verify RR01B activates. 	<p>OATC</p> <p>OATC</p> <p>SS315.101</p> <p>CR200.146</p>	<p>Takes action IAW C.4-B.01.04.B (TRIP OF TV RECIRC PUMPS)</p> <ul style="list-style-type: none"> • If in Mode 1 or 2, then manually scram IAW C.4-K (IMMEDIATE REACTOR SHUTDOWN) <p>Takes actions IAW C.4-A (Reactor Scram) PA</p> <ul style="list-style-type: none"> • Place Mode Switch in SHUTDOWN. • Verify all Control Rods are inserted to position 04. • Provides scram script to CRS. Report than 9" EOP entry condition. • Controls Reactor water level between inches. When RPV water level starts to <ul style="list-style-type: none"> ○ Place CV-6-13 Manual Loading Low Flow Valve in AUTO set b and 20 inches ○ Close both Main FW Reg Valve ○ Close MO-1133 and MO-1134 Feedwater Line Block valves ○ Verify CV-6-13 is closed when reaches +15 to +20 inches • Monitor Reactor Power <ul style="list-style-type: none"> ○ Insert SRM and IRM detectors ○ Switch recorders from APRM t
		BOP	<ul style="list-style-type: none"> ○ Range down on IRMs as nece • Verify SDV Vent and Drain Valves clo • Verify Recirc Pumps have run back to <p>Takes actions IAW C.4-A (REACTOR SCRAM</p> <ul style="list-style-type: none"> • Plant page that a Reactor Scram has c • Open Main Generator output breakers 8N8.

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
	NOTE: The remaining BOP actions in C.4-A may NOT be performed depending on when the LOCA is recognized.		<ul style="list-style-type: none"> • Trip the Main Turbine. • Verify the Generator Field Breaker Op
			<ul style="list-style-type: none"> • Start the Turbine Aux Oil Pump. • Verify Turbine Exhaust Hood Sprays in • Start the Turbine Bearing Lift Pumps • Verify Main Steam Pressure Control o Set is controlling Reactor Pressure. • At C-25, Place the POST SCRAM swit and verify all available Drywell Recircu are operating • Verify 3300 gpm through each operati Pump • Verify Auxiliary Oil Pump running on a operating Feed Pump • Verify 3000 gpm through each operati Condensate Pump
t 6	<p>6. <u>Loss of High Pressure Feed / Alternate RPV Level Control</u></p> <p>a. Role Play in-plant operators as necessary. There is no apparent cause for the loss of the Feed Pumps.</p> <p>NOTE: If these start automatically they will still trip. Verify the following:</p> <ul style="list-style-type: none"> • When RCIC flow reaches ~ 100 gpm, verify EVENT TRIGGER 26 activates. This will trip RCIC (RC03) after a 30 second time delay. • When HPCI MO-2036 begins to open (Red Light ON), verify EVENT TRIGGER 27 activates. This will immediately trip HPCI (HP03). <p>NOTE: Both systems are set to trip on high exhaust pressure complications from the LOCA.</p>	<p>CRS</p> <p>OATC</p> <p>CRS</p> <p>OATC</p>	<p>Directs performance of C.5-1100 (RPV Control)</p> <ul style="list-style-type: none"> • Recognizes the loss of both Feed Pump • Attempts to restart the Feed Pumps • Notifies CRS that Feed Pumps will not <p>Directs RPV level control using HPCI and/or F</p> <ul style="list-style-type: none"> • Attempts to start HPCI and RCIC • Notifies CRS that HPCI and RCIC both high exhaust pressure.
t 6	Inhibit ADS to avoid auto initiation that would result in a violation of cooldown rate or a loss of adequate core cooling.	<p>CRS</p> <p>OATC/ BOP</p>	<p>Direct Alternate Level control Actions</p> <ul style="list-style-type: none"> • Inhibits ADS

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
		OATC/ BOP	<ul style="list-style-type: none"> Starts a SBLC pump for injection IAW (Use of Alternate Injection Systems for Makeup) <ul style="list-style-type: none"> Verifies injection Adequately monitors and reports level and Pressure, both values trends.
t 7	<p>7. <u>LOCA in Primary Containment (Drywell):</u></p> <p><u>NOTE:</u> Containment Spray/Cooling actions may not be taken if the crew prioritizes RPV water level.</p>	<p>BOP</p> <p>CRS</p> <p>BOP</p> <p>BOP</p>	<p>Reports Drywell pressure rising</p> <ul style="list-style-type: none"> Reports EOP entry conditions. <ul style="list-style-type: none"> DW pressure, DW Temp and T <p>Directs performance of C.5-1200 (PC Control)</p> <ul style="list-style-type: none"> Start Torus sprays Start all available Torus cooling Spray the Drywell Performs C.5 1200 actions Places Torus Sprays in service IAW C (Containment Sprays): <ul style="list-style-type: none"> Verifies RHR Pumps running Takes Cont Spray/Cooling LPC Bypass (B) to BYPASS Opens MO-2007, 2011, & 2009 Verifies LPCI Inject Outboard V closed; MO-2012 and MO-2013 Initiates Containment Cooling <ul style="list-style-type: none"> RHR SW Outlet valve controller Place HX Bypass in CLOSE ECCS Load Shed to MANUAL Start RHR SW Pump(s) Adjust flow to ≈3500 gpm per p
			<ul style="list-style-type: none"> Start all available drywell cooling IAW (Defeat Drywell Cooler Trips) <ul style="list-style-type: none"> Place all D/W fan control switch Open Knife switch KS3100

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
		BOP	<ul style="list-style-type: none"> ○ Verify fan inlet dampers are in ○ Place all D/W fan control switch ○ OPEN associated fan disch da • Initiates Drywell Spray IAW C.5-3502 (Containment Sprays): <ul style="list-style-type: none"> ○ Open Drywell Spray Outboard ○ Open Drywell Spray Inboard M ○ Close Torus Cooling MO-2009
7 T 2	8. <u>Alternate RPV Level Control / Emergency Blowdown:</u> When RPV water level can <u>NOT</u> be maintained >-149", Emergency Depressurize the reactor.	CRS SS304.226 CR304.139	Verifies two or more Injection Subsystems line pumps running. When RPV level is < -126 inches and prior to inches, directs performance of C.5-2002 (Emergency RPV Depressurization) <ul style="list-style-type: none"> • Verifies Torus level > -5.9 ft. • Directs opening of all 3 ADS SRVs. • Directs RPV Level restoration
TH	a. Verify Event Trigger 28 goes active when A SRV Handswitch is taken to Open	BOP BOP/ OATC	<ul style="list-style-type: none"> • Verifies that both Core Spray Subsystem Pumps are available for injection • Opens 3 ADS SRVs
	1) Verify that Malfunction RR03B (B Loop Rupture) goes active at 3% severity.	BOP BOP OATC	<ul style="list-style-type: none"> • Monitor and report RPV level values and • Controls RPV injection from RHR. • Opens Knife Switch to Bypass LPCI 5 Timer using C.5-3208 • Throttles MO-2013. • May divert LPCI flow using B.03.04-05 COOLING HARD CARDS) • Controls RPV injection from Core Spray. <ul style="list-style-type: none"> ○ Throttles MO-1754 • Controls RPV injection from the Condens
	9. <u>SCENARIO TERMINATION</u>		

SCENARIO TIME-LINE:

Q	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSE
OR	<p>a. The scenario may be terminated when Emergency Depressurization has been performed OR RPV water level is recovered above TAF.</p> <p>b. The scenario may be also terminated at the discretion of lead instructor/evaluator</p> <p>c. End the scenario by placing the simulator in FREEZE.</p>	<p>Crew:</p> <p>Crew:</p>	<ul style="list-style-type: none">• Remain in simulator for potential question evaluator.• No discussion of scenario or erasing of p marking is allowed.