

Facility: Monticello Scenario No.: NRC Scenario **1** Op-Test No.: MNGP 2013301
 Examiners: _____ Operators: _____

Initial Conditions: 100% Power
 11 Core Spray Pump OOC
 12 Service Water Pump OOC

Turnover: Perform RB/Torus Vacuum Breaker Test

Event No.	Malfunction No.	Event Type*	Event Description
1	C-04-B19	N / TS BOP / SRO	BOP performs RB/Torus Vacuum Breaker Test. The second vacuum breaker will fail open.
2	CH01_023	I / R / TS OATC / SRO	Control Rod 18-15 Drifts OUT. The OATC will be successful inserting the control rod and reducing Rx power < 100%.
3	SW01A	C BOP / SRO	The running RBCCW pump will trip and the standby pump will fail to auto start. The BOP will be successful in manually starting the standby pump.
4	ED05E	C BOP/ OATC / SRO	Bus 15 will lockout resulting in a loss of the running CRD pump. The OATC will be successful starting the standby pump. The BOP will take actions for loss of Bus 15.
5	CH08B	C OATC / SRO	While the BOP is taking actions for the loss of Bus 15, the remaining CRD pump will trip resulting in a complete loss of CRD and requiring a reactor scram.
6	FW16A/B, HP03, RC03	C (Post) CREW	A complete loss of high pressure feed will occur following the scram requiring alternate level control actions.
7	RR01B, RR03B	M Crew	A LOCA will begin in the Drywell which will drive RPV level to lower. Alternate level control actions will be unsuccessful which will require the crew to perform an Emergency Depressurization.

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

ES-301-4 Quantitative attributes:

Total Malfunctions (5-8): **6**
 Malfunction(s) after EOP (1-2): **E6**
 Abnormal Events (2-4): **E2, E3, E4, E5**
 Major Transient(s) /E-Plan entry (1-2): **E7**
 EOPs (1-2): **1100 & 2002**
 EOP Contingencies (0-2): **2 (ALC, ED)**
 Critical Tasks (2-3): **2**

ES-301-5 Quantitative attributes:

BOP Normal (1/set): **E1**
 OATC Reactivity (1/set): **E2**
 BOP I/C (4/set): **E3, E4**
 OATC I/C (4/set): **E2, E4**
 SRO-I I/C (4/set incl. 2 as OATC): **E2 – E5**
 SRO Tech Spec (2/set): **E1, E2**
 ALL Major Transients (2/set): **E7**

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: MONTICELLO

SEG # ILT-SS-21E

SEG TITLE: 2013 ILT NRC SCENARIO 1

REV. # 0

PROGRAM: INITIAL LICENSE TRAINING

#: MT-ILT

COURSE: NRC SIMULATOR EVALUATION

#: N/A

TOTAL TIME: 60-90 MINUTES

Additional site-specific signatures may be added as desired.

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

Guide Requirements

Goal of Training:

This Scenario evaluation has been written for the 2013 ILT NRC Exam. Once this exam is complete and exam security is relaxed, this SEG should be appropriate to use for the following activities:

- Future ILT NRC / Audit Exam Evaluations
 - SRO Certification Evaluations
 - LOR Crew development
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Learning Objectives:

1. Demonstrate the ability to predict and/or monitor changes in parameters associated with operating system controls for the appropriate tasks.
 2. Demonstrate the ability to correctly use procedures to correct, control, or mitigate the consequences of normal and abnormal operations for the appropriate tasks.
 3. Demonstrate the ability to monitor automatic operations of the systems to ensure proper operation for the appropriate tasks.
 4. Demonstrate the ability to manually operate and/or monitor systems in the control room in accordance with approved procedures for the appropriate tasks.
 5. Demonstrate the ability to complete administrative requirements, as necessary, in order to operate the plant for the appropriate tasks.
 6. Demonstrate knowledge of and ability to implement shift supervision duties as they relate to crew operations for the appropriate tasks.
 7. Given a degrading or improving plant condition or event, demonstrate the ability to: (CRS)
 - a. Evaluate trends that may result in equipment damage or reduction in plant safety.
 - b. Ensure proper diagnosis of plant problems by monitoring and interpreting data (information from panel indications).
 - c. Evaluate and diagnose challenges to Critical Plant Parameters.
 - d. Evaluate events and accidents.
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Prerequisites:

1. Completion of the MT-ILT Training Program, or
 2. Completion of the SRO Certification Program, or
 3. Currently enrolled in the LOR Training Program
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Training Resources:

1. Full Scope Simulator
 2. MTF-7100-051 (Attendance Record) or LMS Equivalent
 3. 3139 (Control Room Shift Turnover Checklist)
 4. 3140 (Shift Supervisors Office Shift Turnover Checklist)
 5. Marked up copy of Test 0141 with LCO tracking module & PJB
 6. Lead Instructor – Crew Turnover Brief paperwork
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References:

1. Test 0141
2. T.S. 3.6.1.6
3. ARP 5-A-27 (Rod Drift)
4. ARP 5-A-3 (Rod Withdraw Block)
5. ARP 5-A-14 (APRM Alarm)
6. ARP 5-A-51 (RBM HI/INOP)
7. C.4-B.01.03.C (Control Rod Drifting)
8. B.01.03-05.G.2 (HCU Isolation)
9. B.01.03-05.H.10 (Rod Drift Out procedure)
10. TS LCO 3.1.3
11. ARP 6-B-32 (RBCCW Low Disch Pres)
12. C.4-B.02.05A (Loss of RBCCW)
13. ARP 8-B-18 (NO. 15 4160V Bus Lockout)
14. ARP 5-B-17 (Charging Water Lo Press)
15. C.4-B.09.06-C (Loss of 15 Bus)
16. C.4-B.01.03.A (Loss of CRD Flow)
17. C.4-K (Immediate Reactor Shutdown)
18. C.4-A (Reactor Scram)
19. C.5-1100 (RPV Control)
20. C.5-1200 (Primary Containment Control)
21. C.5-2002 (Emergency Depressurization)
22. C.5-3203 (Use of Alternate Injection Systems for RPV Makeup)
23. C.5-3204 (RPV makeup with CRD)
24. C.5-3502 (Containment Sprays)
25. C.5-3503 (Defeat Drywell Cooler Trips)
26. C.5-3208 (Bypass LPCI 5 Minute Timer)
27. B.03.04-05.H1-8 (Torus Cooling Hard Cards)

Commitments: 1. None

Evaluation Method: The following methods are acceptable methods for examinee evaluation:

- 2013 ILT NRC Exam Process (NUREG 1021 & FP-T-SAT-72)
- MT-ILT (MNGP ILT Program Description)
- M-9700 (SRO Certification Program Description)
- FP-T-SAT-73 (Licensed Operator Requalification Program)

Operating Experience: Not Applicable to Evaluation Scenarios

Related PRA Information:

Initiating Event with Core Damage Frequency:
 LOCA with Loss of High Pressure Injection Systems

Important Components / Accident Class:
 Class 1A – Accident sequence involving loss of inventory makeup in which reactor pressure remains high.

Important Operator Actions with Task Number:
 XRPVBLDWN Y – Failure to Emergency Depressurize

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

SRO Tasks:

SS299.354	Apply administrative requirements for Tech Spec Section 3.6 and Bases to Containment Systems	5-7
SS315.167	Direct the response to a Control Rod Drifting	5-7
SS299.349	Apply administrative requirements for Tech Spec Section 3.1 and Bases to Reactivity Control Systems	5-7
SS315.107	Supervise response to a loss of RBCCW flow	5-7
SS315.140	Supervise response to loss of Bus 15 or Bus 16	5-7
SS315.102	Supervise response to a loss of CRD pump flow	5-7
SS315.164	Supervise immediate reactor shutdown	5-7
SS315.101	Supervise response to a reactor scram	5-7
SS304.226	Implement the response for a small break LOCA or loss of high pressure injection where RPV level can <u>NOT</u> be maintained above TAF and RPV blowdown is required to recover level above TAF with low pressure systems and/or alternate coolant injection systems.	5-7

RO Tasks:

CR299.356	Apply Tech Spec Section 3.6 and Bases to Containment Systems	1-5
CR200.226	Respond to a drifting control rod	1-4
CR299.351	Apply Tech Spec Section 3.1 and Bases to Reactivity Control Systems	5
CR200.152	Perform the procedure for a Loss of RBCCW Flow	1-4
CR200.184	Perform the procedure for a loss of BUS 15 or 16	1-4
CR200.147	Perform the procedure for a loss of CRD pump flow	1-4
CR200.208	Perform the procedure for immediate reactor shutdown	1-4
CR200.146	Perform the procedure for a Reactor Scram	1-4
CR304.139	Perform actions for a small break LOCA or loss of high pressure injection where RPV level can <u>NOT</u> be maintained above TAF and RPV blowdown is required to recover level above TAF with low pressure systems and/or alternate coolant injection systems.	1-4

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. RB to Torus Vacuum Breaker fails OPEN
2. Control Rod drifts out (SV-122 failure)
3. RBCCW Pump trip
4. Bus 15 Lockout
5. CRD Pump trip

After EOP Entry:

1. Loss of High Pressure Feed (Reactor Feed Pumps, HPCI and RCIC)

Abnormal Events:

1. Control Rod Drifting
2. Loss of RBCCW Flow
3. Loss of Bus 15
4. Loss of CRD Flow

Major Transients:

1. LOCA requiring Emergency Depressurization

Critical Tasks:

1. **CT 1:** Scram the reactor when no CRD pump is running and the second accumulator low pressure alarm is received.
2. **CT 22:** When RPV water level can **NOT** be maintained $>-149''$, Emergency Depressurize the reactor.

SCENARIO OVERVIEW:**SEQUENCE OF EVENTS:****Event 1: RB/Torus Vacuum Breaker Test (0141)**

- BOP performs Reactor Building to Torus Vacuum Breaker Test.
- The second valve tested fails open which requires the CRS to declare the valve inoperable IAW TS 3.6.1.6.

Event 2: Control Rod 18-15 Drifts OUT

- The selected control rod (18-15) will begin drifting out. This will require the OATC to take action to insert the control rod. Once inserted the control rod need to be electrically disarmed to remain at position 00.
- The CRS will declare control rod 18-15 inoperable IAW TS 3.1.3

Event 3: Trip of 11 RBCCW Pump

- 11 RBCCW Pump will trip on overload and 12 RBCCW pump will fail to automatically start. This will require the BOP operator to manually start #12 RBCCW pump.

Event 4: Bus 15 LOCKOUT

- Bus 15 will Lockout resulting in a loss of the running CRD Pump. The OATC will be required to take action to start 12 CRD pump and restore CRD parameters.
- While the BOP operator is taking actions for the loss of 15 Bus, the remaining CRD pump will trip resulting in a complete loss of CRD flow.

Event 5: Loss of CRD requiring a reactor scram

- The complete loss of CRD flow will require the crew to insert a reactor scram.
- Following the scram a complete loss of high pressure feed will occur.

Event 6: Loss of High Pressure Feed requiring Alternate RPV Level Control

- A loss of high pressure feed will occur and the crew will be unable to restart Reactor Feed pumps, HPCI or RCIC.

Event 7: Alt Level Control with a LOCA requiring Emergency Depressurization

- While in alternate level control a LOCA will continue to lower RPV water level. Eventually RPV water level will lower below TAF and require the crew to perform an Emergency Depressurization. Low pressure injections systems will be used to restore level.

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
	<p>1. INITIAL CONDITIONS (IC):</p> <ul style="list-style-type: none"> a. Mode: 1 b. Present Power Level: 100% c. XCEL System Condition: Green d. Plant CDF: Green e. Electrical lineup – 2R. f. Fuel Pool Status: Green, 79.2 hours to boil g. Generator Output: ~605 MWe h. Staffing: Normal Weekday Dayshift i. Planned Shift Activities: Test 0141 j. The following equipment is OOS: <ul style="list-style-type: none"> 1) 11 Core Spray Pump for motor replacement. <ul style="list-style-type: none"> a) LCO 3.5.1 is NOT met b) Condition B was entered at 0600 yesterday c) Required Action B.1 is due in 7 Days 2) 12 Service Water Pump for scheduled maintenance 		
BOOTH INST	<p>2. SIMULATOR SET UP</p> <ul style="list-style-type: none"> a. Reset the simulator to IC-281 (PW: mallard1) and place in RUN. Verify the correct malfunctions, remotes, overrides and event triggers are loaded as listed in the Simulator Input Summary page(s). 		

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	b. Insert Manual Trigger 30 to load simulator initial conditions and preloaded malfunctions.		
	c. Tag out 11 Core Spray Pump as follows: <ol style="list-style-type: none"> 1) Place its hand switch in PTL. 2) Hang a CAUTION (yellow) card on the pump 3) Verify its GREEN light is OFF. 4) Hang a PROTECTED EQUIPMENT sign on the B Core Spray system. d. Tag out 12 Service Water Pump as follows: <ol style="list-style-type: none"> 1) Place hand switch in NORMAL-AFTER-STOP 2) Hang a CAUTION (yellow) card on the pump 3) Verify its GREEN light is OFF. e. Ensure the following are provided for the crew: <ol style="list-style-type: none"> 1) Turnover checklists (3139 & 3140) 2) Marked up copy of Test 0141 3) LCO Tracking Module 4) Two stopwatches f. ENSURE Cross Flow is ENABLED on PCS as follows: <ol style="list-style-type: none"> 1) Verify computer points CFW966-CFW969 are set to "ENABLED" 2) ENSURE Remote PO03 (CROSSFLOW DISABLED/ENABLED) is set to ENABLED 		

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	g. Verify the status board is updated IAW Section 1 h. Complete the Simulator Setup Checklist		
FLOOR INST	3. <u>SIMULATOR PRE-BRIEF:</u> a. REVIEW the scenario initial conditions as listed in Section 1: For examination purposes a “Lead Instructor – Crew Turnover Brief” has been created. This should be reviewed with the crew prior to allowing the crew in the simulator. b. VERIFY the crew performs a walk-down of the control boards prior to starting the shift brief.	Crew	Performs walk down of control boards and reviews turnover checklists.
	4. <u>SHIFT BRIEF</u> a. Role Play as necessary. Turbine Building status: 1). 5 Condensate Demins are in service. 2). C vessel d/p is highest @ 5.4 psid. 3). 12 Service Water Pump is tagged out for scheduled maintenance	Crew	Conduct and participate in the Shift Brief
	4). All other systems in Turbine building are normal. b. Role Play as necessary. Extra out plant operator. 1) Nothing to add. c. Role Play as necessary. Rx Building status: 1) 11 Core Spray Pump is tagged out 2) All other systems in the Rx Bldg are normal.	CRS	Crew assumes the duty.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
<p>Event 1</p> <p>BOOTH INST</p>	<p>5. <u>RB/Torus Vacuum Breaker Test</u></p> <p>a. DPIS readings for Step 1 are provided.</p> <p>b. Respond as RBO that DWV-8-2 is closed</p> <p>c. Respond as RBO that DWV-8-1 is closed</p> <p>d. When AO-2380 is taken to OPEN, verify Event Trigger 28 goes active. This will prevent AO-2380 from closing once opened.</p> <p>NOTE: AO-2380 should auto close when the switch is released.</p> <p>e. If notified as Engineering about IST requirements, acknowledge the notification</p> <p>f. Role Play Ops Mgr as necessary for new LCO. Will notify the Plant Mgr and NRC Resident.</p>	<p>BOP</p> <p>BOP</p> <p>CRS SS299.354 CR299.356</p>	<p>Performs Test 0141 (Reactor Building to Torus Vacuum Breaker Operability Check)</p> <p>Verifies DPIS 2572 and 2573 are reading less than 0. (Step 1)</p> <p>Verifies locally DWV-8-2 is CLOSED (Step 2)</p> <p>Open/Close and time AO-2379. (≈14 seconds) (Step 3)</p> <p>Verifies locally DWV-8-1 is CLOSED (Step 4)</p> <p>Open/Close and time AO-2380. (≈11 seconds OPEN) (Step 5)</p> <p>Reports to the CRS that AO-2380 will NOT close.</p> <ul style="list-style-type: none"> • May recognize IST requirements not met • Evaluates T.S. 3.6.1.6 as NOT met and enters Condition A. <ul style="list-style-type: none"> ○ A.1 is a 72 hour action to close the Vacuum Breaker.
<p>Event 2</p> <p>BOOTH INST</p>	<p>6. <u>Rod Drift OUT</u></p> <p>a. When directed by the lead evaluator, insert MANUAL TRIGGER 1, and verify the following malfunction goes active:</p> <p>1) CH01_023 Control Rod 18-15 Drift OUT</p> <p>Key Parameter Response: Control Rod 18-15 drifting out and reactor power rising above 100%</p>		
	<p>Key Expected Alarms: 5-A-27 (Rod Drift), 5-A-3 (Rod Withdraw Block), 5-A-14 (APRM Alarm), 5-A-51 (RBM HI/INOP).</p>		

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
<p>BOOTH INST</p> <p>FLOOR INST</p>	<p>Automatic Actions: None</p> <p>b. Once the control rod is fully inserted, the OATC will need to hold the rod at position 00 or the rod will again drift out.</p> <p>c. If asked about CRD Pump Bypass Flow, Role Play as the RB Operator, wait 2 minutes and report that flow is 30 gpm.</p> <p>d. If asked to check out HCU, state that SV-122 is hot to the touch.</p> <p>NOTE: Depending on how long it takes to perform the immediate actions, reactor power may peak at 108%.</p> <p>e. Acknowledge as Nuclear Engineering about the rod drift and power spike. State that you will assemble a team and investigate immediately.</p>	<p>OATC CR200.226</p> <p>SS315.167</p> <p>CRS SS299.349 CR299.351</p>	<p>Takes actions IAW C.4-B.01.03.C (Control Rod Drifting)</p> <ul style="list-style-type: none"> • Take ROD SELECT POWER SWITCH to OFF and back to ON • Reselect drifting rod AND <u>insert</u> to position 00 and may release switch to check if the drifting is clear. • Notifies CRS • Verify proper CRD System parameters • Verify core thermal power and margins to thermal limits have not been exceeded • Notify Supervisor Engineer (Nuclear) • Refer to B.01.03-05.H.10 (Rod Drift Out procedure) and B.01.03-05.G.2 (HCU Isolation). <p>Evaluates TS LCO 3.1.3 as NOT met and enters Condition C.</p> <ul style="list-style-type: none"> • Required action C.1 (Insert rod) is met • Required action C.2 (Disarm rod) is due in 4 hours

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	<p>f. If asked to electrically and/or hydraulically isolate the HCU, wait 1 minute, and DELETE CH01_023. Report the HCU is electrically and/or electrically isolated.</p> <p>g. Once the rod is inserted, TS are addressed and at the discretion of the Lead Evaluator then move on to the next event.</p> <p>NOTE: The B Manual actions are not required for evaluation.</p>		<ul style="list-style-type: none"> • May direct the HCU to be electrically and/or hydraulically disarmed
Event 3 BOOTH INST	<p>7. #11 RBCCW Pump Trip</p> <p>a. When directed by the Lead Examiner, insert MANUAL TRIGGER 3</p> <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>	BOP CR200.152	<p>Takes action IAW C.4-B.02.05A (Loss of RBCCW)</p> <ul style="list-style-type: none"> • Verify a RBCCW pump is running <ul style="list-style-type: none"> ○ Notices that #12 RBCCW Pump failed to auto start and manually starts the pump • Notifies Reactor Building and/or Turbine Building Operator(s) to investigate the cause of the trip.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
<p>BOOTH INST</p> <p>FLOOR INST</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>CRS SS315.107</p>	<ul style="list-style-type: none"> • Notifies Engineering and/or Maintenance of the failure of 11 RBCCW Pump and the failure of 12 RBCCW Pump to auto start. • Verifies RWCU isolates on high temperature <p>Notifies Ops Management and performs crew brief.</p>
<p>Event 4</p> <p>BOOTH INST</p>	<p>8. BUS 15 LOCKOUT</p> <p>a. When directed by the Lead Examiner, insert MANUAL TRIGGER 5</p> <p>1) Verify the following Malfunction goes active: ED05E, #15 BUS LOCKOUT.</p> <p>Key Parameter Response: No voltage on 15 Bus, loss of ½ control room lighting, and loss of a CRD Pump.</p> <p>Key Expected Alarms: 8-B-18 (NO. 15 4160V BUS LOCKOUT), 5-B-17 (CHARGING WATER LO PRESS)</p> <p>Automatic Actions: None</p>	<p>BOP</p> <p>SS315.140 CR200.184</p> <p>OATC</p> <p>SS315.102 CR200.147</p>	<p>Takes actions IAW C.4-B.09.06-C (Loss of 15 Bus)</p> <ul style="list-style-type: none"> • Notifies CRS • Determines a LOCKOUT exists on 15 Bus <p>Takes action IAW C.4-B.01.03.A (Loss of CRD Flow)</p> <ul style="list-style-type: none"> • Notifies CRS and starts #12 CRD Pump

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	b. When called as the Turbine Building Operator to cut in cooling to 11 EDG, wait one minute and insert Manual Trigger 7 . Report SW cooling is supplying 11 EDG.	BOP	C.4-B.09.06-C actions continued <ul style="list-style-type: none"> • Determines 11 EDG is without cooling water and dispatches Turbine Building Operator to cut in cooling water.
BOOTH INST	c. When this switch is taken to PTL, verify Event Trigger 22 goes active. This will initiate a trip of #12 CRD pump and require a reactor scram for a complete loss of CRD		<ul style="list-style-type: none"> • Places the following switches in PULL-TO-LOCK <ul style="list-style-type: none"> ○ 152-511/CS (1AR TRANS TO 15 BUS) ○ 152-502/CS (11 STBY DG TO 15 BUS)
Event 5 CT 1 BOOTH INST	<p>9. Loss of CRD & Reactor Scram:</p> <p>NOTE: Based on the complete loss of CRD pumps with no possibility of restoration, the CRS may NOT wait until the second accumulator alarm is received.</p> <p>Scram the reactor when no CRD pump is running and the second accumulator low pressure alarm is received.</p> <p>a. Verify Event Trigger 26 goes active when the Mode switch is placed in SHUTDOWN. This will initiate the following:</p> <p>1) Trip of RFPs after 5 and 10 second delays.</p>	CRS CRS SS315.164 CR200.208 OATC OATC SS315.101 CR200.146	Directs actions IAW C.4-B.01.03.A (Loss of CRD Flow) <ul style="list-style-type: none"> • If no CRD flow is available then insert a reactor scram when the second accumulator low pressure alarm is received. Directs action IAW C.4-K (IMMEDIATE REACTOR SHUTDOWN) <ul style="list-style-type: none"> • Reduce recirculation flow to minimum and insert a reactor scram using the scram pushbuttons Takes actions IAW C.4-A (Reactor Scram) PART A: <ul style="list-style-type: none"> • Place Mode Switch in SHUTDOWN. <ul style="list-style-type: none"> ○ Verify all Control Rods are inserted to or beyond position 04.

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	<p>2) A small break LOCA on a 2 minute ramp after a 2 minute delay.</p> <p>NOTE: The remaining BOP actions in C.4-A may NOT be performed depending on when the LOCA is recognized.</p>	<p>BOP</p>	<ul style="list-style-type: none"> • Provides scram script to CRS. Reports RPV less than 9” EOP entry condition. • Controls Reactor water level between +9 and +48 inches. When RPV 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 inches ○ Close both Main FW Reg Valves ○ Close MO-1133 and MO-1134 (HP Feedwater Line Block valves) ○ Verify CV-6-13 is closed when RPV level reaches +15 to +20 inches • 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. <ul style="list-style-type: none"> • Verify Recirc Pumps have run back to minimum <p>Takes actions IAW C.4-A (Reactor Scram) PART B:</p> <ul style="list-style-type: none"> • Plant page that a Reactor Scram has occurred. • Open Main Generator output breakers 8N7 & 8N8. • Trip the Main Turbine. • Verify the Generator Field Breaker Open.
			<ul style="list-style-type: none"> • Start the Turbine Aux Oil Pump.

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> • Verify Turbine Exhaust Hood Sprays in service. • Start the Turbine Bearing Lift Pumps • 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 3300 gpm through each operating Feed Pump • Verify Auxiliary Oil Pump running on any non-operating Feed Pump • Verify 3000 gpm through each operating Condensate Pump
Event 6	<p>10. <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><u>NOTE:</u> If these start automatically they will still trip.</p> <p><u>NOTE:</u> Both systems are set to trip when flow rises. They will 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 Pumps • Attempts to restart the Feed Pumps • Notifies CRS that Feed Pumps will not start. <p>Directs RPV level control using HPCI and/or RCIC</p> <ul style="list-style-type: none"> • Attempts to start HPCI and RCIC • Notifies CRS that HPCI and RCIC both tripped on high exhaust pressure.
		<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:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		OATC/ BOP	<ul style="list-style-type: none"> • Starts a SBLC pump for injection IAW C.5-3203 (Use of Alternate Injection Systems for RPV Makeup) <ul style="list-style-type: none"> ○ Verifies injection ○ Adequately monitors and reports RPV level and Pressure, both values and trends.
Event 7	<p>11. <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>	BOP CRS BOP	<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 Torus temp <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.5-3502 (Containment Sprays): <ul style="list-style-type: none"> ○ Verifies RHR Pumps running
		BOP	<ul style="list-style-type: none"> ○ Takes Cont Spray/Cooling LPCI Initiation Bypass (B) to BYPASS ○ Opens MO-2007, 2011, & 2009 (B Loop) ○ Verifies LPCI Inject Outboard Valves are closed; MO-2012 and MO-2013. <ul style="list-style-type: none"> • Initiates Containment Cooling

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		BOP	<ul style="list-style-type: none"> ○ RHRSW Outlet valve controller set 20% ○ Place HX Bypass in CLOSE ○ ECCS Load Shed to MANUAL OVERRIDE ○ Start RHRSW Pump(s) ○ Adjust flow to ≈3500 gpm per pump ● Start all available drywell cooling IAW C.5-3503 (Defeat Drywell Cooler Trips) <ul style="list-style-type: none"> ○ Place all D/W fan control switches to OFF ○ Open Knife switch KS3100 ○ Verify fan inlet dampers are in AUTO ○ Place all D/W fan control switches to ON ○ OPEN associated fan disch dampers ● Initiates Drywell Spray IAW C.5-3502 (Containment Sprays): <ul style="list-style-type: none"> ○ Open Drywell Spray Outboard MO-2021 ○ Open Drywell Spray Inboard MO-2023 ○ Close Torus Cooling MO-2009
Event 7 CON'T CT-22	<p>12. <u>Alternate RPV Level Control / Emergency Blowdown:</u></p> <p>When RPV water level can NOT be maintained >-149", Emergency Depressurize the reactor.</p>	CRS SS304.226 CR304.139	<p>Verifies two or more Injection Subsystems lined up with pumps running.</p> <p>When RPV level is < -126 inches and prior to -149 inches, directs performance of C.5-2002 (Emergency RPV Depressurization)</p>

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	a. Verify Event Trigger 20 goes active when A SRV Handswitch is taken to Open 1) Verify that Malfunction RR03B (Large Line Break) goes active at 3% severity .	BOP BOP/ OATC BOP BOP OATC	<ul style="list-style-type: none"> • Verifies Torus level > -5.9 ft. • Directs opening of all 3 ADS SRVs. • Directs RPV Level restoration • Verifies that both Core Spray Subsystems and LPCI Pumps are available for injection • Opens 3 ADS SRVs • Monitor and report RPV level values and trends • Controls RPV injection from RHR. • Opens Knife Switch to Bypass LPCI 5 Minute Timer using C.5-3208 • Throttles MO-2013. • May divert LPCI flow using B.03.04-05.H (Torus Cooling Hard Cards) • Controls RPV injection from Core Spray. <ul style="list-style-type: none"> ○ Throttles MO-1754 • Controls RPV injection from the Condensate system.

FLOOR INST	<p>13. SCENARIO TERMINATION</p> a. The scenario may be terminated when Emergency Depressurization has been performed OR RPV water level is recovered above TAF. b. The scenario may be also terminated at the discretion of lead instructor/evaluator	Crew:	<ul style="list-style-type: none"> • Remain in simulator for potential questions from evaluator.
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SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	c. End the scenario by placing the simulator in FREEZE.	Crew:	<ul style="list-style-type: none"> • No discussion of scenario or erasing of procedure marking is allowed.

Facility: Monticello Scenario No.: NRC Scenario **2** Op-Test No.: MNGP 2013
 Examiners: _____ Operators: _____

Initial Conditions:

37% Power with plant startup in progress
 1AR Transformer OOC
 12 Service Water Pump OOC

Turnover:

OATC to raise reactor power with recirc pumps to 40%
 BOP to place B MFRV in service

Event No.	Malfunction No.	Event Type*	Event Description
1	None	R - OATC	OATC raises reactor power to 40% with recirc pumps
2	None	N - BOP	At 40%, the BOP will place the remaining MFRV in service.
3	C-04-A35	C BOP / SRO	The RPV Flange will develop a leak. The BOP will take actions to stop the leak.
4	NI14C	C & TS OATC / CRS	APRM 3 will fail upscale requiring the OATC to bypass the APRM. CRS will address TSs.
5	RC02	C - TS BOP / SRO	RCIC will inadvertently initiate requiring the BOP to secure the system. The CRS will address Technical Specifications
6	AP01B	C - BOP	SRV B will fail open. The BOP will take actions but the SRV won't close. The BOP will recognize a scram is required. The Crew will insert a scram and then the SRV will close.
7	PC05	MAJOR CREW	After the scram, a torus rupture will occur. The crew will take actions to fill the torus but eventually will need to perform an Emergency Depressurization.
8	CH02_56	C - POST OATC / SRO	When the scram is inserted, one control rod will fail to insert. This will require the OATC to take additional abnormal procedure actions to insert the control rod.

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

ES-301-4 Quantitative attributes:

Total Malfunctions (5-8): **6**
 Malfunction(s) after EOP (1-2): **E8**
 Abnormal Events (2-4): **E5, E6**
 Major Transient(s) /E-Plan entry (1-2): **E7**
 EOPs (1-2): **1200 & 2002**
 EOP Contingencies (0-2): **1 (ED)**
 Critical Tasks (2-3): **2**

ES-301-5 Quantitative attributes:

BOP Normal (1/set): **E2**
 OATC Reactivity (1/set): **E1**
 BOP I/C (4/set): **E3, E5, E6**
 OATC I/C (4/set): **E4, E8**
 SRO-I I/C (4/set incl. 2 as OATC): **E3 – E6, E8**
 SRO Tech Spec (2/set): **E4, E5**
 ALL Major Transients (2/set): **E7**



SIMULATOR EXERCISE GUIDE (SEG)

SITE: MONTICELLO

SEG # ILT-SS-22E

SEG TITLE: 2013 ILT NRC SCENARIO 2

REV. # 0

PROGRAM: INITIAL LICENSE TRAINING

#: MT-ILT

COURSE: NRC SIMULATOR EVALUATION

#: N/A

TOTAL TIME: 60-90 MINUTES

Additional site-specific signatures may be added as desired.

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

Guide Requirements

Goal of Training:

This Scenario evaluation has been written for the 2013 ILT NRC Exam. Once this exam is complete and exam security is relaxed, this SEG should be appropriate to use for the following activities:

- Future ILT NRC / Audit Exam Evaluations
- SRO Certification Evaluations
- LOR Crew development

Learning Objectives:

1. Demonstrate the ability to predict and/or monitor changes in parameters associated with operating system controls for the appropriate tasks.
2. Demonstrate the ability to correctly use procedures to correct, control, or mitigate the consequences of normal and abnormal operations for the appropriate tasks.
3. Demonstrate the ability to monitor automatic operations of the systems to ensure proper operation for the appropriate tasks.
4. Demonstrate the ability to manually operate and/or monitor systems in the control room in accordance with approved procedures for the appropriate tasks.
5. Demonstrate the ability to complete administrative requirements, as necessary, in order to operate the plant for the appropriate tasks.
6. Demonstrate knowledge of and ability to implement shift supervision duties as they relate to crew operations for the appropriate tasks.
7. Given a degrading or improving plant condition or event, demonstrate the ability to: (CRS)
 - a. Evaluate trends that may result in equipment damage or reduction in plant safety.
 - b. Ensure proper diagnosis of plant problems by monitoring and interpreting data (information from panel indications).
 - c. Evaluate and diagnose challenges to Critical Plant Parameters.
 - d. Evaluate events and accidents.

Prerequisites:

1. Completion of the MT-ILT Training Program, or
2. Completion of the SRO Certification Program, or
3. Currently enrolled in the LOR Training Program

Training Resources:

1. Full Scope Simulator
2. MTF-7100-051 (Attendance Record) or LMS Equivalent
3. 3139 (Control Room Shift Turnover Checklist)
4. 3140 (Shift Supervisors Office Shift Turnover Checklist)
5. Form 2300 and Reactivity Maneuvering steps

References:

1. Form 2300 and Nuclear Engineers Reactivity Maneuvering Steps
2. C.1 (STARTUP)
3. B.05.07-05.D.4 (Place Remaining B Main FW Reg Valve CV-6-12B in Service)
4. 5-B-20 (Condenser Low Vacuum Scram Trip)
5. TLCO 3.3.1.1
6. 4-A-14 (RCIC LOW FLOW)

7. C.4-G (Inadvertent ECCS Initiation)
8. TS 3.5.3
9. C.4-B.03.03A (Stuck Open Relief valve)
10. 5-A-46 (SRV Open)
11. C.4-K (Immediate Reactor Shutdown)
12. C.4-A (Reactor Scram)
13. C.5-1100 (RPV Control)
14. 6-B-9/10 (High Water Level In RHR Rooms)
15. 4-B-4 (Torus Hi-Low Level)
16. 4-B-19/24 (Torus Vacuum Breakers Open)
17. 5-A-49 (Radwaste Trouble)
18. C.5-1200 (Primary Containment Control)
19. C.5-3401 (Torus Water Level Makeup)
20. C.5-1300 (Secondary Containment Control)
21. C.5-2002 (Emergency Depressurization)

Commitments:

1. None

Evaluation Method:

- The following methods are acceptable methods for examinee evaluation:
- 2013 ILT NRC Exam Process (NUREG 1021 & FP-T-SAT-72)
 - MT-ILT (MNGP ILT Program Description)
 - M-9700 (SRO Certification Program Description)
 - FP-T-SAT-73 (Licensed Operator Requalification Program)

Operating Experience:

Not Applicable to Evaluation Scenarios

Related PRA Information:

Initiating Event with Core Damage Frequency:

Stuck Open SRV

Important Components / Accident Class:

Class V – Unisolated Torus Leak

Important Operator Actions with Task Number:

XRPVBLDWN Y – Failure to Emergency Depressurize
 FLOODRB16Y – Fail to flood RB within 1-6 hours after torus leak.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):**SRO Tasks:**

SS200.133	Direct Reactor Startup to Full Power IAW C.1	5-7
SS299.362	Apply administrative requirements of Technical Requirements Manual	5-7
SS315.160	Supervise response to inadvertent ECCS initiation	5-7
SS299.355	Apply administrative requirements for Tech Spec Section 3.5 and Bases to ECCS and RCIC	5-7
SS315.109	Supervise response to a stuck open relief valve	5-7
SS315.164	Supervise immediate reactor shutdown	5-7
SS315.101	Supervise response to a reactor scram	5-7
SS314.115	Supervise torus water level makeup	5-7
SS304.194	Implement primary containment control	5-7

RO Tasks:

CR200.127	Perform a power ascension after the reactor is on line	1-5
CR259.103	Place Remaining MAIN FW REG VALVE in service (A)(B)	1-4
CR299.364	Apply Requirements of Technical Requirements Manual	5
CR200.204	Perform the procedure for an inadvertent ECCS initiation	1-4
CR299.355	Apply Tech Spec Section 3.5 and Bases to ECCS and RCIC	1-4
CR200.154	Perform the procedure for a stuck open relief valve	1-4
CR200.208	Perform the procedure for immediate reactor shutdown	1-4
CR200.146	Perform the procedure for a Reactor Scram	1-4
CR314.119	Perform actions associated with Torus Water Level Makeup	1-4
CR304.145	Perform actions for a loss of inventory in the torus requiring RPV blowdown or anticipation of blowdown and depressurizing to the main condenser.	1-4

QUANTITATIVE ATTRIBUTES

Malfunctions:*Before EOP Entry:*

1. RPV Flange Leak
2. Condenser Vacuum Switch failure
3. Inadvertent RCIC start
4. Stuck open SRV

After EOP Entry:

1. Stuck Control Rod

Abnormal Events:

1. Inadvertent RCIC start
2. Stuck open SRV

Major Transients:

1. Torus Leak requiring RPV Blowdown

Critical Tasks:

1. **CT-6:** When an SRV is stuck open and can **NOT** be closed then insert a manual reactor scram prior to reaching 110°F bulk torus water temperature.
2. **CT-26:** When torus water level can **NOT** be maintained above -3.3', then scram and execute EMERGENCY DEPRESSURIZATION per C.5-2002.

SCENARIO OVERVIEW:**SEQUENCE OF EVENTS:****Event 1: Normal power up with Recirc**

- IAW C.1, Startup Procedure, Section VIII, Power Ascension and Form 2300 Reactivity Adjustment instructions from the Nuclear Engineer, Recirculation flow is increased to raise power from 37% to 40%.

Event 1: Place the 2nd MFRV in service

- IAW C.1, Startup Procedure, Section VIII, Power Ascension Step 17.a, and B.05.07-05, Reactor Level Control, the B MFRV is placed in service.

Event 3: RPV Flange Leak

- An annunciator will be received that indicates the RPV flange is leaking. The BOP will follow ARP guidance and take actions to clear the annunciator.

Event 4: APRM 3 UPSCALE Failure

- APRM 3 will experience an upscale failure requiring the crew to bypass the APRM.
- The CRS will evaluate TS 3.3.1.1.F for APRM 3 being inoperable. Implication only.

Event 5: RCIC inadvertent initiation

- RCIC will inadvertently start requiring the BOP operator to take abnormal procedure actions to secure the system. The CRS will evaluate Tech Specs for inoperable RCIC.

Event 6: SRV B fails open.

- SRV B will fail open. The BOP will take abnormal procedure actions but the valve will not close. This will require the crew to insert a manual scram. Once the scram is inserted the SRV will close and a Torus water leak will begin.

Event 7: Unisolable Torus leak.

- An unisolable leak will occur in the bottom of the Torus from the bay where B SRV was stuck open. This will eventually require the crew to perform an Emergency Depressurization.

Event 8: Control Rod 06-27 fails to insert

- When the reactor scram is inserted from the stuck open SRV one control rod will fail to insert. This will require the OATC to perform additional actions in the scram procedure to insert the control rod.

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
	<p>1. INITIAL CONDITIONS (IC):</p> <ul style="list-style-type: none"> a. Mode: RUN b. Present Power Level: 37% c. XCEL System Condition: Green d. Plant CDF: Yellow for the startup e. Electrical lineup – 2R f. Fuel Pool Status: Green, 79.2 hours to boil g. Generator Output: ~195 MWe h. Staffing: Normal for expected startup activities i. Planned Shift Activities: Continue Reactor Startup by raising power and placing the remaining MFRV in service. j. The following equipment is OOS: <ul style="list-style-type: none"> 1) 1AR Transformer for an Oil Leak 2) 12 Service Water Pump for motor repairs 		
BOOTH INST	<p>2. SIMULATOR SET UP</p> <ul style="list-style-type: none"> a. Reset the simulator to IC-282 (PW: mallard2) and place in RUN. Verify the correct malfunctions, remotes, overrides and event triggers are loaded as listed in the Simulator Input Summary page(s). b. Insert Manual Trigger 30 to load simulator initial conditions and preloaded malfunctions. 		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>c. Tag out both of the 1AR Transformer hand switches 152-511/CS & 152-610/CS as follows:</p> <ol style="list-style-type: none"> 1) Verify both hand switches are in PTL. 2) Hang CAUTION (yellow) cards on both hand switches 3) Verify the GREEN lights are OFF on both hand switches. <p>d. Tag out 12 Service Water Pump as follows:</p> <ol style="list-style-type: none"> 1) Place its hand switch in NORMAL-AFTER-STOP 2) Hang a CAUTION (yellow) card on the pump 3) Verify its GREEN light is OFF. <p>e. Ensure the following are provided for the crew:</p> <p>f. Turnover checklists (3139 & 3140)</p> <p>g. Form 2300 and reactivity maneuvering steps</p> <p>h. C.1 place kept to VIII.A.17.a</p> <p>i. ENSURE Cross Flow is DISABLED on PCS as follows:</p> <ol style="list-style-type: none"> 1) Verify computer points CFW966-CFW969 are set to "DISABLED" 2) ENSURE Remote PO03 (CROSSFLOW DISABLED/ENABLED) is set to DISABLED <p>j. Verify the status board is updated IAW Section 1</p> <p>k. Complete the Simulator Setup Checklist</p>		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
FLOOR OR INST	<p>3. <u>SIMULATOR PRE-BRIEF:</u></p> <p>a. REVIEW the scenario initial conditions as listed in Section 1: For examination purposes a “Lead Instructor – Crew Turnover Brief” has been created. This should be reviewed with the crew prior to allowing the crew in the simulator.</p> <p>b. VERIFY the crew performs a walk-down of the control boards prior to starting the shift brief.</p>	Crew	Performs walk down of control boards and reviews turnover checklists.
	<p>4. <u>SHIFT BRIEF</u></p> <p>a. Role Play as necessary. Turbine Building status:</p> <ol style="list-style-type: none"> 1). 4 Condensate Demins are in service. 2). A vessel d/p is highest @ 4.4 psid. 3). 12 Service Water Pump is tagged out for motor repairs 4). 1AR Transformer is tagged out for an oil leak <p>b. Role Play as necessary. Extra out plant operator.</p> <ol style="list-style-type: none"> 1) Nothing to add. <p>c. Role Play as necessary. Rx Building status:</p> <ol style="list-style-type: none"> 1) All systems in the Rx Bldg are normal. 	Crew	Conduct and participate in the Shift Brief
Event 1	<p>5. <u>Raise Reactor power to 40% with Recirc Pumps</u></p> <p>a. Provide the following:</p> <ol style="list-style-type: none"> 1) 2300 (Reactivity Adjustment) 	CRS SS200.133	Performs a Reactivity Manipulation Brief CRS directs the OATC to raise Recirc speed to achieve 40% reactor power IAW Reactivity maneuvering Steps and C.1 (Startup)

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	2) Nuclear Engineer Reactivity Maneuvering Steps	BOP OATC CR200.127	<p>Provide a Peer Check</p> <ul style="list-style-type: none"> ○ Raises Recirc speed to raise power. ○ Maintains Flow parameters approximately equal ○ Monitors the following parameters: <ul style="list-style-type: none"> ○ Pump Speed ○ Scoop Tube positions ○ Reactor Differential pressure ○ Total Jet Pump Flow ○ Reactor Water Level and Feedwater Flow ○ Reactor Pressure and Steam Flow ○ APRMs ○ Core Thermal Limits
Event 2	6. <u>Place the B MFRV in service</u>	CRS BOP CR259.103	<p>Directs the BOP to place the B MFRV in service</p> <p>Places B MFRV in service IAW B.05.07-05.D.4 (Place Remaining B MAIN FW REG VALVE CV-6-12B in Service).</p> <ul style="list-style-type: none"> • Verifies MO-1134 is OPEN • Verifies CV-6-12B bias (vertical scale) is zero or slightly negative

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> Slowly opens CV-6-12B and observe output signal increasing (horizontal scale).
BOOTH INST	<p>a. Depending on how closely matched the scales are, the COND DEMIN SYSTEM TROUBLE alarm may be received. If so, insert MANUAL TRIGGER 11, wait one minute and respond as the TBO that it was an intermittent low flow alarm.</p>		<ul style="list-style-type: none"> Monitor vessel level and FW flow as CV-6-12B When CV-6-12B horizontal scale matches the vertical scale Place CV-6-12B controller in AUTO
Event 3 BOOTH INST	<p>7. <u>RPV Flange Seal Leak Alarm</u></p> <p>a. When directed by the Lead Examiner, insert MANUAL TRIGGER 1</p> <p>1) Verify Malfunction C-04-A35 goes active</p> <p>Key Parameter Response: Report of the Pressure Indicator reading from the Reactor Bldg.</p> <p>Key Expected Alarms: 4-A-35 (VESSEL FLANGE SEAL LEAK)</p> <p>Auto Actions: None</p> <p>b. Role Play the operator being dispatched as necessary. PI 2-101 is reading 620 psig</p> <p>c. Verify Event Trigger 28 goes true when Handswitch 16A-S48 is taken to open and Malfunction C-04-A35 is deleted 2 minutes later.</p>	BOP	<ul style="list-style-type: none"> Respond to annunciator and inform the CRS Dispatch an operator to report reading on PI 2-101 on C55 Place Handswitch 16A-S48, CV-2369 Reactor Flange Leakoff in the OPEN position (C-04) Maintain Handswitch 16A-S48 in the OPEN position for one minute after the annunciator resets, then place 16A-S48 in CLOSE

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Event 4 Booth Operator	<p>8. <u>APRM 3 UPSCALE Failure</u></p> <p>a. When directed by the lead evaluator, insert MANUAL TRIGGER 3, and verify NI13C goes active:</p> <p>Key Parameter Response: APRM Channel #3 High or INOP Red indicating light lit; APRM Channel #3 recorder upscale high</p> <p>Key Expected Alarms: C05-A-22 (APRM UPSC/INOP Trip), C05-A-3 (Rod Withdraw Block), C05-A14 (APRM Alarm)</p> <p>Automatic Actions: ½ Vote trip for APRM 3 on all 2 out of 4 Vote Logic Channels</p>	OATC	<p>Responds to Annunciators C05-A-3, 14 & 22 and notifies CRS.</p> <ul style="list-style-type: none"> Determines the trip signal by pressing the APRM or APRM ODA "TRIP STATUS" softkey Determines that APRM Channel 3 is upscale and Inoperable
FLOOR OR INST	<p>b. When operator goes to Panel C-37 to observe status of 2 of 4 Voter Modules #1, 2 & 4, inform him these voters indicate the same as Voter Module #3 for APRM Channel #3. Voter Modules 1, 2 & 4 are not modeled.</p>		<ul style="list-style-type: none"> Verifies Automatic actions initiated. Verifies each 2 of 4 Voter Module APRM UPSC/INOP INPUT STATUS LEDs is ON for APRM #3 Rod Block initiated

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> INPUT STATUS LEDs activated on the 2 of 4 Voter for APRM UPSC/INOP, OPRM DIDA/INOP, and OPRM CDA/INOP
	<p>c. Role Play plant support personnel as necessary to acknowledge report.</p>	<p>Crew</p> <p>CRS SS299.351 CR299.353</p> <p>CRS</p> <p>OATC</p>	<ul style="list-style-type: none"> Determines the INOP signal by pressing the APRM or APRM ODA "INOP STATUS" softkey; Critical Self Test Fault <p>Notifies Plant Engineering.</p> <p>Acknowledges alarm receipt and declares APRM Channel #3 inoperable.</p> <p>Evaluates LCO 3.3.1.1, LCO 3.3.2.1 and TLCO 3.3.2.1 as still MET</p> <ul style="list-style-type: none"> These LCOs only require 3 of 4 APRMs to be operable. <p>Directs OATC to bypass APRM Channel #3.</p> <p>Bypasses APRM Ch #3 as directed by the CRS.</p>
Event 5	<p>9. <u>Inadvertent RCIC start.</u></p> <p>a. When directed by the Lead Examiner, insert MANUAL TRIGGER 5</p> <p>1) Verify Malfunction RC02 goes active to cause an auto initiation of RCIC</p> <p><u>Key Parameter Response:</u> Pump speed rising.</p>	<p>Crew</p>	<p>Recognizes the RCIC start and informs CRS</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	<p>Key Expected Alarms: 4-A-14 (RCIC Low Flow)</p> <p>Auto Actions: RCIC starts and injects, Feed flow may reduce to compensate</p>	<p>CRS SS315.160</p> <p>BOP</p>	<p>Makes a plant announcement about RCIC in operation and about evacuation of the RCIC Room</p> <p>Directs BOP to use C.4-G (Inadvertent ECCS Initiation) and secure RCIC</p> <p>C.4-G (Inadvertent ECCS Initiation Signal) actions:</p>
	<p>b. Role Play plant support personnel as necessary to acknowledge report.</p>	<p>CR200.204</p> <p>Crew</p> <p>CRS SS299.355 CR299.355</p>	<ul style="list-style-type: none"> Determines was caused by a spurious signal. Depresses the RCIC Turbine Trip pushbutton. <p>Notifies Management, RP and Single Point of Contact.</p> <p>Evaluates LCO 3.5.3 as NOT met and enters Condition A.</p> <ul style="list-style-type: none"> Required Action A.1: Verify HPCI is operable immediately. This action can be performed by the crew checking the HPCI lineup and checking the logs. Required Action A.2: Restore RCIC in 14 Days
Event 6	<p>10. Stuck OPEN B SRV</p> <p>a. Insert Manual Trigger 7 and verify Malfunction AP01B goes active.</p> <p>Key Parameter Response: C-03 Amber light for B SRV will be ON. MWe and B steam line flow will lower</p> <p>Key Expected Alarms: 5-A-46 (SRV OPEN)</p> <p>Auto Actions: None</p>	<p>BOP</p>	<p>Implement C.4-B.03.03.A (Stuck Open Relief Valve)</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>NOTE: Based on the initial low power to begin the scenario, the crew may not choose to lower power.</p>	<p>CR200.154</p> <p>CRS SS315.109</p>	<ul style="list-style-type: none"> Place handswitch 2E-S4B for SRV B in OPEN and then return to the normal position. Place handswitch 2E-S4B for SRV B in CLOSE. Monitor and control Reactor pressure <p>Direct Rapid Power Reduction when the SRV fails to close</p>
CT-6	<p>When an SRV is stuck open and can NOT be closed then insert a manual reactor scram prior to reaching 110°F bulk torus water temperature.</p>	<p>OATC</p>	<p>When the B SRV remains open, direct a manual scram of the reactor</p> <ul style="list-style-type: none"> When directed, manually scrams the reactor
	<p>11. <u>Immediate Reactor Shutdown</u></p> <p>a. When the Mode switch is placed in SHUTDOWN verify Event Trigger 24 goes active. This will close the stuck open SRV and initiate the Torus leak.</p>	<p>CRS SS315.164</p> <p>OATC CR200.208</p> <p>CRS SS315.101</p> <p>OATC CR200.146</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.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	The OATC may address the stuck rod before proceeding with the remaining C.4.A actions (See Event 8).	OATC	<ul style="list-style-type: none"> • 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" • Controls Reactor water level between +9-48". 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 inches ○ Close both Main FW Reg Valves ○ Close MO-1133 and MO-1134 (HP Feedwater Line Block valves) ○ Verify CV-6-13 is closed when RPV level reaches +15 to +20 inches • 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. • Place DISCH VOL ISOL TEST switch in ISOL • Place SDV HIGH WATER LEVEL BYPASS in BYPASS • Reset the Scram using the SCRAM RESET switch • Reset the Rod Drift alarms

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		OATC	<ul style="list-style-type: none"> • Evacuate personnel from the RB Floor and Equipment Drain Tank Room • Verify the SDV Vent and Drain Valves open • Verify the accumulators recharge
	<p>NOTE: 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) 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. • 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 3300 gpm through each operating Feed Pump

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> Verify Auxiliary Oil Pump running on any non-operating Feed Pump Verify 3000 gpm through each operating Condensate Pump
<p>Event 7</p> <p>BOOTH INST</p>	<p>12. Unisolable Torus leak</p> <p>a. Verify Event Trigger 24 is active and verify Malfunction PC05 at 100%.</p> <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>13. Unisolable Torus Leak/ EOP 1300 Actions</p>	<p>BOP OATC</p>	<p>Respond to annunciators</p> <ul style="list-style-type: none"> Notify Rad Protection that a harsh environment or increase radiation environment may exist in the RHR rooms and that entry is required

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	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.	CRS SS314.115 BOP CR314.119	<p>Enters and directs actions from EOP-1200 (Primary Containment Control)</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
			<ul style="list-style-type: none"> • Opens the HPCI Pump Minimum Flow Valve CV-2065 • Verifies the RCIC CST Suction, MO-2201 Open • Opens the RCIC Pump Minimum Flow Valve CV-2104
CT 26	<p>15. <u>Emergency Depressurization</u></p> <p>When torus water level can NOT 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> <p>BOP</p>	<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 <p>If directed to ANTICIPATE BLOWDOWN and lower RPV pressure using the Turbine Bypass Valves</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CR304.145 BOP	<ul style="list-style-type: none"> At C-07, places PRESS REG OVERRIDE in OPEN until both Bypass valves are open Perform Emergency Depressurization <ul style="list-style-type: none"> When directed by CRS, place 3 ADS SRVs to OPEN Verifies that 3 ADS SRV have opened Monitor RPV Pressure and Level
Event 8	<p>16. <u>Control Rod 06-27 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><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 9 to close CRD-14</p> <p>1) Verify REMOTE FUNCTION CH22 goes active to close CRD-14</p> <p>b. If the OATC places the ROD MOVEMENT CONTROL switch to ROD IN to insert Rod 06-27, verify EVENT TRIGGER 28 goes active and MALFUNCTION CH02_056 DELETES.</p> <p>c. If the OATC uses EMERG ROD IN to insert Rod 06-27, verify EVENT TRIGGER 27 goes active and MALFUNCTION CH02_056 DELETES.</p>	OATC	<ul style="list-style-type: none"> Identifies that Rod 06-27 did not fully insert Informs the CRS and performs actions to insert Control Rod 06-27 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 Bypass the RWM Select and insert the full out rod

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>17. <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.

Facility: Monticello Scenario No.: NRC Scenario **3** Op-Test No.: MNGP 2013
 Examiners: _____ Operators: _____

Initial Conditions:

78% Power
 1AR Transformer OOC
 HPCI OOC

Turnover:

BOP to perform quarterly Bypass Valve Test

Event No.	Malfunction No.	Event Type*	Event Description
1	TC07D	N & TS BOP / CRS	BOP will perform quarterly Bypass Valve Test. The second bypass valve will fail to open. The CRS will address TSs.
2	CH07B	C OATC	The CRD Flow Control Valve will fail closed requiring the OATC to place the standby in service.
3	C-08-B01	C & TS BOP / CRS	The 2R XFMR will develop a severe oil leak requiring the BOP to perform an emergency transfer to the 1R XFMR. The CRS will address TSs.
4	ED05A	C & R BOP / OATC / CRS	A Bus 11 Lockout will occur requiring the BOP to take actions including for a Recirc Pump and Feed Pump Trip. The OATC will insert control rods to exit Stability Region 2.
5	RX03	C OATC / CRS	While inserting control rods, neutron flux oscillations will occur requiring the OATC to insert a manual scram.
6	CH16 & CH19	MAJOR CREW	When the reactor is scrammed, a Hydraulic ATWS will occur requiring the crew to take Failure to Scram actions.
7	SL01A/B	C (POST) OATC	While taking Failure to Scram actions the first SBLC Pump will fail to start requiring the OATC to start the other pump.

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

ES-301-4 Quantitative attributes:

Total Malfunctions (5-8): **5**
 Malfunction(s) after EOP (1-2): **E7**
 Abnormal Events (2-4): **E4, E5**
 Major Transient(s) /E-Plan entry (1-2): **E6**
 EOPs (1-2): **1100 & 2007**
 EOP Contingencies (0-2): 1 (**ATWS**)
 Critical Tasks (2-3): **3**

ES-301-5 Quantitative attributes:

BOP Normal (1/set): **E1**
 OATC Reactivity (1/set): **E4**
 BOP I/C (4/set): **E3, E4**
 OATC I/C (4/set): **E2, E5, E7**
 SRO-I I/C (4/set incl. 2 as OATC): **E2-E5 E7**
 SRO Tech Spec (2/set): **E1, E3**
 ALL Major Transients (2/set): **E6**



SIMULATOR EXERCISE GUIDE (SEG)

SITE: MONTICELLO

SEG # ILT-SS-23E

SEG TITLE: 2013 ILT NRC SCENARIO 3

REV. # 0

PROGRAM: INITIAL LICENSE TRAINING

#: MT-ILT

COURSE: NRC SIMULATOR EVALUATION

#: N/A

TOTAL TIME: 60-90 MINUTES

Additional site-specific signatures may be added as desired.

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

Guide Requirements

Goal of Training:

This Scenario evaluation has been written for the 2013 ILT NRC Exam. Once this exam is complete and exam security is relaxed, this SEG should be appropriate to use for the following activities:

- Future ILT NRC / Audit Exam Evaluations
 - SRO Certification Evaluations
 - LOR Crew development
-

Learning Objectives:

1. Demonstrate the ability to predict and/or monitor changes in parameters associated with operating system controls for the appropriate tasks.
 2. Demonstrate the ability to correctly use procedures to correct, control, or mitigate the consequences of normal and abnormal operations for the appropriate tasks.
 3. Demonstrate the ability to monitor automatic operations of the systems to ensure proper operation for the appropriate tasks.
 4. Demonstrate the ability to manually operate and/or monitor systems in the control room in accordance with approved procedures for the appropriate tasks.
 5. Demonstrate the ability to complete administrative requirements, as necessary, in order to operate the plant for the appropriate tasks.
 6. Demonstrate knowledge of and ability to implement shift supervision duties as they relate to crew operations for the appropriate tasks.
 7. Given a degrading or improving plant condition or event, demonstrate the ability to: (CRS)
 - a. Evaluate trends that may result in equipment damage or reduction in plant safety.
 - b. Ensure proper diagnosis of plant problems by monitoring and interpreting data (information from panel indications).
 - c. Evaluate and diagnose challenges to Critical Plant Parameters.
 - d. Evaluate events and accidents.
-

Prerequisites:

1. Completion of the MT-ILT Training Program, or
 2. Completion of the SRO Certification Program, or
 3. Currently enrolled in the LOR Training Program
-

Training Resources:

1. Full Scope Simulator
 2. MTF-7100-051 (Attendance Record) or LMS Equivalent
 3. 3139 (Control Room Shift Turnover Checklist)
 4. 3140 (Shift Supervisors Office Shift Turnover Checklist)
 5. Marked up copy of OPS-TRB-0570
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References:

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1. OSP-TRB-0570
 2. LCO 3.7.7
 3. 5-B-41 (CRD Hi Temperature)
 4. B.01.03-05.E.4 (Placing the Standby CRD Flow Control Valve into Service)
 5. 8-B-01 (No. 2R XFMR Trouble)
 6. B.09.06-05.E.1 (Transfer of Plant Buses From 2R to 1R - Emergency Method)
 7. LCO 3.8.1
 8. 8-B-14 (NO. 11 4160V Bus Lockout)
 9. C.4-B.09.06.A (Loss Of Bus 11 Or Bus 12)
 10. C.4-B.01.04.A (Trip Of One Recirc Pump)
 11. C.4-B.06.05.A (Feedwater Pump Trip)
 12. C.4-B.05.01.02.A (Control Of Neutron Flux Oscillations)
 13. C.4-F (Rapid Power Reduction)
 14. 5-A-38 (OPRM Alarm)
 15. 5-A-45 (OPRM Trip)
 16. C.4.K (Immediate Reactor Shutdown)
 17. EOP 1100 (RPV Control)
 18. EOP 2007 (Failure to Scram)
 19. C.5-3301 (Defeat MSIV Low-Low Level Isolation)
 20. C.5-3205 (Prevent Core Spray injection)
 21. C.5-3101 (Alternate Rod Insertion)
 22. B.03.05-05.G.1 (SBLC Manual Initiation)
 23. Torus Cooling Hard Cards
-

Commitments:

1. None
-

Evaluation Method:

The following methods are acceptable methods for examinee evaluation:

- 2013 ILT NRC Exam Process (NUREG 1021 & FP-T-SAT-72)
 - MT-ILT (MNGP ILT Program Description)
 - M-9700 (SRO Certification Program Description)
 - FP-T-SAT-73 (Licensed Operator Requalification Program)
-

Operating Experience:

Not Applicable to Evaluation Scenarios

Related PRA Information:**Initiating Event with Core Damage Frequency:**

ATWS

Important Components / Accident Class:

CRD

Important Operator Actions with Task Number:

UH – Failure to control RPV water level in an ATWS scenario.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):**SRO Tasks:**

SS299.355	Apply administrative requirements for Tech Spec Section 3.7 and Bases to Plant Systems	5
SS299.358	Apply administrative requirements for Tech Spec Section 3.8 and Bases to Electrical Power Systems	5
SS315.138	Supervise response to loss of Bus 11 or Bus 12	5-7
SS315.103	Supervise response to a trip of one recirculation pump	5-7
SS315.119	Supervise response to control neutron flux oscillations	5-7
SS315.159	Supervise rapid power reduction	5-7
SS315.164	Supervise immediate reactor shutdown	5-7
SS304.213	Implement the bases for RPV Control	5-7
SS304.201	Implement the response for a failure to scram	5-7
SS304.244	Implement the response during a high power ATWS with heat addition to torus requiring entry into level power control with RPV level controlled below -33" and RPV blowdown not required.	5-7
SS314.111	Supervise defeat of RPV low-low level isolation for MSIV closure	5-7
SS314.108	Supervise terminate and prevent	5-7
SS314.101	Supervise alternate rod insertion	5-7

RO Tasks:

CR299.357	Apply Tech Spec Section 3.7 and Bases to Plant Systems	5
CR201.111	Place the Standby CRD Flow Control Valve into Service	1-4
CR262.133	Transfer of Plant Buses From 2R to 1R using the Emergency Method	1-4
CR299.358	Apply Tech Spec Section 3.8 and Bases to Electrical Power Systems	5
CR200.182	Perform procedure for a loss of BUS 11 or 12	1-4
CR200.148	Perform the procedure for one recirculation pump trip	1-4
CR200.168	Perform the procedure for Control of Neutron Flux Oscillations	1-4
CR200.203	Perform the procedure for rapid power reduction	1-4
CR200.208	Perform the procedure for immediate reactor shutdown	1-4
CR212.105	Manually Initiate the ATWS System	1-4
CR314.104	Perform actions associated with Failure to Scram	1-4
CR314.129	Perform actions during a high power ATWS with heat addition to torus requiring entry into level power control with RPV level controlled below -33" and RPV blowdown not required.	1-4
CR314.115	Defeat RPV Low-Low Level Isolation for MSIV Closure	1-4
CR314.112	Perform actions to Terminate and Prevent injection	1-4
CR314.105	Perform actions associated with Alternate Rod Insertion	1-4
CR211.106	Manually Initiate Standby Liquid Control System	1-4

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. Stuck Closed Bypass Valve
2. CRD Flow Control Valve failure
3. 2R Transformer oil leak
4. Bus 11 Lockout

After EOP Entry:

1. ARI Failure
2. SBLC Pump failure

Abnormal Events:

1. Emergency Transfer of plant power from the 2R to 1R transformer.
2. Loss of Bus 11
3. Trip of One Recirc Pump
4. Neutron Flux Oscillations

Major Transients:

1. Hydraulic ATWS

Critical Tasks:

1. **CT-8:** Scram the reactor in response to core oscillations as indicated by:
 - LPRM HI or DOWNSCALE alarms in a wide area of the core that repeatedly alarm, then clear.
 - LPRM indications on the RBM ODA displays indicate oscillation.
 - APRM recorders indicate a peak-to-peak oscillation greater than 10% that is not attributable to pressure or Recirc flow control problems.
2. **CT-46:** During failure to scram conditions with reactor power above 3.5%, terminate and prevent injection from all sources except SBLC, RCIC, and CRD until level lowers to at least -33".
3. **CT-48:** 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.

SCENARIO OVERVIEW:**SEQUENCE OF EVENTS:****Event 1: Exercise Main Turbine Bypass Valves**

- BOP operator will perform OPS-TRB-0570 (Quarterly Bypass Valve Test). The second Bypass valve will fail to open, stopping the test and requiring the CRS to evaluate Tech Specs.

Event 2: CRD Flow Control Valve fails closed

- The CRD Flow Control Valve (CV-19A) will fail closed resulting in CRD high temperature alarms. The OATC will take action to transfer to the standby flow control valve.

Event 3: 2R Trouble – Oil Leak

- A 2R Trouble alarm will be received. The Outplant operator will report a large oil leak on the transformer. This will require the BOP operator to perform an emergency transfer to the 1R transformer. The CRS will evaluate Tech Specs.

Event 4: Bus 11 Lockout

- An 11 Bus lockout will occur requiring the BOP to take actions including actions for a trip of a recirc pump. The OATC will need to insert control rods to exit Stability Region 2 of the power to flow map.

Event 5: Neutron Flux Oscillations requiring a manual reactor scram

- While the OATC is inserting control rods for RPR neutron flux oscillations will begin. This will require the OATC to insert a manual reactor scram.

Event 6: Hydraulic ATWS.

- When the reactor is scrammed multiple control rods will fail to insert. The crew will take action IAW the Failure to Scram procedure to lower power and insert control rods.

Event 7: SBLC Pump Failure.

- While the crew is taking failure to scram action the first SBLC pump that the OATC attempts to start will fail. The OATC will be successful in starting the second pump.

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
	<p>1. <u>INITIAL CONDITIONS (IC):</u></p> <ul style="list-style-type: none"> a. Mode: RUN b. Present Power Level: 78% c. XCEL System Condition: Green d. Plant CDF: Yellow for HPCI & 1AR e. Electrical lineup – 2R f. Fuel Pool Status: Green, 79.2 hours to boil g. Generator Output: ~455 MWe h. Staffing: Weekend Night Shift i. Planned Shift Activities: Main Turbine Bypass Valve Exercise Test. j. The following equipment is OOS: <ul style="list-style-type: none"> 1) 1AR Transformer for an Oil Leak 2) HPCI for Aux Oil pump repair. <ul style="list-style-type: none"> a) LCO 3.5.1 is NOT met b) Condition J was entered at 0600 today c) Required Action J.1 is complete d) Required Action J.2 is due in 14 days 		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	<p>2. <u>SIMULATOR SET UP</u></p> <p>a. Reset the simulator to IC-283 (PW: mallard3) and place in RUN. Verify the correct malfunctions, remotes, overrides and event triggers are loaded as listed in the Simulator Input Summary page(s).</p> <p>b. Insert Manual Trigger 30 to load simulator initial conditions and preloaded malfunctions.</p> <p>c. Tag out both of the 1AR Transformer hand switches 152-511/CS & 152-610/CS as follows:</p> <ol style="list-style-type: none"> 1) Verify both hand switches are in PTL. 2) Hang CAUTION (yellow) cards on both hand switches 3) Verify the GREEN lights are OFF on both hand switches <p>d. Tag out HPCI as follows:</p> <ol style="list-style-type: none"> 1) Verify the Aux Oil Pump hand switch in PTL, hang a CAUTION (yellow) card on the pump hand switch and verify its GREEN light is OFF. 2) Verify MO-2034 & MO-2035 are closed, hang CAUTION (yellow) cards on the valve hand switches and verify their GREEN lights are OFF on C-03 and the MIMIC. 		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<ul style="list-style-type: none"> 3) Depressurize the HPCI steam line by opening CV-2043 (Steam Line Drain) until 0 psig is indicated. 4) Place a Protected Equipment Sign on C-04 for RCIC e. Ensure the following are provided for the crew: <ul style="list-style-type: none"> 1) Turnover checklists (3139 & 3140) 2) LCO Tracking Module for HPCI 3) Marked up copy of OPS-TRB-0570 f. ENSURE Cross Flow is DISABLED on PCS as follows: <ul style="list-style-type: none"> 1) Verify computer points CFW966-CFW969 are set to "DISABLED" 2) ENSURE Remote PO03 (CROSSFLOW DISABLED/ENABLED) is set to DISABLED g. Verify the status board is updated IAW Section 1 h. Complete the Simulator Setup Checklist 		
FLOOR INST	<p>3. <u>SIMULATOR PRE-BRIEF:</u></p> <ul style="list-style-type: none"> a. REVIEW the scenario initial conditions as listed in Section 1: For examination purposes a "Lead Instructor – Crew Turnover Brief" has been created. This should be reviewed with the crew prior to allowing the crew in the simulator. b. VERIFY the crew performs a walk-down of the control boards prior to starting the shift brief. 	Crew	Performs walk down of control boards and reviews turnover checklists.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	<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 54-56 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>		

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
<p>Event 3</p> <p>BOOTH INST</p> <p>BOOTH INST</p>	<p>7. <u>Oil leak on 2R / Emergency transfer to 1R</u></p> <p>a. When directed by the Lead Examiner, insert Manual Trigger 7 and verify C-08-B01, 2TR Trouble goes active</p> <p>Key Parameter Response: None</p> <p>Key Expected Alarms: 8-B-01 (No. 2R XFMR TROUBLE)</p> <p>Auto Actions: None</p> <p>NOTE: The following cue must make it clear that it is imperative to do the emergency transfer operation.</p> <p>b. Role Play the dispatched operator: 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</p>	<p>BOP</p> <p>CRS</p> <p>BOP CR262.133</p>	<ul style="list-style-type: none"> • Dispatch an operator to investigate from a distance. • Verify that 2R Voltages appear normal • Relay information about the oil leak to the CRS and makes plant page to clear personnel from the area <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"> • Verify 115KV system voltage is ≥ 117.4 KV or confirm that the 10TR/XFMR auto load tap changer is in service. • Bus 13 <ul style="list-style-type: none"> ○ Place 152-302/CS to CLOSE ○ Place 152-301/CS to TRIP

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	<p>NOTE: Verify the BOP has opened the knife switch on C-31. If not, then DO NOT open 3N4 with the following actions.</p> <p>c. Role Play the equipment operator dispatched to open 3N4 as necessary. Wait 1 minutes and:</p> <ol style="list-style-type: none"> 1) Activate Manual Trigger 9 2) Verify Remote Function ED06, 3N4 Local operation, to OPEN <p>d. If asked, Role Play personnel to confirm that the 10TR XFMR Auto load tap changer is in service.</p>		<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 152-102/CS to CLOSE ○ Place 152-101/CS to TRIP • Bus 12 <ul style="list-style-type: none"> ○ Place 152-202/CS to CLOSE ○ Place 152-201/CS to TRIP
BOOTH INST		BOP	<ul style="list-style-type: none"> • Open knife switch 16 on panel C-31 • Open 3N4 34.5KV Circuit Breaker
BOOTH INST		CRS SS299.358	<ul style="list-style-type: none"> • Dispatch an operator to place the 2R Load Tap Changers in Manual and adjust voltages locally • Notify the System Dispatcher (TSO) of the Transfer to the 1R Transformer <p>Evaluates LCO 3.8.1 as NOT met</p> <ul style="list-style-type: none"> • Condition A is applicable

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	e. Role Play as necessary to inform the crew that another operator will be called in to perform OSP-MSC-0542	CR299.358	<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 INST	f. 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 4 BOOTH INST	<p>8. <u>Bus 11 Lockout</u></p> <p>a. When directed by the lead evaluator, Insert Manual Trigger 11 verify ED05A goes active .</p> <p>Key Parameter Response: Loss of voltage on Bus 11, Trip of 11 Recirc Pump, Trip of 11 Feedpump</p> <p>Key Expected Alarms: 8-B-14 (NO. 11 4160V BUS LOCKOUT)</p> <p>Auto Actions: None</p>	<p>SS315.138 CR200.182</p> <p>OATC/ BOP</p> <p>BOP</p> <p>OATC</p> <p>BOP</p>	<p>Responds to annunciators and reports to the CRS</p> <p>Enters C.4-B.09.06.A (Loss Of Bus 11 Or Bus 12)</p> <ul style="list-style-type: none"> Monitor and control Reactor water level +9 to +48” Places 11 FW Pump in STOP

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>NOTE: This will be a required action once the OATC performs the reactivity manipulation using C.4-F (Rapid Power Reduction).</p> <p>b. While the 2nd control rod is being inserted for the reactivity manipulation and at the discretion of the lead evaluator, move on to <u>Event 5.</u></p>	<p>SS315.103 CR200.148</p> <p>OATC</p> <p>OATC SS315.159 CR200.203</p>	<p>Enters C.4-B.01.04.A (Trip Of One Recirc Pump)</p> <ul style="list-style-type: none"> Closes MO-2-53A (11 RECIRC PUMP DISCHARGE) valve After 5 minutes, verify APRM rod block setpoints and reopens the discharge valve. <p>Enters C.4-B.06.05.A (Feedwater Pump Trip)</p> <ul style="list-style-type: none"> Adjusts Master Controller as necessary to control RPV level <p>Enters C.4-B.05.01.02.A (Control Of Neutron Flux Oscillations)</p> <ul style="list-style-type: none"> Determines plant is operating in Stability Region 2 of the power to flow map If plant is operating in the restricted area, Stability Region I, or Stability Region II, AND neutron flux oscillations are observed for any reason, THEN perform a manual reactor scram. <p>Enters C.4-F (Rapid Power Reduction)</p> <ul style="list-style-type: none"> Inserts control rods to restore operating conditions within the analyzed region of the power flow map. Based on plant conditions, power will need to be reduced to approximately 35-40% power to exit Region 2.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
<p>Event 5 BOOTH INST</p> <p>CT-8</p>	<p>9. <u>Neutron Flux Oscillations</u></p> <p>a. When the second control rod is being inserted and/or directed by the Lead Examiner, insert Manual Trigger 13 and verify RX03 and CH19 go active.</p> <p>Key Parameter Response: Reactor power oscillation 10-20%</p> <p>Key Expected Alarms: 5-A-38 (OPRM ALARM), 5-A-45 (OPRM TRIP)</p> <p>Auto Actions: None, OPRM Scram failure</p> <p>Scram the reactor in response to core oscillations as indicated by:</p> <ul style="list-style-type: none"> • LPRM HI or DOWNSCALE alarms in a wide area of the core that repeatedly alarm, then clear. • LPRM indications on the RBM ODA displays indicate oscillation. • APRM recorders indicate a peak-to-peak oscillation greater than 10% that is not attributable to pressure or Recirc flow control problems. 	<p>SS315.119</p> <p>OATC CR200.168</p>	<p>Enters C.4-B.05.01.02.A (Control Of Neutron Flux Oscillations)</p> <p>If plant is operating in the restricted area, Stability Region I, or Stability Region II, AND neutron flux oscillations are observed for any reason, THEN perform a manual reactor scram.</p>
	<p>10. <u>Immediate Reactor Shutdown</u></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</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>11. <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 >3%, 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>12. Hydraulic ATWS Power Leg Actions</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>NOTE: ARI will NOT work for this scenario.</p>	<p>OATC CR314.105</p> <p>SS314.101</p> <p>CR212.105</p>	<ul style="list-style-type: none"> Performs C.5-3101 (Alternate Rod Insertion) Verifies Recirc pumps are at minimum speed and trips the pumps Arms and Actuates A/B ATWS and determines if ARI is having success.
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>a. When requested to close CRD-168, activate Manual Trigger 15 and verify CH34 goes active. Wait 1 minute and report it as closed.</p>	<p>OATC</p>	<p>Performs PART C (INCREASE COOLING WATER DIFFERENTIAL PRESSURE AND USE RMCS)</p> <ul style="list-style-type: none"> Bypasses RWM Starts both CRD pumps 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 <ul style="list-style-type: none"> Establish Drive Pressure as high as possible below 400 psig by one or more of the following:

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	b. If requested to close CRD-14, activate Manual Trigger 17 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	c. Prior to the OATC inserting control rods, DELETE Malfunction CH19 to allow rods to be driven in.		<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
BOOTH INST	d. When requested to deenergize the ARI valves insert Manual Trigger 19 , this modifies RR18 is to Open . Wait 1 minute and report the ATWS 125 VDC Breakers Open. NOTE: These contacts are modeled in the simulator. The jumpers are included with the C.5-3101 procedure.		<p>Performs PART D (RESCRAM CONTROL RODS)</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. ● 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
BOOTH INST	e. If requested to open CRD-14, modify Remote Function CH22 is to Open , wait 1 minute and report CRD-14 Open. NOTE: This may take up to 7 minutes.		<ul style="list-style-type: none"> ● Verifies SDV Vent and drain valves Open ● When Annunciator C05-B-21 clears, closes the SDV vent and drain valves
BOOTH INST	f. If the Manual Reactor Scram is inserted for Part D, Delete Malfunction CH16 to allow the control rods to insert.		<ul style="list-style-type: none"> ● Inserts a Manual Reactor Scram

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
CT-46	<p>During failure to scram conditions with reactor power above 3.5%, terminate and prevent injection from all sources except SBLC, RCIC, and CRD until level lowers to at least -33".</p> <p>For level control, the CRS should direct condensate and feedwater injection re-established and used to maintain level in the desired band.</p>	<p>BOP CR314.112</p> <p>BOP</p> <p>CRS</p>	<ul style="list-style-type: none"> • Prevents injection from Condensate & Feedwater by placing the FRV Controllers in Manual and closing the Reg Valves • Prevents injection form HPCI by placing the Aux Oil Pump in PTL • 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 <3.5% 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 • Uses Condensate & Feedwater as necessary to maintain established level band.
	<p>15. <u>Hydraulic ATWS Pressure Leg Actions</u></p>	<p>CRS/ BOP</p>	<ul style="list-style-type: none"> • Stabilize RPV pressure below 1056 psig using the one remaining Bypass Valve and/or SRVs (LL-SET)

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>16. (PRIMARY CONTAINMENT CONTROL)</p> <p>NOTE: Based on Crew priorities and Torus water temperature EOP-1200 actions may be taken.</p>	<p>BOP</p> <p>CRS</p> <p>BOP</p>	<p>Monitor Primary Containment Parameters</p> <ul style="list-style-type: none"> If Torus Water Temperature exceeds 90°F, notify the CRS of the EOP C.5-1200 entry condition. <p>Enters EOP C.5-1200 Primary (Containment Control)</p> <ul style="list-style-type: none"> Directs start of all available Torus Cooling <p>Starts all available Torus Cooling IAW the Hard Card.</p> <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. CLOSE MO-2002 (2003), HX Bypass. Verify V-AC-5(4), A(B) RHR RM COOLER in operation.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
BOOTH INST	<p>When Power & Level Control actions have been performed AND when directed by the Lead Examiner, Delete Malfunction CH16 to allow the control rods to insert.</p> <p>17. SCENARIO TERMINATION</p> <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.

Facility: Monticello Scenario No.: NRC Scenario **4(SPARE)** Op-Test No.: MNGP 2013
 Examiners: _____ Operators: _____

Initial Conditions:

100% Power
 12 Service Water Pump

Turnover:

BOP to shift RBCCW Pumps

Event No.	Malfunction No.	Event Type*	Event Description
1	None	N BOP	BOP will transfer to the standby RBCCW pump
2	C-05-B20	I - TS OATC / SRO	A low condenser vacuum switch will fail with RPS failing to insert a ½ scram. The OATC will need to insert a ½ scram and the CRS will address Technical Specifications
3	AP07	C & TS BOP / CRS	The ADS timer will inadvertently initiate requiring the BOP to inhibit it. The CRS will address TSs.
4	04-A2S70-04	C & R BOP / OATC / CRS	The EPR will fail upscale automatically placing the MPR in service. The BOP will be unsuccessful lowering reactor power and pressure with the MPR requiring the OATC to reduce recirc to stay below 100% power.
5	04-A2S59-02	C OATC / CRS	The MPR will fail in the lowering direction requiring the OATC to insert a manual scram.
6	CH22A/B	MAJOR CREW	When the reactor is scrammed a set of SDV vent and drain valves will fail to close. This will drive radiation levels up in the RB and require the crew to perform an ED when two max safe values are reached.
7	AP08D	C (POST) BOP	When performing actions for the ED, one SRV will fail to open. This will require the BOP to open other SRVs until a total of 3 are verified open.

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

ES-301-4 Quantitative attributes:

Total Malfunctions (5-8): **6**
 Malfunction(s) after EOP (1-2): **E7**
 Abnormal Events (2-4): **E3, E4, E5**
 Major Transient(s) /E-Plan entry (1-2): **E6**
 EOPs (1-2): **1300 & 2002**
 EOP Contingencies (0-2): **1 (ED)**
 Critical Tasks (2-3): **2**

ES-301-5 Quantitative attributes:

BOP Normal (1/set): **E1**
 OATC Reactivity (1/set): **E4**
 BOP I/C (4/set): **E3, E4, E7**
 OATC I/C (4/set): **E2, E5**
 SRO-I I/C (4/set incl. 2 as OATC): **E2, E3, E4, E5**
 SRO Tech Spec (2/set): **E2, E3**
 ALL Major Transients (2/set): **E6**

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE: MONTICELLO

SEG # ILT-SS-24E

SEG TITLE: 2013 ILT NRC SCENARIO 4

REV. # 0

PROGRAM: INITIAL LICENSE TRAINING

#: MT-ILT

COURSE: NRC SIMULATOR EVALUATION

#: N/A

TOTAL TIME: 60-90 MINUTES

Additional site-specific signatures may be added as desired.

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

Guide Requirements

Goal of Training:

This Scenario evaluation has been written for the 2013 ILT NRC Exam. Once this exam is complete and exam security is relaxed, this SEG should be appropriate to use for the following activities:

- Future ILT NRC / Audit Exam Evaluations
 - SRO Certification Evaluations
 - LOR Crew development
-

Learning Objectives:

1. Demonstrate the ability to predict and/or monitor changes in parameters associated with operating system controls for the appropriate tasks.
 2. Demonstrate the ability to correctly use procedures to correct, control, or mitigate the consequences of normal and abnormal operations for the appropriate tasks.
 3. Demonstrate the ability to monitor automatic operations of the systems to ensure proper operation for the appropriate tasks.
 4. Demonstrate the ability to manually operate and/or monitor systems in the control room in accordance with approved procedures for the appropriate tasks.
 5. Demonstrate the ability to complete administrative requirements, as necessary, in order to operate the plant for the appropriate tasks.
 6. Demonstrate knowledge of and ability to implement shift supervision duties as they relate to crew operations for the appropriate tasks.
 7. Given a degrading or improving plant condition or event, demonstrate the ability to: (CRS)
 - a. Evaluate trends that may result in equipment damage or reduction in plant safety.
 - b. Ensure proper diagnosis of plant problems by monitoring and interpreting data (information from panel indications).
 - c. Evaluate and diagnose challenges to Critical Plant Parameters.
 - d. Evaluate events and accidents.
-

Prerequisites:

1. Completion of the MT-ILT Training Program, or
 2. Completion of the SRO Certification Program, or
 3. Currently enrolled in the LOR Training Program
-

Training Resources:

1. Full Scope Simulator
 2. MTF-7100-051 (Attendance Record) or LMS Equivalent
 3. 3139 (Control Room Shift Turnover Checklist)
 4. 3140 (Shift Supervisors Office Shift Turnover Checklist)
 5. Lead Instructor – Crew Turnover Brief paperwork
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References:

1. B.02.05-05.E.1 (Transfer to Standby Pump)
 2. C05-A-22 (APRM UPSC/INOP Trip)
 3. C05-A-3 (Rod Withdraw Block)
 4. C05-A14 (APRM ALARM)
 5. LCO 3.3.1.1, LCO 3.3.2.1 and TLCO 3.3.2.1
 6. 3-A-25 (Auto Blowdown Timer Activated)
 7. C.4-G (Inadvertent ECCS Initiation)
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8. LCO 3.3.5.1 & LCO 3.5.1
 9. C07-B-15 (EPR Trouble)
 10. C.4-B.05.09-B (Main Steam Pressure Regulator Failure Causing Increased Pressure)
 11. B.04.01-05.E.01 (Changing Recirculation Flow) hard card
 12. 5-B-16 (Reactor Press Hi/Low)
 13. C.4-B.05.09.A (Main Steam Pressure Regulator Failure Causing Reduction in Main Steamline Pressure)
 14. C.4-A (Reactor Scram)
 15. C.5-1100 (RPV Control)
 16. C.5-1300 (Secondary Containment Control)
 17. C.5-2002 (Emergency Depressurization)
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Commitments: 1. None

Evaluation Method: The following methods are acceptable methods for examinee evaluation:

- 2013 ILT NRC Exam Process (NUREG 1021 & FP-T-SAT-72)
- MT-ILT (MNGP ILT Program Description)
- M-9700 (SRO Certification Program Description)
- FP-T-SAT-73 (Licensed Operator Requalification Program)

Operating Experience: Not Applicable to Evaluation Scenarios

Related PRA Information:

Initiating Event with Core Damage Frequency:
None

Important Components / Accident Class:
None

Important Operator Actions with Task Number:
None

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):**SRO Tasks:**

SS299.351	Apply administrative requirements for Tech Spec Section 3.3 and Bases to Instrumentation	5-7
SS315.160	Supervise response to inadvertent ECCS initiation	5-7
SS299.353	Apply administrative requirements for Tech Spec Section 3.5 and Bases to ECCS and RCIC	5-7
SS315.123	Supervise response to increasing pressure caused by main steam pressure regulator failure	5-7
SS315.159	Supervise rapid power reduction	5-7
SS315.122	Supervise response to decreasing pressure caused by main steam pressure regulator failure	5-7
SS315.164	Supervise immediate reactor shutdown	5-7
SS315.101	Supervise response to a reactor scram	5-7
SS304.196	Implement secondary containment control	5-7
SS304.239	Implement the response for a primary system leak in secondary containment, exceeding max safe values in 2 or more areas with an RPV blowdown required.	5-7
SS304.198	Implement emergency RPV depressurization	5-7

RO Tasks:

CR208.102	Transfer to the Standby RBCCW Pump	1-4
CR299.353	Apply Tech Spec Section 3.3 and Bases to Instrumentation	5
CR200.204	Perform the procedure for an inadvertent ECCS initiation	1-4
CR299.355	Apply Tech Spec Section 3.5 and Bases to ECCS and RCIC	5
CR200.167	Perform the procedure for a main steam press regulator failure causing increasing pressure	1-4
CR200.108	Changing recirculation flow	1-4
CR200.166	Perform the procedure for a main steam press regulator failure causing a reduction in main steam pressure	1-4
CR200.203	Perform the procedure for rapid power reduction	1-4
CR200.208	Perform the procedure for immediate reactor shutdown	1-4
CR200.146	Perform the procedure for a Reactor Scram	1-4
CR304.105	Perform action associated with Secondary Containment Control	1-4
CR304.153	Perform actions for a primary system leak in secondary containment, exceeding max safe values in 2 or more areas with an RPV blowdown required.	1-4
CR314.101	Perform action associated with Emergency RPV Depressurization	1-4

QUANTITATIVE ATTRIBUTES**Malfunctions:***Before EOP Entry:*

1. APRM upscale failure
2. Inadvertent ADS timer initiation
3. EPR upscale failure with MPR lock
4. MPR fails downscale
5. Scram Discharge Volume failure to isolate

After EOP Entry:

1. ADS Valve failure

Abnormal Events:

1. Inadvertent ECCS initiation
2. Main Steam Pressure Regulator Failure Causing Increased Pressure
3. Main Steam Pressure Regulator Failure Causing Reduction in Main Steam Line Pressure

Major Transients:

1. Unisolable leak from SDV resulting in a RPV blowdown

Critical Tasks:

1. **CT-16 Inhibit ADS to avoid auto initiation that would result in a violation of cooldown rate or a loss of adequate core cooling.**
2. **CT-34 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.**

SCENARIO OVERVIEW:**Event 1: Shift Running RBCCW Pumps (Optional)**

- BOP shifts RBCCW pumps IAW the B-manual for obtaining vibration data.

Event 2: Condenser Vacuum switch Failure

- Condenser Low-Vacuum switch fails. The annunciator alarms but the Channel A RPS logic fails to trip, which requires the OATC to insert a ½ scram on RPS A. The CRS will evaluate Tech Specs for the inoperable switch.

Event 3: ADS Timer Failure (Optional)

- The ADS timer will inadvertently initiate. This will require the CRS to direct that the ADS system be placed in “Inhibit” IAW C.4-G prior to the timer counting down.
- The CRS will evaluate Tech Specs for ADS being in “Inhibit” and declare the ADS function for all 3 ADS valves inoperable. This requires entry into 3.5.1.L & 3.5.1.N.

Event 4: EPR Upscale Failure with MPR Locking in Position (Optional)

- The EPR will fail upscale, resulting in the MPR taking over at a higher CTP and the crew will need to lower reactor pressure.
- When the crew attempts to utilize the MPR to lower reactor pressure, the MPR will lock in place, forcing the OATC to reduce reactor power with Recirc Pumps.

Event 5: MPR Downscale Failure with Reactor Scram

- The MPR will fail downscale and the crew will need to take action to scram the reactor prior to the automatic setpoint of 840 psig with the mode switch in RUN.
- Reactor pressure control will be restored to the MPR following the placement of the mode switch to the SHUTDOWN position.

Event 6: SDV Vent and Drain Valve Failure to Isolate

- Concurrently with the Scram, the SDV Vent and Drain Valves will fail to isolate resulting in an unisolable leak into the Reactor Building.
- Upon two areas reaching MAX SAFE, the CRS will direct the performance of an Emergency Depressurization IAW C.5-1300.

Event 7: D SRV fails to open for the Blowdown

- The BOP will recognize that the D SRV failed to open for the ED and open additional SRVs until a total of 3 are verified open.

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
	<p>1. INITIAL CONDITIONS (IC):</p> <ul style="list-style-type: none"> a. Mode: RUN b. Present Power Level: 100% c. XCEL System Condition: Green d. Plant CDF: Green e. Electrical lineup – 2R. f. Fuel Pool Status: Green, 79.2 hours to boil g. Generator Output: ~605 MWe h. Staffing: Normal Weekday Dayshift i. Planned Shift Activities: Shift to #12 RBCCW pump for vibration analysis j. The following equipment is OOS: <ul style="list-style-type: none"> 1) 12 Service Water Pump for scheduled maintenance 		
BOOTH INST	<p>2. SIMULATOR SET UP</p> <ul style="list-style-type: none"> a. Reset the simulator to IC-284 (PW: mallard4) and place in RUN. Verify the correct malfunctions, remotes, overrides and event triggers are loaded as listed in the Simulator Input Summary page(s). b. Insert Manual Trigger 30 to load simulator initial conditions and preloaded malfunctions. c. Tag out 12 Service Water Pump as follows: <ul style="list-style-type: none"> 1) Place its hand switch in NORMAL-AFTER-STOP 		

SCENARIO TIME-LINE:			
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	2) Hang a CAUTION (yellow) card on the pump 3) Verify its GREEN light is OFF. d. Ensure the following are provided for the crew: e. Turnover checklists (3139 & 3140) f. ENSURE Cross Flow is ENABLED on PCS as follows: 1) Verify computer points CFW966-CFW969 are set to "ENABLED" 2) ENSURE Remote PO03 (CROSSFLOW DISABLED/ENABLED) is set to ENABLED g. Verify the status board is updated IAW Section 1 h. Complete the Simulator Setup Checklist		
FLOOR INST	3. <u>SIMULATOR PRE-BRIEF:</u> a. REVIEW the scenario initial conditions as listed in Section 1: For examination purposes a "Lead Instructor – Crew Turnover Brief" has been created. This should be reviewed with the crew prior to allowing the crew in the simulator. b. VERIFY the crew performs a walk-down of the control boards prior to starting the shift brief.	Crew	Performs walk down of control boards and reviews turnover checklists.
	4. <u>SHIFT BRIEF</u> Role Play as necessary. Turbine Building status: 1). 5 Condensate Demins are in service. 2). E vessel d/p is highest @ 5.2 psid.	Crew	Conduct and participate in the Shift Brief

SCENARIO TIME-LINE:			
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	<p>3). 12 Service Water Pump is tagged out for scheduled maintenance</p> <p>4). All other systems in Turbine building are normal.</p> <p>Role Play as necessary. Extra out plant operator.</p> <p>1) Nothing to add.</p> <p>Role Play as necessary. Rx Building status:</p> <p>1) All systems in the Rx Bldg are normal.</p>	CRS	Crew assumes the duty.
Event 1	<p>5. <u>SHIFT RUNNING RBCCW PUMPS (Optional)</u></p> <p>NOTE: This event is OPTIONAL and has no bearing on the subsequent events. It may be omitted at the discretion of the Lead Examiner when the BOP/CRS candidates have had the requisite NORMAL evolution.</p>	CRS	Directs BOP to Transfer RBCCW to #12 RBCCW Pump IAW
Booth Operator	a. Respond as RBO that you are standing by at the RBCCW pumps	BOP CR208.102	Directs RBO to be stationed by the RBCCW pumps.
Booth Operator	b. Respond as RBO that the #12 RBCCW pump suction and discharge valves are fully open.	BOP	Directs RBO to verify valve positions.
Booth Operator	c. Respond as RBO that the #12 RBCCW pump is operating normally.	BOP BOP	BOP starts standby pump from C-06 Directs RBO to check pump and motor performance
Booth Operator	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.	BOP	Directs RBO to slowly CLOSE discharge valve on #11 RBCCW pump and then immediately secures the pump.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
Booth Operator	<p>NOTE: This event is OPTIONAL and has no bearing on the subsequent events. It may be omitted at the discretion of the Lead Examiner when the BOP/CRS candidates have had the requisite number of Instrument/Component failures, Critical Tasks and Tech Spec calls.</p> <p>When directed by the Lead Evaluator, insert MANUAL TRIGGER 7 and verify AP07 is active:</p> <p>Key Parameter Response: ADS timer timing down and Audible Alarm</p> <p>Key Expected Alarms: 3-A-25 (Auto Blowdown Timer Activated)</p> <p>Automatic Actions: After the ADS timer times out, an ADS actuation will occur, resulting in the depressurization of the RPV.</p>	BOP	Acknowledges the alarm and informs the CRS that the ADS timer is timing down
Booth Operator	<p>a. <u>If</u> Inhibit switches are NOT placed in INHIBIT, <u>Then</u> insert Manual Trigger 8 to activate AP02. This will open the ADS valves. DELETE AP02 if the switches are then placed in INHIBIT.</p>	Crew CRS SS315.160 BOP CR200.204	Verifies plant parameters do not require ADS initiation (DW pressure and Reactor level are in the normal band). Directs the BOP to perform actions of C.4-G (Inadvertent ECCS Initiation) Per step 4 of C.4-G, places ADS Inhibit switches to INHIBIT and informs the CRS that ADS is inhibited.
CT-16	<p>Inhibit ADS to avoid auto initiation that would result in a violation of cooldown rate or a loss of adequate core cooling.</p>	CRS	Evaluates LCO 3.3.5.1 as <u>NOT</u> MET
Booth Operator	<p>b. If contacted as System Engineer, acknowledge report and inform operator you will assemble a troubleshooting team immediately.</p>		<ul style="list-style-type: none"> Enters Conditions A & G Required Actions – Declare ADS Valves inoperable within one hour
		CRS	<p>Evaluates LCO 3.5.1 as NOT MET once ADS valves are declared inoperable.</p> <ul style="list-style-type: none"> Enters Conditions L & N apply.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> Most restrictive Required Action - Condition N requires the plant to be placed in MODE 3 within 12 hours.
Event 4 Booth Operator	<p>8. <u>EPR Upscale Failure with MPR Locking in Position (Optional)</u></p> <p>NOTE: This event is OPTIONAL and has no bearing on the subsequent events. It may be omitted at the discretion of the Lead Examiner when the BOP/CRS/OATC candidates have the requisite number of Instrument/Component failures or reactivity manipulations.</p> <p>a. When directed by the lead evaluator, INSERT MANUAL TRIGGER 9 and verify Override 04-A2S70-04 goes active.</p> <p>Key Parameter Response: RPV Pressure rises which also raises Core Thermal Power</p> <p>Key Expected Alarms: C07-B-15 (EPR Trouble)</p> <p>Auto Actions: The MPR begins to control pressure</p>	BOP	<ul style="list-style-type: none"> Responds to C07-B-15, EPR TROUBLE and notifies the CRS Verifies that the MPR assumes stable steam pressure control Depress the ELECTRIC PRESSURE REG STOP Pushbutton Recognizes that the EPR TROUBLE annunciator does not reset
		<p>CRS SS315.123 BOP CR200.167 BOP/ATC BOP</p>	<p>Performs C.4-B.05.09-B Main Steam Pressure Regulator Failure Causing Increased Pressure</p> <ul style="list-style-type: none"> Monitor Reactor Pressure Identifies that Reactor pressure increased slightly when the EPR failed Attempts to adjust the MPR to lower RPV pressure but will be unsuccessful and informs CRS.

SCENARIO TIME-LINE:			
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Booth Operator	<p>b. Role Play plant support personnel as necessary to acknowledge report.</p> <p>NOTE: It is not the intent of this portion of the SEG to evaluate Tech Specs.</p>	<p>BOP CRS</p> <p>CRS CR200.203 SS315.159 CR202.108</p> <p>OATC</p>	<ul style="list-style-type: none"> Initiate an investigation to determine the cause of the EPR failure Directs OATC to reduce Rx Power using recirc pumps IAW the B.04.01-05.E.01 (Changing Recirculation Flow) hardcard, or IAW C.4-F (Rapid Power Reduction). Lowers power to restore reactor power within thermal limits.
Event 5 Booth Operator	<p>9. MPR Downscale Failure with Reactor Scram</p> <p>a. After crew brief or when directed by the Floor Instructor, INSERT MANUAL TRIGGER 11 and verify override 04-A2S59-01 activates.</p> <p>Key Parameters: Reactor pressure lowers, Reactor power lowers</p> <p>Expected Alarms: 5-B-16 (Reactor Press Hi/Low)</p>	<p>Crew</p> <p>BOP</p>	<p>Identifies Reactor pressure lowering, reports Reactor low pressure alarm and refers to appropriate ARP.</p> <p>Determines MPR setpoint is lowering. Reports this to CRS.</p>
Booth Operator	<p>Automatic Actions: Group 1 Isolation at 840 psig with Mode Switch in RUN</p> <p>b. When the Mode switch is placed in SHUTDOWN, verify EVENT TRIGGER 27 activates and the following occurs:</p> <p>1) 04-A2S59-01 deletes</p>	<p>CRS SS315.122 SS315.101</p> <p>OATC CR200.166 SS315.164</p> <p>OATC SS315.101 CR200.146</p>	<p>Enters C.4-B.05.09.A (Main Steam Pressure Regulator Failure Causing Reduction in Main Steamline Pressure) and directs manual Reactor scram.</p> <p>Inserts a manual Reactor scram.</p> <p>Takes actions IAW C.4-A (Reactor Scram) PART A:</p> <ul style="list-style-type: none"> Place Mode Switch in SHUTDOWN. <ul style="list-style-type: none"> Verify all Control Rods are inserted to or beyond position 04. Provides scram script to CRS. Reports RPV less than 9” EOP entry condition.

SCENARIO TIME-LINE:			
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	2) 01-DS124-02 activates 3) AP08D, RM01F&G activate		<ul style="list-style-type: none"> • Controls Reactor water level between +9 and +48 inches. When RPV 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 inches ○ Close both Main FW Reg Valves ○ Close MO-1133 and MO-1134 (HP Feedwater Line Block valves) ○ Verify CV-6-13 is closed when RPV level reaches +15 to +20 inches • Monitor Reactor Power <ul style="list-style-type: none"> ○ Insert SRM and IRM detectors. ○ Switch recorders from APRM to IRM.
	<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 necessary. • Verify SDV Vent and Drain Valves closed. • Verify Recirc Pumps have run back to minimum Takes actions IAW C.4-A (Reactor Scram) PART B: <ul style="list-style-type: none"> • Plant page 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.

SCENARIO TIME-LINE:			
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			<ul style="list-style-type: none"> Start the Turbine Bearing Lift Pumps 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 3300 gpm through each operating Feed Pump Verify Auxiliary Oil Pump running on any non-operating Feed Pump
			<ul style="list-style-type: none"> Verify 3000 gpm through each operating Condensate Pump
Event 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> <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>	<ul style="list-style-type: none"> The BOP will respond to annunciators and report to the CRS EOP 1300 Entry Conditions <p>Perform the actions of EOP-1300 (Secondary Containment Control)</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CR304.105 CR304.153	<ul style="list-style-type: none"> • Directs evacuation of area or entire reactor building. • Reports Reactor Building radiation levels and temperatures are rising • Keeps the CRS informed of Secondary Containment parameter values and trends
CT-34	<p>NOTE: 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 valves <p>Enters EOP-1300 (Secondary Containment Control)</p> <ul style="list-style-type: none"> • Direct isolation of the SDV • Monitors Secondary Containment parameters • Recognizes when 2 area radiation levels have exceeded Max Safe <ul style="list-style-type: none"> • Enters and directs EOP-2002 (Blowdown) • Verifies Torus level > -5.9 ft. • Directs that 3 ADS SRVs be opened <p>Perform Emergency Depressurization</p> <p>Enters EOP-1300 (Secondary Containment Control)</p> <ul style="list-style-type: none"> • Directs opening of all 3 ADS SRVs.
Booth Operator	<p>a. Verify AP08D and 01-DS124-02 are active. These will prevent D SRV from opening.</p>	BOP	<ul style="list-style-type: none"> • Recognizes that D SRV failed to open

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
			<ul style="list-style-type: none"> • Opens additional SRVs until a total of 3 are open

FLOOR INST	<p>12. SCENARIO TERMINATION</p> <p>The scenario may be terminated when Emergency Depressurization has been performed.</p> <p>The scenario may be also terminated at the discretion of lead instructor/evaluator</p> <p>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.
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