

Appendix D

Scenario Outline

Form ES-D-1

Facility: MNGP Scenario No.: NRC-01 Op-Test No.: MNGP-07Examiners: _____ Operators: _____

Initial Conditions: 100% reactor power with RCIC inoperable due to planned maintenance on the trip/throttle valve. Test 0008 MAIN STEAM LINE ISOLATION VALVE CLOSURE SCRAM TEST is scheduled to be performed.

Turnover:
Perform Test 0008 MAIN STEAM LINE ISOLATION VALVE CLOSURE SCRAM TEST.

Event No.	Malf. No.	Event Type*	Event Description
1	MS06A	N (BOP) (SRO)	Perform Test 0008 MAIN STEAM LINE ISOLATION VALVE CLOSURE SCRAM TEST. The 'A' Outboard MSIV will fail to close when required by test resulting in an ITS LCO.
2	CH07B	I (RO)	CRD Flow Control Valve Fails Closed. The STBY FCV will be placed in service when High CRD Temperature annunciator alarms.
3	AP07	C (BOP) (SRO)	Inadvertent ADS timer actuation. ADS taken to inhibit. ITS LCO
4	TU03G TU03H	R (RO)	Main Turbine Vibrations, lower reactor power to lower / stabilize vibrations.
5	SW01A	C (BOP)	RBCCW system degradation. RBCCW Pump Trip. Standby pump fails to auto start.
6	FW20A	C (RO)	Loss of Air to 'A' Feed Reg. Valve. FRV Lockup and recovery.
7	MS04A MS04B	M (ALL) M (ALL) M (ALL)	Steam line break inside primary containment. Scram. Unable to spray D/W. EOP 1100 entry (RPV Control). EOP 1200 entry (Primary Containment Control). EOP 2002 entry (Blowdown)
8	S054-01	C (BOP)	Failure of D ADS SRV to open

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

Retention: Life of policy + 10yrs.
Retain in: Training Program File

	SIMULATOR EXERCISE GUIDE (SEG)
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SITE

: MNGP

SEG # 2007 ILT NRC 1

SEG

TITLE: LOCA, Blowdown

REV. # 0

PROGRAM

: ILT

#: MT-ILT

COURSE: NRC EXAM

#: N/A

TOTAL TIME: 1.5 HOURS

Additional site-specific signatures may be added as desired.

Developed by:	J. Ruth	
	<i>Instructor</i>	<i>Date</i>
Reviewed by:	<i>Instructor</i>	<i>Date</i>
	<i>(Simulator Scenario Development Checklist.)</i>	
Validated by:	<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:

ILT NRC EXAM

Learning Objectives:

1. ILT NRC EXAM

Prerequisites:

1. COMPLETION OF MT-ILT PROGRAM

Training Resources:

1. SIMULATOR

References:

1. FP-T-SAT-72

Commitments:

1. N/A

Evaluation Method:

ILT NRC EXAM

Operating Experience:

N/A

Related PRA Information:

Initiating Event with Core Damage Frequency:

LOCA

Important Components:

Containment

Important Operator Actions with Task Number:

XRPVBLDNY- Blowdown to prevent core damage.

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. 'A' CRD FCV fails closed
2. Inadvertent ADS Timer initiation
3. Turbine Vibrations
4. RBCCW Pump trip
5. Feedwater Reg. Valve lockup

After EOP Entry:

1. Drywell Spray failure
2. 'D' ADS SRV fails to open

Abnormal Events:

1. Inadvertent ADS Timer initiation
2. RBCCW Pump trip
3. Feedwater Reg. Valve lockup

Major Transients:

1. LOCA

Critical Tasks:

1. [When D/W temperature cannot be restored and maintained below 281°F, blowdown.]
2. [When a blowdown is initiated and <3 ADS SRVs can be opened, open a non-ADS SRV to ensure 3 SRVs are open.]

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This Evaluation can be run from the following Requalification Exam Scenario Standard (Specific) IC sets:
 - IC-231
2. The following equipment is OOS:
 - RCIC

SEQUENCE OF EVENTS:

Event 1: MSIV Closure Test 0008

- Reactor power is 100%. RCIC is inoperable due to planned maintenance on the trip/throttle valve. The schedule requires test 0008, MAIN STEAM LINE ISOLATION VALVE CLOSURE SCRAM TEST be performed.
- The test will progress normally for the 4 Inboard MSIVs.
- When step 3A for the 'A' Outboard MSIV (Depress and hold MSIV test pushbutton until protective relays energize) the MSIV will not move from its fully open position.
- ITS will be reviewed and be determined that LCO 3.6.1.3 is applicable, Condition A, Required Action A.1 requiring the steam line be isolated within 8 hours.

Event 2: CRD Flow Control Valve Failure

- In-service CRD Flow Control Valve fails and approximately 3 minutes later annunciator 5-B-41 (CRD HI TEMPERATURE) alarms.
- The OATC recognizes that the CRD Flow Control Valve failed closed requiring a shift to the standby FCV.

Event 3: ADS Inadvertent Initiation

- Annunciator 3-A-25, (AUTO BLOWDOWN TIMER ACTIVATED), prompts the crew to determine an ADS timer initiation.
- The BOP operator takes action to verify timer actuation and carries out the actions of C.4-G to place the ADS AUTO/INHIBIT switch to INHIBIT.
- ITS will be reviewed and be determined that LCO 3.5.1 is applicable, Condition L. The CRS should prepare to be in MODE 3 within 12 hours.

Event 4: Main Turbine Vibration

- Vibration on bearings 7 and 8 are noted by the crew to be rising or acknowledged when annunciator 7-B-33, TURB VIBRATION HIGH alarms at 10 mils. The computer alarm actuates at 7 mils.
- The CRS will direct a power reduction to mitigate the condition.
- When the reactor power is lowered, turbine vibrations will lower and stabilize.

Event 5: RBCCW Pump Trip

- The running RBCCW pump trips and the standby pump fails to auto start.
- The BOP responds to annunciator 6-B-32 (RBCCW LOW DISCH PRESS)
- BOP starts the standby pump per C.4-B.02.05.A, Loss of RBCCW, and reports system pressure returns to normal.
- Annunciators 4-B-21 (CLEAN UP FILTER DEMIN FAILURE) 4-B-26 (CLEAN UP DEMIN TEMP HI) and 4-B-31 (CLEAN UP DEMIN TEMP HI HI) will cue the crew that the RWCW system has tripped.

Event 6: Loss of Air to 'A' FRV, FRV Lockup

- The 'A' FRV experiences a loss of air due to a localized air line fitting leak and the FRV locks up as expected.
- The OATC responds to annunciator 5-B-40 (FW CONTROL VALVE LOCKED) and places the un-locked FRV in manual control.
- The out plant operator will be dispatched and report that the leak has been repaired allowing the FRV lockup to be reset and restore FWLC to automatic control.

Event 7: Steam Leak Inside Primary Containment

- A small steam line break inside the primary containment will occur which will result in rising drywell pressure.
- The CRS will direct a reactor scram and EOPs-1100 (RPV CONTROL) and 1200 (PRIMARY CONTAINMENT CONTROL) will be entered.
- Torus cooling, sprays and drywell sprays will be directed to mitigate conditions in the primary containment. Drywell sprays will not be able to be initiated on either RHR loop.
- The CRS will direct a blowdown (or Anticipate Emergency Depressurization) due to no being able to maintain drywell temperature below 281°F.

Event 8: 'D' ADS SRV Fails to Open

- 3 ADS valves will be directed to be opened to depressurize the RPV. One of the ADS valves will not open and a non-ADS SRV must be manually opened.
- The scenario will be terminated when the RPV has been depressurized, RPV water level is being maintained above 9 inches, and with concurrence of the lead evaluator.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

TASK	DESCRIPTION	OBJECTIVE
CR240.101	Perform the MSIV exercise test	1-5
CR200.146	Perform the procedure for a reactor scram	1-5
CR201.111	Place the Standby CRD FCV into service	1-5
CR203.111	Transfer the A(B) RHR from LPCI to Torus cooling	1-5
CR200.203	Perform the procedure for rapid power reduction	1-5
CR200.162	Perform the procedure for leak inside the primary containment	1-5
CR304.102	Perform the actions associated with RPV Control	1-5
CR200.204	Perform the procedure for inadvertent ECCS initiation	1-5
CR200.152	Perform the procedure for loss of RBCCW flow	1-5
CR200.164	Perform the procedure for loss of reactor water level control	1-5
CR304.103	Perform the actions associated with Primary Containment Control	1-5
CR314.123	Perform the actions associated with Containment Spray	1-5
SS304.193	Implement RPV Control	6, 7
SS299.328	Apply Tech Spec 3.6 and Bases to the Primary System Boundary	6, 7
SS299.327	Apply Tech Spec 3.5 and Bases to the Core and Containment/Cooling System	6, 7
SS304.194	Implement Primary Containment Control	6, 7
SS315.101	Supervise response to reactor scram	6, 7
SS315.160	Supervise the response to an inadvertent ECCS initiation	6, 7

NOTE: Modify this table as needed to include all scenario time-line items

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC): <ul style="list-style-type: none">• Standard IC-15 (IC-231)• Mode: 1• Exposure: MOC• Power: 100%• Pressure: 1000• Generator: 611 Mwe	(RO/LO /SRO)	

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering actions items per the "Simulator Input Summary.")		
	2. Simulator Pre-brief:		<p>CDF is GREEN, XCEL condition is GREEN. RCIC is in day 2 of LCO 3.5.3 Action A.2, action A.1 has been completed. RCIC is unavailable. Turbine Building Status: 5 Condensate F/D are in service, 'C' demin has highest d/p indication at 4.8 psid. All other conditions are normal. Reactor Building Status: RCIC maintenance is in progress, all other conditions are normal.</p> <p>The following support is available: Normal Day Shift <u>Operations</u>: normal crew compliment plus 1 relief crew NLO <u>Maintenance</u>: support available upon request <u>Engineering</u>: support available upon request <u>Management</u>: support available upon request</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	3. COMPLETE TURNOVER: a. Review applicable current Unit Status b. Review relevant At-Power Risk status c. Review current LCOs not met and Action Requirements d. Verify crew performs walk down of control boards and reviews turnover checklists.		Performs pre-shift briefing
	4. <u>EVENT 1: MSIV Closure Test 0008</u> a. No trigger is required for this event b. For each Inboard MSIV, when the green light is lit, inform the BOP operator that the respective protected relays de-energize (see TEST 0008, Table 1 for relay numbers). c. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event. d. After the ITS call has been made, call as the Ops Manager and state that an entry into the steam chase to investigate the problem will be planned and made before the steam line is isolated.	BOP CRS CRS CRS	Performs Test 0008: <ul style="list-style-type: none"> • Uses test push button to partially close each Inboard MSIV • Releases test pushbutton when relays de-energize • Records response • Attempts to close first Outboard MSIV and reports failure to close to Shift Supervision Directs test suspended Refers to ITS and enters Required Action A.1 for LCO 3.6.1.3 (8 hours to isolate the steam line). Provides crew brief

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>5. <u>EVENT 2: CRD Flow Control Valve Failure</u></p> <p>a. When directed by the lead evaluator, INSERT TRIGGER 1, CRD FCV FAILURE.</p> <p>b. If directed to investigate CRD temperatures, wait 2 minutes and report that many CRD temperatures are rising and that CRD 26-15 is in alarm.</p> <p>c. When directed to report to the CRD FCV station to support shift of FCV, WAIT 3 minutes and report you are standing by.</p> <p>d. When directed to OPEN CRD-16-2 and CRD-18-2, INSERT TRIGGER 2 and WAIT 2 minutes, then report valves are open.</p> <p>e. When directed to CLOSE CRD-16-1 and CRD-18-1, INSERT TRIGGER 3 and WAIT 2 minutes, then report valves are closed.</p> <p>f. If directed to report CRD temperatures, report all alarms are clear and all temperatures are lowering to normal.</p>	<p>OATC</p> <p>CRS</p> <p>OATC</p> <p>OATC</p> <p>CRS</p>	<p>Responds to annunciator 5-B-41, CRD HI TEMPERATURE</p> <ul style="list-style-type: none"> • Informs Shift Supervision • Sends Reactor Building Operator to investigate CRD temperature recorder • Refers to procedure B.01.03-05 CRDH • Recognizes CRD FCV failure <p>Directs swap to standby CRD FCV</p> <p>Coordinates with Reactor Building Operator and performs the following:</p> <ul style="list-style-type: none"> • Opens standby FCV manual inlet/outlet valves • Places Flow Controller in MANUAL • Manually runs controller to 0 • Places the CRD Flow Selector to the B position • Slowly OPENS the B FCV manually to approximately 54 to 56 gpm • Places the FCV in AUTO • Closes previously in-service FCV manual inlet/outlet valves <p>Acknowledge annunciator 5-B-41 clear and informs Shift Supervision.</p> <p>Provides crew brief</p>

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	6. <u>EVENT 3: ADS Inadvertent Initiation</u> a. When directed by the lead evaluator, INSERT TRIGGER 4, ADS TIMER. b. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event.	OATC BOP BOP CRS CRS	Reports the following alarms: <ul style="list-style-type: none"> 3-A-25, AUTO BLOWDOWN TIMER ACTIVATED Reports the following: <ul style="list-style-type: none"> ADS timer actuation Enters C.4-G, INADVERTENT ECCS INITIATION Places ADS AUTO/INHIBIT control switch to INHIBIT Refers to ITS and enters Required Action G for LCO 3.3.5.1 and declares ADS SRVs inoperable per table 3.3.5.1-1 (function 4.b within 1 hour). Refers to ITS and enters Required Action L for LCO 3.5.1 (be in MODE 3 within 12 hours). Provides crew brief

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	7. <u>EVENT 4: Main Turbine Vibration</u> a. When directed by the lead evaluator, INSERT TRIGGER 5, TURBINE BEARINGS HIGH VIBRATION (bearings 7 and 8). b. When reactor power is reduced, manually lower the malfunction severity of TU03G and TU03H over the span of 5 minutes to approximately 5 mils each. c. If directed to investigate the turbine, WAIT until vibrations have been lowered and report no unusual noise or vibrations are detected.	BOP BOP CRS OATC BOP CRS CRS	Reports annunciator 7-B-33, TURB VIBRATION HIGH (crew may identify condition via computer alarm at 7 mils) Reviews ARP actions: <ul style="list-style-type: none"> • Verifies vibration readings on VR-1716 • If >10 mils, enter shutdown procedure • If rapid power reduction is necessary, enter C.4-F (RAPID POWER REDUCTION) • If vibrations approach 15 mils, then reduce recirc flow to min, scram, trip the turbine • Informs Shift Supervision Directs power reduction to stabilize/reduce turbine vibration Reduces reactor power per C.4-F with reactor recirc Reports turbine vibrations lowering Directs power reduction secured Provides crew brief

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>8. <u>EVENT 5: RBCCW Pump Trip</u></p> <p>a. When directed by the lead evaluator, INSERT TRIGGER, 6 RBCCW pump 11 trip.</p> <p>b. If directed to investigate the RBCCW pumps, WAIT 3 minutes and then report that the bearings on the 11 pump motor appear to be hot, the 12 pump appears to be operating normally.</p> <p>c. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event.</p> <p>d. If directed to help restore RWCU, report that both filter demins are in hold.</p>	BOP	<p>Recognize lowering RBCCW system pressure</p> <p>Reports annunciator 6-B-32, RBCCW LOW DISCH PRESS</p> <p>Performs immediate actions of C.4-B.02.05.A , LOSS OF RBCCW</p> <ul style="list-style-type: none"> • Starts 12 RBCCW pump • Verifies RBCCW pressures return to normal

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>9. <u>EVENT 6: Loss of Air to 'A' FRV</u></p> <p>a. When directed by the lead evaluator, INSERT TRIGGER 7, LOSS OF AIR TO THE 'A' FRV.</p> <p>b. If directed to investigate, WAIT 4 minutes and report that the air connection to the FRV has come loose and air is escaping from the loose connection. Also report that the connection can easily be tightened, and if directed to do so, WAIT 2 minutes and report that the connection has been tightened and the air leak has stopped. The system engineer recommends resetting the lock out. DELETE malfunction LOSS OF AIR TO THE 'A' FRV.</p> <p>c. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event.</p>	<p>OATC</p> <p>OATC</p> <p>CRS</p> <p>OATC</p>	<p>Reports annunciator 5-B-40, (FW CONTROL VALVE LOCK) and performs the following:</p> <ul style="list-style-type: none"> • Reports the Feedwater Control Valve Lockup/reset amber light for the 'A' FRV is lit. • Monitors RPV water level <p>Enters C.4-B.05.07.A</p> <ul style="list-style-type: none"> • Places the UNLOCKED FRV in controller in manual <p>When the report that that air leak has been repaired is given, the CRS will direct that the lockup be reset.</p> <p>When directed to attempt to reset the lockup:</p> <ul style="list-style-type: none"> • Verify the M/A station for the locked valve is in MANUAL • Verify the M/A station output meter is at the black memory pointer • Verify no major air leakage at the valve • Depress the reset pushbutton for the affected FRV

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		OATC	Place First FRV in Automatic (per B.05.07): <ul style="list-style-type: none"> • Verify Master Controller is in MANUAL • Adjust Master Controller to match demand • Adjust the Feedwater Control MAN/AUTO station to match the deviation • Place Feedwater controller in AUTO • Adjust dial on Master Controller for deviation in the green band and place the Master Controller in AUTO
		OATC	Place Second FRV in Automatic (per B.05.07): <ul style="list-style-type: none"> • Adjust the Feedwater Control MAN/AUTO station to match the deviation • Place the Feedwater Control MAN/AUTO in AUTO

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	10. <u>EVENT 7: Steam Leak Inside Primary Containment</u> a. When directed by the lead evaluator, INSERT TRIGGER 8, SMALL STEAM LINE BREAK INSIDE PRIMARY CONTAINMENT and MS04B, Steam pipe break (after 10 minute delay)	BOP CRS OATC BOP BOP CRS	Reports Drywell pressure rising Directs reactor scram Inserts manual scram: <ul style="list-style-type: none"> Depresses manual scram pushbuttons Places Mode Switch in SHUTDOWN Verifies all rods in Makes scram report Carries out subsequent actions of C.4-A (REACTOR SCRAM) Reports drywell pressure and temperature and torus temperature EOP entry conditions Carries out subsequent actions of C.4-A (REACTOR SCRAM) Enters EOP-1100 and EOP-1200 and directs: <ul style="list-style-type: none"> Start all available torus cooling Start all available drywell cooling Start torus sprays Start drywell sprays

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	If requested to investigate the problem with Div 2 cooling / spray function, report you will investigate.	BOP / OATC	<p>Start all available torus cooling: (B.03.04) (Div 2 Torus Cooling will not be able to be initiated due to logic malfunction)</p> <p>Start all available torus cooling: (B.03.04-05)</p> <ul style="list-style-type: none"> • Verify RHR SW Outlet controll set at 20% • Close RHR HX Bypass valve • Place ECCS Load Shed Keylock to OVERRIDE • Start RHRSW pump(s) • Adjust RHRSW flow for ~3500 gpm per pump • Place 2/3 Core Height bypass to OVERRIDE • Place LPCI Initiation switch to BYPASS • Partially open Torus Cooling Inj/Test inboard valve for 8 seconds • Open Disch to Torus Outboard valve • Trottle Torus Cooling Inj/Test inboard valve to obtain ~4000 gpm per pump • Verify RHR RM Air Cooling Unit in operation
		BOP / OATC	<p>Start Torus Sprays: (C.5-3502):</p> <ul style="list-style-type: none"> • Place LPCI Initiation to BYPASS • OPEN Disch to Torus Outboard Valve • OPEN Torus Spray Inboard Valve • Trottle Torus Cooling Test Inboard Valve

SCENARIO TIME-LINE:

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		BOP / OATC	Start all available drywell cooling (C.5-3502) <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
		BOP / OATC	Start torus sprays (Div 2 Sprays will not be able to be initiated due to logic malfunction) <ul style="list-style-type: none"> Reports inability to spray torus
		BOP / OATC	Start D/W sprays (Sprays will not be able to be initiated due to logic malfunction on Div 2 and Stuck Valve on Div 1) <ul style="list-style-type: none"> Reports inability to spray drywell
	[When D/W temperature cannot be restored and maintained below 281°F, blowdown.]	CRS	Directs Blowdown when D/W temp cannot be maintained below 281°F
	11. <u>EVENT 8</u>: 'D' ADS SRV Fails to Open		
	[When a blowdown is initiated and <3 ADS SRVs can be opened, open a non-ADS SRV to ensure 3 SRVs are open.]	BOP / OATC	Opens 2 ADS SRVs, and reports 3 rd ADS SRV ('D') will not open. Opens a non-ADS SRV to obtain 3 SRVs open when directed by CRS.

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		CRS	Directs opening of a non-ADS SRV to obtain 3 SRVs open.
	12. When the conditions are stabilized or at discretion of lead instructor/evaluator 13. End the scenario by placing the simulator in freeze		Crew: <ul style="list-style-type: none">• Remain in simulator for potential questions from evaluator.• No discussion of scenario or erasing of procedure marking is allowed.

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
		Malfunction	CH07B	True	1	N/A	CV-19A Fails Closed
		Remote	CH17	Open	2	N/A	'B' CRD FCV Isolations Open
		Remote	CH16	Close	3	N/A	'A' CRD FCV Isolations Close
		Malfunction	AP07	True	4	N/A	Actuation of ADS Timer
		Malfunction	TU03H	41	5	00:10:00	Turbine Bearing #8 Vibration
		Malfunction	TU03G	43	5	00:10:00	Turbine Bearing #7 Vibration
		Malfunction	SW01A	True	6	N/A	11 RBCCW Pump Trip
		Malfunction	FW20A	True	7	N/A	Loss of Air to 'A' FRV
		Malfunction	MS04A	0-20	8	00:10:00	Small Break on 'A' Steam line
		Malfunction	MS04B	2.5	8	00:10:00 (delay)	Break on 'A' Steam line
		Malfunction	MS06A	True	N/A	N/A	'A' Outboard MSIV Failure to Close
		Override	DS178-02	Off	N/A	N/A	RCIC MO-2075 Green Lamp
		Override	DS140-02	Off	N/A	N/A	RCIC MO-2076 Green Lamp
		Override	DS090-02	Off	N/A	N/A	RCIC MO-2078 Green Lamp

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
		Override	A02DS033-02	Off	N/A	N/A	RCIC MO-2076 Green Lamp on Mimic
		Override	A02DS035-02	Off	N/A	N/A	RCIC MO-2075 Green Lamp on Mimic
		Override	S103-01	Off	N/A	N/A	Div 2 CTMT SPR LPCI BYP
		Override	S030-01	Close	N/A	N/A	MO-2022 Hand Switch
		Override	S030-02	Open	N/A	N/A	MO-2022 Hand Switch
		Override	A1DS126	On	N/A	N/A	12 RBCCW Pump White Light
		Override	S054-01	Off	N/A	N/A	D SRV Fails to Open

Hang caution tags on RCIC steam isolation and stop valves.

Simulator Scenario Development Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include justification for the no answer or the corrective action needed to correct the discrepancy after the item.

- | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| 1. The scenario contains objectives for the desired tasks and relevant human performance tools. | Yes | No |
| 2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.) | Yes | No |
| 3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both. | Yes | No |
| 4. Plant PRA initiating events, important equipment, and important tasks are identified. | Yes | No |
| 5. Turnover information includes a Daily At Power Risk Assessment provided by the PRA group. | Yes | No |
| 6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given. | Yes | No |
| 7. The scenario guide includes responses for all communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices. | Yes | No |
| 8. The scenario includes related industry experience. | Yes | No |
| 9. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance. | Yes | No |

Developer and Reviewer: Once checklist is completed and deficiencies are corrected, sign the cover page.

Simulator Scenario Validation Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include an explanation after the item.

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| 1. The desired initial condition(s) could be achieved. | Yes | No |
| 2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario. | Yes | No |
| 3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes | No |
| 4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario. | Yes | No |
| 5. During the simulator scenario, observed changes corresponded to expected plant response. | Yes | No |
| 6. Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request | Yes | No |
| 7. Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence. | Yes | No |

Discrepancies noted (Check "none" or list items found) ☐ None
SAR = Simulator Action Request

SAR: _____ SAR: _____ SAR: _____ SAR: _____

Comments: _____

Validator: Sign the cover page only after noted discrepancies are corrected or compensatory actions are taken to ensure quality training.

Appendix D	Scenario Outline	Form ES-D-1	
<p>Facility: <u>MNGP</u> Scenario No.: <u>NRC-02</u> Op-Test No.: <u>MNGP-07</u></p> <p>Examiners: _____ Operators: _____</p> <p>_____</p> <p>_____</p> <p>Initial Conditions: <u>89% reactor power. Test OSP-TRB-0570, EXERCISE MAIN TURBINE BYPASS VALVES, is scheduled to be completed.</u></p> <p>Turnover: <u>Complete Test OSP-TRB-0570, EXERCISE MAIN TURBINE BYPASS VALVES and return to 100% power.</u></p>			
Event No.	Malfunction No.	Event Type*	Event Description
1	TC06B	N (BOP) (SRO)	Complete Test OSP-TRB-0570, EXERCISE MAIN TURBINE BYPASS VALVES The #2 Turbine Bypass Valve will not open as required by the test resulting in an ITS LCO.
2	CH08A	C (RO)	11 CRD Pump trip. Start 12 CRD pump.
3	TC05A	I (BOP)	EPR Oscillations and placing the MPR in control.
4	RR02C PP06	I (RO) (SRO)	RPV press inst fails upscale, half scram fails to be initiated. ITS LCO.
5	MS09	C (BOP)	11 Steam Packing Exhauster trip, start standby blower.
6	RR07 RR08	R (RO) C (BOP) (SRO)	12 Recirc pump motor bearing temp and vibrations high and subsequent shutdown of pump. ITS LCO.
7	PP05A PP05C CH16	M (ALL)	Group 1 isolation, ATWS EOP-2007 (Failure to Scram) entry. All rods inserted, EOP-1100 (RPV Control) entry and RPV parameter recovery
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p>			



SIMULATOR EXERCISE GUIDE (SEG)

SITE: MNGP	SEG # 2007 ILT NRC 2
SEG TITLE: ATWS	REV. # 0
<p>PROGRAM: ILT #: MT-ILT</p> <p>COURSE: NRC EXAM #: N/A</p> <p style="text-align: center;">TOTAL TIME: 1.5 HOURS</p> <p>Additional site-specific signatures may be added as desired.</p> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 40%;"> <p>Developed by:</p> <p>Reviewed by:</p> <p>Validated by:</p> <p>Approved by:</p> </div> <div style="width: 40%; text-align: center;"> <p>J. Ruth</p> <p><i>Instructor</i></p> <p><i>Instructor</i></p> <p><i>(Simulator Scenario Development Checklist.)</i></p> <p><i>Validation Lead Instructor</i></p> <p><i>(Simulator Scenario Validation Checklist.)</i></p> <p><i>Training Supervision</i></p> </div> <div style="width: 15%; text-align: right;"> <p><i>Date</i></p> <p><i>Date</i></p> <p><i>Date</i></p> <p><i>Date</i></p> </div> </div>	

Guide Requirements

Goal of Training:

 ILT NRC EXAM

Learning Objectives:

 1. ILT NRC EXAM

Prerequisites:

 1. COMPLETION OF MT-ILT PROGRAM

Training Resources:

 1. SIMULATOR

References:

 1. FP-T-SAT-72

Commitments:

 1. N/A

Evaluation Method:

 ILT NRC EXAM

Operating Experience:

 N/A

Related PRA Information:
Initiating Event with Core Damage Frequency:

Group 1 Isolation

Important Components:

Class IV- Accident sequences involving failure to scram leading to a high-pressure challenge to containment resulting from power generation into the containment.

Important Operator Actions with Task Number:

See critical task listing

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)**Malfunctions:***Before EOP Entry:*

1. 11 CRD Pump Trip
2. EPR Oscillations
3. RPV Pressure Inst Fails Upscale
4. Steam Packing Exhauster Blower Trip
5. 12 RR Pump Motor Bearing Hi Temp/Vibration
6. Group 1 Isolation

After EOP Entry:

1. ARI Failure

Abnormal Events:

1. 11 CRD Pump Trip
2. EPR Oscillations
3. 12 RR Pump Motor Bearing Hi Temp/Vibration

Major Transients:

1. ATWS

Critical Tasks:

1. [With Reactor power >3% or unknown, insert control rods to shutdown the reactor.]
2. [With Reactor power >3% or unknown, RPV water level above -33 inches, prevent RPV injection to lower power.]
3. [With an ATWS condition present, inhibit ADS before ADS valve actuation.]

SCENARIO OVERVIEW:**INITIAL CONDITIONS:**

1. This Evaluation can be run from the following Requalification Exam Scenario Standard (Specific) IC sets:

IC-232

3. The following equipment is OOS:

None

SEQUENCE OF EVENTS:**Event 1: OSP-TRB-0570, EXERCISE MAIN TURBINE BYPASS VALVES**

Reactor power is ~89%. The schedule requires test OSP-TRB-0570, EXERCISE MAIN TURBINE BYPASS VALVES be performed.

When step 2 is performed for the #2 turbine bypass valve, it will fail to open due to an instrument malfunction.

ITS will be reviewed and be determined that LCO 3.7.7 is applicable, action A.1. The CRS should direct that repairs be initiated to be completed within 2 hours.

A report from the I&C shop will be made to inform the CRS that the repairs can be completed within 1 hour.

Event 2: 11 CRD Pump Trip

The running CRD pump trips.

Annunciators 5-B-17 (CHARGING WATER LO PRESS), 5-B-25 (CRD PUMP 3-16A BREAKER TRIPPED), and 5-B-26 (CRD PUMP 3-16A OL) alarm.

The non-running pump is required to be manually started.

Event 3: Pressure Regulator Oscillation, EPR

The OATC / BOP operator reports oscillations of reactor power, level, and/or pressure, and MWe output.

The BOP operator will initiate action to stabilize pressure control by lowering the MPR set point so it will take control and running down the EPR setpoint to clear the oscillations per B.05.09-05.H.1 and B.05.09-05.H.3.

ITS will be reviewed and be determined that LCO Condition 3.2.1, 3.2.2, and 3.2.3 are not applicable, at this time, but would need to be reviewed again if power is <90%.

Event 4:

RPS RPV high pressure relay 5A-K5C fails initiating annunciators 5-B-11 (REACTOR VESSEL HI PRESS SCRAM TRIP) and 5-B-4 (REACTOR AUTO SCRAM CHANNEL A).

The crew determines that a ½ scram condition should exist but does not.

CRS reviews ITS section 3.3.1.1 and directs a ½ scram be inserted on the 'A' side of RPS within 1 hour.

Event 5: Steam Packing Exhauster Fan Trip

The running Steam Packing Exhauster will trip resulting in alarm 7-A-28 (STM PKG EXH K3A & K3B BLWR MTR HI TEMP)

The operator will start the standby blower, open its outlet valve, and close the outlet valve on the tripped unit.

Event 6: 12 Reactor Recirc Pump Motor Bearing High Temp / Vibration

The 12 Reactor Recirc pump motor will experience bearing high temperatures and subsequent vibration. Annunciator 4-C-24 (RECIRC PUMP MTR B HI VIBRATION) will alarm.

When vibrations exceed 3 mils the 12 Reactor Recirc pump will be shutdown. This will require a power reduction via lowering both recirc pump speed and inserting control rods to meet the requirements of power/flow map.

The CRS will recognize LCO Conditions 2.1.1, 3.4.1, and 3.3.1.1 are applicable at this time, when power is lowered below 90%.

Event 7: Group 1 Isolation / ATWS

A spurious Group 1 isolation (MSIV closure) will occur and an ATWS condition will result in the crew performing actions of EOP-2007, Failure to Scram.

After the initial actions of the EOP power leg are performed, the OATC will insert control rods and initiate SBLC.

The BOP will take actions to prevent injection into the RPV.

When all control rods are inserted, SBLC will be secured.

RPV water level will be returned to the normal band.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

TASK	DESCRIPTION	OBJECTIVE
CR245.102	Perform the Turbine Generator Weekly operational tests	1-5
CR200.147	Perform the procedure for a loss of CRD pump flow	1-5
CR200.157	Perform the procedure for primary containment Group 1 isolation	1-5
CR200.203	Perform the procedure for rapid power reduction	1-5
CR202.112	Shutdown one Recirc pump with the reactor at power	1-5
CR203.117/118	Placing "A" / "B" Loop RHR in torus cooling	1-5
CR211.106	Manually initiate SBLC system	1-5
CR314.104	Perform actions associated with Failure to scram	1-5
CR314.112	Perform actions to Terminate and Prevent injection	1-5
SS299.323	Apply T.S. 3.1 and Bases to the Reactor Protection System	6,7
SS299.329	Apply T.S. 3.1 and Bases to the Containment System	6,7
SS299.328	Apply T.S. 3.1 and Bases to the Primary System Boundary	6,7
SS304.201	Implement the response for a failure to scram	6,7
SS314.101	Supervise alternate rod insertion	6,7
SS314.108	Supervise terminate and prevent	6,7
SS315.159	Supervise rapid power reduction	6,7

NOTE: Modify this table as needed to include all scenario time-line items

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC): Standard IC-15 (IC-232) Mode: 1 Exposure: MOC Power: ~89% Pressure: 1000 Generator: ~543 Mwe	(RO/LO /SRO)	
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering actions items per the "Simulator Input Summary.")		
	2. Simulator Pre-brief:		<p>CDF is GREEN, XCEL condition is GREEN. Turbine Building Status: 5 Condensate F/D are in service, 'C' demin has highest d/p indication at 4.8 psid. All other conditions are normal. Reactor Building Status: All conditions are normal.</p> <p>The following support is available: Normal Day Shift</p> <p><u>Operations</u>: normal crew compliment plus 1 relief crew NLO</p> <p><u>Maintenance</u>: support available upon request</p> <p><u>Engineering</u>: support available upon request</p> <p><u>Management</u>: support available upon request</p>

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
3.	EVENT 4: RPV High Press RPS Relay Failure a. When directed by the lead evaluator, INSERT TRIGGER 3, RPV High Press. b. If called, respond as I&C that RPS relay 5A-K5C has de-energized. Will need to check the calibration of the RPV pressure instrument to troubleshoot event. c. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event.	OATC	Responds to annunciators 5-B-11 (REACTOR VESSEL HI PRESS SCRAM TRIP) and 5-B-4 (REACTOR AUTO SCRAM CHANNEL A). Recognize ½ scram should have occurred and did not
		ALL	Refers to ITS and enters Required Action C.1 for LCO 3.3.1.1 (Restore RPS trip capability within 1 hour) Provides crew brief
		CRS	Directs ½ scram be inserted on 'A' RPS Inserts ½ scram by depressing 'A' manual scram pushbutton
		OATC	
4.	Event 5: Steam Packing Exhauster Fan Trip a. When directed by the lead evaluator, INSERT TRIGGER 9, Exhauster Blower #11 Motor Trip. b. If asked to investigate, wait 5 minutes and report that the motor bearings feel very hot.	BOP	Respond to alarm 7-A-28 (STM PKG EXH K3A & K3B BLWR MTR HI TEMP): Report alarm to CRS Start K-3B Steam Packing Exhauster Open K-3B Steam Packing Exhauster outlet Place K-3A Steam Packing Exhauster control switch to OFF Close K-3A Steam Packing Exhauster outlet

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>29. EVENT 6: Group 1 Isolation / ATWS (cont)</p> <p>[With Reactor power >3% or unknown, RPV water level above -33 inches, prevent RPV injection to lower power.]</p>	<p>BOP</p> <p>CRS</p> <p>CRS</p>	<p>Inhibits ADS Performs Terminate and Prevent per C.5-3205:</p> <p>Places CS pumps in PTL , Close injection valves, Place injection bypass keylock in BYPASS</p> <p>Place HPCI Aux Oil Pump in PTL</p> <p>Close both FRVs and Low flow FRV</p> <p>Open LPCI knife switches 10A-S31A/B and close LPCI outboard injection valves</p> <p>Reports rising Torus temperature Directs SBLC injection</p> <p>Enters EOP 1200</p> <p>Directs torus cooling placed in service</p> <p>Starts either 11 or 12 SBLC pump and verifies disch press > RPV pressure</p> <p>When SBLC tank level lowers to 1040 gal. (HSBW), then directs RPV water level restored to 9-48 inches</p> <p>Reports all rods at 00</p> <p>Directs SBLC secured</p> <p>Exits EOP 2007, Enters EOP 1100</p>

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
		BOP	<p>Raises RPV water level with FW</p> <p>Start all available torus cooling: (B.03.04-05)</p> <p>Verify RHR SW Outlet controller set at 20%</p> <p>Start RHRSW pump(s)</p> <p>Adjust RHRSW flow for ~3500gpm per pump</p> <p>Start RHR pump(s)</p> <p>Partially open Torus Cooling Inj/Test inboard valve for 8 seconds</p> <p>Open Disch to Torus Outboard valve</p> <p>Trottle Torus Cooling Inj/Test inboard valve to obtain ~4000gpm per pump</p> <p>Close RHR HX Bypass valve</p> <p>Verify RHR RM Air Cooling Unit in operation</p>
	<p>43. When the conditions are stabilized or at discretion of lead instructor/evaluator</p> <p>44. End the scenario by placing the simulator in freeze</p>		

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
		Malfunction	TC06B	True	N/A	N/A	#2 TBPV Stuck
		Malfunction	CH08A	True	1	N/A	11 CRD Pump Trip
		Malfunction	TC05A	40	2	00:05:00	Pressure Regulator Oscillation, EPR
		Remote	RR02C	950	3	N/A	RPV High Press
		Remote	PP06	Instld	3	N/A	Scram (Auto) Bypass
		Malfunction	B04	On	3	N/A	Annunciator 5-B-4 Cry Wolf
		Malfunction	RR07	100	4	N/A	12 Recirc Pmp Mtr Bearing Hi Temp
		Malfunction	RR08	100	4	00:05:00	12 Recirc Pmp Mtr Vibration
		Malfunction	CH16	True	5	N/A	Failure to Scram
		Malfunction	PP05A	True	5	N/A	Spurious Grp 1
		Malfunction	PP05C	True	5	N/A	Spurious Grp 1
		Malfunction	MS09	True	9	N/A	Exhauster Blower #11 Motor Trip
		Override	S07-02	Off	N/A	N/A	ATWS 'A' Man Trip
		Override	S08-02	Off	N/A	N/A	ATWS 'C' Man Trip
		Override	S23-02	Off	N/A	N/A	ATWS 'B' Man Trip
		Override	S24-02	Off	N/A	N/A	ATWS 'D' Man Trip
		Override	S36-06	Off	N/A	N/A	'B' Man Scram PB

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
		Override	S34-04	On	N/A	N/A	Mode Switch-Run
		Override	S34-03	Off	N/A	N/A	Mode Switch-Refuel
		Override	S34-01	Off	N/A	N/A	Mode Switch-Shutdown
		Override	S34-02	Off	N/A	N/A	Mode Switch-Startup

Simulator Scenario Development Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include justification for the no answer or the corrective action needed to correct the discrepancy after the item.

- | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| 1. The scenario contains objectives for the desired tasks and relevant human performance tools. | Yes | No |
| 2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.) | Yes | No |
| 3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both. | Yes | No |
| 4. Plant PRA initiating events, important equipment, and important tasks are identified. | Yes | No |
| 5. Turnover information includes a Daily At Power Risk Assessment provided by the PRA group. | Yes | No |
| 6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given. | Yes | No |
| 7. The scenario guide includes responses for all communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices. | Yes | No |
| 8. The scenario includes related industry experience. | Yes | No |
| 9. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance. | Yes | No |

Developer and Reviewer: Once checklist is completed and deficiencies are corrected, sign the cover page.

Simulator Scenario Validation Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include an explanation after the item.

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| 1. The desired initial condition(s) could be achieved. | Yes | No |
| 2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario. | Yes | No |
| 3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes | No |
| 4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario. | Yes | No |
| 5. During the simulator scenario, observed changes corresponded to expected plant response. | Yes | No |
| 6. Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request | Yes | No |
| 7. Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence. | Yes | No |

Discrepancies noted (Check "none" or list items found) ☐ None
 SAR = Simulator Action Request

SAR: _____ SAR: _____ SAR: _____ SAR: _____

Comments: _____

Validator: Sign the cover page only after noted discrepancies are corrected or compensatory actions are taken to ensure quality training.

Appendix D	Scenario Outline	Form ES-D-1	
Facility: <u>MNGP</u> Scenario No.: NRC-03a Op-Test No.: MNGP-07 Examiners: _____ Operators: _____ _____ _____			
Initial Conditions: <u>Reactor power is ~95% with APRM 2 inoperable.</u>			
Turnover: Withdraw control rod 26-27 to position 08 and then perform Test 0255-03-IA-1-1, CORE SPRAY LOOP A QUARTERLY PUMP AND VALVE TESTS.			
Event No.	Malf. No.	Event Type*	Event Description
1	CH02	C (RO)	Withdraw control rod with raised drive pressure.
2	N/A	N (BOP)	Perform Test 0255-03-IA-1-1, CORE SPRAY LOOP A QUARTERLY PUMP AND VALVE TESTS. [Event Deleted]
3	SL02A	(SRO)	SBLC Squib Valve Loss of Continuity ITS LCO
4	NI13D	I (RO)	APRM 4 Fails Upscale. Bypass APRM and reset half scram.
5	FW15B	C (BOP) R (RO)	12 RFP bearing high temperature, shutdown 12 RFP. Lower reactor power to support removal of 12 RFP.
6	HP01	I (BOP) (SRO)	HPCI inadvertent initiation and shutdown. HPCI will be inoperable. ITS LCO.
7	RU07	M (ALL)	RWCU Leak, un-isolable, EOP-1300 Entry, Scram Blowdown, EOP 2002 Entry.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			



SIMULATOR EXERCISE GUIDE (SEG)

SITE:MNGP

SEG # 2007 ILT NRC 3

SEG TITLE: RWCU LEAK, BLOWDOWN

REV.# 0

PROGRAM: ILT

#: MT-ILT

COURSE: NRC EXAM

#: N/A

TOTAL TIME: 1.5 HOURS

Additional site-specific signatures may be added as desired.

Developed by:

J. Ruth*Instructor**Date*

Reviewed by:

*Instructor**(Simulator Scenario Development Checklist.)**Date*

Validated by:

*Validation Lead Instructor**(Simulator Scenario Validation Checklist.)**Date*

Approved by:

*Training Supervision**Date*

Guide Requirements

Goal of Training:

 ILT NRC EXAM

Learning Objectives:

 1. ILT NRC EXAM

Prerequisites:

 1. COMPLETION OF MT-ILT PROGRAM

Training Resources:

 1. SIMULATOR

References:

 1. FP-T-SAT-72

Commitments:

 1. N/A

Evaluation Method:

 ILT NRC EXAM

Operating Experience:

 N/A

Related PRA Information:

Initiating Event with Core Damage Frequency:

 RWCU Leak

Important Components:

 Secondary Containment

Important Operator Actions with Task Number:

 XRPVBLDWN- Failure to depressurize in time to prevent core damage.

QUANTITATIVE ATTRIBUTES (Use this form for Evaluations only.)

Malfunctions:

Before EOP Entry:

1. Withdraw control rod with elevated drive pressure
2. SBLC Squib Loss of Continuity
3. #4 APRM Fails Upscale
4. #12 RFP Motor Bearing Hi Temp
5. HPCI Inadvertent Initiation
6. RWCU Leak

After EOP Entry:

1. Failure of Group 3 Isolation

Abnormal Events:

1. #12 RFP Motor Bearing Hi Temp
2. HPCI Inadvertent Initiation

Major Transients:

1. RWCU Leaking into Secondary Containment

Critical Tasks:

1. [Before any area temperature, radiation, or water level reaches max safe value (Tables W, X, Z), scram.]
2. [Wait until 2 or more areas above max safe values of same parameter (Tables W, X, Z), blowdown.]

SCENARIO OVERVIEW:

INITIAL CONDITIONS:

1. This Evaluation can be run from the following Requalification Exam Scenario Standard (Specific) IC sets:

IC-233

3. The following equipment is OOS:

#2 APRM

SEQUENCE OF EVENTS:

Event 1: Withdraw Control Rod with Elevated Drive Pressure

Reactor Engineering requests control rod 26-27 be withdrawn from 00 to 08.

Initial attempt to withdraw the rod will be unsuccessful requiring drive water pressure to be raised to withdraw the rod per B.01.03-05.H.4. When drive pressure is raised the rod will withdraw.

~~**Event 2:** Perform Test 0255-03-IA-1-1 (CORE SPRAY LOOP A QUARTERLY PUMP AND VALVE TEST).~~ [Event Deleted]

~~—Performance of test will consist of valve stroke and timing and pump start with head/flow measurement.~~

ITS will be evaluated for LCO 3.5.1 Conditions for applicability per the test instruction.

Event 3: SBLC Squib Valve Loss of Continuity

The RO will respond to and report annunciator 5-B-31 (LOSS OF CONTINUITY TO SQUIB VALVE) alarm.

ITS will be reviewed and be determined that LCO 3.1.7 is applicable, Required Action B.1 provides a 7 day period before further actions are required.

Event 4: #4 APRM Fails Upscale

The RO will respond to and report annunciators 5-A-3 (ROD WITHDRAW BLOCK), 5-A-14 (APRM HI), 5-A-30 (APRM HI HI INOP CH 4, 5, 6), 5-B-3 (REACTOR NEUTRON MONITOR SCRAM TRIP), 5-B-5 (REACTOR AUTO SCRAM CHANNEL B) alarms.

ITS will be reviewed and be determined that LCO 3.3.1 is not applicable, as the requirement is 2 operable APRMs per trip system.

The APRM will be bypassed and the ½ scram reset.

Event 5: #12 RFP Bearing High Temp / Shutdown

The BOP will respond to and report annunciator 6-A-26 (RCT FEED PUMP BRG HIGH TEMP), alarm.

Recognize bearing high temperature on trend recorder approaching 225°F.

Lower reactor power and remove RFP from service.

Event 6: HPCI Inadvertent Initiation

BOP responds to start of the HPCI turbine.

Determines that initiation is inadvertent by verifying RPV level and D/W pressure are normal.

Shuts down HPCI by tripping and taking the Aux Oil Pump to PTL.

ITS will be reviewed and be determined that LCO 3.5.1 is applicable, Required Action H.1 provides a 14 day period before further actions are required.

Event 7: RWCU Leak / Scram

The BOP will respond to and report annunciators 3-B-56 (HIGH AREA TEMP STEAM LEAK), 4-A-11 (REACTOR BUILDING HI RADIATION) alarms.

Recognizes event is in RWCU room by observing ARMs and area temperatures.

EOP-1300, SECONDARY CONTAINMENT CONTROL, is entered and attempts to isolate RWCU are unsuccessful and a scram is initiated.

When 2 areas above max safe radiation, Blowdown.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE(S):

TASK	DESCRIPTION	OBJECTIVE
CR200.133	Perform a power reduction from >90% to 75%	1-5
CR200.146	Perform the procedure for a reactor scram	1-5
CR200.203	Perform the procedure for rapid power reduction	1-5
CR200.204	Perform the procedure for inadvertent ECCS initiation	1-5
CR209.106	Startup a Core Spray Loop 11(12)	1-5
CR259.126	Take the actions for Reactor Feed pump and Reactor Feed pump Motor Bearing High Temperature	1-5
CR299.353	Apply T.S. section 3.3 and bases to instrumentation	1-5
CR299.355	Apply T.S. section 3.5 and bases to ECCS and RCIC	1-5
CR299.351	Apply T.S. section 3.1 and bases to Reactivity control systems	1-5
CR304.105	Perform actions associated with Secondary Containment control	1-5
CR314.101	Perform the actions associated with Emergency RPV depressurization	1-5
SS304.196	Implement secondary containment control	6,7
SS304.193	Implement RPV control	6,7
SS304.198	Implement emergency RPV depressurization	6,7
SS315.160	Supervise response to inadvertent ECCS initiation	6,7
SS315.159	Supervise rapid power reduction	6,7
SS315.101	Supervise response to reactor scram	6,7
SS299.349	Apply administrative requirements for T.S. 3.1 and bases to reactivity control systems	6,7
SS299.351	Apply administrative requirements for T.S. 3.3 and bases to instrumentation	6,7
SS299.353	Apply administrative requirements for T.S. 3.5 and bases to ECCS and RCIC	6,7

NOTE: Modify this table as needed to include all scenario time-line items

SCENARIO TIME-LINE:			
SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	INITIAL CONDITIONS (IC): Standard IC-15 (IC-233) Mode: 1 Exposure: MOC Power: 100% Pressure: 1000 Generator: 611 Mwe	(RO/LO /SRO)	
	1. SIMULATOR SET UP (perform set up per the "Simulator Setup Checklist", including entering actions items per the "Simulator Input Summary.")		
	2. Simulator Pre-brief:		<p>CDF is GREEN, XCEL condition is GREEN. #2 APRM is downscale. Turbine Building Status: 5 Condensate F/D are in service, 'C' demin has highest d/p indication at 4.8 psid. All other conditions are normal. Reactor Building Status: Conditions are normal.</p> <p>The following support is available: Normal Day Shift</p> <p><u>Operations</u>: normal crew compliment plus 1 relief crew NLO</p> <p><u>Maintenance</u>: support available upon request</p> <p><u>Engineering</u>: support available upon request</p> <p><u>Management</u>: support available upon request</p>

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	3. COMPLETE TURNOVER: a. Review applicable current Unit Status b. Review relevant At-Power Risk status c. Review current LCOs not met and Action Requirements d. Verify crew performs walk down of control boards and reviews turnover checklists.		
	4. EVENT 1: Withdraw Control Rod 26-27 to position 08. a. No event trigger is required for this event. b. The malfunction will automatically delete after 1 or 2 drive water 30 psig increments. c. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event.	OATC	Attempts to withdraw control rod 26-27. When unable to withdraw with normal drive flow, refers to B.01.03-05.H.4 (WITHDRAW OF A CRD UNDER HIGH DRIVE PRESSURE) Raise drive water pressure in increments up to 30 psid, to a maximum of 400 psid and give the drive a withdraw signal after each increment Before moving a different CRD, return drive water pressure to approximately 265 psid

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>16. EVENT 4: #4 APRM Fails Upscale</p> <p>a. When directed by the lead evaluator, INSERT TRIGGER 3, APRM #4 Fullscale.</p> <p>b. If called, respond as the Ops Manager, Plant Manager, and/or System Engineer concerning notification of the event.</p>	<p>OATC</p> <p>BOP</p> <p>CRS</p> <p>OATC</p> <p>CRS</p>	<p>The RO will respond to and report annunciators 5-A-3 (ROD WITHDRAW BLOCK), 5-A-14 (APRM HI), 5-A-30 (APRM HI HI INOP CH 4, 5, 6), 5-B-3 (REACTOR NEUTRON MONITOR SCRAM TRIP), 5-B-5 (REACTOR AUTO SCRAM CHANNEL B):</p> <p> Informs CRS</p> <p> Observes #4 APRM HI HI/INOP light and #4 APRM recorder full scale</p> <p> Observes RPS channel 'B' trip (1/2 scram)</p> <p> Observes and reports HI HI light lit and meter full scale and INOP light not litMay refer to ITS and review Required Action A.1 for LCO 3.3.1.1 to determine the LCO for APRMs is met.</p> <p> Directs #4 APRM bypassed and ½ scram reset</p> <p> Bypasses #4 APRM and resets the ½ scram</p> <p> Provides crew brief</p>

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	<p>31. EVENT 7: RWCU Leak (un-isolable)</p> <p>a. When directed by the lead evaluator, INSERT TRIGGER 6, RWCU Suction Line Break.</p> <p>[Before any area temperature, radiation, or water level reaches max safe value (Tables W, X, Z), scram.]</p>	<p>BOP</p> <p>CRS</p> <p>OATC</p>	<p>The BOP will respond to and report annunciators 3-B-56 (HIGH AREA TEMP STEAM LEAK), 4-A-11 (REACTOR BUILDING HI RADIATION):</p> <p>Reports RWCU room radiation levels and room temperatures are rising</p> <p>Attempts to insert a manual group 3 isolation</p> <p>Attempts to manually close RWCU isolation valves</p> <p>Reports RWCU valves will not isolate</p> <p>Enters EOP-1300 (Secondary Containment Control) and EOP-1100 (RPV control)Directs Reactor ScramInserts a manual scram, provides scram report:</p> <p>Reactor scram</p> <p>Mode switch in shutdown</p> <p>All rods inserted</p>
	<p>[Wait until 2 or more areas above max safe values of same parameter (Tables W, X, Z), blowdown.]</p>	<p>CRS</p> <p>BOP</p>	<p>Determines 2 area radiation levels are above max safe</p> <p>Enters EOP-2002 (Blowdown)</p> <p>Directs BlowdownOpens 3 ADS valves</p>

SEQ	SEQUENCE OF EVENTS / INSTRUCTOR NOTES	CREW POS	EXPECTED STUDENT RESPONSES
	39. When the conditions are stabilized or at discretion of lead evaluator. 40. End the scenario by placing the simulator in freeze		

SIMULATOR INPUT SUMMARY							
Relative Order	System Or Panel Drawing	Type	Code	Severity Or Value	Event Trigger	Timing	Description
		Malfunction	NI12B	True	N/A	N/A	APRM #2 Downscale
		Malfunction	CH02	True	1	N/A	Control rod 26-27 stuck
		Malfunction	SL02A	True	2	N/A	Loss of Squib 'A' Continuity
		Malfunction	NI13D	True	3	N/A	APRM #4 Fullscale
		Malfunction	FW15B	100	4	N/A	RFP #12 Bearing Hi Temp
		Malfunction	HP01	True	5	N/A	HPCI Auto Initiation
		Malfunction	RU08	True	6	N/A	Grp 3 Isolation Failure
		Malfunction	RU07	25	6	00:30:00	RWCU Suction Line Break
		Override	S75-02	On	N/A	N/A	MO-2397 HS Open
		Override	S75-01	Off	N/A	N/A	MO-2397 HS Close
		Override	S50-02	On	N/A	N/A	MO-2398 HS Open
		Override	S50-01	Off	N/A	N/A	MO-2398 HS Close
		Override	S25-02	On	6	N/A	MO-2399 HS Open
		Override	S25-01	Off	6	N/A	MO-2399 HS Close

Place caution tag on APRM bypass joystick for #2 APRM

Simulator Scenario Development Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include justification for the no answer or the corrective action needed to correct the discrepancy after the item.

- | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| 1. The scenario contains objectives for the desired tasks and relevant human performance tools. | Yes | No |
| 2. The scenario identifies key parameter response, expected alarms, and automatic actions associated with the induced perturbations. (This action applies to all SEG's new or revised for those on the ANS/ANSI-3.5-1998 standard. This action is NOT applicable for those on the ANS/ANSI-3.5-1985 standard.) | Yes | No |
| 3. The scenario content adequately addresses the desired tasks, through simulator performance, instructor-led training freezes, or both. | Yes | No |
| 4. Plant PRA initiating events, important equipment, and important tasks are identified. | Yes | No |
| 5. Turnover information includes a Daily At Power Risk Assessment provided by the PRA group. | Yes | No |
| 6. The scenario contains procedurally driven success paths. Procedural discrepancies are identified and corrected before training is given. | Yes | No |
| 7. The scenario guide includes responses for all communications to simulated personnel outside the Control Room, based on procedural guidance and standard operating practices. | Yes | No |
| 8. The scenario includes related industry experience. | Yes | No |
| 9. Training elements and specific human performance elements are addressed in the scenario critique guide to be used by the critique facilitator. The critique guide includes standards for expected performance. | Yes | No |

Developer and Reviewer: Once checklist is completed and deficiencies are corrected, sign the cover page.

Simulator Scenario Validation Checklist

Mark with an X Yes or No for any of the following. If the answer is No, include an explanation after the item.

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| 1. The desired initial condition(s) could be achieved. | Yes | No |
| 2. All malfunctions and other instructor interface items were functional and responded to support the simulator scenario. | Yes | No |
| 3. All malfunctions and other instructor interface items were initiated in the same sequence described within the simulator scenario. | Yes | No |
| 4. All applicable acceptance criteria were met for procedures that were used to support the simulator scenario. | Yes | No |
| 5. During the simulator scenario, observed changes corresponded to expected plant response. | Yes | No |
| 6. Did the scenario satisfy the learning or examination objectives without any significant simulator performance issues, or deviations from the approved scenario sequence? If learning objective(s) could not be satisfied, identify the objectives in the Simulator Action Request | Yes | No |
| 7. Evaluation: The simulator is capable of being used to satisfy learning or examination objectives without exceptions, significant performance discrepancies, or deviation from the approved scenario sequence. | Yes | No |

Discrepancies noted (Check "none" or list items found) ☐ None
 SAR = Simulator Action Request

SAR: _____ SAR: _____ SAR: _____ SAR: _____

Comments: _____

Validator: Sign the cover page only after noted discrepancies are corrected or compensatory actions are taken to ensure quality training.