Appendix D	**Scenario Outline**	**Form ES-D-1**

Facility: _____DAEC_____ Scenario No.: __ESG#1___ Op-Test No. 2005-01

Examiners:_____ Operators:_____

_____ _____

_____ _____

Initial Conditions: Reactor start up is in progress. The reactor is currently at 150 psig. Work was performed on PSV 4407 while the plant was shutdown, it is currently inoperable

Turnover: Reactor start up is in progress. The plant was shut down due to PSV 4407 leaking. It has been fixed. We are currently at 150 psig and holding.

STP 3.4.3-03, MANUAL OPENING AND EXERCISING OF THE ADS AND LLS RELIEF VALVES, for LLS PSV 4407 must be run prior to raising reactor power.

Currently one bypass valve is open 75%. The STP requires that one bypass valve be opened 100% and the second be open 15%. When he STP is complete continue with the plant start up.

Torus Cooling has been placed in service preparation of the STP, and TS 3.5.1 Condition B has been entered.

STP 3.6.2.1-01, Suppression Pool Water Temperature Surveillance, is available for when you open the SRV.

STP 3.8.1-04, Standby Diesel Generators Operability Test, (Slow Start From Norm Start Air) is in progress. The "A" EDG has been tested satisfactorily. The "B" EDG test is in progress. The STP is complete through step 7.2.25. It is currently in it's one hour run for TS, and the 2 hour run for stabilization of the Generator Stator and Main Bearing temperatures.

During the start up the Start Up Feed Reg Valve was sticking. It was decided that the Start Up Feed Reg Valve be isolated and level be controlled via the "B" Feed Reg Valve. At the beginning of your shift, there are 2 I & C techs going to look at the operator. They may call for your assistance to cycle the valve.

I & C has asked that the "A" IRM be bypassed for a short time. They are working near the preamp and do not want to give the plant any half scrams. The work should take about 45 minutes, and then the "A" IRM may be unbypassed.

There is a severe thunderstorm warning for the next 2 hours for the Linn and Benton Counties.

Event No.	Malf No:	Event Type*	Event Description
1		R (RO)	A control rod pull brief will be conducted. At the end of the brief, the RO will raise power with control rods to achieve 1 bypass valve 100% open and the second bypass valve 15% open. During the power ascension, the "C" IRM will fail up scale resulting in a half scram. When the target conditions are met, the STP can be run.

2	1	I (RO/SRO)	The RO will respond to annunciators' 1C05A B-3, C-3, and A-2. "C" IRM will fail up scale resulting in a half scram. The RO will bypass the failed IRM and reset the half scram. This is a TS entry due to the loss of the "C" IRM and another IRM bypassed. The actions of the TS are already met, and the TS is exited when the operable IRM is unbypassed and the failed IRM is bypassed. TS is 3.3.1.1 Condition A is momentarily entered
3		N (BOP)	Performance of STP 3.4.3-03, Manual Opening and Exercising of the ADS and LLS Relief Valves for PSV 4407 will be run.
4	2	C (RO)	The "B" Feed Reg valve fail in the automatic mode. This will result in RPV level going up. The RO will have to take manual control of the feed reg valve to maintain RPV level.
5	3	C (BOP) And TS (SRO)	The "B" EDG will develop a problem. The BOP will send the Aux man to investigate. The report back from the EDG room will state that there are 2 annunciators on 1C94, A-3, JACKET COOLANT LEVEL LOW, and A-4, JACKET COOLANT TEMPERATURE HIGH OR LOW. The report will also state that the jacket coolant temperature is currently 195 degrees and going up. The BOP will remove the "B" EDG from service and the SRO will enter the applicable TS
6	4	C (BOP/SRO)	PSV 4407 will not close when the HS is taken to the Auto position. AOP 683 will be entered. Per the AOP, the valved will be cycled. After the cycling, it will be determined that the SRV did not close. Based on the AOP, the crew will insert a manual scram.

7	5	M	The condensate pump transient will result in a rupture of feedwater piping in the DW. The rupture will occur at the feed water check valve. This will result in a drywell high pressure and entry into EOP 1 and EOP 2. On the 2-psig signal, 1A3 will lock out due to a short in the "A" CS motor. The "B" CS pump will trip For EOP 2, the crew will have to spray the drywell. The Crew will also have to monitor Torus water level and secure Condensate and Feed to stop the torus water level rise. Because RPV pressure is so low, HPCI and RCIC will isolate shortly after the event. The RHR inject valve will fail to automatically open. The BOP will have to control his injection into the RPV LPCI.
8	6	C (BOP)	The RHR inject valve will **not open** automatically, requiring the operator to attempt to manually open the valve to maintain RPV level. The Selected Loop valve will not open, and the BOP will be required to wait 10 minutes for LPCI Loop Select to time out to be able to inject with the Non-Selected Loop of RHR. Being able to inject into the RPV with RHR is a **critical task**.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

NMC Committed to Nuclear Excellence	EVALUATION SCENARIO GUIDE (ESG)

SITE: **DAEC**

LOW POWER, ROD PULL TO PERFORM SRV CYCLING STP, IRM FAIL UPSCALE, FEED REG VALVE LOCK UP AND RESET, EDG RUNNING FOR STP MUST BE SECURED, STUCK OPEN SRV, FEED WATER RUPTURE IN CONTAINMENT. **ESG ILC 17 REV. 1**

PROGRAM: **OPERATIONS** **#:**

COURSE: **ILC** **#:** **50007**

TOTAL TIME: **80 MINUTES**

Developed by:		
	Instructor	*Date*
Validated by:		
	SME/Instructor	*Date*
Reviewed by:		
	Operations Manager	*Date*
Approved by:		
	Training Supervisor-Operations	*Date*

ESG 17, ILC NRC Exam, Rev. 1

GUIDE REQUIREMENTS

Training Resources:	Simulator Simulator Booth Instructor Phone Talker Simulator Floor Instructor
References:	IPOI 2, Rev. 80 STP 3.8.1-04, Rev. 14 STP 3.6.2.1-01, Rev. 2 ARP 1C05A C-3, Rev. 6 ARP 1C05A A-2, Rev. 9 STP 3.4.3-03, Rev. 5 ARP 1C05A D-1, Rev. 6 OI 644, Rev. 73 OI 324, Rev. 65 ARP 1C94 A-4, Rev. 9 AOP 683, Rev. 2 OI 149 QRC 1, Rev. 1 OI RHR QRC 3, Rev. 1 EOP 1, Rev. 11 EOP 2, Rev. 12 EPIP
Commitments:	None
Evaluation Method:	Dynamic Simulator
Operating Experience:	None

ESG 17, ILC NRC Exam, Rev. 1

SCENARIO SUMMARY:

Current plant operating status:

- Reactor start up is in progress. The plant was shut down due to PSV 4407 leaking. It has been fixed. We are currently at 150 psig and holding.
- STP 3.4.3-03, MANUAL OPENING AND EXERCISING OF THE ADS AND LLS RELIEF VALVES, for LLS PSV 4407 must be run prior to raising reactor power.
- Currently one bypass valve is open 75%. The STP requires that one bypass valve be opened 100% and the second be open 15%. Control rods will have to be withdrawn to achieve the STP conditions. When the STP is complete begin pulling control rods to start up the plant.
- Torus Cooling has been placed in service preparation of the STP, and TS 3.5.1 Condition B has been entered.
- STP 3.6.2.1-01, Suppression Pool Water Temperature Surveillance, is available for when you open the SRV.
- STP 3.8.1-04, Standby Diesel Generators Operability Test, (Slow Start From Norm Start Air) is in progress. The "A" EDG has been tested satisfactorily. The "B" EDG test is in progress. The STP is complete through step 7.2.25. It is currently in it's one hour run for TS, and the 2 hour run for stabilization of the Generator Stator and Main Bearing temperatures.
- During the start up the Start Up Feed Reg Valve was sticking. It was decided that the Start Up Feed Reg Valve be isolated and level be controlled via the "B" Feed Reg Valve. At the beginning of your shift, there are 2 I & C Techs looking at the operator. They may call for your assistance to cycle the valve.
- I & C has asked that the "A" IRM be bypassed for a short time. They are working near the "A" IRM Preamp and do not want to generate any half scrams. The work should take about 45 minutes, and then the "A" IRM can be unbypassed.
- There is a severe thunderstorm warning for the next 2 hours for the Linn and Benton Counties.

Scenario segments:

Event 1 (R-ATC)

- Control rods will be pulled to achieve one bypass valve 100% open and the second bypass valve 15% open.

Event 2 (I-ATC)

- During the rod pull, the “C” IRM will fail upscale. This will result in a rod block and half scram. The SRO will consult TS and determine that for a short time, until the “A” IRM is unbypassed, they were not in compliance with TS 3.3.1.1 Condition A. This is because there were not 2 operable IRMs. The crew will unbypass the “A” IRM and bypass the “C” IRM, reset the half scram, consult TS and continue with the rod pull.

Event 3 (N BOP)

- When the conditions of STP 3.4.3-03, MANUAL OPENING AND EXERCISING OF THE ADS AND LLS RELIEF VALVES, are met, the BOP will cycle PSV 4407.

Event 4 (C-ATC)

- “B” feed Reg Valve controller will fail in automatic resulting in the ATC operator taking manual control of Feedwater flow.

Event 5 (C-BOP)

- The EDG will develop a jacket cooling water leak that will require the EDG to be unloaded and removed form service.
- The SRO will declare the EDG inoperable and TS 3.8.1 Condition B will be entered.

Event 6 (C-BOP)

- Shortly after the EDG is declared inoperable, PSV 4407 will fail open again. The Crew will enter AOP 683 and cycle the hand switch for PSV 4407 in attempts to close the SRV. The cycling of the hand switch will not close the PSV.

Event 7 (M- ALL)

- Shortly after scramming the reactor, a feedwater leak will begin inside the primary containment. The leak will propagate and entry into EOP 1 and 2 will be required.
- On the 2 psig signal, bus 1A 3 will receive a lockout due to a fault in the “A” CS pump motor.
- The “B” CS pump will trip.
- HPCI will trip on its start.

- The crew may not diagnose the problem to be a feedwater line rupture. If this occurs, they will be able to maintain RPV level with Feedwater, but the torus level will rise. They will be forced to remove feedwater injection based on either torus level, or when the entire Hotwell is pumped to the torus, the condensate pumps will trip on low suction pressure.
- Per EOP 2 the crew will spray the torus and the drywell and take actions to lower the torus level.

Event 8 (C-BOP)

- The RHR inject valve will **not open** automatically, requiring the operator to attempt to manually open the valve to maintain RPV level. The Selected Loop valve will not open, and the BOP will be required to wait 10 minutes for LPCI Loop Select to time out to be able to inject with the Non-Selected Loop of RHR. Being able to inject into the RPV with RHR is a **critical task**.

The End

- When feedwater is secured, the RPV depressurized and RPV level being maintained with RHR, the scenario will be complete

TASKS ASSOCIATED WITH SIMULATOR EXERCISE:

⇒ RO (NSOE, ANSOE)

- ♦ 1.07 Perform Surveillance Test Procedures
- ♦ 19.06 Shutdown the SBDG
- ♦ 72.07 Withdraw control rods using group notch
- ♦ 79.01 Operate the IRM system during a plant startup
- ♦ 94.51 Respond to Abnormal Safety Relief Valve Operation
- ♦ 93.22 Perform immediate operator responses to a reactor scram.
- ♦ 95.14 Perform EOP Defeat 4.
- ♦ 95.21 Perform EOP Defeat 11.
- ♦ 95.26 Perform EOP Defeat 16.
- ♦ 95.44 Perform the actions of RC/L of EOP-1.
- ♦ 95.59 Perform T/L leg of EOP 2 for a rising torus level
- ♦ 95.63 Perform the DW/T leg of EOP-2
- ♦ 95.64 Perform the DW/P leg of EOP-2

⇒ Shift Supervisor (SS)

- ♦ 1.01 Direct routine crew and control room activities.
  - 1.01.02 Coordinate operator activities.
  - 1.01.03 Ensure control room activities conform to ACP 1410.1, Conduct of Operations.
- ♦ 1.02 Determine operability of Tech Spec required components.
  - 1.02.02 Determine if the instrument, component, or system is operable.
  - 1.02.03 Declare the instrument, component, or system is inoperable, enter the correct LCO, and determine and direct performance of the LCO STP.
- 1.21 Direct crew response to normal events/accidents
  - 1.21.01 Evaluate the event or accident to determine its cause and develop mitigation strategies.
  - 1.21.02 Recognize and prioritize data relevant to the accident or event.
  - 1.21.03 Direct appropriate conservative actions to mitigate the accident or event and stabilize plant parameters.
  - 1.21.06 Analyze results and direct alternate mitigation actions.

- 3.01 Implement the Emergency Plan
  - 3.01.01 Declare the appropriate EAL
- 4.05 Direct crew actions to increase reactor pressure from approximately 80-90 psig to one bypass vale is open
  - 4.05.01 Supervise crew withdrawing control rods.
- 5.51 Direct crew response to Abnormal Safety Relief Valve Operation
  - 5.49.01 Direct crew response to perform the Immediate and Follow-up Actions of TURBINE LUBE OIL TROUBLE tab of AOP 693.
- 6.14 Direct Crew response to perform EOP Defeat 4.
  - 6.14.01 Direct operator actions to perform EOP Defeat 4.
- 6.21 Direct Crew response to perform EOP Defeat 11.
  - 6.21.01 Direct operator actions to perform EOP Defeat 11.
- 6.26 Direct Crew response to perform EOP Defeat 16.
  - 6.26.01 Direct operator actions to override the containment sample valves Group 3 isolation using EOP Defeat 16.
- 6.44 Direct crew response for performance of the RC/L leg of EOP-1.
  - 6.44.01 Direct operator actions to maintain RPV level between 170″ and 211″ using the Table 1 injection systems.
- 6.59 Direct Crew response for performance of the T/l leg of EOP-2 for a slow rising torus level
  - 6.59.01 Direct operator actions to lower torus water level with RHR system using Defeat 13 as necessary.
- 6.62 Direct Crew response for performance of the T/T leg of EOP-2.
  - 6.62.01 Direct operator actions to place RHR in the Torus cooling mode.
- 6.63 Direct Crew response for performance of the DW/L leg of EOP-2.
  - 6.63.01 Direct operator actions to maintain drywell temp <150° using drywell-cooling systems and bypassing the main intake coils if necessary.
  - 6.63.03 Direct operator actions to secure the running Recirc pumps, initiate drywell sprays using RHR pumps not required continuously for adequate core cooling and verify drywell cooling fans have tripped.
- 6.64 Direct Crew response for performance of the DW/P leg of EOP-2.
  - 6.64.02 Direct operator actions to Initiate Torus sprays using RHR pumps not required continuously for adequate core cooling.

SCENARIO OUTLINE:

BOOTH INSTRUCTOR ACTIONS

1 SIMULATOR SET UP:

1.1 General Instructions

a. Reset to IC 7. This places you at approximately 100 psig; you need to get to 150 psig with one bypass valve open approximately 75%. You do this by:

(1) Establish condenser vacuum by starting the Mechanical Vacuum Pump and closing the main condenser vacuum breakers.

(2) Bypass the "A" IRM.

(3) Place the steam loads in the proper condition per OI 683, IAW Section 3.2 through step 3.

a) This OI has you close some steam line drains. It should be done prior to pulling the control rods in the next step.

(4) When you reset the simulator you will be on pull sheet step 10, you must pull control rods until step 16 rods are at their withdrawal limits.

a) NOTE that the first set of rods that you reset into get pulled to 48. These can be pulled continuously by bypassing the RWM.

b) When they get to 48, place the RWM back in operate and continue the pull until step 16, then assess the position of the #1 bypass valve.

c) When the bypass valve is at 75%, Mark up the rod pull sheet to reflect the current rod positions. [Note that it should be through Step 16 on the pull sheet.]

(5) Verify that IPOI 2 Section 4.1 is and you are just waiting for the STP on PSV-4407.

(6) Place RHR in Torus Cooling IAW OI 149, Section 5.4 through step 12.

(7) Per OI 573, section 5.2 verify that steps complete through step 13. This is for the air purge of the containment.

(8) Place HPCI and RCIC in stand by readiness.

(9) Per OI 261, Section 7.1, start a vessel drain to the main condenser via RWCU. This will place you at step 6 of the OI.

(10) Per OI 691, mark up section 3.2 for starting the Mechanical Vacuum Pump. Be ready to start the JETS.

(11) OI 693.3, Turbine Lube Oil, section 3.2 is complete. Waiting to roll the turbine.

b. Verify event trigger definition for event trigger # 5 is **pcpdwg .gt. 2.0**.

c. Type in the **malfunctions** as listed on the Malfunction table in this ESG.

d. Type in the **overrides** as listed on the override table in this ESG.

e. Have a copy of **STP 3.4.3-03, MANUAL OPENING AND EXERCISING OF THE ADS AND LLS RELIEF VALVES**. Mark it up as follows:

(1) On the Prerequisites page initial step 6.1.

(2) N/A pages 10 thorugh19
(3) On page 20, N/A steps 8.3.2 through 8.3.6
(4) ON page 21, N/A steps 8.4.2 through 8.4.6
(5) This will leave only section 7.1 to complete for PSV 4407.

f. Reset all SRM and IRM alarm lights at 1C-36.
g. Place the "A" IRM in bypass.
h. Have a copy of **STP 3.8.1-04, STANDBY DIESEL GENERATORS OPERABILITY TEST (SLOW START FROM NORM START AIR),** and mark up as follows:
(1) Remove all of the "A" EDG paperwork.
(2) For Section 6.0, PREREQUISITES;
a) X and initial the "B" EDG, N/A the others
b) For 6.1.2, initial and list the following as Risk Significant;
(1) RED: "A" ESW, "A" EDG, and Startup Transformer.
(2) Orange: RCIC, 125 VDC Swing Charger, 1D120, HPCI, and Div 2 250 charger 1D44.
c) For 6.1.3, initial the Note and all of the steps as the CRS.
(3) For Section 7.2 1G-21 OPERABILITY;
a) Initial all notes and steps up to and including the NOTE at the top of page 29. DO NOT initial step 7.2.29, the EDG load time requirements.
(1) For step 7.2.7, write in **Today** for the date, and about **25 min. ago** for the time.
(2) For step 7.2.25.c write in 4250 Volts.
(3) For step 7.2.25.d write in the 4250 volts and 484 amps.
(4) For step 7.2.25.e write in 484 amps.
(5) For step 7.2.25.f write in **10minutes before turnover**.
b) Step 7.2.70, sign the performed by, place today as the date, place turnover for the time, and initial.
i. Pump the drywell equipment and floor drain pumps.
j. Have a copy of STP 3.6.2.1-01, SUPRESSION POOL WATER TEMPERATURE SURVEILLANCE. Nothing needs to be signed on this copy.
k. LCO and Safety Function Determination paperwork, for any outstanding LCOs

1.2 EVENT TRIGGER DEFINITIONS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
5	Pcpdwg .gt. 2.0	Drywell pressure at 2 psig
Event Triggers1-4 will be inserted per the driving instructions in the body of the scenario.		

1.3 MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	Delay	Ramp	ET	Initial Value	Final Value
T=0	CS01B	B CS pump will trip on start					
T=0	STRH02	RHR inject valve fails to automatically open					
T=0	ED08C	Lock out of 1A3	5		5		
T=0	HP02	HPCI turbine trip	10		5		
As dir	NM04C	"C" IRM fails up scale			1	As is	100
As dir	FW12B	B Feed Reg Valve fail in auto		800	2	As is	50
As dir	AN1C08B(26)	B Diesel Gen 1G-21 Panel 1C-94 Trouble			3		ON
As dir	AD01H	PSV 4407 leak			6	As is	50
As dir	FW17A	Rupture of feed water inside PC		200	4	As is	75
As dir	FW20A	Rupture of feed water inside PC		300	4	As is	75
As dir	DG03B	B EDG trip			10		
As dir	RR30	Reactor bottom head leak			11	As is	50
As dir	SW22H	DW CLG units well water blockage			5	As is	100
As dir	SW22I	DW CLG units well water blockage			5	As is	100
As dir	SW22J	DW CLG units well water blockage			5	As is	100
As dir	SW22K	DW CLG units well water blockage			5	As is	100
As dir	SW22L	DW CLG units well water blockage			5	As is	100
As dir	SW22M	DW CLG units well water blockage			5	As is	100
As dir	SW22N	DW CLG units well water blockage			5	As is	100

1.4 OVERRIDES:

Time	Override No.	Override Title	Delay	Ramp	ET	Initial Value	Final Value
T=0	AO MCFR1374(1)	Offgas flow (0-150 cfm)					0
T=0	AO MCFR1374(2)	Offgas flow (0-150 cfm)					0
T=0	DI FW	A condensate pump HS				As is	Stop

1.5 REMOTE FUNCTIONS:

Time	Remote No.	Remote Title	Delay	Ramp	ET	Initial Value	Final Value
T=0	DG11	EDG 21 in parallel				As is	Parallel
T=0	RH24	MO-1905 fails to open				As is	Close

FLOOR INSTRUCTOR ACTIONS

2 Simulator Pre-brief:

2.1 Individual position assignments

BOOTH / FLOOR INSTRUCTOR ACTIONS

2 Conduct pre-scenario activities in accordance with the following procedures:

3.1 If this scenario is used in training mode: OTI 101

4 TURNOVER INFORMATION

⇒ Day of week and shift

- ♦ Wednesday
- ♦ Day shift

⇒ Weather conditions

- ♦ Warm
- ♦ Severe thunder storm warnings for Linn and Benton Counties for the next 2 hours

⇒ (Plant power levels) Start up, 150 psig in the RPV

- ♦ MWT N/A
- ♦ MWE N/A
- ♦ CORE FLOW N/A

⇒ Thermal Limit Problems/Power Evolutions

- ♦ Rod pull to achieve one bypass valve 100% open, and the second 15% for STP 4.3-03, MANUAL OPENING AND EXERCISING OF THE ADS AND LLS RELIEF VALVES.
- ♦ You are currently ready to begin the rod pull at **step 17** of the rod pull sheet.

⇒ Plant Risk Status

- ♦ CDF N/A
- ♦ Color N/A

⇒ Existing LCOs, date of next surveillance

- ♦ TS 3.5.1 Condition B for RHR being in Torus Cooling Mode of Operation. Currently in Day 1 of 7.

⇒ STPs in progress or major maintenance

- ♦ Making preparations for running STP 3.4.3-03, MANUAL OPENING AND EXERCISING OF THE ADS AND LLS RELIEF VALVES, for LLS PSV 4407.
- ♦ STP 3.8.1-04, Standby Diesel Generators Operability Test, (Slow Start From Norm Start Air) is in progress. The STP is only for the “B” EDG. The STP is complete through step 7.2.25. It is currently in it’s one hour run for TS, and the 2 hour run for stabilization of the Generator Stator and Main Bearing temperatures.

⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment

- ♦ Start up in progress currently in IPOI 2 Section 4.1 is complete with the exception of step 20 C. The plant shut down 1 week ago to repair PSV 4407. It has been fixed and STP 3.4.3-03 must be run to prove operability of PSV 4407 prior to continuing on with the start up.

- ♦ Torus Cooling has been placed in service to support the STP.
- ♦ The Start up Feed Reg valve was sticking and not controlling RPV level very well. It was determined that the Start up Feed Reg valve be isolated and level be controlled on the "B" feed Reg Valve.
  - Right after shift turnover 2 I & C Techs are going to go out and look at the operator of the valve and try to determine what the problem is.

⇒ Comments, evolutions, problems, core damage frequency, etc.

- ♦ RHR has been placed in Torus cooling per OI 149 section 5.4. This procedure is currently waiting at step 13.
- ♦ The Mechanical Vacuum Pump has been started IAW OI 691 section 3.2.
- ♦ Vessel drain to the main condenser via RWCU is established via OI 261, Section 7.1. You are currently on step 6 of this section.
- ♦ HPCI and RCIC have been placed in stand by readiness IAW their respective procedures.
- ♦ Air purge of the containment is in progress IAW OI 573 section 5.2. You are currently waiting to perform step 13.
- ♦ OI 693.3, Turbine Lube Oil, section 3.2 is complete. Waiting to roll the turbine.
- ♦ I & C has asked that the "A" IRM be bypassed for a short time. They are working near the "A" IRM Preamp and do not want to generate any half scrams. The work should take about 45 minutes, and then the "A" IRM can be unbypassed.
- ♦ The WCC is fully staffed with 2 extra NSPEOs.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Shift Turnover	• Provide Shift Turnovers to the **SRO** and **RO**s.	• Get familiar with plant conditions. **SRO** will provide beginning of shift brief to coordinate the tasks that were identified on the shift turnover. (SRO 1.01)
Pull control rods to achieve 1 bypass valve full open and the second to 15%. **EVENT #1 (R ATC)**	NOTE that this brief may be preformed prior to the scenario starting.	**SRO** will perform a Control Rod pull brief IAW IPOI 2. He will discuss the following topics: (1.01) • The major brief will be given prior to the scenario. The CRS may review the following during the scenario: o Attention to detail. o Previous misposition events. o Alertness o Insert and withdrawal limits **RO** will pull control rods to achieve one bypass valve 100% open and the second bypass valve 15% open to establish the conditions for the cycling of PSV 4407. **(Critical)** (72.07)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
"C" IRM failing upscale. **EVENT #2 (I ATC)**	**BOOTH INSTRUCTOR** after the RO has pulled a round of control rods, perform the following: **IMF NM04C by setting event trigger 1 to true.** This will result in the "C" IRM failing up scale. This will cause a rod out block and half scram. **Booth Instructor** the Crew may call you and tell you that they must unbypass the "A" IRM to bypass the "C" IRM. Inform the control room that you are done with what you were doing and will not be in an area where you may bump the "A" IRM preamp any more.	**ATC operator** will respond to annunciator 1C05A C-3, IRM UPSCALE, and perform the following: • Announce the alarm to the SRO. • Determine that "C" IRM has failed upscale (Step 3.4). • Inform the CRS to comply with TS (Step 3.4.a). • Ask for permission to unbypass the "A" IRM and to bypass the "C" IRM. (3.4.b **(critical for the event)** (79.01) **SRO** will: • Call I & C and inform them that you must unbypass the "A" IRM • Grant permission to bypass the "C" IRM. • Consult TS to determine if there are any TS considerations. o He will determine that that until the "A" IRM is unbypassed they are not in compliance with TS 3.3.1.1 Condition A. o The condition of "A' is already met as the half scram is in. o When "A" is unbypassed and "C" is bypassed, TS 3.3.1.1 can be exited. o A total of 4 IRMs are required for the TRM rod block. This is met the entire time. (1.02) **ATC operator** will respond to annunciator 1C05A A-2, "A" RPS AUTO SCRAM, and perform the following; • Determine that the cause of the scram has been corrected by bypassing the IRM (step 3.4 and 3.9) • Reset the half scram (step 3.10 **(critical for the event).** **Crew** will write a work request card and submit it to the Work Control Center.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Rod pull to achieve the conditions for the STP continued. **EVENT #1 Continued**		**SRO** will direct that the rod pull to achieve one bypass valve full open and the second one 15% open continue. **ATC operator** will continue to pull control rods to achieve one bypass valve full open and the second one 15% open • The ROs will inform the CRS when the conditions of the STP are met.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Performance of STP 3.4.3-03. **EVENT #3 (N BOP)**	NOTE that this brief may be preformed prior to the scenario starting. **Booth Instructor** a portion of this STP requires an operator in the back panel, Role play as an extra operator to perform the back panel verifications required by the STP. **Booth Instructor** when the crew gets to the step where STP 3.6.2.1-01 is to be started, Role-play as an extra operator to perform the STP.	NOTE that this evolution has been briefed prior to the crew assuming the watch. The CRS may give a short brief to the crew prior to performing the STP. **SRO** will perform an abbreviated evolution brief with the crew to perform STP 3.4.3-03. The shortened brief should contain the following major topics: (1.02) • Equipment to be tested • Sequence of events • Expected Trends or Results • STAR techniques • Need for exercising caution and conservatism • Criteria and method of stopping the evolution **ATC operator** will perform STP 3.4.3-03 by performing the following: (1.07) • Verify the prerequisites. o EHC Pressure Set is set at minimum (150 psig), establish steam flow to the condenser via the bypass valves until #1 bypass valve indicates approximately 75% open. o Verify turbine steam seal pressure is approximately 2.0 psig. (Adjust if necessary). o Verify RHR is in torus cooling per OI 149. o CLOSE the following steam drains, MO-4423, MO-1043, MO-1044, MO-4424, CV-1064, MO-1042, MO-1098, MO-1038, MO-1039, MO-1040, MO-1041, MO-1034, MO-1035, and MO-1028. • MAIN STEAM LINE "D" RELIEF VALVE PSV-4407 TEST o Adjust reactor power as necessary and raise steaming rate until #2 Bypass Valve is approximately 15% open. o Commence monitoring Torus water level and temperature by performing STP 3.6.2.1-01 (Suppression Pool Water Temperature Surveillance), Section 7.1.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
		o At 1C05, adjust all IRM range switches to their highest possible position while maintaining indication above the downscale alarm. o At 1C03, perform the following: ▪ Confirm PSV-4407 indicates closed (green indicating light on). ▪ Place LLS PSV-4407 handswitch to OPEN. **(Critical for this event).** ▪ Verify that PSV-4407 solenoid has energized (red indicating light on). ▪ Confirm PSV-4407 amber indicating light on. o Confirm the following: ▪ At 1C07, Bypass Valve movement in the CLOSED direction. ▪ At 1C21, white "TAILPIPE PRESSURE NORMAL" light (PSV-4407) is off. ▪ At 1C21, noticeable temperature increase in PSV TAILPIPE TEMPERATURE as read on the BLUE pen of temperature recorder TR-4400D. ▪ Computer point T536 - PSV-4407 OPEN OR LEAKING OPEN typed out. ▪ At 1C03A, confirm annunciator SRV/SV TAILPIPE HI PRESS OR HI TEMP (1C03A, C-5) activates. (Annunciator activation might be delayed until temperature reaches 250 degrees Fahrenheit). o At 1C03, place LLS PSV-4407 handswitch to AUTO. **(Critical for this event)** o Confirm the following: ▪ At 1C07, Bypass Valve movement in the OPEN direction. ▪ At 1C21, white "TAILPIPE PRESSURE NORMAL" light (PSV-4407) is on. ▪ At 1C21, noticeable temperature decrease in PSV TAILPIPE TEMPERATURE as read on the BLUE pen of temperature recorder TR-4400D.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
		▪ Computer point T536 - PSV-4407 OPEN OR LEAKING CLSD typed out. ▪ At 1C03, confirm annunciator SRV/SV TAILPIPE HI PRESS OR HI TEMP (1C03A, C-5) resets and amber indicating light off. (Annunciator reset will be delayed until temperature drops below 250 degrees Fahrenheit). o Secure (monitoring Torus water level and temperature) from performing STP 3.6.2.1-01 (Suppression Pool Water Temperature Surveillance), Section 7.1: o Immediately initiate performance of STP 3.6.2.1-01 (Section 7.2) if either of the following situations exist (otherwise, mark this step N/A): ▪ This step will be N/Aed. When the STP section is complete, he will inform the CRS.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
"B" Feed Reg Valve fails open in Auto **EVENT #4 (C ATC)**	**Booth Instructor** When the SRV has been cycled: The BOP operator is waiting for the Tail Pipe high temp/pressure alarm to clear And RPV level has about returned to the middle of the green band, or at the direction of the lead evaluator, perform the following: **IMF FW12B at 50 over 800 seconds by setting event trigger 2 to true.** This will fail the B feed reg valve open.	**ATC operator** will respond to annunciator 1C05A D-1 and perform the following: • Announce the alarm to the SRO. • Determine that level rising. o As necessary, take manual control of any or all of the following Feedwater controllers to restore Reactor level to between 186 and 195 inches: **(critical for the event)** ▪ B FEED REG VALVE MANUAL/AUTO TRANSFER HC-1621. **CREW** May determine that feed water level control can be transferred over to the "A" Feed Reg Valve in AUTO IAW OI 644 by performing the following: (1.21) • Slowly OPEN the A feed reg valve and CLOSE the B feed reg valve in MANUAL. • Per OI 644 o Verify manual control of Feedwater Regulating Valve CV-1579 by adjusting the potentiometer while monitoring reactor water level.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
"B" Feed Reg Valve fails open in Auto **EVENT #4 (C ATC)**		o Select 'V' on display for A[B] Feed Reg Valve CONTROLLER HC-1579. o With MASTER FEED REG VALVE CONTROLLER LC-4577 in MANUAL, adjust the potentiometer to match reading on HC-1579 top display. o Select AUTO on the A FEED REG VALVE CONTROLLER, HC-1579. o Verify that MASTER FEED REG VALVE CONTROLLER, LC-4577 is controlling Feedwater Regulating Valve CV-1579. o Place the MASTER FEED REG VALVE CONTROLLER LC-4577, in AUTO and verify that LC- 4577 is controlling Feedwater Regulating Valve CV-1579. o Verify 'S' is selected on LC-4577 and HC-1579.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Jacket coolant leak of the B EDG. **EVENT #5 (C BOP)**	**Booth Instructor** shortly after the feed reg valve is restored to operation, or at the direction of the Lead evaluator, perform the following: **IMF AN 1C08B(26) by setting event trigger 3 to true.** This will give the "B" EDG trouble alarm. **Booth instructor** when sent to the B EDG room to investigate, wait about 2 minutes and report the following: • There are 2 abnormal alarms, o 1C94 A-3, Jacket Coolant Level Low, and o 1C94 A-4, Jacket Coolant Temperature High or Low • On your initial first glance you see coolant on the floor, • The expansion tank is empty, • And the jacket coolant temperature is 195 degrees and going up slowly. **Note to Evaluator** if the crew determines to shutdown the EDG via the OI, if the evolution takes 15 minutes, the EDG will trip on its own.	**RO** will respond to annunciator 1C08B C-3, "B" EDG trouble alarm and perform the following: • Announce the alarm to the SRO. • Send an operator to the B EDG room to investigate. **RO,** with the SROs concurrence, will respond to ARP 1C94 A-4 and perform the following: • Determine that there is no LOOP or LOCA emergency occurring. • With the report that the jacket cooling temperature is above 195º. • Unload the SBDG. (19.06) **(Critical for segment)** • Trip the SBDG and notify the CRS. (19.06) **(Critical for segment)** The Crew may elect to remove the EDG from service via OI 324, if they do this they will take the following actions: • If the SBDG is in PARALLEL OPERATION, then reduce the load on the Diesel Generator to 1500-1600 KW by using the DIESEL GENERATOR 1G-31[21] SPEED ADJUST CONTROL. • Adjust A[B] DIESEL GENERATOR 1G-31[1G-21] VOLTAGE ADJUST to maintain 0.9 power factor per Appendix 1.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Jacket coolant leak of the B EDG. **EVENT #5 (C BOP)**	**Booth Instructor** if the crew takes greater than 15 minutes from the time that they are informed of the Jacket cooling leak and High temperature alarm, then perform the following: **IMF DG03B by setting event trigger 10 to true.** This will trip the B EDG	• Operate at 1500-1600 KW for 10 minutes to allow for cooldown. (Based on the current conditions, the 10 minute cooldown may be waived). • Verify AC Sources LCO has been entered if applicable. • Place the BUS 1A3[4] TRANSFER breaker mode selector switch is in MANUAL. **(Critical for this evolution)** • Reduce the load on the Diesel Generator to 50 KW by using the DIESEL GENERATOR 1G-21 SPEED ADJUST CONTROL. • Place the control switch for 4KV BREAKER 411 B DIESEL GENERATOR 1G-21 in the TRIP position. **(Critical for this evolution)** o Observe that the green (breaker tripped) and the white (closing spring charged) indicating lights are ON. • Place the BUS 1A4 TRANSFER breaker mode selector switch in the AUTO position. **(Critical for this evolution)** • At 1C08, confirm annunciator 4KV BUS AUTO TRANSFER INOP (1C08A, D-7) is reset. • Place the B GOVERNOR MODE SWITCH (DROOP) HS-3234B at 1C94 in UNIT. • At 1C08, perform the following: o Set B Diesel Generator frequency to approximately 60 Hz using handswitch B Diesel Generator 1G21 speed adjust. o Set B Diesel Generator voltage to approximately 4160 VAC using handswitch B Diesel Generator 1G21 voltage adjust. • Stop B DIESEL GENERATOR [1G-21 by performing one of the following: o Place B DIESEL GENERATOR 1G-21 CONTROL handswitch HS-3231B on Panel 1C08 in the STOP position, hold for 5 to 10 sec., and then return to AUTO. **(Critical for this evolution)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Jacket coolant leak of the B EDG. **EVENT #5 (C BOP)**		**SRO** will determine the following: • With the jacket cooling problem and the EDG in PTL. • The EDG must be declared inoperable. • TS section 3.8.1 Condition B must be entered and the following steps taken. o Perform SR 3.8.1.1 for operable offsite circuits. o Within 4 hours declare required features supported by the inoperable EDG inoperable when the redundant required features are inoperable o Determine that the fault is not a common cause failure. o Perform SR 3.8.1.2 for the operable EDG once per 72 hours, o Restore the inoperable EDG to operable within 7 days (1.02)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
SRV 4407 fails open **EVENT #6 (C BOP)**	**Booth Instructor** when the "B" EDG is secured and/or at the direction of the lead evaluator, perform the following: **IMF AD01H by setting event trigger 6 to true** This will result in PSV 4407 failing 50% open. **Booth instructor** allow the crew some time to diagnose that the SRV is open based on a high temperature. Then perform the following: **MMF AD01H 75 over 60 seconds** **Booth Instructor;** **Immediately AFTER the scram**, perform the following: **DMF ADO1H**	**BOP operator** will respond to annunciator 1C03A C-5 by performing the following: • Announce the alarm to the SRO. • Inform the SRO that AOP 683 must be entered. **SRO** will enter AOP 683. Per AOP 683, between the **SRO** and **BOP operator,** they will determine the following: (6.51) • Determine that the SRV is open per the checks of the AOP. • Determine that power is less than 75%. **BOP operator** will • Cycle the affected Safety Relief Valve's handswitch. **(critical for the event)** • Determine that the SRV has **not** closed based on the Amber light above the handswitch staying on. • Report to the SRO that SRV 4407 has **NOT** closed. **(critical for the event)** (94.51) **SRO** will • Per the AOP, based on the SRV not closing, the CRS will direct that the reactor be scrammed. (**Critical for the event**) • May also direct that the MSIVs be closed to slow down the cooldown rate. ATC or RO will manually scram the reactor as directed. (**critical for event**)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Feedwater line break in the Primary containment **EVENT #7 (M ALL)**	**Booth Instructor** IMMEDIATELY after the scram or at the direction of the Lead evaluator, perform the following: **IMF FW17A at 75 over 200** **and** **FW20A at 75 over 300 by setting event trigger 4 to true.** This will start a leak from the feedwater system and the reactor into the primary containment. **Booth Instructor** when the event settles out, RPV level will stabilize out at about 125 inches. To keep a slow lowering trend in RPV level perform the following: **IMF RR30 at 50 by setting event trigger 11 to true.** Note that this malfunction may be deleted at any time as the driver sees fit.	**Crew** will respond to any of the following: • An increase of feedwater flow. • DW pressure rising as indicated by either of the following: o Pressure indicators on 1C03 or 1C09 o Annunciator 1C05B B-1 clearing **SRO** will direct and the **Crew** will perform: • Direct the actions of IPOI 5 be completed (93.22) **SRO** when the DW reaches 2 psig the SRO will direct and the crew will perform the following: • The CRS will direct and the Crew will perform the following actions from **EOP 1.** o Verify all rods fully inserted. **(Critical for event #7)** o Per RC/L • Maintain RPV level 170 to 211” with available inject sources. (95.44, SRO 6.44) • On the scram bus 1A3 will lock out. This will result in; o A loss of “A” CS and “A” and “C” RHR pumps.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Feedwater line break in the Primary containment **EVENT #7 (M ALL) continued**	**Booth Instructor verify the following when the DW reaches 2 psig:** Event trigger 5 comes true. This will result in the following: • Lock out of 1A3, due to the starting current of the A CS pump. • HPCI trip • Blockage of all of the "B" side D/W coolers will occur,	o "A" EDG will be running without ESW for cooling. o The Crew will secure the "A" EDG. • HPCI will trip shortly after it initiates. • "B" CS pump will trip on initiation. • The Condensate pumps will be running, however this system is broken and in additions to slowing the RPV leak, it is raising the Torus level. (See EOP 2 T/L actions) • CRS will direct and the crew will perform; o "B" CRD be injected into the RPV. **(Critical for event #7)** o SBLC be injected into the PRV **(Critical for event #7)** o RHR be injected into the RPV. **(Critical for Scenario Critical Task)** **Scenario Critical Task is to maintain RPV level. To do this, the crew will determine that RHR is the only system that is available and has the capacity to maintain RPV level**. (See **Event #8** for RHR details). o Per RC/P • Override CV 4371A, (Defeat 11) (95.21, SRO 6.21) **(Critical for event #7)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Feedwater line break in the Primary containment **EVENT #7 (M ALL) continued**		o The CRS will direct and the Crew will perform the following actions from **EOP 2.** • Per T/L • Maintain torus level between 10.1 and 13.5 feet. (95.59, SRO 6.59) ▪ Torus level may become a concern. (The Malfunction is a break on the feedwater injection line.) ▪ If the crew diagnoses that the leak is on the feedwater system they may elect to secure injection from Condensate. • Per T/T • Maintain below 95°F by starting torus cooling if necessary. • Per DW/T • Attempt to maintain below 150°F. • As temperatures rise install defeat 4. (95.14, SRO 6.14). • When out of the hatched region of Graph 7, Drywell Spray Initiation Limit, spray the D/W. **(Critical for Scenario Critical Task)** (95.63, & 6.63) • Enable containment sprays by placing Containment Spray Enable Switch HS-1903C in Manual. **(Critical for Scenario Critical Task).** • Open MO-1902, Inboard Drywell Spray Valve. **(Critical for Scenario Critical Task).** • Open MO-1903 Outboard Drywell Spray Valve. **(Critical for Scenario Critical Task).** **Scenario Critical Task: BEFORE drywell temperature reaches 280°F and WHILE in the safe region of the DWSIL, THEN initiate drywell sprays** • Per PC/P ▪ When torus pressure rises above 2 psig, and before 11 psig, Spray the Torus. (95.64, SRO 6.64)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Manual operation of the RHR Inject Valve. **EVENT # 8 (C BOP)**		**BOP** operator will determine that the RHR inject valve did not open on the RHR initiation signal, and verify via Quick Response Card, ”Manual LPCI Initiation”, the following: • When reactor pressure is below 240 psig, verify RHR injection into the reactor vessel. o Will determine that MO-1905 did not open automatically. o Will Attempt to open the MO using it’s handswitch and regain injection into the RPV. **(Critical for this evolution)** o Will determine that the valve will not open. • Per the follow up actions of QRC, • If necessary, open the Inboard and Outboard Inject Valves on the Non-Selected RHR Loop approximately 10 minutes after LPCI initiation. **(Critical for this evolution)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Feedwater line break in the Primary containment **EVENT #7 (M ALL) Continued**	**Booth Instructor,** when the DW has been sprayed and RPV level is being maintained by RHR, with the concurrence of the Lead Evaluator, the scenario can be terminated. Freeze the simulator and announce: **The scenario is complete, please stand by your stations for follow up questions if necessary.**	

***** END OF SCENARIO *****

*** REVIEW SCENARIO OBJECTIVES WITH THE OPERATORS ***

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Pull control rods to achieve 1 bypass valve full open and the second to 15% **EVENT #1 (R-ATC)**	**SRO** reviews the rod group and their insert/withdrawal limits. • Conduct a Pre-Rod-Movement Brief o Perform a shortened brief. (Major brief will be preformed prior to the scenario) **RO** • Withdraw control rods to achieve one bypass valve full open and the second 15% open. **(Critical for event 1)**	IPOI 2 Rev. 80 P&L #6 IPOI 2 Step 4.2 (20 c) for STP preparation	Rod pull brief conducted IAW IPOI 2 P&L #6 or equivalent procedure reference. Sat_____ Unsat_____ Conduct Rod Withdrawal performed IAW IPOI 2 Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
"C" IRM failing upscale. **EVENT #2 (C-ATC)**	**ATC operator** will respond to annunciator 1C05A C-3, IRM UPSCALE, and perform the following: • Ask for permission to unbypass the "A" IRM and bypass the "C" IRM. **(Critical for event 2)** **SRO** grants permission to unbypass "A" and to bypass the "C" IRM. • Determines that until the A IRM is unbypassed, they are in TS 3.3.1.1 Condition A for less than 2 operable IRM channels. They have 12 hours to trip the RPS channel, which is already met. **ATC operator** will respond to annunciator 1C05A A-2, "A" RPS AUTO SCRAM, and perform the following; • Reset the half scram **(critical for event 2)**	ARP 1C05A C-3 Rev. 6 Step 3.4b ARP 1C05A A-2 Rev. 9 Step 10	Bypassing the "C" IRM IAW ARP 1C05A C-3 Sat_____ Unsat_____ SRO determines the TS for less than 2 IRMs is an entry into 3.3.1.1 Condition A Sat_____ Unsat_____ Reset the half scram IAW ARP 1C05A A-2 Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Performance of STP 3.4.3-03. **EVENT #3 (N-BOP)**	**SRO** will perform a pre-evolution brief for the performance of STP 3.4.3-03 **ATC operator** will perform the step of Section 7.1 for STP 3.4.3-03. • Place LLS PSV handswitch to OPEN. **(Critical for event 3)** • At 1C03, Place LLS PSV handswitch to AUTO. **(Critical for event 3)**	STP 3.4.3-03 Rev. 5 Step 7.1.4.b Step 7.1.6	Performance of STP 3.4.3-03, Step 7.1.4.b Sat_____ Unsat_____ Performance of STP 3.4.3-03, Step 7.1.6 Sat_____ Unsat_____
"B" Feed Reg Valve fails open in Auto **EVENT #4 (C ATC)**	**ATC operator** will respond to annunciator 1C05A D-1 and perform the following: • Determine that level rising. o As necessary, take manual control of any or all of the following Feedwater controllers to restore Reactor level to between 186 and 195 inches: **(critical for the event)**	ARP 1C05A D-1 Rev. 6 Step 3.4	ARP 1C05A D-1 step 3.4 place the controller in manual Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Jacket coolant leak of the B EDG. **EVENT #5 (C BOP)**	**RO** will respond to ARP 1C94 A-4 Jacket Coolant Temperature High or Low and perform the following: • He will unload the EDG. **(Critical for event 5)** • He will trip the EDG. **(Critical for event 5)** **SRO** will determine the following: • The EDG must be declared inoperable and TS section 3.8.1 Condition B must be entered and the following steps taken o Perform SR 3.8.1.1 for operable offsite circuits. o Within 4 hours declare required features supported by the inoperable EDG inoperable when the redundant required features are inoperable o Determine that the fault is not a common cause failure. o Perform SR 3.8.1.2 for the operable EDG once per 72 hours, o Restore the inoperable EDG to operable with in 7 days	ARP 1C94 A-4 Rev. 9 Step 3.2 TS Section 3.8.1	Unloading the EDG IAW ARP 1C94 A-4 step 3.2 Sat_____ Unsat_____ Tripping the EDG IAW ARP 1C94 A-4 step 3.2 Sat_____ Unsat_____ SRO TS call for an inoperable EDG. Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Jacket coolant leak of the B EDG. **EVENT #5 (C BOP)**	If the crew determines to remove the EDG via OI 324, they will perform the following Critical steps:	OI 324, Rev. 65	
	• Place the BUS 1A3[4] TRANSFER breaker mode selector switch is in MANUAL. **(Critical for this evolution)**	Step 7	Unloading the EDG IAW OI 324 step 7. Sat_____ Unsat_____
	• Place the control switch for 4KV BREAKER 411 B DIESEL GENERATOR 1G-21 in the TRIP position. **(Critical for this evolution)**	Step 9	Unloading the EDG IAW OI 324 step 9. Sat_____ Unsat_____
	• Place the BUS 1A4 TRANSFER breaker mode selector switch in the AUTO position. **(Critical for this evolution)**	Step 10	Unloading the EDG IAW OI 324 step 10. Sat_____ Unsat_____
	• Place B DIESEL GENERATOR 1G-21 CONTROL handswitch HS-3231B on Panel 1C08 in the STOP position, hold for 5 to 10 sec., and then return to AUTO. **(Critical for this evolution)**	Step 14a	Unloading the EDG IAW OI 324 step 14a. Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
SRV 4407 fails open **EVENT #6 (C-BOP)**	Per AOP 683, between the **SRO** and **BOP operator,** that the SRV is OPEN and perform the following: **BOP operator** will; • Cycle the affected Safety Relief Valve's handswitch. **(Critical for event 6)** • Report to the SRO that SRV 4407 has not closed. **(Critical for event 6)**	AOP 683 Rev. 2 Open Safety/Relief Safety Valve Step 3.b Step 3.c	Per AOP 683 the Open Safety/Relief Safety Valve section, cycle the affected SRVs HS per step 3.b. Sat_____ Unsat_____ Per AOP 683 the Open Safety/Relief Safety Valve section, verify the valve is closed step 3.c. Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Feedwater line break in the Primary containment **EVENT #7 (M-ALL)**	**SRO** when the DW reaches 2 psig the SRO will perform the following: • Enter EOP 1 o Verify all rods fully inserted. **(Critical for event #7)** o "B" CRD be injected into the RPV. **(Critical for event #7)** o SBLC be injected into the PRV **(Critical for event #7)** o Override CV 4371A, (Defeat 11) (95.21, SRO 6.21) **(Critical for event #7)** **Scenario Critical Task is to maintain RPV level. To do this, the crew will determine that RHR is the only system that is available and has the capacity to maintain RPV level**. (See **Event #8** for RHR details). o RHR be injected into the RPV. **(Critical for Scenario Critical Task)**	EOP 1 Rev. 11 Step RC/L-1 Step RC/P	EOP 1 maintain RPV water level with RHR, step RC/L-1. Sat_____ Unsat_____ EOP 1 maintain RPV water level with RHR, step RC/P-1. Sat_____ Unsat_____ Scenario Critical Task for maintaining RPV level. Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Feedwater line break in the Primary containment **EVENT #7 (M-ALL)**	• Enter EOP 2 o When out of the hatched region of Graph 7, Drywell Spray Initiation Limit, spray the D/W. **(Critical for Scenario Critical Task)** (95.63, & 6.63) • Enable containment sprays by placing Containment Spray Enable Switch HS-1903C in Manual. **(Critical for Scenario Critical Task).** • Open MO-1902, Inboard Drywell Spray Valve. **(Critical for Scenario Critical Task).** • Open MO-1903 Outboard Drywell Spray Valve. **(Critical for Scenario Critical Task).** **Scenario Critical Task: BEFORE drywell temperature reaches 280°F and WHILE in the safe region of the DWSIL, THEN initiate drywell sprays**	EOP 2 and QRC 1 Step DW/T-5 QRC 1 step 2 QRC 1 step 3 d	Scenario Critical Task for maintaining spraying the D/W. Sat_____ Unsat_____
RHR inject valve **EVENT # 8 (C-BOP)**	Upon direction from the CRS will inject into the RPV via RHR. • Will attempt to open the MO using it's handswitch and regain injection into the RPV. **(Critical for this evolution)** o Will inform the CRS that the RHR inject valve will not open. • If necessary, open the Inboard and Outboard Inject Valves on the Non-Selected RHR Loop approximately 10 minutes after LPCI initiation. **(Critical for this evolution)**	RHR QRC 3 Step 7a Follow up step 4	Per EOP 1 RPV level control, step RC/L-1. Manually inject into the RPV with RHR. Sat_____ Unsat_____

SEG/ESG Validation Checklist

SEG/ESG ____ESG_17_____ Rev. _____1_____

- ☐ Correct IC or plant status identified.
- ☐ Shift turnover forms filled out (both CRS/OSM and NSOE) if required.
- ☐ Additional documents are prepared (STPs, Work Orders, LCO Paperwork).
- ☐ SOMS tags identified and included in setup instructions.
- ☐ Special setup instructions identified; handswitch manipulations, procedure markups, alarm borders, 3D case available, computer points substituted, etc.
- ☐ Setup files correctly called out.
- ☐ Malfunction list is accurate.
- ☐ Override list is accurate.
- ☐ Remote function list is accurate.
- ☐ Event triggers are accurate.
- ☐ Time/Notes section is accurate and includes all reasonable cues that may be given to initiate an action. Cues are unambiguous and provide a definitive moment to take action.

Instructor Activity section is accurate and complete:

- ☐ Actions are clearly defined for Booth or Floor instructor.
- ☐ Role-playing is clearly noted.
- ☐ The sequence of events is completely and concisely narrated even if it takes no instructor action.
- ☐ Automatic actions that require verification are noted.
- ☐ Reasonable alternate paths are considered and included.
- ☐ Event trigger activation is distinguished from narrative text (**Bold font**)
- ☐ Noun descriptions of actions that occur on event trigger initiation are complete, for example "…set **ET 3** to **TRUE** which activates malfunction **SW21C** resulting in a loss of the C Well Water Pump."
- ☐ Other simulator control actions are clearly distinguished from narrative text, for example "…after drywell temperature reaches 280 deg. F **SNAP** the simulator to **IC 0**."
- ☐ Student and Instructor copies of worksheets or other training activities are verified correct and electronically attached to the file if appropriate.

SEG/ESG Validation Checklist

SEG/ESG ____ESG_17_____ Rev. _____1_____

Expected Student Response Section is accurate and complete:

- ☐ Critical tasks are accurate and clearly identified. Probable critical tasks are also listed with logical connection to the scenario; for example "If the crew fails to get all the rods inserted before ED the critical task becomes…" (N/A as appropriate)
- ☐ Tasks are clearly noted and properly numbered as appropriate.
- ☐ Knowledge objectives are clearly noted and properly numbered as appropriate.
- ☐ Expected as well as probable student responses are listed with logical connection to the scenario. (N/A as appropriate)
- ☐ Actions are appropriately delineated by position(s); OSM, CRS, STA, RO, NSOE, Fire Brigade Leader, At the Controls Operator, etcetera. (N/A as appropriate)
- ☐ Actions are listed using a logical order; by position and chronology. (N/A as appropriate)
- ☐ Crew Performance Criteria follow the same chronology as the student responses, are complete and accurate. (For ESGs only)
- ☐ For Walkthrough and Training Mode Scenarios with pre-planned pauses, sufficient information is presented to allow the instructor to meet the goal of the training.

Turnover information (as required) is correct:

- ☐ Day and shift are appropriate.
- ☐ Weather conditions do not conflict with malfunctions.
- ☐ Power levels are correct.
- ☐ Thermal limit problems and power evolutions are realistic and include a reason for any downpower.
- ☐ Existing LCOs include start date, remaining time and actions.
- ☐ Plant Risk Assessment (CDF and Color).
- ☐ STPs are appropriate for day and shift.
- ☐ Core Damage Frequency has been properly calculated and listed to 3 decimal places.
- ☐ Maintenance is realistic for plant conditions.
- ☐ Comments, evolutions, problems, etc, includes extra personnel (licensed/non-licensed if necessary), any condition that affects the flow of the scenario and any condition that does not fit in another category.

SME/Instructor	Date
SME/Instructor	Date

SEG/ESG Validation Checklist

SEG/ESG ____ESG_17_____ **Rev. _____1_____**

Crew:		Instructors:	
OSM		Booth	
CRS		Floor	
STA		Extra	
1C05			
1C03			
BOP			

Crew Comment:

Resolution:

Crew Comment:

Resolution:

NOTE: Following approval of SEGs, this page may be discarded.

SEG/ESG Validation Checklist

SEG/ESG ____ESG_17_____ Rev. _____1_____

Crew Comment:

Resolution:

Crew Comment:

Resolution:

Crew Comment:

Resolution:

NOTE: Following approval of SEGs, this page may be discarded.

Appendix D	**Scenario Outline**	**Form ES-D-1**

Facility: _____DAEC_____ Scenario No.: ESG 2__ Op-Test No.: 2005-01

Examiners:_____ Operators:_____

_____ _____

_____ _____

Initial Conditions: The plant is at 1500MWth."A" CS pump is tagged out to repair a lower bearing. TS 3.5.1 Condition B has been entered.

Turnover: Power has been lowered to perform NS-930002, Turbine Stop Valve and Combined Intermediate Valve Test.

The "A" CS pump is tagged out for replacement of the lower bearing. TS 3.5.1 Condition B has been entered, and are currently in day 3 of 7 of the LCO. Work is expected to be complete in 2 days.

Last shift I & C Techs finished work on the LT-4559, which feeds into the feedwater level control circuit and the "A" GEMAC level indicator. The I & C Techs and System Engineer would like to maintain level control in "A" over night to observe it's response.

Event No.	Malf No:	Event Type*	Event Description
1		N (BOP)	Performance of NS-930002, Main Turbine Stop and Combined Intermediate Valve Test
2		R (RO)	Begin raising power with reactor recirc to achieve 80% capability.
3	1	C (RO/SRO)	"B" recirc speed controller will fail and will begin to run away requiring the RO to lock it up. This will require a TS check to determine if the speed mis-match between the two-recirc pumps is with in the required band.
4	2	C (BOP/SRO)	Spurious Group 2 isolation with the failure of CV 3729 failing to isolate. This will require entry into TS for a failed primary containment isolation valve. This spurious group 2 will be able to be reset. This will allow the BOP to re-align the non-failed valves of the isolation.
5	3	C (BOP)	The running River Water Supply pump trips requiring entry into AOP 410. The operator will assess the situation and start another RWS pump.

6	4	C (BOP)	A slow leak in the Turbine Lube oil system will develop requiring entry into ARP 1C07A A-7. IAW ARP 1C07A A-7 the operator is to verify that additional turbine lube oil pumps start. These pumps fail to auto start requiring the BOP operator to manually start them Lube oil will recover after the EBOP is started.
7	5	I (RO/SRO)	The "A" GEMAC level transmitter will fail upscale requiring that level control be transferred to "B". This is also a TS for GEMAC level instruments being > 2.5" apart.
8	6	M (all)	The lube oil pressure will momentarily recover. However as the leak worsens, the system pressure continue to lower. This will force the crew to enter AOP 693, Main Turbine/EHC Failures When the crew attempts to scram the plant they will determine that an electrical ATWS prevents the rods from inserting. They will enter **Power Level control**, (EOP Contingency) to lower reactor power. The control rods will be inserted by pulling the RPS fuses per RIP 101.2.
9		C (BOP)	When all of the rods are fully inserted, the BOP will continue with the actions of AOP 683 to stop the rolling of the Main Turbine. These actions will include; Closing the MSIVs. Securing all oil pumps.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

NMC Committed to Nuclear Excellence	EVALUATION SCENARIO GUIDE (ESG)

SITE: **DAEC**

TURBINE STOP VALVE TEST, POWER ASCENSION WITH RECIRC, "B" RECIRC SPEED CONTROLLER RUN AWAY, SPURIOUS GROUP 2 ISOLATION [INCOMPLETE], RUNNING RWS PUMP TRIP, TURBINE LUBE OIL LEAK, AOP 683, GEMAC LEVEL TRANSMITTER FAIL UP SCALE, ELECTRICAL ATWS, POWER LEVEL CONTROL **ESG 18** **REV. 1**

PROGRAM: **OPERATIONS** **#:**

COURSE: **ILC** **#:** **50007**

TOTAL TIME: **90 MINUTES**

Developed by: _____
Instructor *Date*

Validated by: _____
SME/Instructor *Date*

Reviewed by: _____
Operations Manager *Date*

Approved by: _____
Training Supervisor-Operations *Date*

GUIDE REQUIREMENTS

Training Resources:	Simulator Simulator Booth Instructor Phone Talker Simulator Floor Instructor
References:	NS930002, Rev. 3 IPOI 3, Rev. 66 AOP 255.2, Rev. 24 1C05B B-8, Rev. 7 1C06A B-2, Rev. 5 AOP 410, Rev. 15 ARP 1C07A A-7, Rev. 5 AOP 683, Rev. 4 RIP 101.2, Rev. 3 ATWS, Rev 12 EOP 1, Rev.11 Technical Specifications EPIP
Commitments:	None
Evaluation Method:	Dynamic Simulator
Operating Experience:	None

ESG 18, ILC NRC Exam, Rev. 1

SCENARIO SUMMARY:

Current plant operating status:

- Starting at 0200 power has been lowered to 1500 MWTh to perform NS-930002, Turbine Stop Valve and Combined Intermediate Valve Test.
- The "A" CS pump is tagged out for replacement of the lower bearing. TS 3.5.1 Condition B has been entered, and are currently in day 3 of 7 of the LCO. Work is expected to be complete in 2 days.
- Last shift the I & C Techs finished work on the LT-4559, which feeds into the feedwater level control circuit and the "A" GEMAC level indicator. The I & C Techs and System Engineer would like to maintain level control in "A" over night to observe it's response.

Scenario segments:

EVENT #1 (N-BOP)

- NS-930002, Main turbine Stop and Combined Intermediate Valve Test is due. The BOP will run and complete the NS.

EVENT #2 (R-ATC)

- When the NS is complete, the ATC operator will raise power with recirc.

EVENT #3 (C-ATC)

- As power is raised, the speed controller of the "B" Recirc M-G will fail. It will begin ramping up with no operator action. The ATC operator will take actions to lock up the Recirc M-G set speed controller.
- The SRO will assess the Recirc Pump speed mis-match and determine if it is still in compliance with TS Section 3.4.1 Condition C.
- Crew will also enter AOP 255.1 for an abnormal power change.

EVENT #4 (C-BOP)

- A spurious Group #2 isolation will occur. While performing the Group 2 ARP, the BOP will determine that a valve did not isolate as expected. He will take action to isolate the malfunctioning valve.
- The SRO will assess TS and determine that they meet the conditions of 3.6.1.3 Condition A.

EVENT #5 (C- ~~ATC~~/ BOP)

- The running RWS pump will trip. The BOP operator will respond to the appropriate annunciator and start another RWS pump. The crew may momentarily enter AOP 410 "Loss of River Water Supply."

EVENT #6 (C-BOP)

- A slow turbine lube oil leak will develop resulting in a lowering of the main turbine lube oil pressure.
- When the turbine lube oil low-pressure alarm sounds, the BOP will determine that some automatic pump starts did not occur. He will start these pumps that did not automatically start. Turbine lube oil pressure will momentarily respond to the additional pump starts.

EVENT #7 (I-ATC)

- The "A" GEMAC level transmitter will slowly fail up scale. This will result in actual level lowering, the ATC operator will have to diagnose this and select B for level control.
- The SRO will also check TRM section 3.3.6 for narrow range level indication.

EVENT #8 (M-ALL)

- The turbine lube oil leak will continue to get bigger. The crew will enter AOP 693, "Main Turbine/EHC Failures." This will result in the crew inserting a manual scram.
- On the manual scram the crew will determine that the plant is in an Electrical ATWS.
- With the electrical ATWS, the crew will momentarily forgo the remaining actions of AOP 693 and attempt to place the plant in a safe condition IAW the ATWS EOP.
- Based on plant conditions, the crew will enter the Power Level Control Contingency of the ATWS EOP.
- The crew will perform the Electrical ATWS RIPs and find that pulling of the RPS fuses will result in all of the control rods inserting.

EVENT #9 (C-BOP)

- When all of the rods are fully inserted, the BOP will continue with the actions of AOP 693 to stop the rolling of the Main Turbine.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE:

⇒ RO (NSOE, ANSOE)

- 1.04 Respond to annunciators.
- 1.05 Perform GEMAC Control Functions.
- 1.07 Perform Surveillance Test Procedures.
- 6.02 Perform manual startup/initiation (SBLC).
- 8.11 Manually delay or interrupt ADS auto initiation.
- 93.11 Raise power by 10% with Recirc flow when above 35% power.
- 93.22 Perform immediate operator responses to a reactor scram.
- 94.03 Respond to power/reactivity abnormal change condition.
- 94.49 Respond to main Turbine and EHC failures.
- 95.03 Perform reactor scram using the RPS Trip Test switches.
- 95.04 Perform reactor scram using the RPS Fuse removal.
- 95.08 Insert control rods by increasing CRD cooling flow and pressure.
- 95.09 Insert control rods by manually driving control rods.
- 95.21 Perform EOP Defeat 11.
- 95.25 Perform EOP Defeat 15.
- 95.45 Perform initial EOP 1 actions (RC).
- 95.50 Perform /L to control RPV level during an ATWS.
- 95.51 Perform Power/Level control.
- 95.56 Perform /P to control RPV pressure during an ATWS.
- 95.57 Perform /Q to reduce reactor power or scram the reactor.
- 99.04 Respond to a “B” RWS Pump 1P117B trip.

⇒ Shift Supervisor (SS)

- 1.01 Direct routine crew and control room activities.
  - 1.01.02 Coordinate operator activities.
  - 1.01.03 Ensure control room activities conform to ACP 1410.1, “Conduct of Operations.”

- ♦ 1.02 Determine operability of Tech Spec required components.
  - 1.02.02 Determine if the instrument, component, or system is operable.
  - 1.02.03 Declare the instrument, component, or system is inoperable, enter the correct LCO, and determine and direct performance of the LCO STP.
- ♦ 1.21 Direct crew response to too normal events/accidents.
  - 1.12.01 Evaluate the event or accident to determine its cause and develop mitigation strategies.
  - 1.12.02 Recognize and prioritize data relevant to the accident or event.
  - 1.12.03 Direct appropriate conservative actions to mitigate the accident or event and stabilize plant parameters.
  - 1.12.06 Analyze results and direct alternate mitigation actions.
- ♦ 1.22 Determine operability for TRM Components.
- ♦ 3.01 Implement the Emergency Plan.
  - 3.01.01 Declare the appropriate EAL.
- ♦ 4.21 Direct crew actions to perform the immediate operator responses to a reactor scram.
- ♦ 5.03 Direct crew response to power/reactivity abnormal change condition.
  - 5.03.02 Direct immediate operator actins to prevent exceeding any plant/reactor limits.
  - 5.03.04 Direct operator actions to control the malfunctioning system or component.
  - 5.03.05 Confirm the rod pattern, thermal limits and reactor power are within the allowed range.
- ♦ 5.49 Direct crew response to a Main Turbine /EHC failures.
  - 5.49.01 Direct crew response to perform the Immediate and follow-up actions of Turbine Lube Oil Trouble tab of AOP 693.
- ♦ 6.04 Direct crew response to perform reactor scram by RPS fuse removal.
  - 6.04.01 Direct operator actions to insert control rods using RIP 101.2.
- ♦ 6.08 Direct crew response to insert control rods by increasing CRD cooling flow and pressure.
  - 6.08.01 Direct operator actions to perform RIP 103.2.
- ♦ 6.09 Direct crew response to insert control rods by manually driving control rods.
  - 6.09.01 Direct operator actions to insert control rods using RIP 103.3.
- ♦ 6.21 Direct Crew response to perform EOP Defeat 11.
  - 6.21.01 Direct operator actions to perform EOP Defeat 11.

- ♦ 6.25 Direct Crew response to perform EOP Defeat 15.
  - • 6.25.01 Direct operator actions to perform EOP Defeat 15.
- ♦ 6.45 Direct Crew response for performance of initial EOP 1 actions (RC).
  - • 6.45.04 Direct operator actions to initiate any of the following which should have initiate but did not, isolations, ECCCS initiations, SBDG initiation.
  - • 6.45.05 Exit EOP 1 and enter ATWS.
- ♦ 6.50 Direct crew response to perform /L to control level during an ATWS.
- ♦ 6.51 Direct crew response to perform Power/Level control.
  - • 6.51.01 Direct operator actions to terminate and prevent injection into the RPV from: Condensate/Feedwater, HPCI, RHR, and Alternate ATWS Injection systems (Table 2B).
  - • 6.51.03 Direct operator actions to continue to lower RPV level until reactor power drops below 5% or RPV level reaches +15", or all SRVs remain closed and drywell pressure remains below 2.0 psig.
- ♦ 6.56 Direct crew response to perform /Q to reduce reactor power or scram the reactor during an ATWS.
- ♦ 6.57 Direct crew response to perform /P to control RPV pressure during an ATWS.

SCENARIO OUTLINE:

BOOTH INSTRUCTOR ACTIONS

1 SIMULATOR SET UP:

1.1 General Instructions

a. Reset to IC 20, then perform the following:
   (1) Run the recirc controllers down to about 28 on the milli amp readings. Allow to settle out and see if the MWTh are below 1500. This is the starting point for the turbine valve testing NS.
   (2) Ensure that the load line is below 99%.
b. Set event trigger 11 to **zdituhs3150(4) .ge. 1**.
c. Type in malfunctions that are listed in the below **MALFUNCTION** Table.
d. Type in overrides that are listed in the below **OVERRIDE** Table
e. Call up the **REMOTE** functions from the drivers station as they are directed from the body of the ESG.
f. Have a copy of NS 930002, "Turbine Stop Valve and Combined Intermediate Valve Test," available for the crew. **Nothing** has to be marked up in the NS prior to handing to the crew to perform.
g. Need **SFDP paperwork** for the "A" CS system being tagged out for the replacement of the lower motor bearing. The LCO is currently in day 3 of 7.

1.2 EVENT TRIGGER DEFINITIONS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
11	Zdituhs3150(4) .ge. 1	TGOP HS in Start activates event trigger **RED**. This means that it is ok to Delete malfunction1C07A[7] and override AOTUPU-3106
Event triggers 1-4, 6-10 will be called out in the body of the scenario.		

1.3 MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	Delay	Ramp	ET	Initial Value	Final Value
T=0	RP05A	Auto scram failure					
	RP05B	Manual scram failure					
	RP05C	ARI failure					
	RP05E	Individual scram test switches					
As dir	RR17B	B recirc speed controller run away		350	1	As is	100
As dir	MS21B	Spurious group 2 isolation			2		
T=0	MS22F	Failure of CV 3729 to isolate					
As dir	RR20A	A GEMAC failing upscale		800	3	As is	100
As dir	SW19C	C RWS pump trip			4		
As dir	AN1C07A [7]	Annunciator for low turbine lube oil pressure	195		10	As is	ON
As dir	TU04	Turbine Lube oil leak		200	6	As is	80
As dir	RD11A	Trip of the A CRD pump			7		
As dir	RD11B	Trip of the B CRD pump			8		
As dir	Rd13	Vent of the SAH		100	9	As is	100
T=0	CS01	A CS Pump Trip					

1.4 OVERRIDES:

Time	Override No.	Override Title	Delay	Ramp	ET	Initial Value	Final Value
As dir	AO TU PI-3106	Turbine lube oil pressure		200	10	As is	.15
T=0	SW HS-2907A	“A” RWS pump				As is	Auto
T=0	LO CSHS-2103(1)	1P-211A White light				As is	Off
T=0	LO CSHS-2103(2)	1P-211A Green light				As is	Off
T=0	LO CSHS-2103(3)	1P-211A Amber light				As is	Off
T=0	LO CSHS-2103(4)	1P-211A Red light				As is	Off

1.5 REMOTE FUNCTIONS:

Time	Remote No.	Remote Title	Delay	Ramp	ET	Initial Value	Final Value
As dir	MC01	Condenser vacuum breakers					OPEN
As dir	MC02	Condenser vacuum breakers					OPEN

FLOOR INSTRUCTOR ACTIONS

2 Simulator Pre-brief:

2.1 Individual position assignments

BOOTH / FLOOR INSTRUCTOR ACTIONS

2 Conduct pre-scenario activities in accordance with the following procedures:

3.1 If this scenario is used in training mode: OTI 101

4 TURNOVER INFORMATION

⇒ Day of week and shift

- ♦ Wednesday
- ♦ Day shift

⇒ Weather conditions

- ♦ Warm
- ♦ Dry

⇒ (Plant power levels) Pwr 75%

- ♦ MWT 1447
- ♦ MWE 474
- ♦ CORE FLOW 30.00

⇒ Thermal Limit Problems/Power Evolutions

- ♦ Beginning at 0200, power was lowered to approximately 1500 MWTh to perform NS 93002, “Turbine Stop Valve and Combined Intermediate Valve Test.”
- ♦ After the test, power may be returned to 80% with recirc at 3 to 5 MWE per minute. The REs want to hold power here for a few hours to monitor thermal limits.

⇒ Plant Risk Status

- ♦ CDF 9.158E-6
- ♦ Color Green

⇒ Existing LCOs, date of next surveillance

- ♦ Day 3 of 7 for the “A” CS system. “A” CS pump is tagged for the replacement of the lower motor bearing. The work is expected to be complete in 2 days.

⇒ STPs in progress or major maintenance

- ♦ NS 930002, Turbine Stop Valve and Combined Intermediate Valve Test, needs to be run this shift.

⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment

- ♦ Our shift, the I & C Techs worked on Level Transmitter LT-4559. This feeds into the feedwater level control circuit, and the “A” GEMAC. “A” level control has been selected, and the I & C Techs would like to maintain level control in “A” for the next 24 hours to observe its response.

⇒ Comments, evolutions, problems, core damage frequency, etc.

- ♦ The WCC is staffed with 1 extra NSPEO.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Shift Turnover	• Provide Shift Turnovers to the **SRO** and **RO**s.	• Get familiar with plant conditions. **SRO** will provide beginning of shift brief to coordinate the tasks that were identified on the shift turnover. (SRO 1.01)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
NS 93002 Turbine Stop Valve and Combined Intermediate Valve Test. **EVENT #1 (N BOP)**		NOTE that this evolution has been briefed prior to the crew assuming the watch. The CRS may give a short brief to the crew prior to performing the STP. **SRO** will perform an abbreviated evolution brief with the crew to perform STP 3.4.3-03. The shortened brief should contain the following major topics: (1.02) • Equipment to be tested • Sequence of events • Expected Trends or Results • STAR techniques • Need for exercising caution and conservatism • Criteria and method of stopping the evolution **BOP operator** will perform NS 930002, "Turbine Stop Valve and Combined Intermediate Valve Test," by performing the following. SRO. (1.07) • Verify Prerequisite 6.1 has been satisfied. • Depress and hold (until Step 7.1.3) SV-1 TEST and confirm that Stop Valve #1 closes slowly until the last 10% of travel, and then rapidly closes fully. **(Critical for event # 1)** • Release SV-1 TEST and confirm Stop Valve #1 indicates open. **(Critical for event # 1)** • Depress and hold (until Step 7.1.5) SV-2 TEST and confirm at Stop Valve #2 closes slowly until the last 10% of travel, and then rapidly closes fully. **(Critical for event # 1)** • Release SV-2 TEST and confirm Stop Valve #2 indicates open. **(Critical for event # 1)** • Depress and hold (until Step 7.1.7) SV-3 TEST and confirm that Stop Valve #3 closes slowly until the last 10% of travel, and then rapidly closes fully. **(Critical for event # 1)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
NS 93002 Turbine Stop Valve and Combined Intermediate Valve Test. **EVENT #1 (N BOP) Continued**		• Release SV-3 TEST and confirm Stop Valve #3 indicates open. **(Critical for event # 1)** • Depress and hold (until Step 7.1.9) SV-4 TEST and confirm that Stop Valve #4 closes slowly until the last 10% of travel, and then rapidly closes fully. **(Critical for event # 1)** • Release SV-4 Test and confirm Stop Valve #4 indicates open. **(Critical for event # 1)** • Depress and hold (until Step 7.1.11) ISV IV NO. 1 TEST. **(Critical for event # 1)** o Confirm Intercept Valve #1 closes slowly until the last 10% of travel, and then rapidly closes fully. o Confirm After Intercept Valve #1 is fully closed, Intermediate Stop Valve #1 closes slowly until the last 10% of travel, and then rapidly closes fully. NOTE: this portion of the NS will result in alarms on 1C07B B-6, MSR 1st SSTAGE DRAIN TANKS 1T-91A TO 1T91B HI DELTA P. These alarms are expected for this evolution. • Release ISV IV NO. 1 TEST and confirm that both Intermediate Stop Valve #1 and Intercept Valve #1 indicate open. **(Critical for event # 1)** • Depress and hold (until Step 7.1.13) ISV IV NO. 2 TEST. **(Critical for event # 1)** o Confirm Intercept Valve #2 closes slowly until last 10% of travel, and then rapidly closes fully. o Confirm After Intercept Valve #2 is fully closed, Intermediate Stop Valve #2 closes slowly until the last 10% of travel, and then rapidly closes fully. • Release ISV IV NO. 2 TEST and confirm that both Intermediate Stop Valve #2 and Intercept Valve #2 indicate open. **(Critical for event # 1)** • Depress and hold (until Step 7.1.15) ISV IV NO. 3 TEST. **(Critical for event # 1)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
NS 93002 Turbine Stop Valve and Combined Intermediate Valve Test. **EVENT #1 (N BOP) Continued**		o Confirm Intercept Valve #3 closes slowly until the last 10% of travel, and then rapidly closes fully. o Confirm After Intercept Valve #3 is fully closed, Intermediate Stop Valve #3 closes slowly until the last 10% of travel, and then rapidly closes fully. • Release ISV IV NO. 3 TEST and confirm that both Intermediate Stop Valve #3 and Intercept Valve #3 indicate open. **(Critical for event # 1)** • Depress <u>and hold</u> (until Step 7.1.17) ISV IV NO. 4 TEST. **(Critical for event # 1)** o Confirm Intercept Valve #4 closes slowly until the last 10% of travel, and then rapidly closes fully. o Confirm After Intercept Valve #4 is fully closed, Intermediate Stop Valve #4 closes slowly until the last 10% of travel, and then rapidly closes fully. • Release ISV IV NO. 4 TEST and confirm that both Intermediate Stop Valve #4 and Intercept Valve #4 indicate open. **(Critical for event # 1)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Power ascension with recirc. **EVENT #2 (R ATC)**		**SRO** When NS 930002 is complete, • Hold a short brief outlining the power change. At a minimum, the brief will discuss the following: (1.01) o Increasing reactor power after short-term power reductions causes local xenon concentrations to decrease. This causes MFLCPR, MFLPD, and MAPRAT to increase more rapidly than during power increases with steady or increasing xenon concentration o Per the REs, raise power at 3 to 5 MWE/min from the current power to 80%, then hold for an hour to monitor the thermal limits. o From IPOI 3 section 3.0, “Power Change Guidelines”: ▪ When changing power above 1500 MWth (≈78%), send an operator to monitor and maintain LP Heater 1E-5A and B Drain Discharge Flow below 16.4" wg to prevent flow induced vibration in the heater tube bundles. ▪ Monitor core total power as indicated by the APRM, Steam Flow, and Feedwater Flow recorders on Panel 1C05 o Use human performance prevention tools like, Peer checking, STAR **ATC operator** will begin raising power with recirc by manually adjusting the Recirc Flow Controllers. At a minimum, he will monitor the following: **(Critical for Event 2)** • Reactor Recirc parameters: • APRMs • Feed flow/steam flow. (93.11)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
"B" Recirc speed controller run away. **EVENT #3 (C ATC)**	**Booth Instructor,** after a measurable power rise, and at the direction of the Lead Evaluator begin the recirc flow controller run away by performing the following: **IMF RR17B to 100 over 350 sec by setting event trigger 1 to true** This will cause the "B" recirc M-G speed controller to run away. **Booth Instructor** respond a plant personnel and respond as necessary: As the I & C shop, respond that you will look at the MOORE controller logic for speed control and get back to them soon. As the WCC, report that you will call in a licensed operator to take manual control of the locked up recirc scoop tube and manually control it as the crew request, but it will be about an hour. As the ERT, go along with what the crew wants to do, and tell them that they will take over the repairs of the "B" speed control problem.	**ATC operator** will determine that power is going up by itself, and determine that the "B" recirc M-G speed controller is ramping up by itself. He will take the following actions to stop the run away: • Lock the scoop tube of the "B" recirc M-G speed controller. [**Critical**] • Enter AOP 255.2, "Power/Reactivity Abnormal Change." (94.03) **SRO** will direct and the **ROs** will perform the following actions per AOP 255.2: (94.03, & SRO 5.03) • Take any necessary steps to bring the reactor power/reactivity transient under control, including, but not limited to: o The Scoop Tube Lockup stopped the event • Monitor for undamped oscillations. • Verify thermal limits on the Official 3D Case. • Plot the current position on the power to flow map. SRO will determine if the recirc pump speed mis-match will put them out of compliance with the LPCI Loop Select limits. • TS SR 3.4.1.1 states that the speed of the faster pump shall be ≤ 122% of the speed of the slower pump when operating at ≥ 69.4% RTP. • Based on the calculation, the SRO will determine if he is in compliance with TS 3.4.1 Condition C. o If he is not in compliance, then he has 2 hours to restore the mis-match within limits, or Trip one of the recirc pumps (1.02)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
"B" Recirc speed controller run away. **EVENT #3 (C ATC)**		**SRO** will activate the Event Response Team and ensure that a WRC is written to help mitigate the event. (1.01) **Crew** (if the Recirc Flow is outside of the Mismatch limits), will discuss how they will restore the mismatch to within it's limits. • Either raise the speed of the unlocked Recirc Pump to match the locked Recirc Pump. **OR** • Send a licensed operator to the Recirc M-G Set room and take manual control of the locked Recirc Pump and lower it to within the limits.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Spurious Group 2 isolation with a failure of a valve to isolate. **EVENT#4 (C BOP)**	**Booth Instructor** when the recirc scoop tube is locked, and official case is run, and the TS has been addressed, or at the direction of the Lead Evaluator, perform the following: **IMF MS21B by setting event trigger 2 to true.** This will result in a spurious group 2 isolation. From another malfunction, CV-3729 will not close.	**Crew** will respond to Annunciator 1C05B B-8, PCIS GROUP "2" ISOLATION INITIATED and 1C05B D-8 PCIS GROUP "4" ISOLATION INITIATED. • Will determine that the group 2 and 4 initiations are spurious. • The crew will determine that the Gr 4 is not applicable at this power, but the group 2 is. **BOP operator** will perform the following IAW ARP 1C05B B-8: (1.04) • Check the amber lights on the PCIS status board on Panel 1C04 to determine if a half or a full Group 2 Isolation has occurred. • If only half Group 2 Isolation has occurred and any Group 2 Isolation setpoint has been reached or exceeded with a failure to isolate, manually close the Group 2 valves from Section 2.0, "AUTOMATIC ACTIONS." o Will determine that CV 3729 OUTBD DW EQUIP DRAIN ISOL valve has not closed. [**Critical**] o Take the hand switch of CV 3729 to close and verify that the valve closes. [**Critical**] • Verify completion of the Group 2 Isolation by one of the following means: o CIMs board o Verifying all valves in proper position by Section 2.0 of this ARP. **SRO** will consult TS and determine the following: • TS 3.6.1.3 Condition A must be entered due to the failure of the CV to isolate on its Group 2 signal. (1.02) • TS 3.4.5 Condition A for the DW sump not being operable. 24 hour LCO. • May also look at TS 3.3.6.1. • Determine that this is an 8 hour reportable.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Trip of the running RWS pump. **EVENT #5 (C ATC)**	**Booth Instructor** when the TS determination has been made for the failure of the primary containment isolation valve, or at the direction of the Lead Evaluator, perform the following: **IMF SW19C by setting event trigger 4 to true.** This will trip the running RWS pump. **Booth Instructor** if sent to the intake to check on the trip of the C RWS pump, wait about 10 minutes and inform them that the lower bearing on the "C" RWS pump is very hot. Also inform them that the "A" pump looks good. If asked to look at the B or D, inform the control room that which ever pump it is, it running sat.	**BOP operator** will respond to annunciator 1C06A B-2, "C" RWS PUMP 1P-117C TRIP, by performing the following: (99.04) • Confirm RWS PUMP 1P-117C tripped or secured on Panel 1C-06. • Start or verify running RWS PUMP 1P-117A [**Critical**] o The BOP will determine that the "A" RWS pump did not start. • Start both RWS pumps in the B RWS loop. [**Critical]** • Determine that only one is needed, and secure one. **SRO** will consult TS based on one RWS pump failing, and determine that the "A" Loop RWS is inoperable and enter TS 3.7.2 condition A. **SRO** may momentarily enter AOP 410, "Loss of River Water Supply," because before the A RWS pump was started, there were no river water pumps running. Once in the AOP the crew will verify the following: • There are RWS pumps running and the AOP can be exited.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Turbine Lube Oil leak. **EVENT # 6 (C BOP)**	**Booth Instructor** when the A RWS pump is running and it is determined that there are no TS for the loss of one RWS pump, or at the direction of the Lead Evaluator, perform the following: **IOR TUPI-3106 to .15 over 200 sec,** **And** **IMF AN1C07A [7] to on at 195 sec, by setting event trigger 10 to true.** This will lower the meter for turbine lube oil pressure on the main turbine to below 15 psig. **Booth Instructor**, (there is no leak, but the indications will make it look as if there is). When the BOP operator starts the TGOP, verify **event trigger 11 comes true.** This allows deleting the malfunction to turn off the low lube oil pressure annunciator and the override to return the lube oil pressure back to it's pre-event pressure. When **Event Trigger 11 is true**, perform the following: **Delete** **DOR TUPI-3106**, and **DMF AN1C07A [7]** **Booth Instructor**, if asked to look at the Turb LO, report that everything looks normal, other than the TGOP is running.	**BOP** will determine that turbine lube oil pressure is lowering and perform the actions of ARP 1C07A A-7, "TURBINE LUBE OIL BEARING HEADER LO PRESSURE," and perform the following; • Verify TGOP 1P-38 running. If not, enter AOP 693. o Will manually start the TGOP. **[Critical]** • When the TGOP is started, relays that turbine lube oil pressure has returned to normal.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Failure of the "A" GEMAC level transmitter. **EVENT #7**	**Booth Instructor** when the turbine lube oil has been restored by the starting of the TGOP, or at the direction of the Lead Evaluator, perform the following: **IMF RR20A by setting event trigger 3 to true.** This will result in the "A" GEMAC level transmitter failing upscale.	**ATC operator** will notice level on the "B" and "C" GEMACs going low and perform the following: (1.05) • Notify the SRO of the condition. • Determine that cause of the error is the "A" GEMAC. • Transfer level control over to the "B" level control. [**Critical**] **SRO** will consult the TRM for the variation in the narrow range level indicators on 1C05 and declare the following: • Per TRM 3.3.6, for the narrow range level indicators being out of their tolerance for daily instrument checks. • Determine that TRM requires 2 channels of narrow range level instrumentation to be operable. With the B and C still operable, we meet this spec. (1.22)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major turbine lube oil break to ATWS. **EVENT #8 (M ALL)**	**Booth operator** when TRM issue is addressed for the GEMAC, or at the direction of the Lead Evaluator, perform the following: **IMF TU04 at 80 over 200 sec. by setting event trigger 6 to true.** This will result in turbine lube oil pressure lowering to the point where reactor scram will have to be inserted. **Booth Instructor** role play as follows: IF called as the second to vent the scram air header, acknowledge the call, **BUT do not** vent the scram air header. Until all control rods are fully inserted. **Booth Instructor** When the plant is scrammed, the rods will not go in. When the RIPS are performed, the ATC operator will raise CRD cooling water DP and CRD flow. **When** the rods begin to drift in, trip one or both of the CRD pumps, as necessary, to stop the movement of the control rods. Do this by performing the following: **IMF RD11A by setting event trigger 7 to true to trip the A CRD pump and if necessary.** **IMF RD11B by setting event trigger 8 to true to trip the B CRD pump.**	**Crew** will report that the turbine lube oil pressure is again lowering. • From ARP 1C07A A-7, TURBINE LUBE OIL BEARING HEADER LO PRESSURE, (1.04) o When Lube Oil pressure lowers to > 15 psig, the **BOP operator** will inform the SRO of the following: ▪ Monitor Turbine Lube Oil Pressure Gauge PI-3106 on 1C07. If pressure cannot be maintained >15 psig, enter AOP 693. **SRO** will direct and the **crew** will perform the following actions IAW AOP 693, "MAIN TURBINE/EHC FAILURES," section TURBINE LUBE OIL TROUBLE. (94.49, SRO 5.49) • Verify TGOP and EBOP is running. • **If** Bearing Header pressure is < 12 psig or is dropping and cannot be controlled, o If time permits, reduce power per IPOI 4 Section 6.0 (Fast Power Reduction. o Manually scram the Reactor per IPOI 5 (Reactor Scram). **(Critical for event #8)** **NOTE,** at this point, the crew will determine that there is an electrical ATWS. This AOP will be placed on hold until it can be finished. (See **Event # 9)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major turbine lube oil break to ATWS. **EVENT #8 (M ALL)**		**SRO** will direct and the **crew** will perform the following actions IAW AOP 693 MAIN TURBINE/EHC FAILURES, section TURBINE LUBE OIL TROUBLE. (94.49, SRO 5.49) • When Turbine lube oil lower to <12 psig, o **ATC operator** will insert a manual reactor scram. **(Critical for event 8)** ▪ The **ATC operator** will inform the SRO that the plant is in an Electrical ATWS. **(Critical for event 8)**
	[REPEAT OF INSTRUCTIONS] **Booth Instructor** **When** the rods begin to drift in trip one or both of the CRD pumps, as necessary, to stop the movement of the control rods. Do this by performing the following: **IMF RD11A by setting event trigger 7 to true to trip the A CRD pump and if necessary.** **IMF RD11B by setting event trigger 8 to true to trip the B CRD pump.**	**SRO** will direct and the **crew** will perform the following actions: • ENTER EOP 1 and transition to ATWS (95.45, SRO 4.21, 6.45) • Lock out ADS. (RO 8.11) **(Critical for event 8)** • Install defeat 15. (RO 95.25, SRO, 6.25) **(Critical for event 8)** **Critical Task for this Scenario.** **IF a scram is required and Reactor power is above 5%, THEN reduce power below 5% using one or more of the following methods:** • **Manual scram signal** • **Inserting control rods using RIPs** • **Manual ARI signal** • **Injection of Boron** o Per the /Q leg: (RO, 95.57, SRO, 6.56) o Mode switch to shutdown. **(Critical for Critical Task)** o Recirc to minimum. **(Critical for Critical Task)** o Initiate ARI. o Initiate SBLC. **(Critical for Critical Task)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major turbine lube oil break to ATWS. **EVENT #8 (M ALL)**		o Initiate the Rod Insertion Procedures, RIPs. NOTE: there is no specified order to insert the RIPs. The Crew will put in as many as required to insert the control rods. The following is the list of RIPs that may be used. But keep in mind that only Pulling the RPS fuses will insert all of the control rods. ▪ RIP 101.1, RPS Trip Test Switches ▪ RIP 101.2, RPS Fuse Removal **(Critical for Critical Task)** (95.04,SRO 6.04) • At 1C15; o Fuse C71-F18A Terminal CC-F3 o Fuse C71-F18C Terminal CC-F4 o Fuse C71-F18E Terminal CC-F5 o Fuse C71-F18G Terminal CC-F6 • At 1C17; o Fuse C71-F18B Terminal CC-F3 o Fuse C71-F18D Terminal CC-F4 o Fuse C71-F18F Terminal CC-F5 o Fuse C71-F18H Terminal CC-F6 ▪ RIP 101.3, Vent the Scram Air Header ▪ RIP 103.1, Individual Scram Test Switches. ▪ RIP 103.2, Increase CRD Cooling Flow and Pressure. ▪ RIP 103.3, Manually Drive Control Rods (RO, 6.02, 95.03, 95.08, 95.09 SRO, 6.08, 6.09)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major turbine lube oil break to ATWS. **EVENT #8 continued**		o Per the /L leg: (RO 95.50, SRO 6.50) ▪ Assess power greater than 5% and enter Power Level Control. **(Critical for Critical Task)** **Critical Task for this Scenario.** **IF a reactor scram is required, and Reactor power is >5%, and Power/level control is required,** **THEN terminate and prevent injection until conditions allow reinjection** ▪ Enter power level control. (RO 95.51) (SRO 6.51) • Secure and prevent injection from: • Condensate and feed **(Critical for Critical Task)** • HPCI **(Critical for Critical Task)** • Core Spray and RHR. o (Note that the RPV pressure will be above the shutoff head of both of these systems, therefore preventing injection is not required at this time.) o Per the /P leg (SRO6.57, STA, 4.07) ▪ Install defeat 11. (RO 95.21) (SRO 6.21) **(Critical for event # 8)** ▪ Maintain pressure stable. (RO 95.56, SRO 6.57)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major turbine lube oil break to ATWS. **EVENT #8 continued**	**Booth Instructor,** when all of the rods are fully inserted perform the following: **IMF RD13 at 100 by setting event trigger 9 to true,** This will vent the scram air header. **Booth Instructor** when RD13 is in, call the control room and inform them that you have vented the scram air header. **Booth Instructor** when told to restore the scram air header, perform the following: **DMF RD13.**	When all of the control rods are inserted, **SRO** will direct and the **crew** will perform the following: • Exit ATWS and re-enter EOP 1 o Remove the Defeat 15 and leave the defeat 17 portion of the package in place. o When called that the scram air header is vented, have the second restore the scram air header. • Enter EOP 1 and perform the following: o Maintain level 170 to 211. When the reactor is stable, the **SRO** will direct and the **Crew** will perform the following: • Re-enter **AOP 693 for the Turbine problems that initiated this event.**
Isolation of the Main Turbine for a Loss of Turbine Lube Oil. **EVENT # 9 (C BOP)**	**Booth Instructor** when called as the Aux to break vacuum, perform the following: **IRF MC01 and set to OPEN.** **IRF MCO2 and set to OPEN.**	The **BOP** will perform the following per AOP 693 for the Turbine Lube Oil problems. o Verify the Main Turbine is tripped. o Close the MSIVs. **(Critical for Event #9)** o Break condenser vacuum by opening vacuum breakers V03-0067 and V03-0073 ▪ Done by an inplant operator o Place TURNING GEAR DRIVE MOTOR handswitch HS-3153 in PULL-TO-LOCK. **(Critical for Event #9)** o Place the Bearing Lift Pump handswitches in PULL-TO-LOCK. **(Critical for Event #9)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
	The Scenario may end when the remainder of the immediate actions of AOP 683 are performed and the plant is stable, or at the direction of he lead evaluator. When the scenario is over, freeze the simulator and announce: **The scenario is complete, please stand by your stations for follow up questions if necessary.**	

***** END OF SCENARIO *****

*** REVIEW SCENARIO OBJECTIVES WITH THE OPERATORS ***

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
NS 93002 Turbine Stop Valve and Combined Intermediate Valve Test. **EVENT #1 (N-BOP)**	**SRO** will perform a pre-job brief for the performance of NS 93002, Turbine Stop Valve and Combined Intermediate Valve Test. (The brief will be covered prior to the scenario). **BOP operator** will perform NS 93002, "Turbine Stop Valve and Combined Intermediate Valve Test," by performing the following: o Depress and hold SV-1, 2, 3, & 4 TEST and confirm that Stop Valve #1 closes slowly until the last 10% of travel, and then rapidly closes fully. **(Critical for event # 1)** o Release SV-1, 2, 3, & 4 TEST and confirm Stop Valve #1 indicates open. **(Critical for event # 1)** o Depress and hold ISV IV NO. 1, 2, 3, & 4 TEST. **(Critical for event # 1)** o Release ISV IV NO. 1, 2, 3, & 4 TEST and confirm that both Intermediate Stop Valve #2 and Intercept Valve #2 indicate open. **(Critical for event # 1)**	NS 93002, Rev. 3	Performance of NS 93002. Sat _____ Unsat _____
Power ascension with recirc. **EVENT #2 (R-ATC)**	**SRO** Hold a short brief outlining the power change. (The major brief has been given prior to the scenario.) **ATC operator** will begin raising power with recirc by manually adjusting the Recirc Flow Controllers. **(Critical for Event # 2)**	IPOI 3, Rev. 66	Reactivity evolution Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
"B" Recirc speed controller run away. **EVENT #3 (C-ATC)**	**ATC operator** will determine that power is going up by itself, and determine that the "B" recirc M-G speed controller is ramping up by itself. He will take the following actions to stop the run away: Lock the scoop tube of the "B" recirc M-G speed controller. **(Critical for Event # 3)** **SRO** will address TS and determine **IF the recirc pump speed mis-match** will put them out of compliance with the LPCI Loop Select limits. • TS SR 3.4.1.1 states that the speed of the faster pump shall be less than or equal to 122% of the speed of the slower pump when operating at greater than or equal to 69.4% RTP. • Based on the calculation, the SRO will determine if he is in compliance with TS 3.4.1 Condition C. o If he is not in compliance, then he has 2 hours to restore the mis-match within limits, or Trip one of the recirc pumps.	AOP 255.2, Rev. 24 Technical Specifications	Run away recirc speed control. Sat _____ Unsat _____ Recirc Mismatch TS determination (if necessary) Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Spurious Group 2 isolation with a failure or valve to isolate. **EVENT#4 (C-BOP)**	**BOP operator** will perform the following IAW ARP 1C05B B-8. • Will determine that CV 3729 OUTBD DW EQUIP DRAIN ISOL valve has not closed. **(Critical for Event # 4)** • Take the hand switch of CV 3729 to close and verify that the valve closes. **(Critical for Event # 4)** **SRO** will consult TS and determine the following: TS 3.6.1.3 Condition A must be entered due to the failure of the CV to isolate on its Group 2 signal.	ARP 1C05B B-8, Rev. 7 Technical Specifications	Spurious Group 2 isolation not complete. Sat _____ Unsat _____ Closing CV3729 due to it failing to auto close. Sat _____ Unsat _____ TS determination on failed PCIS valve. Sat _____ Unsat _____
Trip of the running RWS pump. **EVENT #5 (C-ATC)**	**BOP operator** will respond to annunciator 1C06A B-2, "C" RWS PUMP 1P-117C TRIP, by performing the following: • Start RWS PUMP 1P-117A and determine that it did not start. **(Critical for Event # 5)** • Start both RWS pumps in the B RWS loop. **(Critical for Event # 5)** **SRO** will consult TS based on one RWS pump failing, and determine that the “A” Loop RWS is inoperable and enter TS 3.7.2 condition A.	ARP 1C06A B-2, Rev. 5 Step 3.2 Step 3.3	Restoration of River Water Supply operation. Sat _____ Unsat _____ Declare the proper TS for the loss of one RWS loop Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Turbine Lube Oil leak. **EVENT # 6 (C-BOP)**	**BOP** will determine that turbine lube oil pressure is lowering and perform the actions of ARP 1C07A A-7, "TURBINE LUBE OIL BEARING HEADER LO PRESSURE," and perform the following; • Verify TGOP 1P-38 running. If not, enter AOP 693 o Will manually start the TGOP. **(Critical for Event # 6)**	ARP 1C07 A-7, Rev. 5 Step 3.1	Restoration of turbine lube oil. Sat _____ Unsat _____
Failure of the "A" GEMAC level transmitter. **EVENT #7 (I-ATC)**	**ATC operator** will notice level on the B and C GEMACs going low and perform the following: • Transfer level control over to the "B" level control. **(Critical for Event # 7)** **SRO** will consult the TRM for the variation in the narrow range level indicators on 1C05 and declare the following: • Per TRM 3.3.6, for the narrow range level indicators being out of their tolerance for daily instrument checks. • Determine that TRM requires 2 channels of narrow range level instrumentation to be operable. With the B and C still operable, we meet this spec.	Technical Requirements Manual	Transfer of level control due to a malfunctioning level transmitter. Sat _____ Unsat _____ TRM determination for narrow range level instruments Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Major turbine lube oil break to ATWS. **EVENT #8 (M-ALL)**	**SRO** will direct and the **crew** will perform the following actions IAW AOP 693, "MAIN TURBINE/EHC FAILURES," section "TURBINE LUBE OIL TROUBLE." (94.49, SRO 5.49) o **ATC** operator will insert a manual reactor scram. **(Critical for event 8)** o The **ATC** operator will inform the SRO that the plant is in an Electrical ATWS. **(Critical for event 8)** **SRO** will direct and the crew will perform the following actions • Lock out ADS (RO 8.11) **(Critical for event 8)** • Install defeat 15 (RO 95.25, SRO, 6.25) **(Critical for event 8)** **Critical Task for this Scenario.** **IF a scram is required and Reactor power is above 5%,** **THEN reduce power below 5% using one or more of the following methods:** ▪ **Manual scram signal** ▪ **Inserting control rods using RIPs** ▪ **Manual ARI signal** ▪ **Injection of Boron** o Mode switch to shutdown. **(Critical for Critical Task)** o Recirc to minimum. **(Critical for Critical Task)** o Initiate SBLC. **(Critical for Critical Task)**	EOP 1, Rev. 11 ATWS, Rev. 12 RIP 101.2, Rev. 3	Determination of the ATWS condition. Sat _____ Unsat _____ Transition from EOP 1 to ATWS. Sat _____ Unsat _____ Enter Power Level Control, **Critical Task for the Scenario.** Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Major turbine lube oil break to ATWS. **EVENT #8 (M-ALL) Continued**	▪ RIP 101.2, RPS Fuse Removal **(Critical for Critical Task)** (95.04,SRO 6.04) • At 1C15; o Fuse C71-F18A Terminal CC-F3 o Fuse C71-F18C Terminal CC-F4 o Fuse C71-F18E Terminal CC-F5 o Fuse C71-F18G Terminal CC-F6 • At 1C17; o Fuse C71-F18B Terminal CC-F3 o Fuse C71-F18D Terminal CC-F4 o Fuse C71-F18F Terminal CC-F5 o Fuse C71-F18H Terminal CC-F6	ATWS Rev. 12 RIP 101.2	RPS Fuse Removal. **Critical Task for Scenario.** Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Major turbine lube oil break to ATWS. **EVENT #8 (M-ALL) Continued**	• Per the /L leg: (RO 95.50, SRO 6.50) o Assess power greater than 5% and enter Power Level Control. **(Critical for Critical Task)** **Critical Task for this Scenario.** **IF a reactor scram is required, and Reactor power is >5%, and Power/level control is required, THEN terminate and prevent injection until conditions allow reinjection** o Secure and prevent injection from: ▪ Condensate and feed **(Critical for Critical Task)** ▪ HPCI **(Critical for Critical Task)** • Per the /P leg (SRO6.57, STA, 4.07 o Install defeat 11. (RO 95.21) (SRO 6.21) **(Critical for event # 8)**	ATWS Rev. 12	Enter Power Level Control, **Critical Task for the Scenario.** Sat _____ Unsat _____ Installed Defeat 11 Sat _____ Unsat _____
Isolation of the Main Turbine for a Loss of Turbine Lube Oil. **EVENT # 9 (C BOP)**	The **BOP** will perform the following per AOP 683 for the Turbine Lube Oil problems o Close the MSIVs. **(Critical for Event #9)** o Place TURNING GEAR DRIVE MOTOR handswitch HS-3153 in PULL-TO-LOCK. **(Critical for Event #9)** o Place the Bearing Lift Pump handswitches in PULL-TO-LOCK. **(Critical for Event #9)**	AOP 683	Securing the Main Turbine for a loss of Lube Oil. Sat _____ Unsat _____

SEG/ESG Validation Checklist

SEG/ESG ___**ESG 18**_____ **Rev.** ___**1**_____

- ☐ Correct IC or plant status identified.
- ☐ Shift turnover forms filled out (both CRS/OSM and NSOE) if required.
- ☐ Additional documents are prepared (STPs, Work Orders, LCO Paperwork).
- ☐ SOMS tags identified and included in setup instructions.
- ☐ Special setup instructions identified; handswitch manipulations, procedure markups, alarm borders, 3D case available, computer points substituted, etc.
- ☐ Setup files correctly called out.
- ☐ Malfunction list is accurate.
- ☐ Override list is accurate.
- ☐ Remote function list is accurate.
- ☐ Event triggers are accurate.
- ☐ Time/Notes section is accurate and includes all reasonable cues that may be given to initiate an action. Cues are unambiguous and provide a definitive moment to take action.

Instructor Activity section is accurate and complete:

- ☐ Actions are clearly defined for Booth or Floor instructor.
- ☐ Role-playing is clearly noted.
- ☐ The sequence of events is completely and concisely narrated even if it takes no instructor action.
- ☐ Automatic actions that require verification are noted.
- ☐ Reasonable alternate paths are considered and included.
- ☐ Event trigger activation is distinguished from narrative text (**Bold font**)
- ☐ Noun descriptions of actions that occur on event trigger initiation are complete, for example "…set **ET 3** to **TRUE** which activates malfunction **SW21C** resulting in a loss of the C Well Water Pump."
- ☐ Other simulator control actions are clearly distinguished from narrative text, for example "…after drywell temperature reaches 280 deg. F **SNAP** the simulator to **IC 0**."
- ☐ Student and Instructor copies of worksheets or other training activities are verified correct and electronically attached to the file if appropriate.

SEG/ESG Validation Checklist

SEG/ESG ___**ESG 18**_____ **Rev.** ___**1**_____

Expected Student Response Section is accurate and complete:

- ☐ Critical tasks are accurate and clearly identified. Probable critical tasks are also listed with logical connection to the scenario; for example "If the crew fails to get all the rods inserted before ED the critical task becomes…" (N/A as appropriate)
- ☐ Tasks are clearly noted and properly numbered as appropriate.
- ☐ Knowledge objectives are clearly noted and properly numbered as appropriate.
- ☐ Expected as well as probable student responses are listed with logical connection to the scenario. (N/A as appropriate)
- ☐ Actions are appropriately delineated by position(s); OSM, CRS, STA, RO, NSOE, Fire Brigade Leader, At the Controls Operator, etcetera. (N/A as appropriate)
- ☐ Actions are listed using a logical order; by position and chronology. (N/A as appropriate)
- ☐ Crew Performance Criteria follow the same chronology as the student responses, are complete and accurate. (For ESGs only)
- ☐ For Walkthrough and Training Mode Scenarios with pre-planned pauses, sufficient information is presented to allow the instructor to meet the goal of the training.

Turnover information (as required) is correct:

- ☐ Day and shift are appropriate.
- ☐ Weather conditions do not conflict with malfunctions.
- ☐ Power levels are correct.
- ☐ Thermal limit problems and power evolutions are realistic and include a reason for any downpower.
- ☐ Existing LCOs include start date, remaining time and actions.
- ☐ Plant Risk Assessment (CDF and Color).
- ☐ STPs are appropriate for day and shift.
- ☐ Core Damage Frequency has been properly calculated and listed to 3 decimal places.
- ☐ Maintenance is realistic for plant conditions.
- ☐ Comments, evolutions, problems, etc, includes extra personnel (licensed/non-licensed if necessary), any condition that affects the flow of the scenario and any condition that does not fit in another category.

SME/Instructor	Date
SME/Instructor	Date

SEG/ESG Validation Checklist

SEG/ESG ESG 18 **Rev.** 1

Crew:		Instructors:	
OSM		Booth	
CRS		Floor	
STA		Extra	
1C05			
1C03			
BOP			

Crew Comment:

Resolution:

Crew Comment:

Resolution:

NOTE: Following approval of SEGs, this page may be discarded.

SEG/ESG Validation Checklist

SEG/ESG ESG 18 **Rev.** 1

Crew Comment:

Resolution:

Crew Comment:

Resolution:

Crew Comment:

Resolution:

NOTE: Following approval of SEGs, this page may be discarded.

Appendix D	**Scenario Outline**	**Form ES-D-1**

Facility: _____DAEC_____ Scenario No.: ESG 3__ Op-Test No.:_____

Examiners:_____ Operators:_____

_____ _____

_____ _____

Initial Conditions: The plant is operating at 100% capability. RCIC is inoperable. The crew has been receiving 1T136 tank hi level alarms.

Turnover: The plant is operating at 100% capability. It is a warm summer day. The "B" RHRSW pump is to be started for chemistry to obtain a sample. You are to start the "B" RHRSW pump, IAW OI 416, and then call the Chemists.

RCIC is inoperable due to finding water in the oil. The RCIC turbine has been tripped. The mechanics are down looking at the RCIC turbine. They are working with the WCC on how the tagout should be written. The WCC will inform you when they are ready to tag out the RCIC turbine. Because of RCIC inoperable, TS 3.5.3 Condition A has been entered. Currently in day 1 of 14.

The plant received 3 1T136 high-level alarms, 1C07B D-10. Each alarm stayed in for about 90 seconds.

Event No.	Malf No:	Event Type*	Event Description
1		N (BOP)	IAW OI 416, start the "B" RHRSW pump.
2	1	C (RO)	An APRM flow unit will fail down scale. This will result in a half scram. RO will respond to ARP 1C05A E-2 for the flow unit, and 1C05A A2 for the half scram. Per the actions of ARP 1C05A E-2 the RO will remove the A flow unit from service and reset the half scram.
3	2	C (BOP/SRO)	The "B" RHRSW pump will develop a motor bearing problem and begin to seize up. The BOP will have to remove the RHRSW pump from service. The SRO will enter TS 3.7.1 Condition A.
4	4	C (RO/SRO)	A control rod will drift in, (OE 18716). Per the actions of ARP 1C05 A D-6, the RO will stop the drifting by applying an Emergency In signal to the control rod. TS will be entered for either an inoperable control rod.
5	5	C (BOP)	The #6 feed water heater controller will fail in AUTOMATIC. This will require controlling the feedwater

			heater in manual.
6	3	C (BOP/SRO)	The Start up transformer will receive annunciator 1C08A A-7, Start Up Transformer Trouble. When investigated the problem will require the transformer to be removed from service. This will require entry into TS 3.8.1 Condition A, for loss of one offsite power source.
7	6	R (RO)	Condenser Hot Well conductivity will begin to rise due to a tube leak. The crew will enter AOP 639 IAW AOP 639 when the influent conductivity of the condensate demineralizers reaches 1 micro mho, the crew will perform a fast power reduction with recirc to 27 million lbm/hr flow and scram the plant
8	7	M (all)	When the plant gets to 27 million lbm/hr flow, a manual scram will be inserted Following the reactor scram a LOCA will develop. The crew will enter EOP 1 and 2 Torus and Drywell sprays will be initiated to protect the containment. HPCI will malfunction and trip. Due to failure high-pressure injection systems, **ALC** will be entered. The available inject systems will be lined up. When RPV level lowers to +15 inches an **ED** will be performed.
9		C (BOP)	HPCI's flow controller will fail in automatic. The BOP will diagnose the problem and place the flow controller in manual and inject into the RPV for a short period of time. HPCI will eventually trip so the ED can occur.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

NMC Committed to Nuclear Excellence	EVALUATION SCENARIO GUIDE (ESG)

SITE: **DAEC**

APRM FLOW UNIT FAIL DOWNSCALE, "B" RHRSW PUMP MOTOR OVERLOAD, START UP TRANSFORMER FAILURE, CONTROL ROD DRIFT IN, 6B FEEDWATER HEATER LEVEL CONTROL FAIL, CONDENSER TUBE LEAK, REACTOR SCRAM, EOP1, EOP2, ALC ED

ESG 19 **REV. 1**

PROGRAM: **OPERATIONS** **#:**

COURSE: **ILC** **#:** **50007**

TOTAL TIME: **90 MINUTES**

Developed by: _____
Instructor *Date*

Validated by: _____
SME/Instructor *Date*

Reviewed by: _____
Operations Manager *Date*

Approved by: _____
Training Supervisor-Operations *Date*

ESG 19, ILC NRC Exam, Rev. 1

GUIDE REQUIREMENTS

Training Resources:	Simulator Simulator Booth Instructor Phone Talker Simulator Floor Instructor
References:	OI 416, Rev. 38 OI 454, Rev. 44 ARP 1C05A E-2, Rev. 6 ARP 1C03B B-8, Rev. 6 ARP 1C08A A-7, Rev. 15 ARP 1C05 A D-6, Rev. 10 AOP 255.2, Rev. 24 AOP 255.1, Rev. 26 ARP 1C06B C-10, Rev. 2 AOP 639, Rev. 22 OI 304.1, Rev. 46 OI 304.2, Rev. 52 EOP 1, Rev. 11 EOP 2, Rev. 12 OI 152 QRC 1, Rev. 3 ALC, Rev. 4 ED, Rev. 4 Technical Specifications EPIP
Commitments:	None
Evaluation Method:	Dynamic Simulator
Operating Experience:	None

ESG 19, ILC NRC Exam, Rev. 1

SCENARIO SUMMARY:

Current plant operating status:

- The plant is operating at 93% thermal power.
- It is a warm summer day.
- RCIC is inoperable due to finding water in the oil. The RCIC turbine has been tripped. The mechanics are down looking at the RCIC turbine. They are working with the WCC on how the tagout should be written. The WCC will inform you when they are ready to tag out the RCIC turbine. Because of RCIC inoperable, TS 3.5.3 Condition A has been entered. Currently in day 1 of 14.
- The "B" RHRSW pump is to be started for chemistry to obtain a sample. You are to start the "B" RHRSW pump, IAW OI 416, and then call the Chemists.
- During the past shift there have been 3 1T136 High-level alarms, 1C07B D-10. Each alarm stayed in for about 90 seconds. The Aux man went into the condenser bay and found nothing out of the ordinary.

Scenario segments:

EVENT #1 (N- BOP)

- Start the "B" RHRSW Pump IAW OI 416.

EVENT #2 (C-RO)

- The "B" APRM flow unit will fail down scale. This will result in a half scram. The ATC RO will respond to ARP 1C05A E-2 for the flow unit, and 1C05A A2 for the half scram. Per the actions of ARP 1C05A E-2 the RO will remove the B flow unit from service and reset the half scram.

EVENT #3 (C-BOP)

- The "B" RHRSW pump will develop a motor bearing problem and begin to seize up. The BOP operator will have to remove the RHRSW pump from service IAW ARP 1C03B B-8.
- The SRO will enter TS 3.7.1 Condition A.

EVENT #4 (C-RO)

- A control rod will drift in. Per the actions of ARP 1C05A D-6, the RO will stop the drifting by applying an Emergency In signal to the control rod.
- The control rod will be declared inoperable and TS 3.1.3 Condition C will be entered.

EVENT #5 (C-BOP)

- The 1E-6B feed water heater drain valve controller will fail in AUTOMATIC. This will require controlling the feedwater heater drain valve in manual IAW ARP 1C06B C-10.

EVENT #6 (C-BOP)

- The Start up transformer will receive annunciator 1C08A A-7, Start Up Transformer Trouble. When investigated, the problem will require the transformer to be removed from service.
- This will require entry into TS 3.8.1 Condition A, for loss of one offsite power source.

EVENT #7 (R-RO)

- Condenser Hot Well conductivity will begin to rise due to a tube leak. The crew will enter AOP 639. This will result in a fast power reduction.
- When recirc flow is reduced to 27-million lbm/hr flow, the reactor will be scrammed.

EVENT #8 (M-ALL)

- Following the reactor scram a LOCA will develop.
- The crew will enter EOP 1 and 2.
- Torus and Drywell sprays will be initiated to protect the containment.
- Due to failure high-pressure injection systems, **ALC** will be entered.
- When RPV level lowers to +15 inches an **ED** will be performed.

EVENT #9 (C-BOP)

- HPCI's flow controller will fail in automatic. The BOP will diagnose the problem and place the flow controller in manual and inject into the RPV for a short period of time.
- HPCI will eventually trip so the ED can occur.

TASKS ASSOCIATED WITH SIMULATOR EXERCISE:

⇒ RO (NSOE, ANSOE)

- ♦ 1.04 Respond to annunciators.
- ♦ 1.05 Perform GEMC controller functions.
- ♦ 15.01 Transfer an Essential bus from the start up transformer to the standby transformer.
- ♦ 30.01 Start up the RHRSW System.
- ♦ 30.03 Manually shut down the RHRSW System.
- ♦ 94.02 Respond to abnormal control rod movement/indication.
- ♦ 94.03 Respond to power/reactivity abnormal change condition.
- ♦ 94.18 Respond to reactor water/condensate high conductivity condition.
- ♦ 95.14 Perform EOP Defeat 4.
- ♦ 95.44 Perform actions of RC/L of EOP 1.
- ♦ 95.45 Perform initial EOP 1 actions (RC).
- ♦ 95.63 Perform DW/T leg of EOP 2.
- ♦ 95.76 Perform ALC with 1 Core Spray and 1 other ECCS pump available.
- ♦ 95.80 Perform ED using SRVs.
- ♦ 99.13 Respond to Rod Drift.

⇒ Shift Supervisor (SS)

- ♦ 1.01 Direct routine crew and control room activities.
  - 1.01.02 Coordinate operator activities.
  - 1.01.03 Ensure control room activities conform to ACP 1410.1, “Conduct of Operations.”
- ♦ 1.02 Determine operability of Tech Spec required components.
  - 1.02.02 Determine if the instrument, component, or system is operable.
  - 1.02.03 Declare the instrument, component, or system is inoperable, enter the correct LCO, and determine and direct performance of the LCO STP.
- ♦ 1.21 Direct crew response to normal events/accidents.
  - 1.12.01 Evaluate the event or accident to determine its cause and develop mitigation strategies.

- 1.12.02 Recognize and prioritize data relevant to the accident or event.
- 1.12.03 Direct appropriate conservative actions to mitigate the accident or event and stabilize plant parameters.
- 1.12.06 Analyze results and direct alternate mitigation actions.

♦ 1.22 Determine operability for TRM Components.

♦ 3.01 Implement the Emergency Plan.

- 3.01.01 Declare the appropriate EAL.

♦ 4.21 Direct crew actions to perform the immediate operator responses to a reactor scram.

♦ 5.03 Direct crew response to power/reactivity abnormal change condition.

- 5.03.02 Direct immediate operator actins to prevent exceeding any plant/reactor limits.
- 5.03.04 Direct operator actions to control the malfunctioning system or component.
- 5.03.05 Confirm the rod pattern, thermal limits and reactor power are within the allowed range.

♦ 6.14 Direct crew response to perform EOP Defeat 4.

- 6.14.01 Direct operator actions to install Defeat 4.

♦ 6.21 Direct Crew response to perform EOP Defeat 11.

- 6.21.01 Direct operator actions to perform EOP Defeat 11.

♦ 6.63 Direct crew response for performance of the DW/T leg of EOP 2.

- 6.63.01 Direct operator actions to maintain drywell temperature 150 F using drywell cooling systems.
- 6.63.03 Direct operator actions to maximize drywell cooling by installing Defeat 4.
- 6.63.08 Direct operator actions to secure running recirc pumps, initiate drywell sprays using RHR pumps not required continuously for adequate core cooling.

♦ 6.44 Direct crew response for performance of the RC/L of EOP 1.

- 6.44.03 Direct operator actions to restore and maintain RPV level between +170 and +211 inches with one or more Preferred Injection systems (Table 1A).
- 6.44.04 Direct operator actions to maintain RPV level above +15 inches and if necessary augment injection with Alternate Injection Systems (Table 2A).

- ♦ 6.45 Direct Crew response for performance of initial EOP 1 actions (RC).
  - 6.45.04 Direct operator actions to initiate any of the following which should have initiated but did not, isolations, ECCCS initiations, SBDG initiation
- ♦ 6.78 Direct crew response for performance of ED.
- ♦ 6.76 Direct crew response for perform ALC with 1 Core Spray and 1 other ECCS pump available.

SCENARIO OUTLINE:

BOOTH INSTRUCTOR ACTIONS

1 SIMULATOR SET UP:

1.1 General Instructions

a. Reset to IC 20, then perform the following:
b. Verify the following event trigger definitions:
   (1) **RDPACC(1) .LT. 1440** is set for event trigger 4.
   (2) **ZDISWHS4925B(1) .GE. 1** is set for event trigger 10.
   (3) **PCPDWG .GT. 2.0** is set for event trigger 9.
   (4) **ZDIRDC11AS3(1) .RE. 1** is set to event trigger 15.
c. Type in malfunctions that are listed in the below **MALFUNCTION** Table.
d. Type in overrides that are listed in the below **OVERRIDE** Table.
e. This ESG will require the BOP to perform STP 3.8.1-01 for a loss of an offsite source. Have enough copies available for the entire ESG run.

1.2 EVENT TRIGGER DEFINITIONS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
4	**RDPACC(1) .LT. 1440**	Scram accumulator pressure low
10	**ZDISWHS4925B(1) .GE. 1**	B RHRSW pump handswitch taken to stop. When event trigger #10 goes true, [RED], the booth instructor will delete override AO SW1P-22B.
9	**PCPDWG .GT. 2.0**	DW 2 psig
15	**ZDIRDC11AS3(1) .GE. 1**	Emergency In switch taken to Emer In. When the #15 event trigger goes true, [RED], the booth instructor will delete malfunction RD061039.
The rest of the event triggers will be called out in the body of the scenario.		

1.3 MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	Delay	Ramp	ET	Initial Value	Final Value
As dir	NM11B	B APRM flow unit fail DS		45	20	As is	0
As dir	AN1C03B(17)	RHRSW pump over load or trip		21	2		On
As dir	AN1C08A(7)	Start up transformer trouble alarm			3		On
T=0	ED06C	Start up transformer lockout			4		
As dir	RD061039	Rod 1039 drives in			5		
As dir	MC07	Condenser tube leak			6	As is	1.7
T=0	RR15A	Recirc line break	120	1600	4	As is	25
As dir	HP02	HPCI turbine trip			7		
As dir	HP03	HPCI Flow Controller fail in Auto			9	As is	0
T=0	RC02	RCIC Turbine Trip					
T=0	AN 1C04C(32)	RCIC Pump Lo Suction Pressure				As is	OFF

1.4 OVERRIDES:

Time	Override No.	Override Title	Delay	Ramp	ET	Initial Value	Final Value
As dir	AO SW1P-22B	B RHRSW pump amps		20	2	As is	.9
As dir	AI FW LIC-1348(1)	1E-6B Drain VLV CV(set pt.R1)			8	As is	1

1.5 REMOTE FUNCTIONS:

Time	Remote No.	Remote Title	Delay	Ramp	ET	Initial Value	Final Value
As dir	MC01	Main condenser vacuum breakers				CL	OP
As dir	MC02	Main condenser vacuum breakers				CL	OP

FLOOR INSTRUCTOR ACTIONS

2 Simulator Pre-brief:

2.1 Individual position assignments

BOOTH / FLOOR INSTRUCTOR ACTIONS

2 Conduct pre-scenario activities in accordance with the following procedures:

3.1 If this scenario is used in training mode: OTI 101

4 TURNOVER INFORMATION

⇒ Day of week and shift

- ♦ Wednesday
- ♦ Day shift

⇒ Weather conditions

- ♦ Warm
- ♦ Dry

⇒ (Plant power levels) Pwr 94%

- ♦ MWT 1787
- ♦ MWE 613
- ♦ CORE FLOW 46.9

⇒ Thermal Limit Problems/Power Evolutions

- ♦ None

⇒ Plant Risk Status

- ♦ CDF 2.362 E -5
- ♦ Color Yellow

⇒ Existing LCOs, date of next surveillance

- ♦ RCIC, day 1 of 14, TS 3.5.3 Condition A.
- ♦ Protected systems include:
  - A and B EDG, A and B ESW, B RWS, HPCI, and Div 2 250VDC charger 1D44.

⇒ STPs in progress or major maintenance

- ♦ None

⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment

- ♦ Chemistry needs to take a sample of the water in the RHRSW IAW NS790702, “Continuous Service Water Release Sampling and Analysis.”
- ♦ Based on pump run times, the “B” RHRSW pump is the one that should be started for this evolution. Therefore, right after turnover, start the “B” RHRSW pump IAW OI 416. When it is running call Chemistry.
- ♦ RCIC is inoperable due to finding water in the oil. The RCIC turbine has been tripped. The mechanics are down looking at the RCIC turbine. They are working with the WCC on how the tagout should be written. The WCC will inform you when they are ready to tag out the RCIC turbine.

⇒ Comments, evolutions, problems, core damage frequency, etc.

- ♦ WCC is fully staffed.
- ♦ There is one extra NSPEO in the pump house for the start of the B RHRSW pump.
- ♦ During the past shift there have been 3 1T136 High-level alarms, 1C07B D-10. Each alarm stayed in for about 90 seconds. The Aux man went into the condenser bay and found nothing out of the ordinary.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Shift Turnover	• Provide Shift Turnovers to the **SRO** and **RO**s.	• Get familiar with plant conditions. **SRO** will provide beginning of shift brief to coordinate the tasks that were identified on the shift turnover. (SRO 1.01)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Start up of the "B" RHRSW pump for Chemistry to obtain a sample. **EVENT #1 (N BOP)**	**Booth Instructor,** when he crew has the watch, and/or at the direction of the Lead Evaluator Role-play as the NSPEOs as directed in the plant. When asked, report that the oil levels of the "B" ESW and "B" RHRSW pump motors are sat and that room ventilation is operating. When directed, report back that the Auto vent is shut and no leakage is observed.	After the watch is assumed, the **CRS** will direct the BOP to start up the "B" RHRSW pump IAW OI 416 for Chemistry to obtain a sample. The **BOP operator** will start the "B" RHRSW IAW OI 416: • Start ESW Per OI 454. [**Critical for Event #1**] o Place HS-4928B on 1C06 in the START position. o Verify red indicating light ON and amps between 95 and 115. o Verify flow greater than 300 gpm. o Verify auto vent closed, no excessive leakage, and room air flow. • Prior to pump start, verify, MO-1947 RHR HX SERVICE WATER OUTLET valve closed. • Prior to next two steps, notify Chemistry and verify NS790702 Continuous Service Water Release Sampling and Analysis is current. • If starting B side pumps, start B and/or D RHRSW PUMPS by performing either of the following: o Place handswitch HS-4925B, B RHRSW PUMP 1P-22B on Panel 1C03 in the START position, and allow it to spring return to AUTO. (Section 1.0 Step 5.a [**Critical for Event #1**]). • Throttle open MO-1947 RHR SERVICE WATER OUTLET valve with HS-1947C, (Section 1.0 Step 6 [**Critical for Event #1**]). • Continue to raise flow to obtain flow greater than 2000 gpm per running pump as indicated on FI-1944 RHRSW INLET FLOW. • Confirm B RHRSW PUMP 1P-22B, is running by observing the following: o Red (pump running) indicating light on Panel 1C03 is ON. o The associated RHRSW pump ammeters on, Panel 1C03, indicate normal running amps, (between 47 and 70 Amps). • As soon as possible after RHRSW pump start, perform the following: o Inspect the auto vent/vacuum breaker for evidence of excessive leakage.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Start up of the "B" RHRSW pump for Chemistry to obtain a sample. **EVENT #1 (N BOP) continued**		The **BOP operator** will start the "B" RHRSW IAW OI 416, continued: • Monitor RHRSW/ESW Pit Level while system is in operation at 1C-29 on A[B] RHRSW/ESW PIT LEVEL LR-4935A[B], computer point B279 [B280] or locally on LIS-4935A/B. • Control ESW/RHRSW pit level per OI 410 Section 6.6. • Notify Chemistry. (RO 30.01, & SRO 1.01)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

"B" Recirc Flow unit failing down scale.
 	
EVENT #2 (C ATC)
	Booth Instructor, when "B" RHRSW is in service and/or at the direction of the Lead Evaluator, start the next event by performing the following:
	
	IMF NM11B to 0 over 45 sec by setting event trigger 20 to true.
		Crew
		• Recognize the flow unit rod block alarm, 1C05A (E-2), 1C05A C-2 APRM Upscale, 1C05A A-5, Neutron Monitoring Trip, 1C05B A-2, "B" RPS Auto Scram, 1C05B B-2, APRM B, D, or F Upscale Trip or Inop, 1C05B A-6, Rod Out Block, and 1C05B, E-4, "B" RPS Backup Scram Half Scram. They will then follow the 1C05A (E-2) and perform the following:
		  • The Crew will determine that the "B" Flow Unit is the component that failed based on the % flow reading 0% and the other flow units reading close to 100%.
		  • The **ATC operator** will Bypass APRM flow unit "B" on 1C05, with CRS permission. (ARP 1C05A E-2, step 3.4.c **[Critical for Event #2]**)
		  • The **ATC operator** or the **BOP** operator will place the MODE switch for "B" Flow unit in a position other than OPERATE or STANDBY. This is a back panel, 1C37, operation. (ARP 1C05A E-2, step 3.5.a **[Critical for Event #2]**)
		  • The **ATC operator** will reset the half scram. (ARP 1C05A E-2, step 3.5.c **[Critical for Event #2]**)
		
		The CRS will determine the following concerning TS:
		  • Refers to TS 3.3.1.1 RPS and determines that **no TS** exist (B 3.3-9, 10).
		  • Refers to TRM 3.3.2 and determines that **no TRM** exists for rod block.
		
		The Crew will;
		Initiate an AR, WRC and contacts I&C and system engineer.
		(RO 1.04 & SRO 1.02)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Tripping of the "B" RHRSW pump **EVENT #3 (C BOP)**	**Booth Instructor,** after a the "B" APRM flow unit is bypassed and the scram is reset and/or at the direction of the Lead Evaluator begin the RHRSW motor problems by performing the following: **IMF AN1C03B(17)** **AND** **IOR AO SW1P-22B to .9 over 20 sec. by setting event trigger 2 to true.** This will bring in the B RHRSW motor trip alarm and have the motor amps rise up to the alarm setpoint. **Booth Instructor** when the amp meter for the B RHRSW pump is at .9, perform the following: **MOR AO SW1P-22B from AS IS to .95 over 400 sec,** This will slowly ramp up the pump motor amps. **Booth Instructor** as the Amps ramp up, perform the following: Monitor event trigger 10, when the event trigger turns **RED**, the BOP has taken the B RHRSW pump handswitch to STOP. When this happens perform the following: **DELETE the following:** **MF AN1C03B(17) and** **OR AO SW1P-22B**	**The BOP operator** will respond to the annunciator 1C03B B-8 "B" RHRSW PUMP 1P-22B TRIP OR MOTOR OVERLOAD and perform the following: • If Pump 1P-22B did not trip confirm amps >80 on Panel 1C-03 on Ammeter labeled B RHRSW PUMP 1P-22B. • If at any time 1P-22B amps cannot be maintained <80 amps, or either bearing temp cannot be maintained <180°F, or 1P-22B is no longer required for adequate core cooling, o Reduce flow through 1P-22B to minimum o Trip the pump. **(Critical for Event #3)** • Monitor as soon as practical the following computer points using Group Display No 29. o WO96 RHR Service Water 1P-22B Motor Thrust Bearing Temp. 120 F<T<180 F. o WO97 RHR Service Water 1P-22B Motor Bearing Temp. 120 F<T<180 F. (30.03) **CRS** will determine that with the "B" RHRSW pump inoperable, TS 3.7.1 Condition A must be entered. (1.02)

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Control rod 10-39 drifts in. **EVENT #4 (C ATC)**	**Booth Instructor** when the B RHRSW pump is removed from service and the TS has been addressed, and/or at the direction of the Lead Evaluator, perform the following: NOTE: **Driver, read before inserting RD06,** during this next event, you will have to watch the RED/GREEN box for **event trigger 15**. When the ATC operator places the EMERGENCY IN switch to Emergency in, Event Trigger 15 box will turn RED. This is when you have to delete RD061039 When ready perform the following; **IMF RD061039 by setting event trigger 5 to true.** This will start control rod 1039 drifting in. When the ATC operator takes the Emergency In switch to Emergency in, and **event trigger box 15 turns RED**, **DMF RD061039**	**ATC operator** will respond to annunciator 1C05A D-8, Rod Drift, for control rod 10-39, and perform the following: (99.13) • At 1C05, select affected Control Rod, monitor 4 rod display to determine if a control rod is drifting, and if so in what direction. **(Critical for Event #4)** • IF any control rod is drifting **IN**, perform the following: o Place the C11A-S3 EMERG IN/NOTCH OVERRIDE SELECT switch on 1C05 in the EMERG ROD IN position momentarily (less than ½ second) to abort the rod sequence timer. **(Critical for Event #4)** • Determine that the rod has stopped drifting. • Run an OFFICIAL 3D CASE for abnormal reactor power/control rod distributions. • Reset the Rod Drift alarm. **SRO** will direct and the **Crew** will perform the following per AOP 255.2, POWER/REACTIVITY ABNORMAL CHANGE: (RO 94.03, SRO, 5.03) • Take any necessary steps to bring the reactor power/reactivity transient under control, including, but not limited to: o Assuming manual control of a malfunctioning system.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Control rod 10-39 drifts in. **EVENT #4 (C ATC) continued**	**Booth Instructor** role-play as the RE when called. If asked about what to do with the drifted rod: • If asked for a pull sheet to move the drifted rod, inform the crew that you will prepare one. • If told that rod 10-39 is being declared inoperable and has to be fully inserted, inform the crew that you will have to prepare a pull sheet for the move. You also have to prepare a new rod pattern for the RWM, because the control rod will have to be bypassed in the RWM.	• Verify control rod positions are correct for the established sequence, by using Rod Pattern Log. • Verify thermal limits on the Official 3D Case. • In the event of inadvertent entry into area above the power to flow map (i.e., exceeding load line limit) exit this area by inserting control rods. • Notify the Reactor Engineer and Operations Manager. **SRO** will direct and the **Crew** will perform the following per AOP 255.1, "CONTROL ROD MOVEMENT/INDICATION ABNORMAL." (RO 94.02) • Enter the Mispositioned Control Rod TAB. • Run an official case and verify thermal limits are all less than 1.0. o Contact the Reactor Engineer and the Operations Manager ▪ The AOP guidance is more geared to a misposition during a start up, not due to a rod drifting in. After notifying the Reactor Engineer and the Ops Manager, the determination may be to do nothing until the situation has been assessed further. **SRO** will determine that the Control Rod 1039 should be declared inoperable. • Enter TS 3.1.3 Condition C. o Insert within 3 hours. o Disarm within 4 hours

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
The # 6B feedwater level controller will fail to control level at 100%. **EVENT #5** **(C BOP)**	**Booth Instructor** when the TS determination has been made for the drifting control rod, and/or at the direction of the Lead Evaluator, perform the following: **IOR 1E-6B Drain VLV CV(set pt.R1) by setting event trigger 8 to true.** This will result in the 6B heater Drain valve failing in Automatic. **Booth Instructor**, when the Candidate has taken **manual** control of the 6 heater, call the control room and report the following; You are the on shift Aux man and some labors were moving some equipment near an instrument rack in the Turbine building and hit the drain valve controller for the 6B heater. This resulted in an air line fitting coming off. You were able to re-attach the airline and tighten up the fitting. After this report, perform the following: **DOR A1 FW LIC-1348(1)**	**Crew** will respond to annunciator 1C06B C-10, HP FDWTR HTR 1E-6B HI LEVEL, 1C06B D-10, HP FDWTR 1E-6B HI HI LEVEL and 1C07B B-6 MSR 1ST STAGE DRAIN TANKS 1T-91A TO 1T-91B HI DELTA P. The crew will determine that the 6 heater hi level is the event that is causing the MSR level problems and direct the BOP to attend to the 6 heater high level annunciator. The **BOP** will perform the following: • At 1C06 confirm CV-1350 HPHEATER 1E-6B DUMP valve is opening. • At 1C20 perform the following: o Confirm high shell side water level on LIC 1348. o Verify that LIC-1348 is set IAW OI 646, Extraction Steam, in the AUTOMATIC mode, and responding correctly by: ▪ LIC-1348 output signal to CV-1348 going open. ▪ 1E-6B HP HEATER level returning to normal. ▪ LIC-1350, 1E-6B DUMP VALVE output signal closing. • If level remains the same or tends to increase, attempt to control the 1E-6B HP HEATER level with LIC-1348 and or LIC-1350 in the AUTOMATIC mode. • If level remains the same or tends to increase, attempt to control the 1E-6B HP HEATER level with LIC-1348 and or LIC-1350 in the MANUAL mode. **(Critical for Event #5)** • The BOP will report that the LIC-1348, the 6A heater drain controller has failed in it's Automatic Mode and is currently in manual with the dump performing the fine level control.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Start up Transformer trouble. **EVENT #6 (C BOP)**	**Booth Instructor** when the 1E-3B heater drain is being controlled in Manual, and/or at the direction of the Lead Evaluator begin the Start up transformer trouble by performing the following: **IMF AN1C08A(7) by setting event trigger 3 to true.** This is the Start up transformer trouble alarm. **Booth Instructor** role-play as the Aux Operator when sent to the start up transformer. Wait about 3 min. then report that the alarm is **Sudden Internal pressure trip.** Report back in about another 2 minutes that you see that the relief has lifted. If called as the SOC thank the crew for the call about removing the Start up transformer from service.	**BOP operator** will respond to annunciator 1C08A A-7, STARTUP TRANSFORMER TROUBLE by announcing the alarm to the CRS, then pulling the ARP and performing the following: • Send an Operator locally to 1X3 Alarm Cubicle to determine the cause of the alarm. • With the aid of Table 1, Attachment 1, take the appropriate Corrective Action. o The BOP will learn from the Aux, that the alarm is: **Sudden internal pressure trip.** Then perform the following: ▪ Take Transformer 1X3 out of service immediately per OI 304.1 and OI 304.2 and initiate a WRC to have 1X3 inspected and repaired as necessary. o BOP should direct the Aux to leave the area. **BOP operator** will inform the CRS of his findings and what the ARP calls for. **CRS** will direct and the **BOP operator** will perform the following: • Per OI 304.2., "4160V/480V ESSENTIAL ELECTRICAL DISTRIBUTION SYSTEM," the BOP operator will transfer the Startup Transformer to the Standby Transformer by performing the following: (15.01) **NOTE** that the Operator will perform the next section of this ESG **2** times, once for 1A3 and once for 1A4. o Verify AC Sources/SBDG LCOs have been entered if applicable. ▪ The BOP will make sure that the CRS is entering the TS LCO prior to removing the Startup Transformer. ▪ **CRS** will assess **TS** and determine that they must enter TS **3.8.1 condition A and B** for the loss of one offsite source. (1.02) ▪ Will inform the BOP to remove the Startup Transformer.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Start up Transformer trouble. **EVENT #6 (C BOP) continued**		o Place the BUS 1A3[4] TRANSFER breaker mode selector switch in the MANUAL position. **(Critical for Event #6)** o Insert the handle in the SYNCHRONIZE switch for 4KV BREAKER 1A301[401] STANDBY TRANSFORMER TO BUS 1A3[4], and place it in the ON position. **(Critical for Event #6)** o Verify that the synchroscope indicates near 12 o'clock and not moving with both white (differential phase voltage) indicating lights are OFF. o Verify that INCOMING VOLTS SYNCHRONIZE and RUNNING VOLTS SYNCHRONIZE are within 8 volts. o Select Phase 1 with the BUS 1A3[4] STARTUP XFMR AMPERES meter switch, and observe ammeter reading. Select Phase 1 with the STANDBY XFMR BUS 1A3 [1A4] AMPERES meter switch. o Place the control switch 4KV BREAKER 1A301[401] STANDBY TRANSFORMER TO BUS 1A3[4] momentarily in the CLOSE position. Observe that the red (breaker closed) and white (closing spring charged) indicating lights are ON. **(Critical for Event #6)** o Observe that the bus has parallel supplies by observing approximately equal currents on the supply ammeters. o Place the control switch 4KV BREAKER 1A302[402] STARTUP TRANSFORMER TO BUS 1A3[4] momentarily in the TRIP position. Observe that the green (breaker open) and white (closing spring charged) indicating lights are ON. **(Critical for Event #6)** o Place the SYNCHRONIZE switch for 4KV BREAKER 1A301[401] STANDBY TRANSFORMER TO BUS 1A3[4] in the OFF position, and remove the handle. **(Critical for Event #6)** o Select individual phases with the BUS 1A3[4] STANDBY XFMR AMPERES meter switch to observe the current load and to verify approximately equal phase currents**.**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Start up Transformer trouble. **EVENT #6 (C BOP) continued**	**Booth Instructor** when the BOP opens the J and K breakers, **Delete Malfunction ED06C** NOTE, if the crew does not open the J and K breakers, the Start up transformer will lock out shortly after the reactor scrams. **Booth Instructor and Lead Evaluator** the next event, Condenser tube rupture, takes about 7 minutes to get to the point where1C80 will alarm. It may be advisable to place the next malfunction in while this event is still in progress.	o On the BUS 1A3[4] VOLTS meter, observe that all three phase-to-phase voltages indicate approximately 4160V by selecting each phase-to-phase position. o Place the BUS 1A3[4] TRANSFER breaker mode selector switch in the AUTO position. **(Critical for Event #6)** **Note** that the BOP may open the "J" and "K" breakers under the direction of either OI 304.1, or per the actions of ARP 1C08A A-7. • Per OI 304.1, "4160V/480V NONESSENTIAL ELECTRICAL DISTRIBUTION SYSTEM," the BOP operator will remove the Startup Transformer form service by performing the following: o Verify Offsite Sources LCO has been entered, if applicable. o Verify Essential Busses 1A3 and 1A4 are transferred to the Standby Transformer or SBDG per OI 304.2. o Notify the load dispatcher that the Startup Transformer (1X3) will be removed from service. o Place STARTUP TRANSFORMER J BREAKER control switch momentarily in the TRIP position. Observe the green (breaker open) indicating light is ON. **(Critical for Event #6)** o Place STARTUP TRANSFORMER K BREAKER control switch momentarily in the TRIP position. Observe the green (breaker open) indicating light is ON. **(Critical for Event #6)** o Open and tagout the local breakers for 1X003-1 and 1X003-2 to deenergize the startup transformer 1X3 cooling system. • Per ARP 1C08A Action 8 of Table1 o Open CB5550, ("J" Breaker). **(Critical for Event #6)** o Open CB5560, ("K" Breaker). **(Critical for Event #6)** **CRS** When the BOP has the Startup Transformer removed from service: • Direct the BOP to perform STP 3.8.1-01, "Offsite Power Sources." o The BOP will begin to perform STP 3.8.1-01.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Small Condenser Tube failure, leading to a fast power reduction. **EVENT # 7 (R ATC)**	**Booth Instructor** when the Startup Transformer is removed form service, and/or at the direction of the Lead Evaluator, perform the following: **IMF MC07 at 1.7 by setting event trigger 6 to true.** This will start a small condenser tube leak. The first audible indication of a tube leak is annunciator 1C06B A-1, 1C80 Trouble. **Booth Instructor** call up Group Display 24 on the SPDS terminal in the instructor area, this will give you the condensate filter demin influent and effluent conductivity. **Booth Instructor** role play as the second and inform him that annunciator 1C80 A-6, INFLUENT HIGH CONDUCTIVITY, is alarming and is currently reading what GD-24 is reading. After the 1C80 alarm is received, **modify MC07 to 4 over 120 sec.**	**Crew** will respond to annunciator 1C06B A-1, CONDENSATE DEMIN PANEL 1C-80 TROUBLE, and perform the following: (1.04) • Send the second assistant to 1C80 to investigate. The **crew** will respond to annunciator 1C80 A-6, INFLUENT HIGH CONDUCTIVITY, and perform the following: • Enter AOP 639, “Reactor Water/Condensate High Conductivity.” • Avoid opening the F/D bypass. The **CRS** will direct and the **Crew** will perform the following actions per AOP 639, “Reactor Water/Condensate High Conductivity.” (RO 94.18, SRO 5.18) • Observe CRS-2738 RWCU influent conductivity. • Review Action Levels of Attachment 1-5 of PCP 1.9, “Water Chemistry Guidelines.” o Per Attachment 5, a Hotwell conductivity of >0.1 will be an Action Level 1. ▪ Write an AR, notify Chemistry, and evaluate. ▪ Attempt to reduce the problem. ▪ If not corrected within 96 hours, write another AR. • Monitor conductivity at the indicated recorders.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Small Condenser Tube failure, leading to a fast power reduction. **EVENT # 7 (R ATC) continued**	**Booth Instructor** Role play as Chemistry and inform them that you will obtain a sample ASAP. It will take between 5 and 10 minutes for a chemist to get the results to the control room. **Wait** at least 5 minutes, then write down what the **influent conductivity** of GD 24 is reading _____. NOTE that if the reading has gone above .2, tell the control room a number a little above the .2 and ask if they want another sample taken. Then **WAIT** another 5 minutes to report a conductivity reading to the control room.	• Call Chemistry to sample. • Ensures that the F/D bypass stays closed. • When the Hotwell conductivity is reading ≥1.0 μmho/cm while the plant is at power, then: o **ATC operator,** per IPOI 4, will reduce reactor power to 27 Mlb/hr. **(Critical for Event #7)** o Manually scram the plant.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major transient LOCA, ALC, ED. **EVENT #8 (M ALL)**	**Booth Instructor** at the time of the scram, event **trigger 4**, RDPACC(1) .LT. 1440, should have gone true. Verify the following MF inserts: **RR15A at 25 over 1600 sec. with a 2-minute time delay.** This will start a leak that will lead to an ALC ED and trip both FWPs. **Booth Instructor** roll play as the NSPEO if directed to break condenser vacuum: **MRF MC01 and MC02 to open.**	Following the Scram the SS will direct and the crew will perform the actions of IPOI 5. RO 93.22, SRO 4.21 Crew will determine that RPV level lowered below 170" and EOP 1 should be entered. The SS will direct and the crew will perform the following actions IAW EOP 1. • Verify all rods fully inserted. **(Critical for Event #8)** • RC/L o Maintain RPV level 170 to 211" with available inject sources. • RC/P o Override CV 4371A, (Defeat 11). **(Critical for Event #8)** o Stabilize RPV pressure below 1055 psig RO 95.45, SRO 6.45 The SS will direct and the crew will perform the following actions per AOP 639, “Reactor Water/Condensate High Conductivity.” • Manually operate HPCI, RCIC, and/or SRVs as needed for pressure control. • Manually close CV-1490B, Hotwell Reject Valve. • Trip or verify tripped, the running condensate and feedwater pumps. • Bypass condenser High Backpressure Trip by placing the HI COND BACKPRESSURE BYPASS switches to BYPASS. • Close the MSIVs and MSL drains. **(Critical for Event #8)** • Trip or verify tripped, the circ water pumps. • Close the Condenser outlet Valves. (Due to the loss of power, this will have to be done manually.) • Break vacuum • Commence an aggressive cooldown with in the limits of IPOI 4.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major transient LOCA, ALC, ED **EVENT #8 (M ALL) continued**	**Booth Instructor** at 2 psig in the DW, Verify that event trigger 9 goes true. This will fail the HPCI Flow controller to '0'.	• Drain the water boxes. • Open V-42-12 RHRSW/ESW ISOL to RW Dilution line to limit the pressure on MO 4208 and 4209. (RO 95.45, SRO 6.45) **Crew** responds to Primary Containment HI/LO pressure alarm 1C05B, B-1. • Determines pressure is HI. • Verify proper operation of well water. • Verify Drywell cooling is sufficient. • Crew makes preparation to vent containment per OI 573 and may get venting started. When the Drywell reaches 2 psig, the crew will; Re-enter EOP 1 and maintain the same mitigation strategies, and Enter EOP 2. The SS will direct and the crew will perform the following actions IAW EOP 2: • PC/H o Install defeat 16 to restore sampling. • DW/T o As temperatures rise install defeat 4. **Scenario Critical Task** **BEFORE drywell temperature reaches 280°F and WHILE in the safe region of the DWSIL, THEN initiate drywell sprays.** o When out of the hatched region of Graph 7, Drywell Spray Initiation Limit, spray the D/W. **(Critical for Scenario Critical Task)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major transient LOCA, ALC, ED **EVENT #8 (M ALL) continued**		• Enable containment sprays by placing Containment Spray Enable Switch HS-1903C in Manual. **(Critical for Scenario Critical Task).** ▪ Open MO-1902 and MO-1903. **(Critical for Scenario Critical Task).** ▪ Open MO-2001 and MO-2000. **(Critical for Scenario Critical Task).** o Maintain below 95°F by starting torus cooling if necessary. RO 95.14, 95.63, SRO 6.14, 6.63, STA 4.07 • PC/P o When torus pressure rises above 2 psig and before 11 psig, Spray the Torus. **(Critical for Event #8)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major transient LOCA, ALC, ED **EVENT #8 (M ALL) continued**	**Note** HPCI will undergo a flow controller failure when the DW reaches 2 psig. **Booth Instructor** when the **HPCI flow** controller failure is identified and HPCI control is transferred to Manual and injected into the RPV for level control, then allow HPCI to inject into the RPV for a short time, **then** perform the following: **IMF HP02 by setting event trigger 9 to true.** This will result in HPCI tripping and not being able to be reset.	The **Crew** will determine that RPV level is lowering. The **CRS** will direct and the **crew** will perform the following actions IAW EOP 1 • Attempt to restore and maintain level with systems form TABLE 1A. o Both CRD pumps will be started. **(Critical for Event #8)** **NOTE,** at the onset of this event, HPCI automatically started when the DW reached 2 psig, however RPV level was high, and HPCI tripped due to a reactor high water level. From this condition, HPCI will automatically initiate when a LO LO RPV level is received. DEPENDING when the crew decides to inject with HPCI, LO LO level or not, will depend on the status of HPCI when the Candidate arrives at the system. For his Actions see **Event # 9 (C BOP)** o The Crew will determine that HPCI is necessary to maintain RPV level and start HPCI. ▪ The CRS will be informed that HPCI is injecting into the RPV in manual mode. • Shortly after HPCI is started, (see event #9), HPCI will trip and not be recoverable. • OSS will be informed that HPCI has tripped and cannot be restarted. RO 95.44, SRO 6.44 The **Crew** will determine that RPV level is still lowering and all available High pressure injection systems are injecting. **CRS** will exit EOP 1 Level Control and enter ALC.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Major transient LOCA, ALC, ED **EVENT #8 (M ALL) continued**		The **CRS** will direct and the **crew** will perform the following actions IAW ALC/ED: • Lock out ADS. **(Critical for Event #8)** • Verify that RHR and CS Systems are running and available for injection. **Scenario Critical Task** **IF the reactor is shutdown under all conditions and RPV level drops to +15", THEN perform Emergency RPV Depressurization before RPV level reaches -25"**. • When RPV level lowers to 15", and prior to -25", Emergency depressurization will be directed. **(Critical for Scenario Critical Task)** • For ED o Torus level verified >4.5'. o 4 ADS SRVs are opened and verified open. **(Critical for Scenario Critical Task)** RO 95.80, SRO 6.78 • When the shutoff head of the CS and RHR pumps is reached, inject into the RPV to restore level above -39". • Exit ALC and return to EOP 1 o Restore RPV level to 170 to 211". (RO 95.76 SRO 6.76) **IF** entry to the Sat Curve has occurred, the **CRS** will direct and the **crew** will perform the following actions: • The wide range Yarways are no good. • Subtract 23 inches form the Fuel Zones and Narrow range GEMACs.

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Transferring HPCI flow control from Automatic to Manual. **Event # 9 (C BOP)**		If the BOP arrives at HPCI and it is not attempting to inject, he will perform the following IAW OI 152, QRC 1: • If HPCI previously tripped on RPV High Water Level, **depress HS-2299,** RX HI WATER LEVEL HPCI TURBINE TRIP reset switch. **(Critical for Event #9)** • **Verify open MO-2247**, HPCI Lube Oil Cooler Supply Valve. • **Verify 1P-233,** HPCI Vacuum Pump has started. • **Verify open MO-2202**, HPCI Turbine Steam Supply. • **Verify 1P-218,** HPCI Aux Oil Pump has started. • **Verify MO-2311,** HPCI Pump Discharge Valve, **open.** • <u>For RPV injection</u>, immediately verify **open MO-2312**, HPCI Inject Valve. From the Follow Up actions; **NOTE** the BOP will perform the following after he has perform the above, **or** if he arrives at HPCI and it is attempting to inject; • **Verify MO-2318**, HPCI Min Flow Bypass Valve, **closes** as HPCI flow raises above 600 gpm. o Determines that MO-2318 is still open and determines that HPCI is not injecting into the RPV. o Diagnose that HPCI Flow Controller has failed in Automatic. o Take manual control of the HPCI Flow Controller and inject into the RPV with HPCI. **(Critical for Event #9)**

SCENARIO TIME-LINE

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
	Booth Instructor and/or Lead Evaluator When the reactor is stable and RPV level is approaching or at the desired level band, and/or at the direction of the Lead Instructor, the scenario can be ended. **Booth Instructor** when the scenario is complete, announce the following: **The scenario is complete, please stand by your stations for follow up questions if necessary.**	

***** END OF SCENARIO *****

*** REVIEW SCENARIO OBJECTIVES WITH THE OPERATORS ***

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Start up of the "B" RHRSW pump for Chemistry to obtain a sample per NS790702 Continuous Service Water Release Sampling and Analysis. **EVENT #1 (N-BOP)**	The **BOP operator** will start the "B" RHRSW IAW OI 416: • Start "B" ESW pump. **(Critical for event # 1)** • Place handswitch HS-4925B, B RHRSW PUMP 1P-22B on Panel 1C03 in the START position, and allow it to spring return to AUTO. (Section 1.0 Step 5.a **[Critical for event # 1])** • Throttle open MO-1947 RHR SERVICE WATER OUTLET valve with HS-1947C. (Section 1.0 Step 6 [**[Critical for event # 1])** RO 30.01, & SRO 1.01	OI 416, Rev. 38	Start up of RHRSW IAW OI 416. Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
"B" Recirc Flow unit failing downscale. **EVENT #2 (C ATC)**	**Crew** Recognize the flow unit is cause of the half scram. They will then follow the actions of annunciator 1C05A (E-2) and perform the following: • The **ATC operator** will Bypass APRM flow unit "B" on 1C05, with CRS permission (ARP 1C05A E-2. **[Critical for event # 2])** • The **ATC operator** or the **BOP** operator will place the MODE switch for "B" Flow unit in a position other than OPERATE or STANDBY. This is a back panel operation. (ARP 1C05A E-2 **[Critical for event # 2]**) • The **ATC operator** will reset the half scram. (ARP 1C05A E-2 **[Critical for event # 2]**) The CRS will determine the following concerning **TS**: • Refers to TS 3.3.1.1 RPS and determines that **NO TS** exist (B 3.3-9, 10). • Refers to TRM 3.3.2 and determines that **NO TRM** exists for rod block. (RO 1.04 & SRO 1.02)	ARP 1C05A E-2, Rev. 6 Step 3.4.c Step 3.5.a Step 3.5.c Technical Specifications Technical Requirements Manual	APRM Flow Unit Failure Sat _____ Unsat _____ TS determination for APRM flow unit Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Tripping of the "B" RHRSW pump **EVENT #3 (C-BOP)**	**The BOP operator** will respond to the annunciator 1C03B B-8 "B" RHRSW PUMP 1P-22B TRIP OR MOTOR OVERLOAD and perform the following: • If at any time 1P-22B amps cannot be maintained <80 amps, o The BOP operator will trip the "B" RHRSW pump. **(Critical for event # 3)** (30.03) **CRS** will determine that with the "B" RHRSW pump inoperable, TS 3.7.1 Condition A must be entered. (1.02)	ARP 1C03B B-8, Rev. 6 Step 3.4.d	Tripping of the "B" RHRSW pump based on high amps Sat _____ Unsat _____ TS determination inoperable RHRSW pump Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Control rod 10-39 drifts in. **EVENT #4 (C-ATC)**	**ATC operator** will respond to annunciator 1C05A D-8, Rod Drift, and perform the following: • At 1C05, select affected Control Rod, monitor 4-rod display to determine if a control rod is drifting, and if so in what direction. **(Critical for event # 4)** • IF any control rod is drifting **IN**, perform the following: o Place the C11A-S3 EMERG IN/NOTCH OVERRIDE SELECT switch on 1C05 in the EMERG ROD IN position momentarily (less than ½ second) to abort the rod sequence timer. **(Critical for event # 4)** **SRO** will consult TS and determine the following: • TS 3.1.3 Condition C for an inoperable Control Rod. o Insert within 3 hours. o Disarm within 4 hours (1.02)	ARP 1C05 A D-6, Rev. 10 Step 3.1 Step 3.3.b	Control rod drifting in. Sat _____ Unsat _____ Control rod inoperable Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
The 1E-6B feedwater level controller will fail to control level at 100%. **EVENT #5 (C-BOP)**	**Crew** will respond to annunciator 1C06B C-10, HP FDWTR HTR 1E-6B HI LEVEL and 1C07B C-4 MSR 2ND STAGE DRAIN TANK 1T-92B HI LEVEL. The Crew will determine that the 6 heater hi level is the event that is causing the MSR level problems and direct the BOP to attend to the 6 heater high level annunciator. The **BOP** will perform the following: • If level remains the same or tends to increase, attempt to control the 1E-6B HP HEATER level with LIC-1348 and or LIC-1350 in the MANUAL mode. **(Critical for Event #5)**	ARP 1C06B C-10, Rev. 2 Step 3.1.e	3A drain valve failing closed. Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Start up Transformer trouble. **EVENT #6 (C-BOP)**	Per OI 304.2. 4160V/480V ESSENTIAL ELECTRICAL DISTRIBUTION SYSTEM, the BOP operator will transfer the Startup Transformer to the Standby Transformer by performing the following: (15.01) • Verify AC Sources/SBDG LCOs have been entered if applicable. o **CRS** will assess **TS** and determine that they must enter TS **3.8.1 condition A** for the loss of one offsite source. (1.02) • Place the BUS 1A3[4] TRANSFER breaker mode selector switch in the MANUAL position. **(Critical for event # 6)** • Insert the handle in the SYNCHRONIZE switch for 4KV BREAKER 1A301[401] STANDBY TRANSFORMER TO BUS 1A3[4], and place it in the ON position. **(Critical for event # 6)** • Place the control switch 4KV BREAKER 1A301[401] STANDBY TRANSFORMER TO BUS 1A3[4] momentarily in the CLOSE position. Observe that the red (breaker closed) and white (closing spring charged) indicating lights are ON. **(Critical for event # 6)**	ARP 1C08A A-7, Rev. 15 OI 304.2, Rev. 52 Section 7.3, Step 1. Section 7.3, Step 2 Section 7.3, Step 3 Section 7.3, Step 7	TS determination for Startup Transformer Sat _____ Unsat _____ Transferring startup transformer to the standby Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Start up Transformer trouble. **EVENT #6 (C-BOP)** **continued**	• Place the control switch 4KV BREAKER 1A302[402] STARTUP TRANSFORMER TO BUS 1A3[4] momentarily in the TRIP position. Observe that the green (breaker open) and white (closing spring charged) indicating lights are ON. **(Critical for event # 6)** • Place the SYNCHRONIZE switch for 4KV BREAKER 1A301[401] STANDBY TRANSFORMER TO BUS 1A3[4] in the OFF position, and remove the handle. **(Critical for event # 6)** • Place the BUS 1A3[4] TRANSFER breaker mode selector switch in the AUTO position. **(Critical for event # 6)** • Place STARTUP TRANSFORMER J BREAKER control switch momentarily in the TRIP position. Observe the green (breaker open) indicating light is ON. **(Critical for event # 6)** • Place STARTUP TRANSFORMER K BREAKER control switch momentarily in the TRIP position. Observe the green (breaker open) indicating light is ON. **(Critical for event # 6)**	OI 304.2, Rev. 52 Section 7.3, Step 9 Section 7.3, Step 10 Section 7.3, Step 13 OI 304.1 Rev 46 Section 5.3, Step 5 Section 5.3, Step 6	Removing the startup transformer form service Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Small Condenser Tube failure, leading to a fast power reduction. **EVENT #7 (R-ATC)**	Crew enters AOP 639 when appropriate. When the Hotwell conductivity is reading ≥1.0 μmho/cm while the plant is at power, then: • Per IPOI 4 reduce reactor power to 27 Mlb/hr. **(Critical for event # 7)**	AOP 639, Rev. 22	Reactivity manipulation for performing a fast power reduction. Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS

Major transient LOCA, ALC, ED.
 	
EVENT #8 (M-ALL)
	The SS will direct and the crew will perform the following actions IAW EOP 1
	• Verify all rods fully inserted. **(Critical for Event #8)**
	• Override CV 4371A, (Defeat 11). **(Critical for Event #8)**
	
	The SS will direct and the crew will perform the following actions per AOP 639, "Reactor Water/Condensate High Conductivity."
	• Close the MSIVs and MSL drains. **(Critical for Event #8)**
	
	The **CRS** will direct and the **crew** will perform the following actions IAW EOP 2.
	(Scenario Critical Task)
	BEFORE drywell temperature reaches 280°F and WHILE in the safe region of the DWSIL, THEN initiate drywell sprays
	• DW/T
	  • When out of the hatched region of Graph 7, Drywell Spray Initiation Limit, spray the D/W. **(Critical for Scenario Critical Task)**
	  • Enable containment sprays by placing Containment Spray Enable Switch HS-1903C in Manual. **(Critical for Scenario Critical Task)**
	  • Open MO-1902 and MO-1903. **(Critical for Scenario Critical Task).**
	  • Open MO-2001 and MO-2000. **(Critical for Scenario Critical Task).**
		EOP 1, Rev. 11
		EOP 2, Rev. 12
		ALC, Rev. 4
		ED, Rev. 4
			Verify all rods fully inserted.
			Sat _____
			Unsat _____
			
			Carry out actions for AOP 639.
			Sat _____
			Unsat _____
			
			Scenario Critical Task, Spray the D/W.
			Sat _____
			Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
	• PC/P of EOP 2 o When torus pressure rises above 2 psig and before 11 psig, Spray the Torus. **(Critical for Event #8)** As level lowers, the **CRS** will direct and the **crew** will perform the following actions IAW EOP 1. • Attempt to restore and maintain level with systems form TABLE 1A. • Both CRD pumps will be started. **(Critical for event # 8)**		Spray the torus Sat _____ Unsat _____ Attempts to restore level via EOP 1 Table 1A Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Major transient LOCA, ALC, ED **EVENT #8 (M-ALL)** **continued**	The **CRS** will direct and the **crew** will perform the following actions IAW ALC/ED: • Lock out ADS. **(Critical for event # 8)** **Scenario Critical Task** **IF the reactor is shutdown under all conditions and RPV level drops to +15", THEN perform Emergency RPV Depressurization before RPV level reaches -25".** • When RPV level lowers to 15", and prior to -25", Emergency depressurization will be directed. **(Critical for event # 8)** • 4 ADS SRVs are opened and verified open. **(Critical for Scenario Critical Task)**	EOP 1, Rev. 11 EOP 2, Rev. 12 ALC, Rev. 4 ED, Rev. 4	Lock out ADS. Sat _____ Unsat _____ ALC ED critical task Sat _____ Unsat _____
HPCI manual control **EVENT #9 (C-BOP)**	If the BOP arrives at HPCI and it is not attempting to inject, he will perform the following IAW OO 152, QRC 1; • If HPCI previously tripped on RPV High Water Level, **depress HS-2299,** RX HI WATER LEVEL HPCI TURBINE TRIP reset switch. **(Critical for Event #9)** **NOTE** the BOP will perform the following after he has perform the above, **or** if he arrives at HPCI and it is attempting to inject; • Take manual control of the HPCI Flow Controller and inject into the RPV with HPCI. **(Critical for Event #9)**	OI 152 QRC 1, Rev. 2	Transfer HPIC from Auto flow control to manual and inject. Sat _____ Unsat _____

ESG Validation Checklist

SEG/ESG ___**ESG 19**_____ **Rev.** _**1**_____

- ☐ Correct IC or plant status identified.
- ☐ Shift turnover forms filled out (both CRS/OSM and NSOE) if required.
- ☐ Additional documents are prepared (STPs, Work Orders, LCO Paperwork).
- ☐ SOMS tags identified and included in setup instructions.
- ☐ Special setup instructions identified; handswitch manipulations, procedure markups, alarm borders, 3D case available, computer points substituted, etc.
- ☐ Setup files correctly called out.
- ☐ Malfunction list is accurate.
- ☐ Override list is accurate.
- ☐ Remote function list is accurate.
- ☐ Event triggers are accurate.
- ☐ Time/Notes section is accurate and includes all reasonable cues that may be given to initiate an action. Cues are unambiguous and provide a definitive moment to take action.

Instructor Activity section is accurate and complete:

- ☐ Actions are clearly defined for Booth or Floor instructor.
- ☐ Role-playing is clearly noted.
- ☐ The sequence of events is completely and concisely narrated even if it takes no instructor action.
- ☐ Automatic actions that require verification are noted.
- ☐ Reasonable alternate paths are considered and included.
- ☐ Event trigger activation is distinguished from narrative text (**Bold font**)
- ☐ Noun descriptions of actions that occur on event trigger initiation are complete, for example "…set **ET 3** to **TRUE** which activates malfunction **SW21C** resulting in a loss of the C Well Water Pump."
- ☐ Other simulator control actions are clearly distinguished from narrative text, for example "…after drywell temperature reaches 280 deg. F **SNAP** the simulator to **IC 0**."
- ☐ Student and Instructor copies of worksheets or other training activities are verified correct and electronically attached to the file if appropriate.

ESG Validation Checklist

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Expected Student Response Section is accurate and complete:

- ☐ Critical tasks are accurate and clearly identified. Probable critical tasks are also listed with logical connection to the scenario; for example "If the crew fails to get all the rods inserted before ED the critical task becomes…" (N/A as appropriate)
- ☐ Tasks are clearly noted and properly numbered as appropriate.
- ☐ Knowledge objectives are clearly noted and properly numbered as appropriate.
- ☐ Expected as well as probable student responses are listed with logical connection to the scenario. (N/A as appropriate)
- ☐ Actions are appropriately delineated by position(s); OSM, CRS, STA, RO, NSOE, Fire Brigade Leader, At the Controls Operator, etcetera. (N/A as appropriate)
- ☐ Actions are listed using a logical order; by position and chronology. (N/A as appropriate)
- ☐ Crew Performance Criteria follow the same chronology as the student responses, are complete and accurate. (For ESGs only)
- ☐ For Walkthrough and Training Mode Scenarios with pre-planned pauses, sufficient information is presented to allow the instructor to meet the goal of the training.

Turnover information (as required) is correct:

- ☐ Day and shift are appropriate.
- ☐ Weather conditions do not conflict with malfunctions.
- ☐ Power levels are correct.
- ☐ Thermal limit problems and power evolutions are realistic and include a reason for any downpower.
- ☐ Existing LCOs include start date, remaining time and actions.
- ☐ Plant Risk Assessment (CDF and Color).
- ☐ STPs are appropriate for day and shift.
- ☐ Core Damage Frequency has been properly calculated and listed to 3 decimal places.
- ☐ Maintenance is realistic for plant conditions.
- ☐ Comments, evolutions, problems, etc, includes extra personnel (licensed/non-licensed if necessary), any condition that affects the flow of the scenario and any condition that does not fit in another category.

SME/Instructor	Date
SME/Instructor	Date

ESG Validation Checklist

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Crew:		Instructors:	
OSM		Booth	
CRS		Floor	
STA		Extra	
1C05			
1C03			
BOP			

Crew Comment:

Resolution:

Crew Comment:

Resolution:

NOTE: Following approval of SEGs, this page may be discarded.

ESG Validation Checklist

SEG/ESG ESG 19 **Rev.** 1

Crew Comment:

Resolution:

Crew Comment:

Resolution:

Crew Comment:

Resolution:

NOTE: Following approval of SEGs, this page may be discarded.