

**INITIAL SUBMITTAL OF SCENARIOS  
FOR THE DUANE ARNOLD EXAMINATION**

**THE WEEK OF APRIL 9, 2001**

# Changes to Operating Exam Outline submitted 1/22/2001

## SIMULATOR SCENARIOS

- 1.) ESG 13 - Added returning SFU to Standby Readiness due to the only performance step to Manual Startup of SFU is to push the TEST pushbutton. Returning to Standby Readiness adds taking the Mode Switch to Manual and then to back to AUTO position.
- 2.) ESG 13 - Events 4 and 5 – Swapped sequence of events and renumbered. Ensures performance of AOP 304.1 actions.
- 3.) ESG 13 - Event 4 - Changed Main Generator Backup Lockout Relay DOES NOT TRIP to TRIPS and changed open transfer of Non essential buses to failure to transfer. This creates an opportunity for operator actions (i.e.: manual bus transfer) in the performance of AOP 304.1.
- 4.) ESG 12 - Removed Event # 2 Place HPCI in Standby Readiness at the suggestion of Chief Examiner.

ES-301 Administrative Topics Outline form ES-301-1

Facility: <u>DAEC</u>		Date of Examination: <u>04/09001</u>
Examination level (circle one): RO / <input checked="" type="checkbox"/> SRO		Operating Test Number: _____
Administrative Topic/Subject Description		Describe Method of Evaluation 1. ONE Administrative JPM OR 2. TWO Administrative Questions
A.1. a	Determine RBM Operability Requirement	The Senior Operator candidate will use Technical Specifications to determine if a Rod Block Monitor channel is required to be operable.
A.1. b	Return an MOV to operable status	The Senior Operator candidate will review a Core Spray System Panel Lineup and determine actions necessary to restore an MOV to an Operable status.
A.2	Perform an STP	The operator will perform the Main Steam Line Radiation Monitor Channel Functional Test.
A.3	Gain Access to a High Rad Area	JPM/Questions The JPM will be administered when the operator enters the RCA. It will test the operators knowledge of the requirements for entry into a High Radiation Area.
A.4	Perform OP-28 EPIP Offsite Agencies Notification Weekly Test	The Senior Operator candidate will perform a weekly test of the communications necessary to notify off-site agencies of an emergency.

ES-301

Control room systems and facility walk through test outline form ES-301

Facility: <u>DAEC</u>		Date of Examination: <u>04/09/01</u>
Exam level (circle one): RO / SRO (I) / <u>SRO (U)</u>		Operating test No: _____
<b>B.1 Control Room Systems</b>		
<b>System /JPM Title</b>	<b>Type Code</b>	<b>Safety Function</b>
b. Restart of RFP following a reactor scram <u>259001-11</u> Task 45.00	(N), (S), (L)	2 Reactor Water Inventory Control
c. Install EOP Defeat 5 to depressurize the reactor <u>239001-02</u> Task 95.25	(N), (S), (L)	3 Reactor Pressure Control
g. Manual Initiation of SBGT and Secondary Containment <u>261000-07</u> Task 7.04	(D), (S), (A) (ESF)	9 Radioactivity Release
*Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrolroom, (S)imulator, (L)ow power, (R)CA		

B.2 Facility Walk-Through		
System /JPM Title	Type Code	Safety Function
a. Manual control of Recirc MG set from MG set room <u>202002-05</u> Task 12.02	(D), (R)	1 Reactivity control
c. Manually Initiate CARDOX <u>286000-03</u> Task NSPEO 9.08	(D), (R), (A) (AOP)	8 Plant Service Systems
*Type Codes: (D)irect from bank, (M)odified from bank, (N)ew , (A)lternate path, (C)ontrolroom, (S)imulator, (L)ow power, (R)CA		

Facility: <u>DAEC</u>		Date of Examination: <u>04/09/01</u>
Examination level (circle one): <input checked="" type="checkbox"/> RO / SRO		Operating Test Number: _____
Administrative Topic/Subject Description		Describe Method of Evaluation 1. ONE Administrative JPM OR 2. TWO Administrative Questions
A.1. a	Determine LCRP from computer	The operator will obtain an Official 3D Case and determine if a Limiting Control Rod Pattern exists
A.1. b	Perform Control Room Shiftly Checklist	The operator will perform a Control Room panel check and determine that five (5) switches are out of position and answer questions associated with each switch and how the error would affect the associated system.
A.2	Perform an STP	The operator will perform the Main Steam Line Radiation Monitor Channel Functional Test.
A.3	Gain Access to a High Rad Area	JPM/Questions The JPM will be administered when the operator enters the RCA. It will test the operators knowledge of the requirements for entry into a High Radiation Area.
A.4	Perform the duties of the Back Panel Communicator	This JPM will test the operators ability to apply the requirements of the Emergency Plan Implementation Procedures.

Facility: <u>DAEC</u> Date of Examination: <u>4/09001</u>		
Exam level (circle one): <u>RO</u> / SRO (I) / SRO (U) Operating test No: _____		
<b>B.1 Control Room Systems</b>		
<b>System /JPM Title</b>	<b>Type Code</b>	<b>Safety Function</b>
a. Start a CRD pump under normal conditions <u>201001-06</u> Task 10.01	(N), (S)	1 Reactivity control
b. Rapid Restart of RFP following a reactor scram <u>259001-11</u> Task 45.00	(N), (S), (L)	2 Reactor Water Inventory Control
c. Install EOP Defeat 5 to depressurize the reactor <u>239001-02</u> Task 95.25	(N), (S), (L)	3 Reactor Pressure Control
d. PRA for manual startup of RCIC system to establish a cooldown <u>217000-16</u> Task 3.04	(N), (S), (L)	4 Heat Removal from Core
e. PRA to re-energize a de-energized essential 4160V bus from the Standby Transformer <u>262001-07</u> Task 15.05	(D) (S), (L)	6 Electrical
f. Respond to APRM Upscale and remove a flow unit from service <u>215005-02</u> Task 99.12	(D), (S), (A)	7 Instrumentation
g. Manual Initiation of SBT and Secondary Containment <u>261000-07</u> Task 7.04	(D), (S), (A) (ESF)	9 Radioactivity Release
*Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrolroom, (S)imulator, (L)ow power, (R)CA		

B.2 Facility Walk-Through		
System /JPM Title	Type Code	Safety Function
a. Manual control of Recirc MG set from MG set room <u>202002-05</u> Task 12.02	(D), (R)	1 Reactivity control
b. Fill Torus using Core Spray <u>209001-03</u> Task NSPEO 39.02	(D), (R), (A)	5 Containment Integrity
c. Manually Initiate CARDOX <u>286000-03</u> Task NSPEO 9.08	(D), (R), (A) (AOP)	8 Plant Service Systems
*Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrolroom, (S)imulator, (L)ow power, (R)CA		

# Changes to Operating Exam Outline submitted 1/22/2001

## JPM WALKTHROUGH EXAM

- 1.) Deselected JPM A.2, Perform OP-24 for the RSP Area, for the SRO. Selected JPM A.2, Perform the Main Steam Line Radiation Monitor Channel Functional Test, from the RO Outline to replace it at the suggestion of Chief Examiner.
- 2.) Revised the Type Code for JPM B.1.e after it was determined that this JPM was actually Direct from the Bank (D) rather than Modified (M) as previously submitted.
- 3.) Re-lettered the five SRO-Upgrade Control Room / In-Plant JPMs to match the assigned letters on the RO exam. This was done at the request of the Chief Examiner.

Scenario Outline

Scenario Number ESG 12 License Exam 4/9/2001

Examiners \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Operators **SRO 1** \_\_\_\_\_  
**RO 1** \_\_\_\_\_  
**RO 2** \_\_\_\_\_

Objectives: Evaluate a reactor power decrease with the Reactor Recirculation System; Startup of the Service Water systems; Response to various instrument failures

Initial Conditions: HPCI is in day 9 of 14, it has been repaired The system is available but, not operable. The crew is to startup service water systems for sampling.

Turnover: The plant is operating at 90% power.

Event No.	Malf. No.	Event Type	Event Description
1	N/A	R	<b>1C05</b> Decrease power with Recirc by 60 MWe. (K/A 202002 A4.01)
2	N/A	N	<b>SRO</b> Direct the BOP operator to start service water systems <b>BOP</b> Startup RHRSW/ESW for sampling. (400000 A4.01)
3	LO RRHS4642A[GREEN] AN:1C03C[29]	I/C	<b>SRO</b> Direct crew response to XFV actuation <b>BOP</b> Respond to XFV-4642A failing in an intermediate position (K/A 223002 A1.01)
4	MS23B	I/C	<b>SRO</b> Direct the BOP operator to verify the Group 3 isolation completed. <b>BOP</b> A group 3B isolation occurs with a failure of CV-4371A (K/A 223002 A1.02)
5	RR06B	I/C	<b>SRO</b> Direct operator response to a trip of one Recirc pump. <b>1C05</b> "B" Recirc MG set trips (K/A 202002 A2.01)
6	HP01	I/C	<b>BOP</b> HPCI spurious initiation (K/A 206000 A2.17)
7	MS08E	M	<b>ALL</b> HPCI steam line break in the Steam Tunnel (K/A 295032 EA1.05)
8	AO RHF11971B	I/C	<b>BOP</b> "B" RHR loop flow indicator fails (K/A 219000 A1.02)
9	HP10B	I/C	<b>BOP</b> HPCI fails to isolate (K/A 223002 A2.01)

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

Scenario No.: ESG 12      Event No.: <u>  1  </u>		
Event Description: Decrease generator load by 60 MWe.		
Time	Position	Applicant's Actions or Behavior
	SRO	Provide a Pre-evolution brief for the 1C05 operator prior to reducing reactor power.  Direct 1C05 operator to reduce generator load by 60 MWe using the Reactor Recirculation System.
	RO	Reduce Recirc flow to decrease generator load by 60 MWe. <ul style="list-style-type: none"> <li>• Reduce Recirc MG Set speed in small increments</li> <li>• Maintain Recirc Loop flow balanced</li> </ul>

Scenario No.: ESG-12

Event No.: 2

Event Description: Startup RHRSW/ESW Systems for chlorination.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct the BOP operator to startup the RHRSW/ESW Systems for chlorination.
	BOP	Startup the ESW System per OI-454. <ul style="list-style-type: none"><li>• Start "A"("B") ESW Pump.</li><li>• Verify flow greater than 300 gpm.</li></ul>
	BOP	Startup the RHRSW System in accordance with OI-416. <ul style="list-style-type: none"><li>• Place PDIC-2046(1947), RHRSW TO RHR ΔP controller in MANUAL and CLOSED.</li><li>• Start "A" and "C"("B" and "D") RHRSW pumps.</li><li>• Adjust flow to attain between 2000 and 2600 gpm per pump.</li></ul>

Scenario No.: ESG-12

Event No.: 3

Event Description: Intermediate excess flow check valve position.

Time	Position	Applicant's Actions or Behavior
	BOP	<p>Acknowledges annunciator 1C03C D-2, EXCESS FLOW CHECK VALVES SYSTEM "B" HI FLOW and responds as directed.</p> <p>At Panel 1C29, monitor excess flow lights to determine the effected instrument line.</p> <p>Notify the HP office and send an operator locally to determine the extent of the leak and isolate if possible.</p> <p>Refer to EFCV Surveillance to determine the effects of a closed XFV.</p> <p>If the System "B" instrument excess flow condition renders a system/component inoperative, notify Shift Supervisor and comply with the requirements of DAEC Tech. Specs. for the effected instrumentation.</p>
	SRO	<p>The SRO will determine that the XFV is inoperable.</p> <p>Using Technical Specifications, determines that the XFV has to be isolated in 72 hours.</p> <p>Will direct the XFV be isolated to stop the leak.</p> <p>Using Technical Specifications, determine that the LPCI Loop Select feature must be returned to operable in 24 hours or LPCI must be declared inoperable.</p>

Scenario No.: ESG-12

Event No.: 4

Event Description: Spurious Group 3B Isolation with CV-4371A failing closed.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP operator to perform the actions of ARP 1C05B C-8.
	BOP	<p>Perform actions directed by ARP 1C05B C-8.</p> <ul style="list-style-type: none"><li>• Check amber lights on the PCIS Status board and determine that only a Group 3B Isolation has occurred.</li><li>• Verify completion of the Group 3B Isolation.</li><li>• Reopen CV-4371A</li><li>• Recognize failure of CV-4371A to reopen when implementing ARP 1C05B (C-8).</li><li>• Determine the cause of the isolation. (spurious, no indications as to source of signal)</li><li>• Reset the Group 3B Isolation. (N/A)</li></ul>

Scenario No.: ESG-12

Event No.: 5

Event Description: Recirc pump trip.

Time	Position	Applicant's Actions or Behavior
	SRO	<p>SRO Enters AOP 255.2 and directs operator actions.</p> <ul style="list-style-type: none"> <li>• Directs the 1C05 operator to monitor APRMs for oscillations. (instability)</li> <li>• Verify thermal limits on an Official Case.</li> <li>• Directs the 1C05 operator to plot power and flow on the power to flow map.</li> <li>• Obtains a Solomon Report and determine if instability exists.</li> <li>• Determines required actions based upon relationship to exclusion and buffer regions.</li> <li>• Notify Reactor Engineer or Operations Manager.</li> <li>• Directs the 1C05 operator to perform the actions of ARP 1C04B, A-1.</li> </ul>
	1C05 RO	<p>The RO should respond to the Recirc pump trip in accordance with ARP 1C04B, A-1.</p> <ul style="list-style-type: none"> <li>• Verify the Automatic Actions have occurred.               <ul style="list-style-type: none"> <li>• "B" Recirc MG Motor Breaker open</li> <li>• "B" Generator Field Breaker open</li> </ul> </li> <li>• Limit operating Recirc pump speed to 100%</li> <li>• Stabilize reactor water level</li> <li>• Secure "B" Recirc pump               <ul style="list-style-type: none"> <li>• Verify OPEN "B" Recirc pump discharge bypass valve</li> <li>• CLOSE "B" Recirc pump discharge valve</li> <li>• After 5 minutes reopen "B" Recirc pump discharge valve</li> </ul> </li> <li>• Determine the cause of the Recirc Pump trip               <ul style="list-style-type: none"> <li>• Monitor system annunciators</li> <li>• Send an operator to the MG Set room to monitor relays</li> </ul> </li> <li>• Perform Single Loop STP and Daily Jet pump Operability-Single Loop Operation.</li> </ul> <p>The next event will occur prior to performance of these STPs.</p>

Scenario No.: ESG-12

Event No.: 6

Event Description: Inadvertent HPCI initiation.

Time	Position	Applicant's Actions or Behavior
	Crew	<u>Recognize the inadvertent initiation of HPCI. CRITICAL</u>
	SRO	Verify by TWO independent sources that RPV level is satisfactory, then Direct that HPCI be secured, per ACP 1410.1, "Conduct of Operations."
	BOP	Secure HPCI with the initiation signal present. <ul style="list-style-type: none"> <li>• Depress and Hold REMOTE TURBINE TRIP pushbutton SV-2259.</li> <li>• Verify HPCI turbine speed reduces.</li> <li>• Verify TURBINE STOP VALVE HV-2201 closed.</li> <li>• When turbine speed reaches 0 rpm, place 1P-218 AUX OIL PUMP handswitch HS-2256 in the PULL-TO-LOCK position.</li> <li>• Verify TURBINE CONTROL VALVE HV-2200 closed.</li> <li>• Release SV-2259 pushbutton.</li> <li>• Verify MO-2312 HPCI INJECT VALVE closed.</li> <li>• Verify MO-2318 MIN FLOW BYPASS VALVE closed.</li> <li>• Identifies that the breaker for MO-2238 has tripped thermal overloads.</li> </ul>

Scenario No.: ESG-12      Event No.: <u>7, 8, and 9</u>		
Event Description: Steam leak in the Steam Tunnel.		
Time	Position	Applicant's Actions or Behavior
	SRO	<p><b>SRO</b> will enter EOP 3 on High steam tunnel temperature and direct the following:</p> <ul style="list-style-type: none"> <li>• Determine the source of the steam leak in the steam tunnel.</li> <li>• Attempt to isolate the leak.</li> </ul> <p><b>SRO</b> will enter EOP 1 and direct the crew to:</p> <ul style="list-style-type: none"> <li>• <u>Manually scram the reactor before any area exceeds a Max Safe Operating Limit (CRITICAL)</u></li> <li>• Perform the actions of IPOI 5</li> <li>• Continue monitoring of the Steam Leak Detection parameters</li> </ul>
	RO	<ul style="list-style-type: none"> <li>• Manual scram</li> <li>• Actions of IPOI 5</li> </ul>
Event 9	BOP	<p>Will attempt to isolate the steam lines and determine the following:</p> <ul style="list-style-type: none"> <li>• MO 2238 has a thermal overload trip and will not close</li> </ul> <p>Continue monitoring of the Steam Leak Detection</p>
	SRO	<ul style="list-style-type: none"> <li>• Direct the RO to maintain reactor water level between 170 to 211 inches.</li> <li>• Determine that the Main Turbine bypass valves cannot control reactor pressure and alternate systems must be used.</li> <li>• Direct a controlled plant cooldown. The cooldown may be performed using RCIC as an injection source.</li> <li>• The SRO may direct a cooldown with the SRVs but must address CV-4371A being closed and not having a continuous supply of nitrogen for the SRVs.</li> <li>• Directs BOP operator to startup and maximize Torus Cooling.</li> </ul>
	1C05	<p>Maintain reactor water level between 170 and 211 inches. Commence a cooldown as directed by the SRO.</p>
Event 8	BOP	<p>Maintains reactor pressure as directed. Starts up and maximizes Torus Cooling. Identifies the failure of "B" Loop flow indicator.</p>

		Uses RHR pump ammeters to determine the amount of flow through "B" Loop.
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# DUANE ARNOLD ENERGY CENTER

## INITIAL OPERATOR EXAMINATION SCENARIO GUIDE

ESG 12

DECREASE REACTOR POWER / STARTUP OF RHRSW/ESW SYSTEMS /  
XFV-4642A INDICATES DUAL POSITION / GROUP 3 ISOLATION / RECIRC  
PUMP TRIP / HPCI AUTO INITIATE / HPCI STEAM LEAK / EOP 3 / EOP 1

Rev. 0

DEVELOPED BY: Michael Fisher 2/6/2001  
Instructor Date

VALIDATED BY: [Signature] 2/11/2001  
SME/Instructor Date

REVIEWED BY: [Signature] 2/11/2001  
Operations Manager Date

APPROVED BY: [Signature] 2/13/01  
Training Supervisor-Operations Date

## NARRATIVE SUMMARY

### Current plant operating status.

The plant is operating at 90% power. HPCI is in day 9 of 14, it has been repaired but is awaiting the operability testing. There is no other inoperable equipment.

### Scenario segments

- Event 1 (R) 1C05 operator will lower reactor load by 60 MWe.
- Event 2 (N) BOP operator will startup the RHRSW and ESW Systems for chlorination of the service water pits.
- Event 3 (I/C) XFV-4642A alarms and indicates dual. The BOP operator will investigate to determine if the XFV is isolated. The SRO will determine that this is not a reportable event. The SRO must also make an operability determination of the valve.
- Event 4 (I/C) A group 3B isolation occurs with a failure of CV-4371A to open when the override switch is taken to the OVERRIDE position.
- Event 5 (I/C) The electrical problem also causes the "B" Recirc MG set to trip and the 1C05 operator will perform the actions of ARP 1C04B A-1, "B" RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD.
- Event 6 (I/C) The HPCI Turbine will receive a spurious initiation signal.
- Event 7 (M) The HPCI Steam line will break in the Steam Tunnel. The crew will enter EOP 3 and EOP 1 to scram the reactor prior to exceeding a Max-Safe temperature in an area.
- Event 8 (I/C) The steam leak in the steam tunnel will result in an incomplete Group 6 isolation. High Steam Tunnel temperature will close the MSIVs and reactor pressure must be controlled with RCIC or SRVs without a continuous nitrogen supply.
- Event 9 (I/C) When placing RHR in Torus Cooling mode, the BOP operator will recognize that the flow indicator for the "B" loop does not indicate flow.
- Event 10 (I/C) If the crew attempts to use HPCI for pressure control, HPCI Aux Oil Pump will not start.

## SCENARIO SPECIFICATIONS

DURATION: 120 min.

## POSITION SPECIFIC TASKS AND OBJECTIVES

⇒ Crew Evolutions:  
None

⇒ RO (NSOE, ANSOE, XANSOE)

- ◆ 93.12 Lower Reactor Power with Recirc Flow when Above 35% Power.
- ◆ 30.01 Startup RHRSW System.
- ◆ 1.04 Respond to Annunciators.
- ◆ 99.11 Respond to "A" RECIRC MG DRIVE MOTOR TRIP OR OVERLOAD.
- ◆ 5.09 Perform manual shutdown with initiation signal present. (HPCI)
- ◆ 67.09 Reactor Building HVAC System Secondary Containment Isolation.
- ◆ 100.26 Respond to steam line break outside containment
- ◆ 93.22 Perform immediate operator responses for reactor scram
- ◆ 2.06 Perform normal torus cooling.
- ◆ 95.68 Perform actions of EOP 3 or Hi area temp, rad, and water level including required scram and ED.
- ◆ 8.04 Perform manual operation of ADS. (possible)

⇒ SRO

- ◆ 1.02 Determine Operability for Tech Spec Required Components.
  - 1.02.02 Determine if the instrument, system or component is operable.
  - 1.02.03 Declare the instrument, component or system inoperable, enter the correct LCO, and determine and direct performance of the LCO STP.
- ◆ 1.11 Ensure the conduct of plant operations and maintenance are in compliance with administration procedures.
  - 1.11.03.02 Differentiate between a Routine Report, Non routine Report, Immediate Notification Event, Reportable Event and a Licensee Event Report.
- ◆ 1.21 Direct crew response to off-normal events
  - 1.21.02 Recognize and prioritize data relevant to the accident or event
  - 1.21.04 Conduct periodic crew briefings to include plant status, priorities, and key ongoing activities.
- ◆ 6.67 Direct crew response for performance of EOP 3 for high area temperature/radiation/water level including required scram and emergency depressurization
  - 6.67.01 Direct operator actions to carry out the SC/T, SC/R and SC/L legs of EOP-3 concurrently and monitor secondary containment conditions.

- 6.67.02 Direct operator actions to isolate the systems discharging into the area that are allowed to be isolated.
- 6.67.03 Enter EOP-1 and direct operator actions to scram the reactor BEFORE any parameter reaches its Max. Safe Operating Limit.
- ◆ 4.21 Direct crew actions to perform the immediate operator responses to a reactor scram.
  - 4.21.01 Direct the operator to insert a manual scram.
  - 4.21.02 Direct the confirmation that the reactor is shutdown.
  - 4.21.03 Direct the operator performance of the IPOI 5 immediate actions

### SCENARIO OBJECTIVE SUMMARY

1. Reactor power decrease
2. Startup of RHRSW System
3. XFV isolation and LPCI loop select inop
4. Spurious Gr. 3 and Recirc pump trip.
5. EOP 1
6. EOP 3

### SCENARIO CHALLENGES

1. None

### PRE-SCENARIO ACTIVITIES

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

- If this scenario is used in training mode: OTI 101.
- If this scenario is used in performance mode: OTI 105.

## SHIFT TURNOVER INFORMATION

- ⇒ Day of week and shift
  - ◆ Monday
  - ◆ Nights
- ⇒ Weather conditions if different from actual conditions
  - ◆ Clear
  - ◆ Cool
- ⇒ Plant power levels 95 % Pwr
  - ◆ MWT 1595
  - ◆ MWE 532
  - ◆ CORE FLOW 49 Mlbms/hr
- ⇒ Thermal Limit Problems/Power Evolutions
  - ◆ System Operations Center wants a decrease of 60 MWe
- ⇒ Existing LCOs, Date Of Next Surveillance
  - ◆ HPCI is inop Day 9 of 14
- ⇒ STPs in progress or major maintenance
  - ◆ None
- ⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment
  - ◆ HPCI is inop due to MO 2239 failure to meet ASME testing requirements. MO 2239 was disassembled and restored. All of the HPCI tags have been removed and the HPCI system has been restored.
  - ◆ The HPCI operability will be run tomorrow. The previous STP was run for post maintenance testing.
  - ◆ RCIC is the only protected system.
- ⇒ Comments, evolutions, problems, etc.
  - ◆ There are no extra personnel
  - ◆ Chemistry will be sampling Service Water Systems. Dr. Lou Kriege did not like the results of today's sample and wants another sample taken. Therefore, chlorination does not need to be performed.
  - ◆ The Aux operator is in the pump house standing by for the service water pump starts.

## SIMULATOR SETUP

### 1. GENERAL INSTRUCTIONS

- a. Reset to IC 15
- b. Restore Malfunction File **ESG12ILC**.
- c. Restore Override File **ESG12ILC**.
- d. Verify that the Yellow Pull sheet is on 1C05

### 2. LIST OF EVENT TRIGGERS

As noted on Malfunction Table all manually inserted

### 3. LIST OF MALFUNCTIONS

ESG12ILC

Time	Malfunction No.	Malfunction Title	ET	Delay	F. Sev.	Ramp	I. Sev.
0	MS23B	Group 3 Isolation	1	0	N/A	N/A	N/A
0	RR06B	Recirc Drive Motor trip	1	0	N/A	N/A	N/A
When called for	HP01	HPCI Auto Initiate	2	N/A	N/A	N/A	N/A
	HP10B	MO-2238 Thermal Overload	N/A	N/A	N/A	N/A	N/A
AS required	MS08E	HPCI System Line Break (Tunnel)	3	N/A	0.01	1200	0
AS req.	an:1C03C[29]	XFV System "B" Hi Flow	4	N/A	N/A	N/A	N/A

## 4. LIST OF OVERRIDES

ESG12ILC

Time	Override No.	Override Title	ET	Delay	Value.	Ramp
0	ZLORRHS4642A[GREEN]	XFV 4642A	4	N/A	ON	N/A
0	ZAORHFI1971B	"B" RHR Loop Flow	N/A	0	0	0
0	ZDIPC5583B	CV-4371A Override	N/A	N/A	NORM	N/A
0	ZLOHPHS2239(1)	MO-2239 GREEN	5	N/A	OFF	N/A
0	ZLOHPHS2239(2)	MO-2239 RED	5	N/A	OFF	N/A
0	ZLOHPMO2239(1)	PCIS 2239 GREEN	5	N/A	OFF	N/A
0	ZLOHPMO2239(2)	PCIS 2239 RED	5	N/A	OFF	N/A
0	ZDIHPHS2242	Manual Isolation	5	N/A	ON	N/A

## 5. LIST OF REMOTE FUNCTIONS

None

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
	Provide the students time to walkdown the panels and then provide the shift turnover.	<p>The students will walkdown the panels and then participate in a shift turnover.</p> <p><b>SRO</b> will conduct a Shift Brief.</p>
	Event 1 is performed to evaluate a significant reactivity manipulation.	<p><b>SRO</b> Provide the 1C05 operator a pre-evolution brief on lowering reactor power.</p> <p><b>SRO</b> will direct the RO to lower generator load by 60 MWe using the Reactor Recirculation System.</p> <p><b>RO</b> will lower generator load by 60 MWe using the Recirc System in accordance with IPOI 3.</p> <ul style="list-style-type: none"> <li>• Reduce Recirc MG Set speed in small increments</li> <li>• Maintain Recirc Loop flows balanced</li> </ul>
	Event 2 will be used to evaluate a normal evolution. The BOP operator will start up the RHRSW and ESW Systems.	<p><b>SRO</b> will direct the BOP to startup the RHRSW and ESW Systems.</p> <p><b>BOP</b> will startup the ESW System in accordance with OI-454.</p> <p><b>BOP</b> will startup the RHRSW System in accordance with OI-416.</p>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>When RHRSW and ESW Systems have been started or as directed by the lead examiner,</p> <p>When directed by the control room to go to 1C-121B,</p>	<p>Event 3 will be used to evaluate an Instrument/Component failure. The crew will respond to a failed excess flow check valve.</p> <p><b>Activate EVENT TRIGGER # 4</b> Verify the following become active <b>LO RRHS4642A[GREEN]</b> <b>AN:1C03B[29]</b></p> <p>Role play as NSPEO and report that there is water leaking out of a fitting on PDIS4642A. The manual isolation to stop the leak is V-16-72. If/when told to isolate V-16-72, report the valve closed, the leak has stopped and helpers and HPs are cleaning it up.</p> <p>Role play as I&amp;C: If requested to aid in trouble shooting say that you will go and meet the NSPEO.</p>	<p><b>BOP</b></p> <ul style="list-style-type: none"> <li>• Report that the valve indicates dual.</li> <li>• Contact NSPEO and HP to determine if a leak exists.</li> </ul> <p><b>SRO</b></p> <p>The SRO will determine that the XFV is inoperable and must be isolated in 72 hours and verified isolated. TS. 3.6.1.3.C.1 and C.2.</p> <p>Once isolated, the SRO will determine that he has 24 hours to restore the LPCI Loop Select feature per T.S. 3.3.5.1.2j or declare LPCI inoperable.</p>



TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>3 min after the recirc transient is under control or as directed by the lead examiner,</p> <p>When HPCI steam supplies are full open:</p> <p>When HPCI Aux Oil Pump is taken to PULL-TO-LOCK,</p>	<p>Event 6 will evaluate an Instrument/Component failure. The crew will respond to an auto initiation of the HPCI system. and.</p> <p><b>Activate EVENT TRIGGER # 2</b> Verify the following become active: <b>IMF HP01</b></p> <p>Event 7 will evaluate a major event. The crew will respond to a steam leak in the steam tunnel.</p> <p><b>IOR for HS to PTL</b></p> <p><b>Activate EVENT TRIGGER # 3</b> Verify the following become active: <b>MS08E</b></p> <p>Monitor Steam Tunnel temperatures on screen MS7.</p> <p>Event 9 will evaluate an Instrument/Component failure. The BOP will recognize that HPCI will not isolate.</p>	<p><u>Crew will recognize that HPCI has inadvertently initiated. (CRITICAL)</u> Crew will respond to an auto initiation of HPCI.</p> <p>SRO will verify by TWO independent sources that RPV level is satisfactory, then Direct that HPCI be secured, per ACP 1410.1, "Conduct of Operations."</p> <p>BOP will secure HPCI with the initiation signal present.</p> <p>Crew will respond to the "Steam Leak Detection" alarm.</p> <p>SRO will enter EOP 3 on High steam tunnel temperature and direct the following:</p> <ul style="list-style-type: none"> <li>• Determine the source of the steam leak in the steam tunnel.</li> <li>• Attempt to isolate the leak.</li> </ul> <p>SRO will enter EOP 1 and direct the crew to: <u>Manually scram the reactor before any area exceeds a Max Safe Operating Limit (CRITICAL)</u></p> <p>BOP will isolate the steam lines and determine the following:</p> <ul style="list-style-type: none"> <li>• MO-2238 has thermal overload trips</li> <li>• MO-2239 will isolate if the manual isolation pushbutton is held and MO-2239 is de-energized however, the break in HPCI steam line will not isolate.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
	<p>When directed to open the breaker for MO-2239 activate Event Trigger # 5.</p> <p>Increase MS08E leak rate to keep steam tunnel temperature &gt; 200°F.</p> <p>Event 8 will evaluate an Instrument/Component failure. The BOP will recognize a failure of the "B" RHR Loop flow indicator.</p>	<p>SRO will direct:</p> <p>IC05 operator will commence a cooldown of the RPV.</p> <p>BOP operator will start up and maximize Torus Cooling.</p> <p>Address reactor pressure control with RCIC operating as an injection source or SRVs that do not have a continuous nitrogen supply.</p> <p>If the crew attempts to use HPCI for pressure control they will determine that the HPCI Aux Oil Pump will not start.</p> <p>BOP will startup and maximize Torus Cooling.</p> <p>BOP will recognize a failure of the "B" RHR Loop flow indicator. RHR Pump ammeters must be used to balance RHR loop flows.</p> <p>SRO will determine that a Site Area Emergency FS1 exists.</p>
<p>When a cooldown of the RPV has been initiated or as directed by the lead examiner,</p>	<ul style="list-style-type: none"> <li>Place the simulator in FREEZE.</li> </ul>	<p>None</p>

## POST-SCENARIO ACTIVITIES

Conduct post-scenario activities in accordance with OTIs.

### REFERENCES

1. OI-416
2. OI-454
3. ARP 1C03B[29]
4. Tech Spec
5. ACP 1410.1
6. ACP 1410.7
7. ACP 1402.3
8. ARP 1C05B (C-8)
9. ARP 1C04B (A-1)
10. AOP 255.2
11. EOP 3
12. IPOI 5
13. EOP 1
14. EPIP 1.1

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Event 1 Decrease generator load by 60 MWe.	<p><b>SRO</b> Provide the 1C05 operator with a pre-evolution brief prior to reducing reactor power.</p> <p><b>SRO</b> will direct the RO to reduce generator load by 60 MWe using the Reactor Recirculation System.</p> <p><b>1C05 RO</b> will reduce generator load by 60 MWe using the Recirc System.</p> <ul style="list-style-type: none"> <li>• Reduce Recirc MG Set speed in small increments</li> <li>• Maintain balanced Recirc loop flows</li> <li>• Monitor APRMs, Main Steam Line flow, and Reactor Feedwater flow</li> </ul>	IPOI 3	Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
<p>Event 2 Startup of RHRSW/ESW Systems for chlorination.</p>	<p><b>SRO</b> Directs the BOP operator to startup RHRSW and ESW Systems.</p> <p><b>BOP</b> Startup the ESW System per OI-454.</p> <ul style="list-style-type: none"> <li>• Start "A"("B") ESW Pump.</li> <li>• Verify flow greater than 300 gpm.</li> </ul> <p><b>BOP</b> Startup the RHRSW System in accordance with OI-416.</p> <ul style="list-style-type: none"> <li>• Place PDIC-2046(1947), RHRSW TO RHR ΔP controller in MANUAL and CLOSED.</li> <li>• Start "A" and "C"("B" and "D") RHRSW pumps.</li> <li>• Adjust flow to attain between 2000 and 2600 gpm per pump.</li> </ul> <p><b>Note: The crew may only start one pump per loop.</b></p>	<p>OI-454, and OI-416.</p>	<p>Sat_____ Unsat_____</p>

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
<p>Event 3 XFV isolation and LPCI loop select inop</p>	<p><b>BOP Acknowledges annunciator 1C03C D-2, EXCESS FLOW CHECK VALVES SYSTEM "B" HI FLOW and responds as directed.</b></p> <p>At Panel 1C29, monitor excess flow lights to determine the effected instrument line.</p> <p>Notify the HP office and send an operator locally to determine the extent of the leak and isolate if possible.</p> <p>Refer to EFCV Surveillance to determine the effects of a closed XFV.</p> <p>If the System "B" instrument excess flow condition renders a system/component inoperative, notify Shift Supervisor and comply with the requirements of DAEC Tech. Specs. for the effected instrumentation.</p>	<p>ARP 1C03B D-2</p>	<p>Determination of XFV 4642A and what it supplies.</p> <p>Sat_____ Unsat_____</p>

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
<p>Event 3 XFV isolation and LPCI loop select feature inop</p>	<p><b>SRO</b> The SRO will determine that the XfV is inoperable. Using Technical Specifications, determines that the XfV has to be isolated in 72 hours. Will direct the XfV be isolated to stop the leak. Using Technical Specifications, determine that the LPCI Loop Select feature must be returned to operable in 24 hours or LPCI must be declared inoperable.</p>	<p>ARP 1C03B D-2 Tech Spec.</p>	<p>Tech Spec determination. Sat_____ Unsat_____</p>

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Event 4, Spurious Gr. 3 isolation	<p><b>SRO</b> Direct the BOP operator to perform the actions directed by ARP 1C05B, C-8.</p> <p><b>BOP</b> Perform actions of ARP 1C05B, C-8</p> <ul style="list-style-type: none"> <li>• Check amber lights on the PCIS Status board and determine that only a Group 3B Isolation has occurred.</li> <li>• Verify completion of the Group 3B Isolation.</li> <li>• Reopen CV-4371A</li> <li>• Recognize failure of CV-4371A to reopen when implementing ARP 1C05B (C-8).</li> <li>• Determine the cause of the isolation. (spurious, no indications as to source of signal)</li> <li>• Reset the Group 3B Isolation.</li> </ul>	ARP 1C05B (C-8)	<p>Recognition of failure of CV 4371A.</p> <p>Sat_____ Unsat_____</p>

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Event 5 Recirc pump trip	<p><b>SRO</b> Enters AOP 255.2 and directs operator actions.</p> <ul style="list-style-type: none"> <li>• Directs the 1C05 operator to monitor APRMs for oscillations. (instability)</li> <li>• Verify thermal limits on an Official Case.</li> <li>• Directs the 1C05 operator to plot power and flow on the power to flow map.</li> <li>• Obtains a Solomon Report and determine if instability exists.</li> <li>• Determines required actions based upon relationship to exclusion and buffer regions.</li> <li>• Notify Reactor Engineer or Operations Manager.</li> <li>• Directs the 1C05 operator to perform the actions of ARP 1C04B, A-1.</li> </ul>		Sat _____ Unsat _____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
<p>Event 5 Recirc pump trip</p>	<p>The RO should respond to the Recirc pump trip in accordance with ARP 1C04B, A-1.</p> <ul style="list-style-type: none"> <li>• Verify the Automatic Actions have occurred.</li> <li>• "B" Recirc MG Motor Breaker open</li> <li>• "B" Generator Field Breaker open</li> <li>• Limit operating Recirc pump speed to 100%</li> <li>• Stabilize reactor water level</li> <li>• Secure "B" Recirc pump                             <ul style="list-style-type: none"> <li>• Verify OPEN "B" Recirc pump discharge bypass valve</li> <li>• CLOSE "B" Recirc pump discharge valve</li> <li>• After 5 minutes reopen "B" Recirc pump discharge valve</li> </ul> </li> <li>• Determine the cause of the Recirc Pump trip                             <ul style="list-style-type: none"> <li>• Monitor system annunciators</li> <li>• Send an operator to the MG Set room to monitor relays</li> </ul> </li> <li>• Perform Single Loop STP and Daily Jet pump Operability-Single Loop Operation.</li> </ul> <p>The next event will occur prior to performance of these STPs.</p>	<p>T.S. ARP 1C04B (A-1)</p>	<p>Recirc pump trip.</p> <p>Sat _____ Unsat _____</p>

<p>Event 6 HPCI Initiation</p>	<p><u>Crew will recognize that HPCI has inadvertently initiated. (CRITICAL)</u></p> <p>Crew will respond to an auto initiation of the HPCI.</p> <p>SRO will verify by TWO independent sources that RPV level is satisfactory, then</p> <ul style="list-style-type: none"> <li>• Direct that HPCI be secured, per ACP 1410.1, "Conduct of Operations."</li> </ul> <p>RO will secure HPCI with the initiation signal present.</p> <ul style="list-style-type: none"> <li>• Depress and Hold REMOTE TURBINE TRIP pushbutton SV-2259.</li> <li>• Verify HPCI turbine speed reduces.</li> <li>• Verify TURBINE STOP VALVE HV-2201 closed.</li> <li>• When turbine speed reaches 0 rpm, place 1P-218 AUX OIL PUMP handswitch HS-2256 in the PULL-TO-LOCK position.</li> <li>• Verify TURBINE CONTROL VALVE HV-2200 closed.</li> <li>• Release SV-2259 pushbutton.</li> <li>• Verify MO-2312 HPCI INJECT VALVE closed.</li> <li>• Verify MO-2318 MIN FLOW BYPASS VALVE closed.</li> <li>• Identifies that the breaker for MO-2238 has tripped thermal overloads.</li> </ul>	<p>ACP 1410.1 OI 152</p>	<p><u>Crew will recognize that HPCI has inadvertently initiated. (CRITICAL)</u></p> <p>Sat _____ Unsat _____</p> <p>Response to HPCI auto initiation.</p> <p>Sat _____ Unsat _____</p>
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<p>Event 7 HPCI steam leak in Steam Tunnel, entry into EOP 3</p>	<p>Crew will respond to the "Steam Leak Detection" alarm.</p> <p>SRO will enter EOP 3 on High Steam Tunnel temperatures and direct the following:</p> <ul style="list-style-type: none"> <li>• Determine the source of the steam leak in the Steam Tunnel.</li> <li>• Attempt to isolate the leak.</li> </ul> <p>Crew will attempt:</p>	<p>EOP 3</p>	<p>Determination of EOP 3 entry and attempt to isolate steam leak</p> <p>Sat_____ Unsat_____</p>
<p>Event 9, HPCI fails to isolate</p>	<ul style="list-style-type: none"> <li>• Find the source of the steam leak</li> <li>• Crew will attempt to isolate</li> <li>• MO 2238 has a thermal overload trip</li> <li>• MO-2239 will isolate if the manual isolation pushbutton is held and MO-2239 is de-energized however, the break in HPCI steam line will not isolate.</li> </ul>		<p>Recognizes that HPCI will not isolate</p> <p>Sat_____ Unsat_____</p>



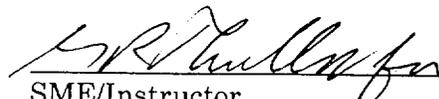
<p>When the plant has been stabilized following the scram and Group 1 isolation.</p>	<p>SRO will direct a controlled plant cooldown.                  The cooldown may be performed using RCIC as an injection source.                  The SRO may direct a cooldown with the SRVs but must address CV-4371A being closed and not having a continuous supply of nitrogen for the SRVs.</p>		
	<p>SRO will:</p> <ul style="list-style-type: none"> <li>• Declare a Site Area Emergency FS1.</li> </ul>	<p>EPIP 1.1</p>	<p>EAL declaration                  Sat_____ Unsat_____</p>

7000

OSG VALIDATION CHECKLIST

Scenario # ESG 12

- 1  Verify that if not run from a protected IC that setup information is provided to reproduce the stated initial conditions.
- 2  Verify that all stated objectives are identified in the body of the OSG.
- 3  Verify that turn over sheets are completed, and are in agreement with both the narrative summary and shift turnover information sheet. Turn over sheets are not required for initial license scenarios.
- 4  Verify that if the scenario requires documents to be provided to the crew, that they are filled out as appropriate (i.e., if an STP is used, it is filled out).
- 5  If this is the initial validation or the revision affects ramp times, event triggers, malfunctions, overrides, remote functions or procedure changes could affect the scenario, then validate the scenario for proper response using a crew. It is preferable to use a crew unfamiliar with the scenario whenever possible. Verify the following while running the scenario:
  - The scenario runs as written and all tasks are performed.
  - The stated time line agrees with actual times.
  - Critical task statements clearly define the expected plant and student response. They should also be written so that they are achievable as written. If any question exists, it is preferable to have operations management participate in the validation.
  - Anticipated instructor role play/cues are identified
  - Management expectations are captured and enforced.
  - Verify administrative documentation requirements (i.e., CMARs / ARs) are identified.
  - Verify reportability requirements (i.e., ESF actuations) are identified.
  - Verify Technical Specification items / LCO declarations are correct. (Contact Licensing as necessary)
  - If procedure steps may cause confusion or disagreement between higher level procedures and OIs/ARPs that operations management is consulted.
- 6 NA Shutdown scenarios include shutdown risk assessment, time to boil calculations and shutdown status board information.

 2/11/01  
SME/Instructor Date

\_\_\_\_\_  
SME/Instructor Date

\_\_\_\_\_  
SME/Instructor Date

Scenario Outline

Scenario Number ESG 13 License Exam 4/9/2001

Examiners \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Operators SRO-1  
RO-1  
RO-2

**Objectives:** Evaluate an increase in reactor power using Recirc; Manual operation of SFU; Performing Main Turbine Operational Tests; Operator response to various instrument and component malfunctions and operator response to a LOCA inside the PC.

**Initial Conditions:** Plant startup is in progress with reactor power is at 50%.

**Turnover:** Reactor power is at 50%. Perform manual startup of "A" SFU for system engineer and return to Standby Readiness. Continue the up power and at 60%, perform STP NS930001, "Main Turbine Operational Tests"

Event No.	Malf. No.	Event Type	Event Description
1	N/A	R	<b>IC05</b> Increase reactor power with Recirc (K/A 202002 A4.01)
2	N/A	N	<b>BOP</b> Perform manual startup of SFU. Return to Standby Readiness. (K/A 290003 A4.01)
3	LO TCBUOSPTST LO TCMTRPRSTG LO TCMTRPRST LO TCMTRPTRP	C	<b>BOP</b> Perform STP NS930001, Main Turbine Operational Tests". The Overspeed Trip Device and Mechanical Trip Valve Test and Backup Overspeed Trip Circuits Test will be UNSAT which requires that the turbine be unloaded immediately. (K/A 241000 K4.13)
4	EG01B ED07A ED07B	I/C	<b>IC05</b> Main Generator backup lockout relay trips and a failure to transfer of the non-essential buses occur when the lockout relay trips. (K/A 262001 K4.03)
5	RR28B	I/C	<b>IC05</b> GEMAC variable leg break (K/A 216000 A2.03)
6	RR15 as necessary	M	<b>Crew</b> Perform actions of EOP 1 and EOP 2 as drywell pressure and temperature rise. (K/A 295024)
7	DI HPHS2256	I/C	<b>BOP</b> HPCI fails to start (K/A 206000 A3.03)
8	RH09A and DI RHHS2001	I/C	<b>BOP</b> Containment Spray valves will not open (K/A 226001 A2.05)
9	RR33	I/C	<b>IC05 and BOP</b> Level oscillations occur when the Saturation Curve is entered. (K/A 216000 A2.08)
10	N/A	M	<b>Crew</b> Perform the actions required by RPV Flooding. (K/A 295028)

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

Scenario No.: ESG 13

Event No.:   1  

Event Description: Increase reactor power with Recirc from approximately 50% to 60%.

Time	Position	Applicant's Actions or Behavior
	SRO	Provide a Pre-evolution brief for the 1C05 operator prior to raising reactor power. Direct 1C05 operator to raise reactor power to 60% using the Reactor Recirculation System.
	RO	Increase Recirc flow to raise reactor power to 60%. <ul style="list-style-type: none"><li>• Increase Recirc MG Set speed in small increments</li><li>• Maintain Recirc Loop flow balanced</li></ul>

Scenario No.: ESG-13

Event No.:   2  

Event Description: Perform a manual startup of SFU and then return SFU to Standby Readiness.

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Direct BOP operator to perform a manual startup "A" SFU per OI-730.</p> <p>Direct the BOP operator to place the "A" SFU in Standby Readiness.</p> <p>Determine that taking the SFU Mode Switch out of Auto requires a log entry.</p>
	BOP	<p>Perform a Manual Startup of "A" SFU.</p> <ul style="list-style-type: none"><li>• Start "A" SFU by depressing test pushbutton PB7316A on Panel 1C26A.</li><li>• Acknowledge CONTROL BUILDING HVAC PANEL 1C26 TROUBLE (1C07A, D-11)</li><li>• Verify Intake Valve AV-7301A OPEN.</li><li>• Verify Electric Heater EC-7304A ON.</li><li>• Verify Discharge Valve AV-7318A OPEN or THROTTLED OPEN.</li><li>• Verify "A" SFU Fan 1V-SF-30A RUNNING.</li><li>• Log start time in Log Book.</li></ul>
	BOP	<p>Return "A" SFU to Standby Readiness.</p> <ul style="list-style-type: none"><li>• At 1C26, place "A SFU MODE SELECT HS-7316A in the MAN position.</li><li>• Place "A" SFU MODE SELECT HS-7316A in the AUTO position.</li><li>• Verify Control Building HVAC in service per Section 3.3.<ul style="list-style-type: none"><li>• The operator will verify that Control Building HVAC is in service per Section 3.3 (Startup) by verifying the following:<ul style="list-style-type: none"><li>• Annunciators clear</li><li>• Dampers in required positions</li><li>• Fans in required status</li></ul></li></ul></li><li>• Log stop time in Log Book.</li></ul>

Scenario No.: ESG-13

Event No.: 3

Event Description: Perform STP NS930001, Main Turbine Operational Tests, Sections 7.3 and 7.9.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct the BOP operator to complete STP NS930001, Main Turbine Operational Tests.
	BOP	<ul style="list-style-type: none"><li>• Perform Section 7.3.</li><li>• Verify PRIMARY SPEED SIGNAL LOST light on first hit panel in 1C49 is OFF.</li><li>• Note: The following steps are to be performed at 1C07.</li><li>• In the MECHANICAL TRIP TEST are, momentarily depress the LOCKED OUT push-button.<ul style="list-style-type: none"><li>• Confirm the following:</li><li>• LOCKED OUT light ON</li><li>• Annunciator MECHANICAL TRIP LOCKOUT (1C07A, A-8) is activated.</li></ul></li><li>• <u>Depress and HOLD</u> the OIL TRIP push-button until the TRIPPED light in the MECHANICAL TRIP area turns ON. (this takes several seconds but WILL NOT come ON)</li><li>• Determine that the Section 7.3 test is Unsatisfactory and that Section 7.9 must be performed immediately.</li></ul>

Scenario No.: ESG-13

Event No.: 3 Con't

Event Description: Perform STP NS930001, Main Turbine Operational Tests, Sections 7.3 and 7.9.

Time	Position	Applicant's Actions or Behavior
	SRO	Determine that Sections 7.3 and 7.9 are Unsatisfactory and the turbine must be unloaded immediately per Special Precaution 2.9.
	BOP	<ul style="list-style-type: none"><li>• Performs Section 7.9</li><li>• Verify that testing of the Overspeed Trip Device and Mechanical Trip Valve is not being conducted. (just determined this as Unsat.)</li><li>• Place the BACKUP OVERSPEED OVERRIDE SWITCH in the OVERRIDE position.</li><li>• <u>Depress and HOLD</u> the BACKUP OVERSPEED TRIP-PUSH TO TEST pushbutton for several seconds.</li><li>• Confirm that the green back-lighting for the BACK-UP OVERSPEED TRIP-PUSH TO TEST pushbutton turns ON.</li><li>• Release the BACKUP OVERSPEED TRIP-PUSH TO TEST pushbutton.<ul style="list-style-type: none"><li>• Confirm that the green back-lighting turns OFF. (Will NOT turn OFF)</li></ul></li><li>• Determine that Section 7.9 is UNSAT.</li></ul>

Scenario No.: ESG-13

Event No.: 4

Event Description: Main Generator Backup Lockout Relay trip results in failure to transfer of Nonessential buses.

Time	Position	Applicant's Actions or Behavior
	SRO	<p>Enter AOP 304.1, Loss of 4160V Nonessential Electrical Power.            May enter EOP 1 if RPV level drops below 170".            Direct 1C05 operator to perform actions of IPOI 5, Reactor Scram.            Direct the BOP operator to perform the actions of AOP 304.1.</p>
	1C05	<p>Perform the actions of IPOI 5.            Note these steps may be performed in any order.</p> <ul style="list-style-type: none"> <li>• Verify neutron flux decreasing</li> <li>• Initiate a backup manual scram.</li> <li>• Initiate a level setback to 175". (Not necessary without Feed pumps)</li> <li>• Place the Mode Switch in the SHUTDOWN position.</li> <li>• Verify all control rods inserted.</li> <li>• Verify Recirc pumps runback to 20%. (Not necessary without Recirc pumps)</li> <li>• Insert all SRMs and IRMs.</li> <li>• Maintain reactor pressure below 1110 psig. (Verifies LLS valves are controlling reactor pressure)</li> <li>• Announce over the page that a reactor scram has occurred.</li> <li>• Monitor Main Condenser backpressure.</li> <li>• Check the status of the Main Turbine.</li> <li>• Secure the Main Generator.</li> </ul> <p>Perform actions of ARPs for tripped Recirc Pumps.</p>
	BOP	<p>Perform the actions directed by AOP 304.1 or as directed by the SRO.</p> <ul style="list-style-type: none"> <li>• Determine that a failure to transfer of the Nonessential buses has occurred and that the buses need to be re-energized.</li> <li>• Re-energizes the Non-essential 4160V buses.</li> <li>• Verify two GSW pumps are running.</li> <li>• Verify two Well Water pumps are running.               <ul style="list-style-type: none"> <li>• Start "B" Well Water pump.</li> </ul> </li> </ul>

Scenario No.: ESG-13

Event No.: 5 and 7

Event Description: GEMAC variable leg break.

Time	Position	Applicant's Actions or Behavior
	1C05	<p>Recognize GEMAC level indicator LI-4560 failing downscale.            Notify SRO of GEMAC failure.            Compare "B" GEMAC with other RPV level indicators.            Diagnose variable leg break.            Select "A" level control.            May select Single Element.            May be directed to install Defeat 4.            May be directed to install Defeat 16.</p>
Event 7	BOP	<p>Recognize Drywell pressure is increasing.            Lineup to vent the Drywell.            Diagnose that HPCI did not auto start when Drywell pressure exceeds 2 psig.            Initiate Torus Spray when directed.            May be directed to install Defeat 4.            May be directed to install Defeat 16.</p>
	SRO	<p>Diagnose variable leg break.            Direct BOP operator to lineup to vent the Drywell.            Enter EOP 1 and EOP 2 when Drywell pressure exceeds 2 psig.            Direct actions of EOP 1.</p> <ul style="list-style-type: none"> <li>• Direct 1C05 operator to maintain RPV level between 170" and 211" using RCIC and CRD.</li> <li>• Direct BOP operator to override CV-4371A Open.</li> </ul> <p>Direct actions of EOP 2</p> <ul style="list-style-type: none"> <li>• Direct 1C05 or BOP operator to install Defeat 4 and maximize Drywell Cooling.</li> <li>• Direct 1C05 or BOP operator to install Defeat 16.</li> <li>• When conditions permit, direct the BOP operator to initiate Torus Spray.</li> </ul>

Scenario No.: ESG-13

Event No.: 6 and 8

Event Description: Recirc Loop break in the Drywell.

Time	Position	Applicant's Actions or Behavior
	SRO	Direct BOP operator to initiate Drywell Spray. Direct BOP operator to maximize Torus Cooling. Direct the 1C05 operator to maintain RPV level with SBLC, RCIC, and CRD. When Drywell temperature cannot be maintained below 280°F, Enter ED contingency. <ul style="list-style-type: none"> <li>• Direct the BOP operator to open 4 ADS SRVs.</li> </ul> Monitor the Saturation Curve.
Event 8	BOP	Attempt to initiate Drywell Spray. <b>Drywell Spray Valves will not open.</b> Maximize Torus Cooling. Send NSPEO to Drywell Spray valves to open manually. Open 4 ADS SRVs. Monitor RPV and containment parameters.
	1C05	Monitor RPV parameters.

Scenario No.: ESG-13

Event No.: 9 and 10

Event Description: Level oscillations and entry into RPV/F.

Time	Position	Applicant's Actions or Behavior
Event 10 Entry into RPV/F	SRO	<p>Determine that the Saturation Curve has been entered.            Directs both operators to increase monitoring of level instrumentation.            Recognizes level oscillations.            Enter RPV/F.            Direct the 1C05 operator to close:</p> <ul style="list-style-type: none"> <li>• MSIVs (if open)</li> <li>• Main Steam Line Drains (if open)</li> <li>• RCIC Steam supply</li> </ul> <p>Direct the BOP operator to increase injection into the RPV with RHR and Core Spray until:</p> <ul style="list-style-type: none"> <li>• 3 or more SRVs are open</li> <li>• RPV pressure at least 50 psig above Torus pressure but as low as possible</li> <li>• RPV pressure not decreasing.</li> </ul>
	BOP	<p>Inject into the RPV with RHR and Core Spray systems until:</p> <ul style="list-style-type: none"> <li>• 3 or more SRVs are open</li> <li>• RPV pressure at least 50 psig above Torus pressure but as low as possible</li> <li>• RPV pressure not decreasing</li> </ul>
	1C05	<p>Close:</p> <ul style="list-style-type: none"> <li>• MSIVs (if open)</li> <li>• Main Steam Line Drains (if open)</li> <li>• RCIC Steam supply</li> </ul>

# DUANE ARNOLD ENERGY CENTER

## INITIAL OPERATOR EXAMINATION SCENARIO GUIDE

ESG 13

INCREASE REACTOR POWER / MANUAL STARTUP OF SFU / NS930001 MAIN  
TURBINE TESTS WITH INOP OVERSPEED TRIPS / GEMAC VARIABLE LEG  
BREAK / FAILURE to AUTO TRANSFER OF NONESSENTIAL 4160VAC BUSES /  
EOP 1 / EOP 2 / LEVEL OSCILLATIONS / RPV/F

Rev. 0

DEVELOPED BY: Michael Feiber 2/6/2001  
Instructor Date

VALIDATED BY: [Signature] 2/11/2001  
SME/Instructor Date

REVIEWED BY: [Signature] 2/11/2001  
Operations Manager Date

APPROVED BY: [Signature] 2/13/01  
Training Supervisor-Operations Date

## NARRATIVE SUMMARY

### Current plant operating status.

The plant is operating at 47% power with no inoperable equipment. A plant startup is in progress. The crew is to continue the startup and raise reactor power with Recirc until 60%. At 60% STP NS930001, "Main Turbine Operational Tests" Sections 7.3, 7.4, 7.5, and 7.9 are to be completed. The System Engineer, for the Control Building HVAC, wants a manual startup of "A" SFU. The BOP will then return "A" SFU to Standby Readiness.

### Scenario segments

- Event 1 (R) 1C05 operator will raise reactor load to 60%.
- Event 2 (N) BOP operator will manually startup "A" SFU using the test pushbutton. After 10 minutes the BOP operator will return "A" SFU to Standby Readiness.
- Event 3 (C) BOP operator will Perform STP NS930001, "Main Turbine Operational Tests, Sections 7.3 and 7.9. The Main Turbine Overspeed and Backup Overspeed trips will be inoperable. This requires the turbine to be unloaded immediately.
- Event 4 (I/C) The Main Generator Backup Lockout Relay will trip causing an open transfer of the Non-Essential buses. However, Non-essential buses 1A1 and 1A2 do not Auto transfer but can be recovered.
- Event 5 (I/C) The "B" GEMAC variable leg will break causing level indication problems and drywell pressure and temperature to increase.
- Event 6 (M) "A" Recirc Loop will develop a leak and Drywell pressure and temperature will continue to rise. The crew will enter EOP 1 and EOP 2.
- Event 7 (I/C) HPCI will fail to start.
- Event 8 (I/C) The RHR containment spray valves will fail to open. This will ensure the crew performs ED on Drywell temperature.
- Event 9 (I/C) When the Saturation Curve is entered, RPV level indications will begin to oscillate.
- Event 10 (M) The crew will enter RPV/F contingency and utilize RHR and Core Spray Systems to attain the successful criteria for RPV/F.

## SCENARIO SPECIFICATIONS

DURATION: 90 min.

## POSITION SPECIFIC TASKS AND OBJECTIVES

⇒ Crew Evolutions:  
None

⇒ RO (NSOE, ANSOE, XANSOE)

- ◆ 93.11 Raise Reactor Power with Recirc Flow when Above 35% Power.
- ◆ 65.18 Perform Manual Initiation of SFU Using Test Pushbutton.
- ◆ 65.16 Return SFU to Standby Readiness.
- ◆ 97.01 Perform Main Turbine Operational Test.
- ◆ 1.04 Respond to Annunciators.
- ◆ 94.08 Respond to Loss of 4160V Non-essential Power Condition.
- ◆ 95.44 Perform actions of RC/L of EOP 1.
- ◆ 95.46 Perform actions of RC/P of EOP 1.
- ◆ 95.63 Perform actions of DW/T of EOP 2.
- ◆ 95.64 Perform actions of DW/P of EOP 2.
- ◆ 95.85 Perform RPV/F actions with the reactor shutdown.
- ◆ 95.89 Increase/Control Injection With Preferred Systems to Establish Flooding Parameters.

⇒ SRO

- ◆ 1.02 Determine Operability for Tech Spec Required Components.
  - 1.02.02 Determine if the instrument, system or component is operable.
  - 1.02.03 Declare the instrument, component or system inoperable, enter the correct LCO, and determine and direct performance of the LCO STP.
- ◆ 1.11 Ensure the conduct of plant operations and maintenance are in compliance with administration procedures.
  - 1.11.03.02 Differentiate between a Routine Report, Non routine Report, Immediate Notification Event, Reportable Event and a Licensee Event Report.
- ◆ 1.21 Direct crew response to off-normal events
  - 1.21.02 Recognize and prioritize data relevant to the accident or event
  - 1.21.04 Conduct periodic crew briefings to include plant status, priorities, and key ongoing activities.
- ◆ 4.10 Direct crew actions to raise reactor power by 10% with Recirc Flow when above 35% power.
  - 4.10.01 Direct the control room crew to raise reactor power using Recirc flow.
  - 4.10.02 Monitor power ascension.

- ◆ 5.08 Direct crew response to Loss of 4160V Non-essential Power Condition.
  - 5.08.01 Direct the performance of the Immediate Actions.
  - 5.08.02 Check the Automatic Actions for concerns
- ◆ 6.44 Direct crew response for performance of RC/L leg of EOP 1.
- ◆ 6.46 Direct crew response for performance of RC/P leg of EOP 1.
- ◆ 6.63 Direct crew response for performance of DW/T leg of EOP 2.
- ◆ 6.64 Direct crew response for performance of DW/P leg of EOP 2.

## SCENARIO OBJECTIVE SUMMARY

1. Reactor power increase
2. Manual Startup of SFU and the Return to Standby Readiness
3. STP NS930001, Main Turbine Operational Tests
4. GEMAC Variable leg break
5. AOP 304.1, Loss of Non-essential buses
6. EOP 1
7. EOP 2
8. RPV/F

## SCENARIO CHALLENGES

1. None

## PRE-SCENARIO ACTIVITIES

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

- If this scenario is used in training mode: OTI 101.
- If this scenario is used in performance mode: OTI 105.

## SHIFT TURNOVER INFORMATION

- ⇒ Day of week and shift
  - ◆ Thursday
  - ◆ Nights
- ⇒ Weather conditions if different from actual conditions
  - ◆ Clear
  - ◆ Cool
- ⇒ Plant power levels 47 % Pwr
  - ◆ MWT 780
  - ◆ MWE 260
  - ◆ CORE FLOW 24 lbs/m/hr
- ⇒ Thermal Limit Problems/Power Evolutions
  - ◆ None
  - ◆ System Operations Center ready for power ascension
- ⇒ Existing LCOs, Date Of Next Surveillance
  - ◆ None
- ⇒ STPs in progress or major maintenance
  - ◆ None
- ⇒ Equipment to be taken out of or returned to service this shift/maintenance or major plant equipment
  - ◆ System Engineer wants "A" SFU started without a Control Building Isolation and run for 10 minutes to attain some flow readings, then returned to Standby Readiness.
- ⇒ Comments, evolutions, problems, etc.
  - ◆ Continue the power ascension using Recirc.
  - ◆ At 60% power Perform NS930001, Main Turbine Operational Tests.
  - ◆ There are no extra personnel

## SIMULATOR SETUP

### 1. GENERAL INSTRUCTIONS

- a. Reset to IC 13
- b. Restore Malfunction File ESG13ILC.
- c. Restore Override File ESG13ILC.
- d. Ensure "B" GEMAC level is in control of Feedwater.
- e. Verify that the Green Pull sheet is on 1C05

### 2. LIST OF EVENT TRIGGERS

Trigger Number	Trigger File Name	Trigger Logic Statement	Trigger Word Description
1		Manually activated	
2		Manually activated	
3		Manually activated	
4		ZDITCBUOSPTST .GE. 1	
5		ZDIRHHS1903C(3) .GE. 1	
6		ZLOED1A102(3) .GE. 1	
7		PCPDWG .GE. 2	
8		Manually activated	

## 3. LIST OF MALFUNCTIONS

## ESG13ILC

Time	Malfunction No.	Malfunction Title	ET	Delay	F. Sev.	Ramp	I. Sev.
0	EG01B	Main Generator Backup Lockout Relay trip	1	0	N/A	N/A	N/A
0	RR28B	"B" GEMAC variable leg break	2	0	100	300	N/A
0	RH09A	MO-1902 Thermal Overloads	5	N/A	N/A	N/A	N/A
As req.	RR15A	"A" Recirc Line break	8	0	0.15	600	N/A
As req.	RR33	RPV Level oscillations	3	N/A	N/A	N/A	N/A
0	SW21D	D Well Water Pump trip	1	N/A	N/A	N/A	N/A
0	ED07B	Bus 1A2 Failure to transfer	N/A	N/A	N/A	N/A	N/A
0	TC12	EHC fluid leak	6		.20	N/A	N/A
0	AD01D	CV-4403 leak	7	N/A	0.01	N/A	N/A
0	ED07A	Bus 1A1 failure to transfer	N/A	N/A	N/A	N/A	N/A

## 4. LIST OF OVERRIDES

## ESG13ILC

Time	Override No.	Override Title	ET	Delay	Value.	Ramp
0	LO TCMTRPRSTG	Main Turbine Mech. Trip Test Resetting light	N/A	N/A	OFF	N/A
0	LO TCBUOSPTST	Backup Overspeed Trip-Push to Test	4	N/A	ON	N/A
0	LO TCMTRPRST	Main Turbine Mech. Trip Test Reset light	N/A	N/A	ON	N/A
0	LO TCMTRPTRP	Main Turbine Mech. Trip Test Tripped light	N/A	N/A	OFF	N/A
0	DI HPHS2256	HPCI Aux Oil Pump	N/A	N/A	PTL	N/A
0	DI RHHS2001	MO-2001	N/A	N/A	CLOSE	N/A
When Req.	ZLORHHS1902(1)	MO-1902 Green	N/A	N/A	OFF	N/A
When Req.	ZLORHHS1902(2)	MO-1902 Red	N/A	N/A	OFF	N/A
When Req.	ZLORHHS2001(1)	MO-2001 Green	N/A	N/A	OFF	N/A
When Req.	ZLORHHS2001(2)	MO-2001 Red	N/A	N/A	OFF	N/A

## 5. LIST OF REMOTE FUNCTIONS

None

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
	Provide the students time to walkdown the panel sand then provide the shift turnover.	<p>The students will walkdown the panels and then participate in a shift turnover.</p> <p><b>SRO</b> will conduct a Shift Brief.</p>
	Event 1 is performed to evaluate a significant reactivity manipulation.	<p><b>SRO</b> Provide the 1C05 operator a pre-evolution brief on raising reactor power.</p> <p><b>SRO</b> will direct the RO to raise reactor power to 60% using the Reactor Recirculation System.</p> <p><b>RO</b> will close MO-4423 and MO-4424 Main Steam Line Drains at 50% power.</p> <p><b>RO</b> will raise reactor power to 60% using the Recirc System in accordance with IPOI 3.</p> <ul style="list-style-type: none"> <li>• Raises Recirc MG Set speed in small increments</li> <li>• Maintain Recirc Loop flows balanced</li> </ul>
10 minutes after the SFU has been started,	Event 2 is used to evaluate a normal evolution.  Role Play as the System Engineer and report that you have all the readings you need on "A" SFU. The BOP will place "A" SFU in Standby Readiness.	<p><b>SRO</b> Determines that a log entry is required for securing "A" SFU.</p> <p><b>SRO</b> will direct the BOP operator to perform a manual startup of "A" SFU per OI-730.</p> <p><b>BOP</b> will perform a manual startup of "A" SFU per OI-730.</p> <ul style="list-style-type: none"> <li>• Start "A" SFU by pushing PB-7316A pushbutton at 1C26.</li> <li>• Place "A" SFU in Standby Readiness.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>During the performance of Section 7.9</p>	<p>Event 3 will be used to evaluate a component failure.</p> <p>When maintenance is called inform the SRO that I&amp;C and Mechanical planners will start print investigation and planning.</p> <p>If Operations Manager is called, agree with SRO recommendations.</p> <p>When the BACKUP OVERSPEED TRIP PUSH TO TEST pushbutton is pushed, Ensure Event Trigger # 4 activates.</p>	<p><b>SRO</b> Direct the BOP to perform the remaining Sections of NS930001, Main Turbine Operational Tests.</p> <p><b>BOP</b> will perform Section 7.3 of NS930001.</p> <ul style="list-style-type: none"> <li>• Determine that Section 7.3 is Unsat.</li> <li>• Notify the SRO that Section 7.3 is Unsat.</li> <li>• Determine that Section 7.9 must be performed immediately.</li> <li>• Perform Section 7.9 of NS930001.</li> <li>• Determine that Section 7.9 is Unsat.</li> <li>• Notify the SRO that Section 7.9 is Unsat.</li> </ul> <p><b>SRO</b> Determine that the turbine must be unloaded immediately (i.e. commence a normal plant shutdown).</p> <p><b>SRO</b> will call maintenance, Operations Manager and other personnel as required.</p>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>When the crew has determined that the turbine needs to be unloaded or as directed by the lead examiner,</p>	<p>Event 4 will be used to evaluate the crew response to a Main Generator Backup Lockout relay trip with the subsequent failure to Auto transfer of the Non-Essential 4160V buses.</p> <p><b>Activate EVENT TRIGGER # 1</b> Verify the following become active <b>EG01B</b> <b>SW21D</b></p> <p>If asked, Buses 1A1 and 1A2 are ok. There are no lockout relays tripped. "C" GSW lockout is not tripped.</p> <p>When contacted to throttle Condensate Pump discharge valve, stall until after ED. Report that the valve is hard to turn and is binding.</p>	<p><b>SRO</b> The SRO will enter AOP 304.1.</p> <ul style="list-style-type: none"> <li>• Direct the 1C05 operator to perform actions of IPOI 5.</li> <li>• Direct BOP operator to perform actions of AOP 304.1.</li> </ul> <p><b>BOP</b></p> <ul style="list-style-type: none"> <li>• Perform the actions directed by AOP 304.1 or as directed by the SRO. <ul style="list-style-type: none"> <li>• Determine that an open transfer of the Non-Essential buses has occurred and the buses failed to auto transfer.</li> <li>• Restore 1A1 and 1A2.</li> <li>• Verify two GSW Pumps are running.</li> <li>• Verify two Well Water Pumps are running.</li> <li>• Determine that only one Well Water pump is running and starts the "B" Well Water pump.</li> </ul> </li> </ul> <p><b>1C05</b></p> <ul style="list-style-type: none"> <li>• Perform the actions of IPOI 5.</li> <li>• Direct NSPEO to throttle a Condensate Pump discharge valve in preparation for pump start.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>As directed by the lead examiner,</p>	<p>Events 5 will evaluate the crew response to a GEMAC variable leg break.</p> <p><b>Activate EVENT TRIGGER # 2</b></p> <p>Verify the following malfunctions become active:</p> <p style="text-align: center;"><b>RR28B</b></p> <p>Event 7</p>	<p><b>1C05</b> The 1C05 operator will recognize "B" GEMAC level indicator LI-4560 lowering. 1C05 operator should compare level indications and determine that the "B GEMAC variable leg has a leak.</p> <p>Select Single Element and "A" Level in control.</p> <p><b>SRO</b> Direct the 1C05 operator to select "A" level control to ensure proper level indication.</p> <p>Monitor containment parameters.</p> <p>May direct BOP operator to line up to vent the Drywell.</p> <p>Enter EOP 1 and EOP 2 when Drywell pressure exceeds 2 psig.</p> <p><b>BOP</b> Starts to line up to vent the Drywell. (There will not be enough time to vent the Drywell.)</p> <p>Diagnose that HPCI did not start when Drywell pressure exceeded 2 psig.</p> <p>Initiate Torus Spray when directed.</p>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>as directed by the lead examiner,</p> <p>The Recirc break must be inserted prior to reactor pressure dropping below 700 psig.</p>	<p>Event 6 will evaluate crew response to High Drywell pressure and temperature.</p> <p>Modify malfunction <b>RR15A to 0.15 with a ramp time of 10 minutes</b></p> <p>Modify AD01D to ensure entry into the Sat Curve</p> <p>Event 8 will evaluate the BOP operator response to failed containment spray valves.</p> <p>When directed to manually open Drywell Spray valves, stall until after RPV/F entry. Report that the valves are bound up and will not move manually.</p>	<p><b>SRO</b> Direct EOP 1 and EOP 2 actions:</p> <ul style="list-style-type: none"> <li>• Direct BOP operator to maximize Torus Cooling.</li> <li>• Direct BOP operator to initiate Drywell Spray.</li> <li>• Direct 1C05 operator to maintain RPV level with HPCI.</li> <li>• When Drywell temperature cannot be maintain below 280°F, Enter ED               <ul style="list-style-type: none"> <li>• Direct the BOP operator to open 4 ADS SRVs.</li> </ul> </li> <li>• Monitor the Saturation Curve.</li> </ul> <p><b>1C05</b></p> <ul style="list-style-type: none"> <li>• Recognize that HPCI will not start.</li> <li>• Monitor RPV parameters.</li> </ul> <p><b>BOP</b></p> <ul style="list-style-type: none"> <li>• Attempt to initiate Drywell Spray. (Drywell Spray valves MO-1902 and MO-2001 will not come open)</li> <li>• Maximize Torus Cooling.</li> <li>• Send an NSPEO to the Drywell Spray valves to open manually.</li> <li>• Open 4 ADS SRVs.</li> <li>• Monitor RPV and Containment parameters.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
	Event 9 Activate Event Trigger # 3 Event 10	<p>SRO will determine entry has been made into the Saturation Curve.            When level oscillations occur, enter RPV/F.</p> <ul style="list-style-type: none"> <li>• Direct operator actions of RPV/F</li> </ul> <p><b>1C05</b></p> <ul style="list-style-type: none"> <li>• Recognize RPV level oscillations.</li> <li>• Coordinate with BOP operator to inject into the RPV to establish flooding conditions.</li> </ul> <p><b>BOP</b></p> <ul style="list-style-type: none"> <li>• Recognize RPV level oscillations.</li> <li>• Inject into the RPV with RHR and Core Spray until Flooding conditions have been reached.</li> </ul>
When Flooding conditions have been reached or as directed by the lead examiner,	<ul style="list-style-type: none"> <li>• Place the simulator in FREEZE.</li> </ul>	None

## POST-SCENARIO ACTIVITIES

Conduct post-scenario activities in accordance with OTIs.

### REFERENCES

1. IPOI 3
2. NS930001
3. Tech Spec
4. ACP 1410.1
5. AOP 304.1
6. IPOI 5
7. EOP 1
8. EOP 2
9. ED
10. RPV/F

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Event 1 Increase reactor power to 60%.	<p><b>SRO</b> Provide the 1C05 operator with a pre-evolution brief prior to raising reactor power.</p> <p><b>SRO</b> will direct the RO to raise reactor power to 60% using the Reactor Recirculation System.</p> <p><b>1C05 RO</b> will raise REACTOR POWER TO 60% using the Recirc System.</p> <ul style="list-style-type: none"> <li>• Maintain balanced Recirc loop flows</li> <li>• Monitor APRMs, Main Steam Line flow, and Reactor Feedwater flow</li> </ul>	IPOI 3	Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
<p>Event 2</p> <p>Startup of SFU and subsequent return to Standby Readiness.</p>	<p><b>SRO</b></p> <p>Direct BOP operator to perform a manual startup "A" SFU per OI-730.</p> <p>Direct the BOP operator to place the "A" SFU in Standby Readiness.</p> <p><b>BOP</b></p> <p>Perform a Manual Startup of "A" SFU.</p> <ul style="list-style-type: none"> <li>• Start "A" SFU by depressing test pushbutton PB7316A on Panel 1C26A.</li> <li>• Acknowledge CONTROL BUILDING HVAC PANEL 1C26 TROUBLE (1C07A, D-11)</li> <li>• Verify Intake Valve AV-7301A OPEN.</li> <li>• Verify Electric Heater EC-7304A ON.</li> <li>• Verify Discharge Valve AV-7318A OPEN or THROTTLED OPEN.</li> <li>• Verify "A" SFU Fan 1V-SF-30A RUNNING.</li> <li>• Log start time in the Log Book.</li> </ul>		<p>Sat_____ Unsat_____</p>

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Event 2 Continued	Return "A" SFU to Standby Readiness. <ul style="list-style-type: none"> <li>• At 1C26, place "A SFU MODE SELECT HS-7316A in the MAN position.</li> <li>• Place "A" SFU MODE SELECT HS-7316A in the AUTO position.</li> <li>• Verify Control Building HVAC in service per Section 3.3.               <ul style="list-style-type: none"> <li>• The operator will verify that Control Building HVAC is in service per Section 3.3 (Startup) by verifying the following:                   <ul style="list-style-type: none"> <li>• Annunciators clear</li> <li>• Dampers in required positions</li> <li>• Fans in required status</li> </ul> </li> </ul> </li> <li>• Log stop time in Log Book.</li> </ul>	OI-730	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
<p>Event 3 Performance of STP NS930001, Main Turbine Operational Tests</p>	<p><b>SRO</b> Direct the BOP operator to complete STP NS930001, Main Turbine Operational Tests.</p> <p><b>BOP</b></p> <p>Perform Section 7.3.</p> <ul style="list-style-type: none"> <li>• Verify PRIMARY SPEED SIGNAL LOST light on first hit panel in 1C49 is OFF.</li> <li>• Note: The following steps are to be performed at 1C07.                             <ul style="list-style-type: none"> <li>• In the MECHANICAL TRIP TEST are, momentarily depress the LOCKED OUT push-button.                                     <ul style="list-style-type: none"> <li>• Confirm the following:</li> <li>• LOCKED OUT light ON</li> <li>• Annunciator MECHANICAL TRIP LOCKOUT (1C07A, A-8) is activated.</li> </ul> </li> <li>• <u>Depress and HOLD</u> the OIL TRIP push-button until the TRIPPED light in the MECHANICAL TRIP area turns ON. (this takes several seconds but WILL NOT come ON)</li> </ul> </li> <li>• Determine that the Section 7.3 test is Unsatisfactory and that Section 7.9 must be performed immediately.</li> </ul>	<p>STP NS930001, Main Turbine Operational Tests</p>	<p>Sat_____ Unsat_____</p>

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Event 3 con't	<p><b>SRO</b> Determine that Sections 7.3 and 7.9 are Unsatisfactory and the turbine must be unloaded immediately per Special Precaution 2.9.</p> <p><b>BOP</b></p> <ul style="list-style-type: none"> <li>• Performs Section 7.9 <ul style="list-style-type: none"> <li>• Verify that testing of the Overspeed Trip Device and Mechanical Trip Valve is not being conducted. (just determined this as Unsat.)</li> <li>• Place the BACKUP OVERSPEED OVERRIDE SWITCH in the OVERRIDE position.</li> <li>• <u>Depress and HOLD</u> the BACKUP OVERSPEED TRIP-PUSH TO TEST pushbutton for several seconds.</li> <li>• Confirm that the green back-lighting for the BACK-UP OVERSPEED TRIP-PUSH TO TEST pushbutton turns ON.</li> <li>• Release the BACKUP OVERSPEED TRIP-PUSH TO TEST pushbutton. <ul style="list-style-type: none"> <li>• Confirm that the green back-lighting turns OFF. (Will NOT turn OFF)</li> </ul> </li> </ul> </li> <li>• Determine that Section 7.9 is UNSAT.</li> <li>• SRO will call maintenance, Operations Manager and other personnel.</li> </ul>	STP NS930001, Main Turbine Operational Tests	<p>Sat_____ Unsat_____</p> <p>Sat_____ Unsat_____</p>

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Event 4, Backup Lockout Relay trip and Open transfer of Non-essential buses	<p><b>SRO</b></p> <p>Enter AOP 304.1, Loss of 4160V Nonessential Electrical Power.</p> <p>Direct 1C05 operator to perform actions of IPOI 5, Reactor Scram.</p> <p>Direct the BOP operator to perform the actions of AOP 304.1.</p>		Sat_____ Unsat_____

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Event 4	<p><b>1C05</b></p> <p>Perform the actions of IPOI 5.</p> <p>Note these steps may be performed in any order.</p> <ul style="list-style-type: none"> <li>• Verify neutron flux decreasing</li> <li>• Initiate a backup manual scram.</li> <li>• Initiate a level setback to 175". (Not necessary without Feed pumps)</li> <li>• Place the Mode Switch in the SHUTDOWN position.</li> <li>• Verify all control rods inserted.</li> <li>• Verify Recirc pumps runback to 20%. (Not necessary without Recirc pumps)</li> <li>• Insert all SRMs and IRMs.</li> <li>• Maintain reactor pressure below 1110 psig. (Verifies LLS valves are controlling reactor pressure)</li> <li>• Announce over the page that a reactor scram has occurred.</li> <li>• Monitor Main Condenser backpressure.</li> <li>• Check the status of the Main Turbine.</li> <li>• Secure the Main Generator.</li> </ul> <p>Perform actions of ARPs for tripped Recirc Pumps.</p> <p>Direct NSPEO to throttle the Condensate Pump discharge valve in preparation for pump start.</p>	IPOI 5	Sat _____ Unsat _____

<p>Event 4</p>	<p><b>BOP</b>                  Perform the actions directed by AOP 304.1 or as directed by the SRO.</p> <ul style="list-style-type: none"> <li>• Determine that an open transfer of the Nonessential buses has occurred and the buses failed to Auto transfer.</li> <li>• Re-energize 1A1 and 1A2</li> <li>• Verify two GSW pumps are running.</li> <li>• Verify two Well Water pumps are running.</li> </ul> <p>Start "B" Well Water pump.</p>		<p>Sat _____ Unsat _____</p>
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<p>Event 5 GEMAC variable leg break</p>	<p><b>SRO</b> Diagnose variable leg break. Direct BOP operator to lineup to vent the Drywell. Enter EOP 1 and EOP 2 when Drywell pressure exceeds 2 psig. Direct actions of EOP 1.</p> <ul style="list-style-type: none"> <li>• Direct 1C05 operator to maintain RPV level between 170" and 211" using RCIC and CRD.</li> <li>• Direct BOP operator to override CV-4371A Open.</li> </ul> <p>Direct actions of EOP 2</p> <ul style="list-style-type: none"> <li>• Direct 1C05 or BOP operator to install Defeat 4 and maximize Drywell Cooling.</li> <li>• Direct 1C05 or BOP operator to install Defeat 16.</li> <li>• When conditions permit, direct the BOP operator to initiate Torus Spray.</li> </ul>	<p>EOP 1 EOP 2</p>	<p>Sat_____ Unsat_____</p>
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<p>Event 6 Recirc Loop break</p>	<p><b>SRO</b></p> <ul style="list-style-type: none"> <li>• Direct BOP operator to initiate Drywell Spray.</li> <li>• Direct BOP operator to maximize Torus Cooling.</li> <li>• Direct the 1C05 operator to maintain RPV level with SBLC, RCIC, and CRD.</li> <li>• When Drywell temperature cannot be maintained below 280°F, Enter ED contingency.</li> <li>• Direct the BOP operator to open 4 ADS SRVs.</li> </ul> <p>Monitor the Saturation Curve.</p>		<p>Sat_____ Unsat_____</p>
<p>Event 6</p> <p>Event 8 Drywell Spray valves will not open</p>	<p><b>1C05</b> Monitor RPV parameters.</p> <p><b>BOP</b> Attempt to initiate Drywell Spray. <b>Drywell Spray Valves will not open.</b> Maximize Torus Cooling. Send NSPEO to Drywell Spray valves to open manually. Open 4 ADS SRVs. Monitor RPV and containment parameters.</p>		<p>Sat_____ Unsat_____</p>

<p>Events 9 and 10 RPV level instrument oscillations and entry into RPV/F</p>	<p><b>SRO</b></p> <p>Determine that the Saturation Curve has been entered.</p> <p>Directs both operators to increase monitoring of level instrumentation.</p> <p>Recognizes level oscillations.</p> <p>Enter RPV/F.</p> <p>Direct the 1C05 operator to close:</p> <ul style="list-style-type: none"> <li>• MSIVs (if open)</li> <li>• Main Steam Line Drains (if open)</li> <li>• RCIC Steam supply</li> </ul> <p>Direct the BOP operator to increase injection into the RPV with RHR and Core Spray until:</p> <ul style="list-style-type: none"> <li>• 3 or more SRVs are open</li> <li>• RPV pressure at least 50 psig above Torus pressure but as low as possible</li> <li>• RPV pressure not decreasing.</li> </ul>		
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<p>Events 9 and 10</p>	<p><b>1C05</b>                  Close:</p> <ul style="list-style-type: none"> <li>• MSIVs (if open)</li> <li>• Main Steam Line Drains (if open)</li> <li>• RCIC Steam supply</li> </ul> <p><b>BOP</b>                  Inject into the RPV with RHR and Core Spray systems until:</p> <ul style="list-style-type: none"> <li>• 3 or more SRVs are open</li> <li>• RPV pressure at least 50 psig above Torus pressure but as low as possible</li> <li>• RPV pressure not decreasing</li> </ul>		
	<p><b>SRO</b>                  EAL Determination</p>		
<p>When the EAL determination is complete or as directed by the Lead Examiner,</p>	<p>Place the Simulator in <b>FREEZE</b>.</p>		

OSG VALIDATION CHECKLIST

Scenario # ESG 13

- 1  Verify that if not run from a protected IC that setup information is provided to reproduce the stated initial conditions.
- 2  Verify that all stated objectives are identified in the body of the OSG.
- 3  Verify that turn over sheets are completed, and are in agreement with both the narrative summary and shift turnover information sheet. Turn over sheets are not required for initial license scenarios.
- 4  Verify that if the scenario requires documents to be provided to the crew, that they are filled out as appropriate (i.e., if an STP is used, it is filled out).
- 5  If this is the initial validation or the revision affects ramp times, event triggers, malfunctions, overrides, remote functions or procedure changes could affect the scenario, then validate the scenario for proper response using a crew. It is preferable to use a crew unfamiliar with the scenario whenever possible. Verify the following while running the scenario:
  - The scenario runs as written and all tasks are performed.
  - The stated time line agrees with actual times.
  - Critical task statements clearly define the expected plant and student response. They should also be written so that they are achievable as written. If any question exists, it is preferable to have operations management participate in the validation.
  - Anticipated instructor role play/cues are identified
  - Management expectations are captured and re-enforced.
  - Verify administrative documentation requirements (i.e., CMARs / ARs) are identified.
  - Verify reportability requirements (i.e., ESF actuations) are identified.
  - Verify Technical Specification items / LCO declarations are correct. (Contact Licensing as necessary)
  - If procedure steps may cause confusion or disagreement between higher level procedures and OIs/ARPs that operations management is consulted.
- 6 ~~NA~~ Shutdown scenarios include shutdown risk assessment, time to boil calculations and shutdown status board information.

*[Signature]* 2/11/01  
 SME/Instructor Date

\_\_\_\_\_  
 SME/Instructor Date

\_\_\_\_\_  
 SME/Instructor Date

# ***DUANE ARNOLD ENERGY CENTER***

## **INITIAL OPERATOR EXAMINATION SCENARIO GUIDE**

# 11

Rev. 0

DEVELOPED BY: *Michael Fisher* *3/3/2001*  
Instructor Date

VALIDATED BY: *[Signature]* *3/3/2001*  
SME/Instructor Date

REVIEWED BY: *M. Fisher* *3-3-2001*  
Operations Manager Date

APPROVED BY: *[Signature]* *3/3/01*  
Training Supervisor-Operations Date

## NARRATIVE SUMMARY

### Current plant operating status.

It is Saturday morning and the plant is operating at  $\approx$  90% power with End of Cycle coastdown in progress. The upcoming refueling outage has been delayed due to a fuel shipment being damaged by a delivery semi-truck wreck. The outage is scheduled to start in eleven (11) days. One ADS valve, PSV-4402, bellows failure alarm activated yesterday; PSV-4402 has been declared inoperable and T.S. 3.5.1.K actions have been completed. PSV-4402 will be repaired during the refueling outage. Heavy rain last night has caused flood warnings to be declared for the Cedar River.

### Scenario segments

- Crew will be directed to perform a normal power reduction to 80% power by Load Dispatcher request due to low grid load. While the RO is reducing power, the BOP operator will be directed to perform STP 3.6.1.7-01, Drywell - Suppression Chamber Vacuum Breaker Operability Test. The C MSL flow indication will not change with the power reduction and should be caught by the RO.

**10CFR55.45 Objectives:** (2), (5), (6), (12) and (13).

- When the lead evaluator is satisfied with the reactivity evolution, a spurious PCIS Group 6B isolation will occur and MO-2238 will fail to auto close. The crew will be able to manually isolate MO-2238. The SRO should declare MO-2238 and HPCI inoperable and refer to T.S. 3.5.1.F and T.S. 3.6.1.A. Since MO-2239 did close with the isolation, MO-2238 is already isolated so the 4 hour time limit to isolate MO-2238 is not a factor. HPCI inoperable is a 14 day LCO.

**10CFR55.45 Objectives:** (3), (4), (12) and (13).

- Shortly after the PCIS Group 6B isolation failure, the B RFP minimum flow valve, CV-1611 will fail open; investigation will reveal an air leak at the valve operator. The crew should reduce recirc flow and power as necessary to control RPV level and/or RFP suction pressure.

**10CFR55.45 Objectives:** (2), (3), (4), (5), (6), (12) and (13).

- After the NRC evaluators are satisfied with the minimum required reactivity manipulation, the A EHC pump will degrade and EHC pressure will start falling. EHC pressure will reach 1300 psig and the low pressure annunciator will activate, however, the standby EHC pump will fail to auto start and the BOP operator will have to manually start it. The crew should initiate a Work Request. (At the discretion of the Lead Examiner)

**10CFR55.45 Objectives:** (2), (3), (4), (5), (12) and (13).

- Shortly after the EHC Transient, the "E" APRM will spike upscale, however, a rod block and RPS trip will fail to occur. The crew can insert a manual half-scam on the "A" side and/or bypass the "E" APRM. The crew should initiate a Work Request. (At the discretion of the Lead Examiner)

**10CFR55.45 Objectives:** (2), (3), (4), (5), (6), (12) and (13).

- Shortly after the "E" APRM failure, a spurious full PCIS Group 1 occurs causing a reactor scram. Eight (8) control rods will not move when the scram occurs. The control rods will be able to be inserted by manually driving the control rods or repeated manual scram will be effective. The pressure spike caused by the Group 1 isolation will cause LLS to actuate. PSV-4401 and PSV-4407 vacuum breakers are stuck open and a rapid increase in drywell air temperature and pressure occur.

**10CFR55.45 Objectives:** (3), (4), (5), (6), (7), (8), (12) and (13).

- Bus 1A4 will lockout when the 2 psig initiation of core spray occurs. The "A" RHR containment spray enable logic will fail actuate the "A" RHR containment cooling valves. This, combined with the loss of 1A4, will prevent the crew from utilizing torus cooling, torus sprays or drywell sprays to mitigate the LOCA from the stuck-open SRVs with failed vacuum breakers. The failure to be able to cool the containment will allow the containment temperature to exceed 280°F, requiring the crew to emergency depressurize. As RPV pressure decreases, the high containment temperature will cause entry into the Saturation Curve, EOP Graph 1, and thus require RPV Flooding to be performed.

**10CFR55.45 Objectives:** (3), (4), (5), (7), (8), (11), (12) and (13).

## SCENARIO SPECIFICATIONS

DURATION: 90 minutes.

## POSITION SPECIFIC TASKS AND OBJECTIVES

⇒ RO (NSOE, ANSOE)

- ◆ **Generic System Activities**

- ◆ Task 1.02 Monitor system parameters.

- ◆ Task 1.04 Respond to annunciators.

- ◆ **RHR**

- ◆ Task 2.02 Verify auto LPCI loop selected.

- ◆ Task 2.03 Verify auto initiation of LPCI.

- ◆ **Core Spray**

- ◆ Task 4.02 Verify auto initiation.

- ◆ **HPCI**

- ◆ Task 5.00 Monitor the HPCI System.

- ◆ **ADS**

- ◆ Task 8.11 Manually delay or interrupt ADS auto initiation.

- ◆ **Reactor Recirc**

- ◆ Task 12.03 Manually operate speed control from control room.

- ◆ **Electrical**

- ◆ Task 15.00 Monitor the 4160/480 essential electrical distribution system.

- ◆ **RHRSW**

- ◆ Task 30.01 Startup RHRSW system.

- ◆ **Main Steam**

- ◆ Task 48.00 Monitor the main steam system.

- ◆ **EHC**

- ◆ Task 52.00 Monitor the EHC system

- ◆ **APRMs**

- ◆ Task 81.00 Monitor the APRM system.

- ◆ Task 81.03 Bypass an APRM.

- ◆ **IPOIs**

- ◆ Task 93.12 Lower reactor power by 10% with recirc flow when above 35% power.

- ◆ Task 93.22 Perform the immediate operator responses to a reactor scram.

- ◆ **AOPs**

- ◆ Task 94.36 Respond to a loss of 1A4.

- ◆ **EOPs**

- ◆ Task 95.06 Perform reactor scram using repeated manual scram.

- ◆ Task 95.08 Insert control rods by increasing CRD cooling flow and pressure.
- ◆ Task 95.09 Insert control rod by manually driving control rods.
- ◆ Task 95.14 Perform EOP Defeat 4.
- ◆ Task 95.26 Perform EOP Defeat 16
- ◆ Task 95.50 Control RPV level -30" to +211" during an ATWS.
- ◆ Task 95.56 Perform /P to control RPV pressure during an ATWS.
- ◆ Task 95.57 Perform /Q to reduce reactor power or scram the reactor.
- ◆ Task 95.63 Perform DW/T leg of EOP 2.
- ◆ Task 95.80 Perform an emergency depressurization using SRVs.
- ◆ Task 95.85 Perform RPV/F actions with the reactor shutdown.

⇒ Shift Supervisor (SS)

- ◆ **Supervise Plant Operations**

- ◆ Task 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.
- ◆ Task 1.02 Determine operability for Technical Specification required components.
  - 1.02.01 Determine the portions of Technical Specification applicable to that instrument, component or system.
  - 1.02.02 Determine if the instrument, component or system is operable.
  - 1.02.03 Declare the instrument, component, or system inoperable, enter the correct LCO and determine and direct performance of the LCO STP.
- ◆ Task 1.03 Determine reportability
  - 1.03.01 Determine the reportability of the event.
  - 1.03.02 Make the appropriate notifications
- ◆ Task 1.11 Ensure the conduct of plant operations and maintenance are in compliance with administrative procedures.

- ◆ **Perform Emergency Duties**

- ◆ Task 3.01 Implement Emergency Plan
  - 3.01.01 Declare the appropriate Emergency Action Level (EAL).
- ◆ IPOIs
- ◆ Task 4.11 Direct crew actions to lower reactor power by 10% with recirc flow when above 35% power.
  - 4.11.01 Direct the control room crew to lower reactor power using recirc flow.
  - 4.11.02 Monitor power descension.

- ◆ Task 4.21 Direct crew actions to perform the immediate operator responses to a reactor scram.
  - 4.21.01 Direct the operator to insert a manual scram.
  - 4.21.02 Direct the confirmation that the reactor is shutdown.
  - 4.21.03 Direct the operator performance of the IPOI 5 immediate actions.
  - 4.21.04 Direct the operator performance of the IPOI 5 follow-up operator actions.
- ◆ AOPs
- ◆ Task 5.36 Direct crew response to a loss of 1A4.
  - 5.36.01 Check automatic actions for immediate concerns
  - 5.36.03 Evaluate plant status and determine necessary mitigation strategies.
- ◆ EOPs
- ◆ Task 6.06 Direct crew response to perform reactor scram using repeated manual scram.
  - 6.06.01 Direct operator actions to insert control rods using RIP 102.1
- ◆ Task 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.
- ◆ Task 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 103.2.
- ◆ Task 6.14 Direct crew response to perform EOP Defeat 4.
  - 6.14.01 Direct operator actions to install EOP Defeat 4.
- ◆ Task 6.26 Direct crew response to perform EOP Defeat 16.
  - 6.26.01 Direct operator actions to override the containment sample valves Group 3 PCIS isolation using EOP Defeat 16.
- ◆ Task 6.50 Direct crew response to control RPV level -30" to +211" during ATWS.
  - 6.50.01 Direct operator actions to lockout ADS.
  - 6.50.02 Direct operator actions to control RPV level between +15" and +211" with injection systems.
- ◆ Task 6.56 Direct crew response to perform /Q to reduce power/scram the reactor during ATWS.
  - 6.56.01 Verify that the 1C05 operator has placed the reactor mode switch to the SHUTDOWN position.
- ◆ Task 6.57 Direct crew response to perform /P to control RPV pressure during an ATWS.
  - 6.57.05 Direct operator actions to augment RPV pressure control with the available systems listed in the /P leg of EOP ATWS.

- ◆ Task 6.62 Direct crew response for performance of the T/T leg of EOP 2.
- ◆ Task 6.63 Direct crew response for performance of the DW/T leg of EOP 2.
  - 6.63.01 Direct operator actions to maintain drywell air temperature <150 degrees-F using drywell cooling systems and bypassing the main intake coils if necessary.
  - 6.63.02 Direct operator actions to maximize drywell cooling by installing EOP Defeat 4 and bypassing the main intake coils.
- ◆ Task 6.64 Direct crew response for performance of the DW/P leg of EOP 2.
- ◆ Task 6.78 Direct crew response for performance emergency depressurization.
  - 6.78.01 Direct operator actions to control injection into the RPV.
  - 6.78.03 Confirm torus level is above 4.5 feet.
  - 6.78.04 Direct operator actions to emergency depressurize the RPV.
  - 6.78.05 Exit the ED EOP Contingency and enter the RC/P leg of EOP 1.
- ◆ Task 6.85 Direct crew response for performance of RPV/F with the reactor shutdown.
  - 6.85.02 Answer the applicable decision blocks to determine if the MSIVs, MSL drains and RCIC steam supply line should be isolated.
  - 6.85.03 Direct operator actions to isolate the MSIVs, MSL drains, and RCIC steam supply.
  - 6.85.04 Direct operator actions to line up and inject with the Table 7 systems to establish directed conditions.
  - 6.85.05 Direct operator actions to maintain the conditions with RPV pressure as low as possible for the Minimum Core Flooding Interval.

⇒ Shift Manager (SM)

- ◆ NONE

⇒ STA

- ◆ None

## **SCENARIO OBJECTIVE SUMMARY**

1. Conduct a power reduction using recirc flow.
2. Perform STP 3.6.1.7-01
3. Address a PCIS Group 6B isolation with a failure.
4. Address a Feedwater and EHC transient.
5. Address an APRM failure.
6. Perform EOP ATWS.
7. Perform EOP 2.
8. Perform RPV/F.

## **SCENARIO CHALLENGES**

1. Inserting control rods while addressing primary containment problems.
2. SS fails to conduct a crew brief before performing emergency depressurization.

## **PRE-SCENARIO ACTIVITIES**

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

- Examiner Standard ES 302 and Appendix E.

## SHIFT TURNOVER INFORMATION

- ⇒ Day of week and shift
  - ◆ Saturday, Dayshift 0700-1900
- ⇒ Weather conditions
  - ◆ Raining, heavy rains last night up north have caused flood warnings to be issued for areas along the Cedar River.
- ⇒ (Plant power levels)                      89% Pwr
  - ◆ 1393 MWT
  - ◆ 496 MWE
  - ◆ 49 Mlbm/hr CORE FLOW
- ⇒ Thermal Limit Problems/Power Evolutions
  - ◆ The Load Dispatcher has just called and requested DAEC to reduce power to 80% due to no available market for our power.
  - ◆ EOC Coastdown in progress due to fuel shipment being damaged.
- ⇒ Existing LCOs, date of next surveillance
  - ◆ PSV-4402, bellows failure occurred yesterday at 1041, still day 1 of 30. Shutdown will wait for the refueling outage. The SRV Bellows Failure annunciator, 1C03A, C-7, was unmasked at 1410 by use of a temporary modification.
- ⇒ STPs in progress or major maintenance
  - ◆ STP 3.6.1.7-01, Drywell - Suppression Chamber Vacuum Breaker Operability Test needs to be performed today.
- ⇒ Equipment to be taken out of or returned to service this shift/maintenance on major plant equipment
  - ◆ None
- ⇒ Comments, evolutions, problems, etc.
  - ◆ Refueling outage to start in 11 days. It was delayed by a fuel shipment being damaged in a delivery semi-truck wreck.
  - ◆ 1D45, Uninterruptible AC inverter, is tagged out for maintenance and 1Y4, Regulating Transformer is supplying 1Y23, the Uninterruptible AC bus.
  - ◆ Breaker 1B6232, supply to SJAЕ condensate return pump 1P-133B was found in the trip free condition and the pump was found seized. It is tagged out and will be replaced first thing Monday Morning.

## SIMULATOR SETUP

### 1. GENERAL INSTRUCTIONS

- a. Reset to IC-27.
- b. Verify event trigger 1 is PCPDWG .GT. 2.
- c. No malfunction files to restore.
- d. Insert the malfunctions listed as "Pre-insert" from the Malfunction Table.
- e. No override files to restore.
- f. Insert the overrides listed as "Pre-insert" from the Override Table.
- g. No remote functions files to restore.
- h. Insert remote function SW15 (river water level) at 737 and then ramp it to 742 feet on a three (3) hour ramp.
- i. Have YELLOW Bound pull sheet marked up for use.
- j. No leakage calculations required.
- k. Pump the Drywell Equipment and Floor Drain sumps during setup.
- l. Verify that the APRM GAFs are set correctly.
- m. Verify the Recirc and FRV Moore controllers are in AUTO.
- n. Verify total core flow is  $\leq 49$  Mlbm/hr.
- o. Set Simulator clock for simulated scenario time.
- p. ROLL CHART RECORDERS.

### 2. LIST OF EVENT TRIGGERS

Trigger Number	Trigger File Name	Trigger Logic Statement	Trigger Word Description
1	N/A	PCPDWG .GT. 2	Drywell Pressure >2 psig
2	N/A	Manually Activated	N/A
3	N/A	Manually Activated	N/A
4	N/A	Manually Activated	N/A
5	N/A	Manually Activated	N/A
6	N/A	Manually Activated	N/A
7	N/A	Manually Activated	N/A
8	N/A	Manually Activated	N/A

### 3. LIST OF MALFUNCTIONS

Time	Malfunction No.	Malfunction Title	ET	Delay	F. Sev.	Ramp	I. Sev.
Pre-insert	AD04D	PSV-4402 Bellows Failure	N/A	0	N/A	N/A	N/A
Pre-ins.	ED08D	1A4 Bus Fault	1	10	N/A	N/A	N/A
Pre-ins.	AD08B1	PSV-4401 Tailpipe Vacuum Breaker Stuck open	N/A	0	N/A	N/A	N/A
Pre-ins.	AD08E1	PSV-4407 Tailpipe Vacuum Breaker Stuck open	N/A	0	N/A	N/A	N/A
Pre-ins.	STNM59	E APRM Fails to Trip Upscale	N/A	0	N/A	N/A	N/A
Pre-ins.	MS31C	MO-2238 Fails to Auto Close	N/A	0	N/A	N/A	N/A
Pre-ins.	MS09C	C MSL Flow Transmitter Fails As Is	N/A	0	0.78	0	AsIs
Pre-ins.	RD021435	Control Rod 14-35 Stuck	N/A	0	N/A	N/A	N/A
Pre-ins.	RD023031	Control Rod 30-31 Stuck	N/A	0	N/A	N/A	N/A
Pre-ins.	RD022219	Control Rod 22-19 Stuck	N/A	0	N/A	N/A	N/A
Pre-ins.	RD023011	Control Rod 30-11 Stuck	N/A	0	N/A	N/A	N/A
Pre-ins.	RD021831	Control Rod 18-31 Stuck	N/A	0	N/A	N/A	N/A
Pre-ins.	RD020223	Control Rod 02-23 Stuck	N/A	0	N/A	N/A	N/A
Pre-ins.	RD023835	Control Rod 38-35 Stuck	N/A	0	N/A	N/A	N/A
Pre-ins.	RD021015	Control Rod 10-15 Stuck	N/A	0	N/A	N/A	N/A
As Dir.	MS30A	Group 6B Isolation, Logic A	2	0	N/A	N/A	N/A
As Dir.	MS30B	Group 6B Isolation, Logic B	2	0	N/A	N/A	N/A
As. Dir.	FW10B	B RFP Min. Flow Valve Opens	3	0	N/A	N/A	N/A
As Dir.	TC12	EHC Leak	4	0	0.10	2:00	0
As Dir.	NM08E	E APRM Failure	5	0	1.00	0	AsIs
As Dir.	MS19A	Group 1 Isolation, Logic A	6	0	N/A	N/A	N/A
As Dir.	MS19B	Group 1 Isolation, Logic B	6	0	N/A	N/A	N/A
As Dir.	AD01B	PSV-4401 Fails Open	7	0	0.20	180	AsIs
As Dir.	AD01H	PSV-4407 Fails Open	7	0	0.20	300	AsIs
As Dir.	RR33	NR GEMAC and Fuel Zone RPV Level Oscillations	8	0	N/A	N/A	N/A
Pre-ins.	AN:1C07A[3]	EHC Pump HS Not in Auto	N/A	N/A	OFF	N/A	N/A
Pre-ins.	AN:1C03A[25}	SRV Bellows Failure	N/A	N/A	OFF	N/A	N/A

4. LIST OF OVERRIDES

Time	Override No.	Override Title	ET	Delay	Value.	Ramp
Pre-insert	ZDITCHS3665B	B EHC Pump Handswitch			Stop	
Pre-insert	ZDIRHHS2001C	A RHR Containment Spray Enable			Reset	

5. LIST OF REMOTE FUNCTIONS

Time	TAG	Title	Value
Pre-insert	SW15	River water level	742

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
t = 0 Shift Turnover	Direct the candidates to conduct panel walkdowns. Provide shift turnover information.	<ul style="list-style-type: none"> <li>• Become familiar with plant conditions and accept the shift.</li> </ul>
t = 0 to 15 minutes Power decrease with Recirc. STP 3.6.1.7-01 Drywell - Suppression Chamber Vacuum Breaker Operability Test.	<p><b>ROLE PLAY</b> as I&amp;C Technicians (called at home), acknowledge the communication from the crew and report that you will be heading out to the plant.</p> <p><b>ROLE PLAY</b> as the inplant operator called to check FT-4410, acknowledge the communication from the crew and report back in two minutes that the FT-4410 rack valves and isolation valves at 1C126B are in the proper position.</p>	<p>SRO</p> <ul style="list-style-type: none"> <li>• Provide crew briefing on the power reduction evolution and the vacuum breaker STP. (Task 1.01 and Perf. Objs. 1.01.02 and 1.01.03)</li> <li>• Direct the reactor operator (RO) to reduce reactor power to 80% of rated at a rate of 2 - 4 MWe/minute by decreasing reactor recirc flow. Monitors the power change. (Task 4.11 and Perf. Objs. 4.11.01 and 4.11.02)</li> <li>• Direct the BOP operator to perform STP 3.6.1.7-01, Drywell - Suppression Chamber Vacuum Breaker Operability Test.</li> <li>• Initiates a Work Request for the C MSL FI/FT-4410 and calls for I&amp;C support. May check T.S. 3.3.6.1, should not be a problem since different instruments are used for MSL high flow isolation.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>• Reduce reactor power using reactor recirc, by adjusting both Recirc MG Set Speed Controller, SIC-9245A/B in small equal increments keeping loop flows balanced. (Task 12.03)</li> <li>• Monitors rate of power change, recirc discharge flow, total core flow, total steam flow, total feed flow and APRM power at 1C04 and 1C05 and generator output at 1C08 per OI-264 and IPOI-3. (Task 93.12)</li> <li>• Determines that C MSL flow indication, FT-4410 is not responding. (Tasks 1.02 and 48.00)</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Perform STP 3.6.1.7-01, Drywell - Suppression Chamber Vacuum Breaker Operability Test.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>When directed by the lead evaluator.</p> <p>Spurious PCIS Group 6B for HPCI occurs.</p>	<p>Activate Event Trigger # 2 to insert the spurious PCIS Group 6B isolation</p> <p>Verify that <b>MS30A</b> and <b>MS30B</b> become active.</p> <p>Then immediately delete both malfunctions.</p> <p><b>DMF MS30A</b></p> <p><b>DMF MS30B</b></p> <p><b>ROLE PLAY</b> as I&amp;C Technicians (called at home), acknowledge the communication from the crew and report that you will be heading out to the plant.</p> <p>If directed to open breaker 1B3453 to deenergize MO-2238 enter the following:</p> <p><b>ROR MO2238</b> <b>IMF HP10B</b></p> <p>If directed to open breaker 1D4109 to deenergize MO-2239 perform the following:</p> <ul style="list-style-type: none"> <li>• <b>ROR MO2239</b> <b>IMF STHP01</b></li> </ul>	<p>SRO (Tasks 1.02, 1.03, 1.11, Perf. Objs. 1.02.01-1.02.03, 1.03.01, 1.03.02)</p> <ul style="list-style-type: none"> <li>• Directs MO-2238 be manually closed.</li> <li>• Directs investigation of the cause of the Group 6B isolation</li> <li>• Declares MO-2238 and HPCI inoperable: <ul style="list-style-type: none"> <li>• Per T.S. 3.5.1.F, HPCI inop has required actions of RCIC being verified operable by administrative means immediately AND HPCI restored to operable within 14 days. <ul style="list-style-type: none"> <li>• Using the PC in the OSS office, access the CHAMPS database and verify the RCIC STPs are up to date.</li> </ul> </li> <li>• Per T.S.3.6.1.3.A, MO-2238 inop requires the affected penetration flow path to be isolated within 4 hrs. This will require the crew to direct MO-2238 or MO-2239 to be de-energized in the closed position.</li> </ul> </li> <li>• Initiates an Action Request per ACP 114.5 and calls for I&amp;C support.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Responds to the HPCI isolation, confirms MO-2238 should have closed and reports the MO-2238 failure to isolate to the Shift Supervisor (SS). (Task 1.02, 1.04, and 5.00)</li> <li>• Manually closes MO-2238 immediately OR when directed by the SS.</li> <li>• Checks the HPCI Auto Isolation Initiated annunciators, 1C03C, A-8 and/or 1C03C, A-9 ARPs for required actions.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>• Monitors 1C05 parameters.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>When directed by the lead evaluator.</p> <p>B RFP Min. Flow Valve. CV-1611 failure</p>	<p>Activate Event Trigger # 3 to fail CV-1611, B RFP min. flow valve open. Verify <b>FW10B</b> becomes active.</p> <p><b>ROLE PLAY</b> as the Aux Operator when directed to check the status the B RFP min. flow valve, CV-1611. If you are sent to the Heater Bay, ask if you are to do an Emergency Entry. If directed to perform an Emergency Entry, wait (4) minutes and report that the air line at the valve operator has broken at the fitting on the valve operator. You cannot get tape to stop the leak if so directed.</p> <p>If told to do a normal entry, wait 10 minutes and give the same report as above.</p>	<p>SRO</p> <ul style="list-style-type: none"> <li>• Directs power reduced with recirc if necessary to maintain RPV level and/or adequate suction pressure for the RFPs.</li> <li>• Initiates a Work Request and calls for mechanical maintenance support.</li> <li>• If the aux. op is directed to perform an Emergency Entry, directs the duty HP to provide support.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>• Observes the B RFP minimum flow valve, CV-1611, is open and communicates it to the SS. (Task 1.02)</li> <li>• Directs the inplant operator to enter the heater bay and check out the minimum flow valve, CV-1611.</li> <li>• Monitors and controls RPV level and RFP suction pressure by reducing recirc flow if necessary.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Assists as directed.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>When directed by the lead evaluator.</p> <p>A EHC Pump degrades. (At the discretion of the Lead Examiner)</p>	<p><b>READ this entire section before taking any actions.</b></p> <p>You will need to delete override ZDITCHS3665B as soon as the operator tries to manually start the B EHC pump.</p> <p>If you are late in allowing the standby pump to start, the crew may scram the reactor.</p> <p><b>DOR ZDITCHS3665B</b></p> <p>Then <b>IMMEDIATELY</b> delete the EHC leak.</p> <p><b>SEQUENCE OF ACTIONS:</b></p> <ol style="list-style-type: none"> <li>1. <b>Activate Event Trigger 4</b> and verify that <b>TC12 12 120</b> becomes active (starts the EHC leak and pressure reduction)</li> <li>2. <b>Delete Override ZDITCHS3665B</b> when the operator takes the B EHC pump handswitch to start.</li> <li>3. <b>DMF TC12</b></li> </ol> <p><b>ROLE PLAY</b> as the aux. operator to check the EHC system, wait two minutes and report that the A EHC pump, 1P-97A, sounds bad. If it has been secured, report everything looks satisfactory.</p>	<p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Notices the EHC pressure falling or responds to the EHC FLUID LO PRESSURE annunciator, 1C07A, D-3. (Tasks 52.00 1.04)</li> <li>• Notices the standby EHC pump, A EHC pump, 1P-97A, has failed to auto start, manually starts the standby pump, checks the EHC parameters, confirms EHC pressure is restored and communicates all this to the SS.</li> <li>• Secures the B EHC pump, 1P-97B.</li> <li>• Sends the aux. operator to check out the EHC system.</li> </ul> <p>SRO</p> <ul style="list-style-type: none"> <li>• Directs the standby EHC pump, 1P-97B, started if the BOP operator fails to start it on his/her own.</li> <li>• Confirms the EHC parameters return to normal</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>When directed by the lead evaluator.</p> <p>E APRM spikes upscale and fails to produce a rod block or scram signal. (At the discretion of the Lead Examiner)</p>	<p>Cause the E APRM to spike upscale by inserting the malfunction and immediately deleting it.</p> <p>Activate Event Trigger # 5.</p> <p><b>NM08E 100</b></p> <p><b>DMF NM08E</b></p>	<p>RO</p> <ul style="list-style-type: none"> <li>• Acknowledges the APRM UPSCALE annunciator, 1C05A, C-2. (Tasks 1.04, 81.00 and 81.03)</li> <li>• Checks the E APRM recorder and notices that the pen went upscale before returning to normal and realize the ROD OUT BLOCK annunciator, 1C05B, A-6, the APRM A, C, E UPSCALE TRIP OR INOP annunciator, 1C05A, B-2 and the NEUTRON MONITORING SYSTEM TRIP annunciator, 1C05A, A-5 all failed to activate and communicates this to the SS.</li> <li>• Takes one or more of the following allowed responses:  Inserts a manual half-scram on the A RPS logic    AND/OR  Bypasses E APRM,            OR  Inserts a full scram  As directed by the SS or by their own initiative.</li> </ul> <p>SRO</p> <ul style="list-style-type: none"> <li>• Acknowledges the report and/or actions from the BOP operator.</li> <li>• If not already taken by the RO, directs one or more of the following allowed responses:  Insert a manual half-scram on the A RPS logic    AND/OR  Bypass E APRM,            OR  Insert a full scram</li> <li>• If a full scram is not initiated, initiates a Work Request and/or Action Request and notifies I&amp;C to investigate.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>If the crew inserts a full scram or when directed by the lead evaluator.</p>	<p>Activate Event Trigger # 6 to insert a full Group 1 MSIV closure:</p> <p>Verify the following malfunctions become active:</p> <p><b>MS19A</b></p> <p><b>MS19B</b></p> <p><b>ED08D</b> (after Drywell Pressure increase.)</p>	<p>RO/BOP Operator/SRO</p> <ul style="list-style-type: none"> <li>• Recognize and announce the PCIS Group 1 isolation to the rest of the crew.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>• Recognize all rods did not fully insert and communicate the ATWS condition to the SS.</li> <li>• Scrams the reactor prior to the high drywell pressure auto scram and carries out the immediate actions of IPOI-5, Reactor Scram: <ul style="list-style-type: none"> <li>• Verify neutron flux decreasing. *</li> <li>• Insert a backup manual scram.</li> <li>• Control RPV level 170" - 211".</li> <li>• Place the mode switch in SHUTDOWN.</li> <li>• Verify all rods Full-In. *</li> <li>• Verify recirc runback to minimum.</li> <li>• Insert SRMs and IRMs.*</li> <li>• Announce the scram over the plant page.*</li> <li>• Check the status of the main turbine and generator. (Task 93.22)</li> </ul> </li> </ul> <p>(* Will be delayed due to ATWS)</p> <p>SRO</p> <ul style="list-style-type: none"> <li>• Directs the RO to perform IPOI-5 immediate actions. (Task 4.21 and Perf. Objs. 4.21.01-4.21.04)</li> <li>• Enters EOP-1 and EOP-2 when LLS actuates and causes drywell pressure to exceed 2 psig.</li> <li>• Enters EOP ATWS when he/she receives the report that not all rods are full in.</li> <li>• Directs the BOP Operator to monitor containment pressure.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Assists the RO with IPOI-5 actions until LLS actuates then he/she will monitor and communicate containment pressure and temperature to the SS</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>The crew recognizes the ATWS condition.</p>	<p><b>ROLE PLAY</b> as the aux operator if sent to investigate the loss of 1A4, and report that the B core spray pump breaker is damaged. If directed to rack it down, report that the racking motor will not move the breaker.</p> <p>Monitor the Rod Display screen on the instructor station PPC terminal and When the RO has increased CRD cooling water flow and attempts to insert control rods, Delete the RD02 malfunction for the selected rod.</p> <p><b>DMFRD02XXXX</b></p> <p><b>XXXX = the selected rod coordinates</b></p> <p>If the RO/BOP Operator uses RIP 102.1, Repeated Manual Scram, Delete as many of the RD02 malfunctions as possible between the time that the scram is reset and a manual scram is re-inserted.</p>	<p>SRO (Tasks 6.06, 6.08, 6.09, 6.50, 6.56, 6.57, and Perf. Objs. 6.06.01, 6.08.01, 6.09.01, 6.50.01, 6.56.01, 6.57.05)</p> <ul style="list-style-type: none"> <li>• Recognizes and communicates the loss of 1A4 and when resources permit, direct an operator to try to determine the cause of the loss of 1A4. (Task 5.36 and Perf. Objs. 5.36.01 and 5.36.03)</li> <li>• Enters EOP ATWS and directs the following: <ul style="list-style-type: none"> <li>• /L Leg: <ul style="list-style-type: none"> <li>• Directs ADS locked out.</li> <li>• RPV level controlled between +15" and +211".</li> <li>• SRO should direct a narrower band in between.</li> </ul> </li> <li>• /P Leg: <ul style="list-style-type: none"> <li>• Verifies that LLS is functioning correctly determines that PSV-4401 and PSV-4407 are stuck open.</li> </ul> </li> <li>• /Q Leg: <ul style="list-style-type: none"> <li>• Follows the first Continuous Recheck Statement and exits the /Q Leg, directs entry into IPOI 5 and performance of the Hydraulic ATWS Rod Insertion Procedures (RIPs).</li> </ul> </li> </ul> </li> <li>• Directs HPCI locked out due to its affect on reactor power.</li> </ul>
<p>When LLS actuates,</p>	<p>Fail PSV-4401 and PSV-4407 partially open.</p> <p>Activate Event Trigger # 7 and verify the following malfunctions become active:</p> <p><b>AD01B 0.20 180</b></p> <p><b>AD01H 0.20 300</b></p>	<p>RO</p> <ul style="list-style-type: none"> <li>• Performs RIP 103.2, Increase CRD Cooling Flow and Pressure. (Task 95.08)</li> <li>• Performs RIP 103.3, Manually Drive Control Rods. (Tasks 95.09 and 95.57)</li> <li>• Performs RIP 102.1, Repeated Manual Scram. (Task 95.06)</li> <li>• Communicates rod insertion status to the SS as it changes.</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>The crew recognizes the ATWS condition. (CONT'D)</p>		<ul style="list-style-type: none"> <li>• Uses condensate and feedwater to control RPV level in the directed band. (Task 95.50)</li> <li>• Monitors and communicates reactor power to the shift supervisor.</li> <li>• Recognizes lowering RPV pressure and communicates it to the SS.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Recognize and communicate to the SS the loss of 1A4 and thus B side core spray and RHR.</li> <li>• Perform any pressure control actions directed. (Task 95.56)</li> <li>• Locks out ADS when directed. (Task 8.11)</li> <li>• Locks out HPCI if directed.</li> <li>• Performs RIP 102.1, Repeated Manual Scram. (Task 95.06)</li> <li>• Recognizes LLS, PSV-4401 and PSV-4407, are not cycling as expected and communicates it to the SS.</li> <li>• Investigates the cause of loss of 1A4. (Tasks 15.00 and 94.36)</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>The crew recognizes the EOP-2 entry.</p>	<p><b>ROLE PLAY</b> as I&amp;C when contacted about HS-2001C, Containment Enable, acknowledge the report from the control room and inform them that you will start looking at the prints to figure out what could be causing the problem.</p>	<p>SRO (Tasks 6.14, 6.26, 6.62, 6.63, and 6.64 and Perf. Objs. 6.14.01, 6.26.01, 6.63.01, 6.63.02)</p> <ul style="list-style-type: none"> <li>• Enters EOP-2 and directs the following: <ul style="list-style-type: none"> <li>• PC/H Leg: Directs EOP Defeat 16 installed.</li> <li>• T/L Leg: Periodically checks torus level.</li> <li>• T/T Leg: Directs the BOP operator to initiate torus cooling and when he/she gets the report that the containment enable handswitch, HS-2001C, will not work realizes that the torus cooling, torus spray, and drywell spray modes of RHR are inoperable.</li> <li>• DW/T Leg: <ul style="list-style-type: none"> <li>• Directs installation of EOP Defeat 4 and bypass of the main intake coils.</li> <li>• Enters the Emergency Depressurization contingency when it is recognized that drywell temperature cannot be maintained below 280°F.</li> </ul> </li> <li>• PC/P Leg: Periodically monitors the status of the Pressure Suppression Graph, EOP Graph 5.</li> </ul> </li> <li>• Directs I&amp;C support of HS-2001C failure investigation.</li> <li>• Enters Emergency Depressurization when it is recognized that drywell temperature cannot be maintained below 280°F.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Verifies proper ECCS initiations. (Tasks 2.02, 2.03, and 4.02)</li> <li>• Performs EOP Defeat 16 when directed. (Task 95.26)</li> <li>• Attempts to initiate torus cooling when directed, recognizes that the containment enable switch, 2001C, does not work and communicates this information to the SS. (Task 30.01)</li> <li>• Performs EOP Defeat 4 and bypasses the main intake coils when</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
<p>The crew enters the ED contingency.</p>	<p>When the 4 ADS SRVs are opened for ED modify malfunctions AD01B and AD01H to 100% severity.</p> <p>When the Saturation Curve has been entered, insert the RPV level oscillation malfunction:</p> <p>Activate Event Trigger # 8</p> <p>Verify that malfunction <b>RR33</b> becomes active.</p>	<p>directed. (Tasks 95.14 and 95.63)</p> <p>SRO</p> <ul style="list-style-type: none"> <li>• Provides a crew briefing about controlling injection from low pressure ECCS systems.</li> <li>• Directs the steps of the ED contingency: (Task/Perf. Objs. 6.78/6.78.01/.03-.05) <ul style="list-style-type: none"> <li>• Verifies torus level &gt;4.5 feet.</li> <li>• Directs the BOP operator to open the 4 ADS SRVs.</li> <li>• Verifies 3 or more SRVs are opened.</li> <li>• Determines if RPV level can be determined (checks Saturation Curve status)</li> </ul> </li> <li>• Monitors the Saturation Curve status, EOP Graph 1, recognizes entry and enters the RPV Flooding (RPV/F) contingency.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>• Maintains the directed level band with condensate and feedwater.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Opens 4 ADS valves when directed. (Task 95.80)</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
The crew enters the RPV/F contingency.	When RPV/F is entered: DMF AD01B DMF AD01H	<p>SRO</p> <ul style="list-style-type: none"> <li>• Provides a crew briefing about RPV/F, required flooding conditions and which systems that will be used to establish the flooding conditions.</li> <li>• Directs the steps of the RPV/F contingency: (Task/Perf. Objs. 6.85/6.85.02-6.85.05) <ul style="list-style-type: none"> <li>• Verifies the reactor is shutdown.</li> <li>• Verifies that at least 3 SRVs can be opened.</li> <li>• Verifies that the MSIVs, MSL Drains and RCIC steam supply are isolated.</li> <li>• Directs the RO and BOP operator to coordinate condensate, core spray and RHR injection to establish the RPV/F conditions of: (Task 95.85) <ul style="list-style-type: none"> <li>• 3 or more SRVs open AND</li> <li>• RPV pressure <math>\geq 50</math> psig above torus pressure AND</li> <li>• RPV pressure not decreasing.</li> </ul> </li> <li>• Determines that the above conditions can be achieved.</li> <li>• Directs control of RPV pressure to maintain 3 or more SRVs open and RPV pressure at least 50 psig above torus pressure, but as low as possible by directing the coordination of reducing injection flow by the RO and BOP Operator. Condensate should be the first system secured to minimize the torus level rise.</li> <li>• Directs I&amp;C to verify the RPV level instrumentation status.</li> <li>• Monitors drywell temperature and exit of the RPV saturation curve.</li> </ul> </li> <li>• Declares an EAL. (Task 3.01 and Perf. Obj 3.01.01)</li> </ul>

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
		RO and BOP Operator <ul style="list-style-type: none"> <li>• Commence injection into the RPV using the directed systems.</li> <li>• Establish the RPV/F conditions.</li> <li>• Reduce injection to control RPV pressure and torus level as directed.</li> </ul>
When the plant is stable <b>AND</b> When directed by the lead evaluator.	Place the simulator in <b>FREEZE</b> and announce to the crew:  "The simulator is paused and the scenario is complete, please stand by your station and do not talk to any other crew member about this exercise until follow-up questioning has been completed and you are released by your evaluator."	SRO/RO/BOP Operator <ul style="list-style-type: none"> <li>• Remain at their station and <b>DO NOT</b> discuss the exercise with each other until released by their evaluator.</li> </ul>

## REFERENCES

1. STP 3.6.1.7-01, Drywell - Suppression Chamber Vacuum Bkr Op Test
2. OI 264
3. IPOI-3
4. ACP 114.5
5. ARP 1C03C, A-8
6. ARP 1C03C, A-9
7. Technical Specifications
8. OI-644
9. 1C07A, D-3
10. OI-693.2
11. ARP 1C05A, C-2
12. ARP 1C05A, B-2
13. ARP 1C05A, A-5
14. ARP 1C05B, A-6
15. OI-878.4
16. IPOI-5
17. EOP 1
18. EOP 2
19. EOP ATWS
20. Emergency Depressurization
21. RPV Flood
22. EPIP 1.1

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Power Reduction and STP performance.	<p>SRO</p> <ul style="list-style-type: none"> <li>• Provide crew briefing on the power reduction evolution and the vacuum breaker STP.</li> <li>• Direct the reactor operator (RO) to reduce reactor power to 80% of rated at a rate of 2 - 4 MWe/minute by decreasing reactor recirc flow. Monitors the power change.</li> <li>• Direct the BOP operator to perform STP 3.6.1.7-01, Drywell - Suppression Chamber Vacuum Breaker Operability Test.</li> <li>• Initiates a Work Request for the C MSL FI/FT-4410 and calls for I&amp;C support.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>• Reduce reactor power using reactor recirc, by adjusting both Recirc MG Set Speed Controller, SIC-9245A/B in small equal increments keeping loop flows balanced.</li> <li>• Monitors rate of power change, recirc discharge flow, total core flow, total steam flow, total feed flow and APRM power at 1C04 and 1C05 and main generator output at 1C08 per OI-264 and IPOI-3.</li> <li>• Determines that C MSL flow indication, FT-4410 is not responding.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Perform STP 3.6.1.7-01, Drywell - Suppression Chamber Vacuum Breaker Operability Test.</li> </ul>	<p>STP 3.6.1.7-01, Drywell - Suppression Chamber Vacuum Bkr Op Test</p> <p>OI 264</p> <p>IPOI-3</p>	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
<p>HPCI Isolation and MO-2238 Failure to isolate.</p>	<p>SRO</p> <ul style="list-style-type: none"> <li>• Directs MO-2238 be manually closed.</li> <li>• Directs investigation of the cause of the Group 6B isolation</li> <li>• Declares MO-2238 and HPCI inoperable: <ul style="list-style-type: none"> <li>• Per T.S. 3.5.1.F, HPCI inop has required actions of RCIC being verified operable by administrative means immediately AND HPCI restored to operable within 14 days. <ul style="list-style-type: none"> <li>• Using the PC in the OSS office, access the CHAMPS database and verify the RCIC STPs are up to date.</li> </ul> </li> <li>• Per T.S.3.6.1.3.A, MO-2238 inop requires the affected penetration flow path to be isolated within 4 hrs. This will require the crew to direct MO-2238 or MO-2239 to be de-energized in the closed position.</li> </ul> </li> <li>• Initiates an Action Request per ACP 114.5 and calls for I&amp;C support.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Responds to the HPCI isolation, confirms MO-2238 should have closed and reports the MO-2238 failure to isolate to the Shift Supervisor (SS).</li> <li>• Manually closes MO-2238 immediately OR when directed by the SS.</li> <li>• Checks the HPCI Auto Isolation Initiated annunciators, 1C03C, A-8 and/or 1C03C, A-9 ARPs for required actions.</li> </ul>	<p>ACP 114.5</p> <p>ARP 1C03C, A-8</p> <p>ARP 1C03C, A-9</p> <p>Technical Specifications</p>	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
HPCI Isolation and MO-2238 Failure to isolate. (CONT'D)	RO <ul style="list-style-type: none"> <li>• Monitors 1C05 parameters.</li> </ul>		
B RFP minimum flow valve, CV-1611 fails open	SRO <ul style="list-style-type: none"> <li>• Directs power reduced with recirc if necessary to maintain RPV level and/or adequate suction pressure for the RFPs.</li> <li>• Initiates a Work Request and calls for mechanical maintenance support.</li> <li>• If the aux. op is directed to perform an Emergency Entry, directs the duty HP to provide support.</li> </ul> RO <ul style="list-style-type: none"> <li>• Observes the B RFP minimum flow valve, CV-1611, is open and communicates it to the SS. (Task 1.02)</li> <li>• Directs the inplant operator to enter the heater bay and check out the minimum flow valve, CV-1611.</li> <li>• Monitors and controls RPV level and RFP suction pressure by reducing recirc flow if necessary.</li> </ul> BOP Operator <ul style="list-style-type: none"> <li>• Assists as directed.</li> </ul>	OI-644	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
A EHC Pump degrades	<p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Notices the EHC pressure falling or responds to the EHC FLUID LO PRESSURE annunciator, 1C07A, D-3.</li> <li>• Notices the standby EHC pump, A EHC pump, 1P-97A, has failed to auto start, manually starts the standby pump, checks the EHC parameters, confirms EHC pressure is restored and communicates all this to the SS.</li> <li>• Secures the B EHC pump, 1P-97B.</li> <li>• Sends the aux. operator to check out the EHC system.</li> </ul> <p>SRO</p> <ul style="list-style-type: none"> <li>• Directs the standby EHC pump, 1P-97B, started if the BOP operator fails to start it on his/her own.</li> <li>• Confirms the EHC parameters return to normal</li> </ul>	<p>1C07A, D-3</p> <p>OI-693.2</p>	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
E APRM Failure	<p>RO</p> <ul style="list-style-type: none"> <li>Acknowledges the APRM UPSCALE annunciator, 1C05A, C-2.</li> <li>Checks the E APRM recorder and notices that the pen went upscale before returning to normal and realize the ROD OUT BLOCK annunciator, 1C05B, A-6, the APRM A, C, E UPSCALE TRIP OR INOP annunciator, 1C05A, B-2 and the NEUTRON MONITORING SYSTEM TRIP annunciator, 1C05A, A-5 all failed to activate and communicates this to the SS.</li> <li>Takes one or more of the following allowed responses: Inserts a manual half-scam on the A RPS logic AND/OR Bypasses E APRM, OR Inserts a full scam As directed by the SS or by their own initiative.</li> </ul> <p>SRO</p> <ul style="list-style-type: none"> <li>Acknowledges the report and/or actions from the BOP operator.</li> <li>If not already taken by the RO, directs one or more of the following allowed responses: Insert a manual half-scam on the A RPS logic AND/OR Bypass E APRM, OR Insert a full scam</li> <li>If a full scam is not initiated, initiates a Work Request and/or Action Request and notifies I&amp;C to investigate.</li> </ul>	<p>ARP 1C05A, C-2</p> <p>ARP 1C05A, B-2</p> <p>ARP 1C05A, A-5</p> <p>ARP 1C05B, A-6</p> <p>OI-878.4</p> <p>IPOI-5</p>	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Group 1 MSIV isolation Scram	<p>RO/BOP Operator/SRO</p> <ul style="list-style-type: none"> <li>Recognize and announce the PCIS Group 1 isolation to the rest of the crew.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>Recognize all rods did not fully insert and communicate the ATWS condition to the SS.</li> <li>Scrams the reactor prior to the high drywell pressure auto scram and carries out the immediate actions of IPOI-5, Reactor Scram: <ul style="list-style-type: none"> <li>Verify neutron flux decreasing.</li> <li>Insert a backup manual scram.</li> <li>Control RPV level 170"- 211".</li> <li>Place the mode switch in SHUTDOWN.</li> <li>Verify recirc runback to minimum.</li> <li>Insert SRMs and IRMs.</li> <li>Announce the scram over the plant page.</li> <li>Check the status of the main turbine and generator.</li> </ul> </li> </ul> <p>SRO</p> <ul style="list-style-type: none"> <li>Directs the RO to perform IPOI-5 immediate actions.</li> <li>Enters EOP-1 and EOP-2 when LLS actuates and causes drywell pressure to exceed 2 psig.</li> <li>Enters EOP ATWS when he/she receives the report that not all rods are full in.</li> <li>Directs the BOP Operator to monitor containment pressure.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>Assists the RO with IPOI-5 actions until LLS actuates then he/she will monitor and communicate containment pressure and temperature to the SS</li> </ul>	<p>IPOI-5</p> <p>EOP 1</p> <p>EOP 2</p> <p>EOP ATWS</p>	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
ATWS, Loss of 1A4	<p>SRO</p> <ul style="list-style-type: none"> <li>• Recognizes and communicates the loss of 1A4 and when resources permit, direct an operator to try to determine the cause of the loss of 1A4.</li> <li>• Enters EOP ATWS and directs the following: <ul style="list-style-type: none"> <li>• /L Leg: <ul style="list-style-type: none"> <li>• Directs ADS locked out.</li> <li>• RPV level controlled between +15" and +211".</li> <li>• SRO should direct a narrower band in between.</li> </ul> </li> <li>• /P Leg: <ul style="list-style-type: none"> <li>• Verifies that LLS is functioning correctly determines that PSV-4401 and PSV-4407 are stuck open.</li> </ul> </li> <li>• /Q Leg: <ul style="list-style-type: none"> <li>• Follows the first Continuous Recheck Statement and exits the /Q Leg, directs entry into IPOI 5 and performance of the Hydraulic ATWS Rod Insertion Procedures (RIPs).</li> </ul> </li> </ul> </li> <li>• Directs HPCI locked out due to its affect on reactor power.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>• Performs RIP 103.2, Increase CRD Cooling Flow and Pressure.</li> </ul>	<p>IPOI-5</p> <p>EOP 1</p> <p>EOP ATWS</p>	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
ATWS, Loss of 1A4 (CONTD)	<ul style="list-style-type: none"> <li>• Performs RIP 103.3, Manually Drive Control Rods.</li> <li>• Performs RIP 102.1, Repeated Manual Scram.</li> <li>• Communicates rod insertion status to the SS as it changes.</li> <li>• Uses condensate and feedwater to control RPV level in the directed band.</li> <li>• Monitors and communicates reactor power to the shift supervisor.</li> <li>• Recognizes lowering RPV pressure and communicates it to the SS.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Recognize and communicate to the SS the loss of 1A4 and thus B side core spray and RHR.</li> <li>• Perform any pressure control actions directed.</li> <li>• Locks out ADS when directed.</li> <li>• Locks out HPCI if directed.</li> <li>• Performs RIP 102.1, Repeated Manual Scram</li> <li>• Recognizes LLS, PSV-4401 and PSV-4407, are not cycling as expected and communicates it to the SS.</li> <li>• Investigates the cause of loss of 1A4.</li> </ul>		

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
LOCA via SORV / EOP 2	<p>SRO</p> <ul style="list-style-type: none"> <li>• Enters EOP-2 and directs the following:               <ul style="list-style-type: none"> <li>• PC/H Leg: Directs EOP Defeat 16 installed.</li> <li>• T/L Leg: Periodically checks torus level.</li> <li>• T/T Leg: Directs the BOP operator to initiate torus cooling and when he/she gets the report that the containment enable handswitch, HS-2001C, will not work realizes that the torus cooling, torus spray, and drywell spray modes of RHR are inoperable.</li> </ul> </li> <li>• DW/T Leg:               <ul style="list-style-type: none"> <li>• Directs installation of EOP Defeat 4 and bypass of the main intake coils.</li> <li>• Enters the Emergency Depressurization contingency when it is recognized that drywell temperature cannot be maintained below 280°F.</li> </ul> </li> <li>• PC/P Leg: Periodically monitors the status of the Pressure Suppression Graph, EOP Graph 5.</li> <li>• Directs I&amp;C support of HS-2001C failure investigation.</li> <li>• Enters Emergency Depressurization when it is recognized that drywell temperature cannot be maintained below 280°F.</li> </ul>	<p>EOP 2</p> <p>Emergency Depressurization</p>	

<b>SCENARIO SEGMENT</b>	<b>CREW PERFORMANCE CRITERIA</b>	<b>PERFORMANCE REFERENCE</b>	<b>COMMENTS</b>
LOCA via SORV / EOP 2 (CONTD)	BOP Operator <ul style="list-style-type: none"><li>• Verifies proper ECCS initiations.</li><li>• Performs EOP Defeat 16 when directed.</li><li>• Attempts to initiate torus cooling when directed, recognizes that the containment enable switch, 2001C, does not work and communicates this information to the SS.</li><li>• Performs EOP Defeat 4 and bypasses the main intake coils when directed.</li></ul>		

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
Emergency Depressurize.	<p>SRO</p> <ul style="list-style-type: none"> <li>• Provides a crew briefing about controlling injection from low pressure ECCS systems.</li> <li>• Directs the steps of the ED contingency: <ul style="list-style-type: none"> <li>• Verifies torus level &gt;4.5 feet.</li> <li>• Directs the BOP operator to open the 4 ADS SRVs.</li> <li>• Verifies 3 or more SRVs are opened.</li> <li>• Determines if RPV level can be determined (checks Saturation Curve status)</li> </ul> </li> <li>• Monitors the Saturation Curve status, EOP Graph 1, recognizes entry and directs increased monitoring for level oscillations.</li> </ul> <p>RO</p> <ul style="list-style-type: none"> <li>• Maintains the directed level band with condensate and feedwater.</li> <li>• Recognizes level fluctuations and notifies the OSS.</li> </ul> <p>BOP Operator</p> <ul style="list-style-type: none"> <li>• Opens 4 ADS valves when directed.</li> <li>• Recognizes level fluctuations and notifies the OSS.</li> </ul>	<p>EOP 2</p> <p>Emergency Depressurization RPV Flood</p>	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
RPV Flooding	<p>SRO</p> <ul style="list-style-type: none"> <li>• Provides a crew briefing about RPV/F, required flooding conditions and which systems that will be uses to establish the flooding conditions.</li> <li>• Directs the steps of the RPV/F contingency: <ul style="list-style-type: none"> <li>• Verifies the reactor is shutdown.</li> <li>• Verifies that at least 3 SRVs can be opened.</li> <li>• Verifies that the MSIVs, MSL Drains and RCIC steam supply are isolated.</li> <li>• Directs the RO and BOP operator to coordinate condensate, core spray and RHR injection to establish the RPV/F conditions of: <ul style="list-style-type: none"> <li>• 3 or more SRVs open AND</li> <li>• RPV pressure <math>\geq 50</math> psig above torus pressure AND</li> <li>• RPV pressure not decreasing.</li> </ul> </li> <li>• Determines that the above conditions can be achieved.</li> <li>• Directs control of RPV pressure to maintain 3 or more SRVs open and RPV pressure at least 50 psig above torus pressure, but as low as possible by directing the coordination of reducing injection flow by the RO and BOP Operator. Condensate should be the first system secured to minimize the torus level rise.</li> </ul> </li> </ul>	<p>EOP 2</p> <p>Emergency Depressurization RPV Flood</p> <p>EPIP 1.1</p>	

SCENARIO SEGMENT	CREW PERFORMANCE CRITERIA	PERFORMANCE REFERENCE	COMMENTS
RPV Flooding (CONT'D)	<ul style="list-style-type: none"> <li>• Directs I&amp;C to verify the RPV level instrumentation status.</li> <li>• Monitors drywell temperature and exit of the RPV saturation curve.</li> </ul> <p>• Declares an EAL.</p> <p>RO and BOP Operator</p> <ul style="list-style-type: none"> <li>• Commence injection into the RPV using the directed systems.</li> <li>• Establish the RPV/F conditions.</li> <li>• Reduce injection to control RPV pressure and torus level as directed.</li> </ul>		

## CREW GRADING ATTACHMENT

ILC NRC Exam Scenario #2 Rev. 0

Operator Name	Position	Evaluator
	Shift Supervisor	
	Reactor Operator	
	BOP Operator	

Management Representative/Lead Evaluator \_\_\_\_\_

### Crew Critical Tasks

Task Statement	SAT	UNSAT
1. When Reactor water level cannot be determined, INJECT into the RPV to maintain RPV pressure above Minimum RPV Flooding Pressure (MRFP).		
2. With a reactor scram required, the reactor not shutdown, and conditions for ADS blowdown met, LOCKOUT ADS prior to initiation to prevent an uncontrolled RPV depressurization, to prevent causing a significant power excursion.		
3. When drywell temperature cannot be maintained below 280°F and before 340°F the crew will INITIATE emergency depressurization.		
4.		
5.		
6.		

*OSG VALIDATION CHECKLIST*

Scenario # ILC ESG # 11

1. \_\_\_ Verify that if not run from a protected IC that setup information is provided to reproduce the stated initial conditions.
2. \_\_\_ Verify that all stated objectives are identified in the body of the OSG.
3. \_\_\_ Verify that turn over sheets are completed, and are in agreement with both the narrative summary and shift turnover information sheet. Turn over sheets are not required for initial license scenarios.
4. \_\_\_ Verify that if the scenario requires documents to be provided to the crew, that they are filled out as appropriate (i.e., if an STP is used, it is filled out).
5. \_\_\_ If this is the initial validation or the revision affects ramp times, event triggers, malfunctions, overrides, remote functions or procedure changes could affect the scenario, then validate the scenario for proper response using a crew. It is preferable to use a crew unfamiliar with the scenario whenever possible. Verify the following while running the scenario:
  - The scenario runs as written and all tasks are performed.
  - The stated time line agrees with actual times.
  - Critical task statements clearly define the expected plant and student response. They should also be written so that they are achievable as written. If any question exists, it is preferable to have operations management participate in the validation.
  - Anticipated instructor role play/cues are identified
  - Management expectations are captured and re-enforced.
  - Verify administrative documentation requirements (i.e., CMARs / ARs) are identified.
  - Verify reportability requirements (i.e., ESF actuations) are identified.
  - Verify Technical Specification items / LCO declarations are correct.
  - If procedure steps may cause confusion or disagreement between higher level procedures and OIs/ARPs that operations management is consulted.
6. \_\_\_ Shutdown scenarios include shutdown risk assessment, time to boil calculations and shutdown status board information.

\_\_\_\_\_  
SME/Instructor

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Date

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SME/Instructor

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Date

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