

*HATCH*  
**Draft Submittal**  
(Pink Paper)

## **SIMULATOR SCENARIOS**

**HATCH DECEMBER 2007 EXAM**

**05000321/2007301 AND 05000366/2007301**

**DECEMBER 3 - 6, 2007, AND  
DECEMBER 10, 2007, (WRITTEN)**

**DRAFT****Facility:** E. I Hatch**Scenario No.:** 1**Op-Test No.:** \_\_\_\_\_**Examiners:** Ron Aiello**Operators:** \_\_\_\_\_

**Initial Conditions:** Unit 2 is at 8% power in mode 2, performing a start-up. IRM "A" is inoperable due to failure of the Range 6 to 7 overlap. IRM "A" is in bypass.

**Turnover:** I & C will be performing a functional test on IRM "A." 34GO-OPS-001-2, "Plant Start-up," is in progress at step 7.4.5. Once the mode switch has been transferred to Run, continue pulling control rods to obtain two bypass valves 100% open for the HPCI surveillance per section 7.4.25.2. Another group of operators will be performing the HPCI run, and are having their pre-job brief at this time.

Event No.	Malf. No.	Event Type*	Event Description
1		N (CBO)	Transfer the Rx Mode switch to Run per 34GO-OPS-001-2, Plant Start-up.
2		R (CBO)	Withdraw control rods to increase reactor power.
3	diD11-F053	(SRO TS) C (BOP)	Fission Product Monitor valve 2D11-F053 fails closed. Time compressed (TC) repair, Return to service.
4	diC51-K617-S2 diC51-K617-S1 mfC12 2614-39	(SRO TS) C (CBO)	PRNM 2out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse. The control rod fuse and logic module are repaired (TC) and the rod withdrawn.
5	mfP51_222C mfP51_222B	C (BOP)	Station Service Air Compressor "C" trips. Must manually start "A".
6	mfC11_30A mf60311334	I (CBO)	CRD "A" trips due to low suction pressure instrument failure. Must start "B."
**7	mfE51_65	(SRO TS) I (BOP)	**Optional – RCIC swaps suction due to a failed ATTS torus water level instrument. (TC repair, re-align)
8A	mfS11_161 mfP64_193A, mfP64_193B	M (ALL)	Loss of all offsite power occurs.
8B	mfR43_62B, mfR43_239C	C (CBO)	2C Emergency Diesel Generator (EDG) starts, but fails to tie to 4160 VAC 2G. Must be manually tied. The "B" EDG fails to auto start and must be started manually after control is transferred to Unit 2.



***DRAFT*****Facility:** E. I Hatch**Scenario No.:** 1**Op-Test No.:** \_\_\_\_\_**Examiners:** Ron Aiello**Operators:** \_\_\_\_\_

Event No.	Malf. No.	Event Type*	Event Description
8C	mfE41_235A mfE41- 235B mfE51_110 diC11B-S4A diC11B-S4A mfC11_30B	C (BOP)	HPCI fails to auto start, must be manually started. RCIC trips and cannot be reset.
			The scenario is terminated after the Station Black abnormal procedure is exited, all 4160 VAC emergency buses are energized, and RWL is being control in the normal band.
Total time was 1 hour and 40 minutes including, including optional failure.			
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

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Time	Position	Applicant's Actions or Behavior
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Note: the copy of the start-up procedure given to the team will have certain steps already completed.

- Performs the following actions in preparation for transferring the mode switch to run:
- Confirms operable APRMs indicate between 7% and 10%.
- Confirms operable APRM DOWNSCALE trips are clear by performing the following at the APRM ODAs:
  - Depresses the “ETC” key until “TRIP STATUS” option illuminates.
  - depresses “TRIP STATUS” key,
  - confirms “APRM Flux Downscale Alarm” is not active.
- Confirms no operable IRMs are upscale.

- Confirms the following:
  - at least three APRM channels per RPS Trip System are operable and
  - at least 2 "APRM Two-Out-Of-Four-Voter-Channels" per RPS Trip System are operable and
  - at least 3 OPRM channels per RPS Trip System are operable
  - Confirms that the following annunciators are clear:
    - · 603-232, Main Steam Line Press A Low
    - · 603-233, Main Steam Line Press B Low

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Time	Position	Applicant's Actions or Behavior
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Time	Position	Applicant's Actions or Behavior
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Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 3Page 2 of 2

**Event Description:** Fission Product Monitor valve 2D11-F053 fails closed. Time compressed (TC) repair, Return to service.

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>• Notifies maintenance to begin investigating and repair of 2D11-F053.</li> <li>• Addresses tech specs 3.4.5,               <ul style="list-style-type: none"> <li>• Identifies a RAS exist for condition 3.4.5.B.1 requiring analyzing of grab samples of primary containment every 12 hours, and</li> <li>• Restoration of the primary containment atmospheric monitoring system to operable status within 30 days.</li> <li>• The valve is a PCIS valve and has failed in its isolation position.</li> </ul> </li> <li>• If time allows, Address tech spec 3.6.1.3.A, four hours to isolate the line and verify the line is isolated once per 31 days.</li> </ul>
		<p>Simulator operator <b>delete</b> override diD11-F053</p> <p>Simulator operator report time compression is being used and that the problem with 2D11-F053 has been repaired including a functional test and the system may be returned to service. An electrician repaired the valve and satisfactorily performed the functional test.</p>
	BOP	<ul style="list-style-type: none"> <li>• Aligns the valve per 34SO-D11-001-2, FPM system operating procedure or they may use the guidelines of 31GO-OPS-021 to open the valve.</li> <li>• Places 2D11-F053 control switch to reset.</li> <li>• Verifies 2D11-F053 opens.</li> <li>• Notify the lab to return the Fission product monitors to service.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>• As time permits, Terminates the FPM RASs.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 4Page 1 of 4

**Event Description:** PRNM 2out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse.

Time	Position	Applicant's Actions or Behavior
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15 min		<p><b>Ensure reactor power is well above 10% before proceeding with this event.</b></p> <p>Simulator operator enters the following: (these IOs are sequence sensitive) enter diC51-K617-S2 <b>first</b> and <b>then</b> diC51-K617-S1 and mfC12_26 14-39 concurrently.</p>
	ALL	<ul style="list-style-type: none"> <li>Address the following alarms: <ul style="list-style-type: none"> <li>Reactor Neutron Monitoring Sys Trip, 34AR-603-109-2</li> <li>Reactor Auto Scram System A trip, 34AR-603-126-2</li> <li>Rod Drift, 34AR-603-247-2</li> <li>Identifies control rod 14-39 has scrammed full in.</li> <li>RMCS / RWM Rod Block OR System Trouble</li> </ul> </li> </ul>
		NOTE: The team may immediately address the abnormal procedure 34AB-C11-004-2 since the control rod is mis-positioned.
	CBO	<ul style="list-style-type: none"> <li>Addresses annunciator "Rod Drift." <ul style="list-style-type: none"> <li>At panel 2H11-P603, confirms that one or more Rod Drift lights are illuminated on the full core display.</li> <li>Selects the drifting rod and confirms that RPIS indicates the rod is not at an even reed switch position.</li> <li>Notifies the Shift Supervisor and the STA</li> <li>Refers to 34AB-C11-004-2, Mis-positioned Control Rods, for recovery of drifting OR mis-positioned control rod.</li> <li>When directed by the Shift Supervisor, resets the rod drift using the Rod Drift Alarm reset switch on Panel 2H11-P603.</li> </ul> </li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Addresses annunciator Reactor Neutron Monitoring Sys Trip. <ul style="list-style-type: none"> <li>Confirms validity of the alarm by checking the neutron monitoring</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 4Page 2 of 4

**Event Description:** PRNM 2out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse.

Time	Position	Applicant's Actions or Behavior
		<p>indicators on panel 2H11-P603, 2H11-P606, and 2H11-P608.</p> <ul style="list-style-type: none"> <li>Identifies Two Out Of Four Logic Module 2C51-K617A has tripped. Observes the HIGH/INOP Trip X red LEDs are illuminated.</li> <li>Identifies none of the APRM/OPRMs are tripped.</li> <li>Reports the information to the SS.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Notifies maintenance to begin repairs on the "On Two Out Of Four Logic" module A.</li> <li>Notifies maintenance to investigate the cause of the control rod scrambling in, possible blown fuse.</li> <li>Addresses tech specs for the logic module 3.3.1.1-1 2.e               <ul style="list-style-type: none"> <li>Determines a RAS exist per 3.3.1.1-1 A requiring the channel or trip system be placed in trip within 12 hours.</li> </ul> </li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Addresses annunciator Reactor Auto Scram System A Trip.               <ul style="list-style-type: none"> <li>Confirm scram group A 1 2 3 4 lights for Trip System A on panel 2H11-P603 are extinguished.</li> <li>Determine the cause of the trip.</li> <li>Attempt to correct or bypass the cause of the trip.</li> <li>Using the Process Computer, run an OD-7 Option 2 and determine whether control rod movement has occurred.</li> </ul> </li> </ul>



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Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 4Page 4 of 4

**Event Description:** PRNM 2out of 4 logic module trips causing a half scram and a control rod to scram in due to a blown fuse.

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>Addresses tech spec 3.1.3.C for an inop control rod,               <ul style="list-style-type: none"> <li>fully insert inoperable control rod within 3 hours and.</li> <li>Disarm the associated CRD within 4 hours.</li> </ul> </li> <li>Confirm compliance with TS 3.2, Power Distribution Limits. IF thermal limits are not acceptable, consult with Reactor Engineering on further actions.</li> </ul>
	CBO	<p>The simulator operator will provide a marked up copy of attachment 2 of 34AB-C11-004-2.</p> <ul style="list-style-type: none"> <li>Refers to attachment 2 to recover the control rod.               <ul style="list-style-type: none"> <li>Withdraws the control rod using both the rod Movement switch and the Rod Out Notch Override switch.</li> </ul> </li> </ul>
	SS	<ul style="list-style-type: none"> <li>Addresses tech specs section 3.1.6 for compliance with BPWS and determines that LCO 3.3.6 does not apply since reactor power is above 10%.</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 5Page 1 of 2

Event Description: Station Service Air Compressor "C" trips. Must manually start "A".

Time	Position	Applicant's Actions or Behavior
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		Insert mfP51_222C. Once B air comp starts <b>TEMPORARILY</b> insert mfP51_222B, this allows B air comp to be restarted.
12 min	BOP	<ul style="list-style-type: none"> <li>• Responds to annunciator "AIR CMPSR 2C Tripped/ Shutdown."</li> <li>• Starts the 2P51-C001B the Standby Air Compressor.</li> <li>• Note: "B" air compressor will auto start if not manually started.</li> <li>• Once tripped may manually re-start B.</li> <li>• If time allows before B compressor is tripped, the team may place A compressor, 2P51-C001A, in standby mode by placing the control switch to start and allowing it to auto shutdown at panel 2H11-P650.</li> <li>• Starts "A" air compressor on 2H11-P650.</li> <li>• Places the control switch 2P51-S3, on Panel 2H11-P650 for Air Comp 2P51-C001C to Off Pull-To-Lock</li> <li>• Contacts Health Physics.</li> <li>• Has the SSS to locally check Air Compressor 2P51-C001C Microprocessor for cause of Trip.</li> <li>• Notifies the SS of the status of the air system.</li> </ul>
	SS	Notifies maintenance to begin investigating the trip condition on B and C Air Compressors.
		As maintenance, <b>report</b> there was an electronic fault on the micro-processor for the B compressor which has been corrected and it is ready to run. The problem with C compressor has not been determined at this time.

**Op-Test No.:**                      **Scenario No.:**    **1**    **Event No.:**    **5**

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**Event Description:** Station Service Air Compressor “C” trips. Must manually start “A”.

[illegible]



Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 6Page 1 of 3

Event Description: CRD "A" trips due to low suction pressure instrument failure. Must start "B."

Time	Position	Applicant's Actions or Behavior
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8 min		Insert mf60311334, window 47, CRD Pump A Suction Press Low, and mfC11_30A, CRD Pump A Trip.
	ALL	<ul style="list-style-type: none"> <li>Respond to annunciator "CRD Pump A Suction Press Low," 34AR-603-146-2, CRD Pump A Trip, 34AR-603-128-2, and CRD HYD TEMP HIGH, 34AR-603-140-2.</li> </ul>
		Note: with no CRD pumps operating the CBO may address 34AB-C11-001-2, Loss Of CRD, first.
	CBO	<ul style="list-style-type: none"> <li>Responds to annunciator "CRD Pump A Suction Press Low."               <ul style="list-style-type: none"> <li>Confirms 2C11-C001A, CRD Pump, has TRIPPED.</li> <li>Confirms CST Level, as indicated by 2P11-R601 on panel 2H11-P650, is greater than 11 feet.</li> <li>Has the SSS confirm 2P11-F005, CST Outlet Valve, is open At the CST.</li> </ul> </li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Has the SSS confirm the following valves are open at the SW diagonal, elevation 108:               <ul style="list-style-type: none"> <li>2C11-F013B CRD Pump "A" Suction</li> <li>2C11-F115B Suction Filter "A" Inlet Isolation</li> <li>2C11-F114B Suction Filter "A" Outlet Isolation.</li> </ul> </li> <li>Attempts to restore the CRD system per:               <ul style="list-style-type: none"> <li>34AB-C11-001-2, Loss of CRD System, or</li> <li>34SO-C11-005-2, Control Rod Drive Hydraulic System.</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 6Page 2 of 3

Event Description: CRD "A" trips due to low suction pressure instrument failure. Must start "B."

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> <li>• Responds to annunciator, "CRD Pump A Trip"</li> <li>• Check the following indications on 2H11-P603 to determine validity of the alarm. <ul style="list-style-type: none"> <li>○ Pump indicating lights.</li> <li>○ 2C11-R600, CRD Flow controller, indicates zero flow.</li> <li>○ 2C11-R605, Cooling Wtr indicator, indicates zero flow.</li> <li>○ 2C11-R601, Charging Water Pressure indicator decreasing.</li> <li>○ 2C11-R602, Drive Water dp indicator decreasing.</li> <li>○ 2C11-R603, Cooling Water dp indicator decreasing.</li> </ul> </li> </ul>
	CBO	<ul style="list-style-type: none"> <li>• Responds the annunciator CRD HYD TEMP HIGH, 34AR-603-140-2</li> <li>• Enter 34AB-C11-001-2, Loss Of CRD.</li> <li>• Confirm the validity of the alarm, have the SSS send an operator to CRD Temperature Recorder, 2C11-R018, (130Rx Bldg). And check temperatures.</li> </ul>
		As the operator sent to the CRD temperature recorder, report that the highest temperature was 270 degrees and several CRDs were at this temperature.



Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 6Page 3 of 3

Event Description: CRD "A" trips due to low suction pressure instrument failure. Must start "B."

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> <li>Addresses abnormal 34AB-C11-001-2, "Loss of CRD." <ul style="list-style-type: none"> <li>IF both CRD pumps are tripped, <ul style="list-style-type: none"> <li>Places 2C11-R600, CRD Flow Control, in manual and decrease the output to zero.</li> <li>Starts the B CRD pump.</li> <li>Returns the flow controller to auto and output to the pre-trip position.</li> <li>IF Reactor Pressure is <math>\geq 900</math> PSIG and the following conditions exist: <ul style="list-style-type: none"> <li>Two or more withdrawn control rod scram accumulators inoperable</li> <li>AND</li> <li>Charging water header pressure <math>&lt; 940</math> PSIG</li> <li>THEN: within 20 minutes restore charging water header pressure <math>\geq 940</math> PSIG or insert a scram.</li> </ul> </li> </ul> </li> </ul> </li> </ul>
		Note: our procedure actions protect us from violating Tech Specs. The SS may be busy directing plant operations and not immediately enter Tech Specs.
	SS	<ul style="list-style-type: none"> <li>Directs maintenance to investigate and repair the "A" CRD pump.</li> <li>Addresses tech specs 3.1.3, and 3.1.5</li> <li>As time allows, once the second accumulator alarm light illuminates due to low charging water pressure, the SS begins a 20 minute RAS per TS 3.1.5.B.</li> <li>Terminates RAS once charging water pressure is restored above 940 psig..</li> </ul>



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Time	Position	Applicant's Actions or Behavior
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Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 8APage 1 of 4

Event Description: Loss of all offsite power occurs.

Time	Position	Applicant's Actions or Behavior
4 min		<b>Insert:</b> mFR43_62B (DIESEL GEN FAIL TO AUTO START 1B) mFR43_239C (DG OUTPUT BKR ONE SHOT FAIL TO AUTO TIE) mFS11_161 (LOSS OF OFFSITE POWER (BLACK OUT)) mFC11_30B, CONTROL ROD DRIVE PUMP B TRIP mFE41_235A (HPCI FAILS TO AUTO START ON LOW LEVEL) mFE41_235B (HPCI FAILS TO AUTO START ON HI DRYWELL PRESS) mFE51_110 (RCIC TURBINE TRIP) diC11B-S4A (CRD LOCA RESET A) diC11B-S4A (CRD LOCA RESET B) mFP64_193A (DRYWELL CHILLER COMPRESSOR A FAIL) mFP64_193B (DRYWELL CHILLER COMPRESSOR B FAIL)
	ALL	Recognizes a loss of offsite power and a plant scram occurs.
		<b>Simulator operator - Once drywell pressure exceeds 1.85 psig, DELETE mFP64_193A and mFP64_193B. (Do NOT defeat LOCA or LOSP signals until requested.)</b>
	SS	Note: the SS may assign one operator to perform RC-1, RC-2 and RC-3. <ul style="list-style-type: none"> <li>• Assigns the CBO to perform RC-1.</li> <li>• Assigns the BOP operator to perform RC-2 and RC-3.</li> <li>• If time allows assigns TC-1 to be performed.</li> <li>• Enters the RC EOP flow chart, 31EO-EOP-010-2, once reactor water level decreases to 3," or drywell pressure increases to 1.85 psig, or reactor pressure increases to 1074 psig.</li> </ul>



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Time	Position	Applicant's Actions or Behavior
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**Op-Test No.:**                      **Scenario No.:**    **1**    **Event No.:**    **8A**

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**Event Description:** Loss of all offsite power occurs.

[illegible]

**Op-Test No.:**                      **Scenario No.:**    **1**    **Event No.:**    **8A**

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**Event Description:** Loss of all offsite power occurs.

[illegible]



Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 8BPage 1 of 4

**Event Description:** 2C Emergency Diesel Generator (EDG) starts, but fails to tie. The "B" EDG fails to auto start.

Time	Position	Applicant's Actions or Behavior
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106	CBO	<ul style="list-style-type: none"> <li>• CONFIRMS appropriate Diesel Generator response to the event.</li> <li>• Evaluates the emergency buses determining "E" is energized, "F" is de-energized with the "B" EDG off, and "G" bus is de-energized but "C" EDG is operating.</li> <li>• Enters 34AB-R22-003-2, "Station Blackout" and "Diesel Generator Recovery," abnormal, 34AB-R43-001-2.</li> </ul>
	CBO	<p>In addressing "G" 4160 VAC bus the operator may use attachment 2 (or placard) of 34AB-R43-001-2 which has the operator:</p> <ul style="list-style-type: none"> <li>• Ask is the diesel running unloaded? Yes</li> <li>• Confirms the normal and alternate supply breakers are open.</li> <li>• Lowers diesel frequency to 57 hertz and then raise hertz to 60. (Critical Task)</li> <li>• If the diesel ties to the bus then as time permits, the operator will proceed to the body of the procedure 34AB-R43-001-2.</li> </ul>
		<p><b>Or</b> enter the body of the procedure, 34AB-R43-001-2, which has him:</p> <ul style="list-style-type: none"> <li>• Confirms that the Diesel Gen "C" Voltage Reg Transfer Auto red light is illuminated.</li> <li>• Confirm Diesel Generator "C" Mode Select switch in norm.</li> <li>• Confirm that the Diesel Generator "C" Voltage Reg Transfer Manual green light is extinguished.</li> <li>• Using Diesel Generator "C" Speed Adjust switch, adjust diesel generator frequency to between 60 and 60.5 Hertz (whatever is required to close breaker). (Critical Task)</li> </ul>

**Op-Test No.:**                      **Scenario No.:**    **1**    **Event No.:**    **8B**

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**Event Description:** 2C Emergency Diesel Generator (EDG) starts, but fails to tie. The “B” EDG fails to auto start.

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**Op-Test No.:**                      **Scenario No.: 1**    **Event No.: 8B**

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**Event Description:** 2C Emergency Diesel Generator (EDG) starts, but fails to tie. The “B” EDG fails to auto start.

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Time	Position	Applicant's Actions or Behavior
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		Note: the team may start HPCI before -35" RWL or DW pressures increases to 1.85psig and therefore not be aware the auto initiation signal has failed.
	BOP	<ul style="list-style-type: none"> <li>Recognizes HPCI fails to auto start at -35" or 1.85psig DW pressure and manually starts per 34SO-E41-001-2, (panel mounted placard). <ul style="list-style-type: none"> <li>Opens 2E41-F059, Lube Oil Cooling Wtr Vlv.</li> <li>Starts 2E41-C002-2, Barometric Condenser Vacuum Pump.</li> <li>Opens 2E41-F001, Turbine Steam Supply Vlv.(critical task)</li> <li>Takes 2E41-C002-3, Aux Oil Pump, control switch to the START position. (critical task)</li> <li>Opens 2E41-F006, Pump Discharge Valve. (critical task)</li> </ul> </li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Confirm the following valves OPENED: <ul style="list-style-type: none"> <li>Turbine Control Vlv</li> <li>Turbine Stop Vlv</li> </ul> </li> <li>Confirm the turbine comes up to speed</li> <li>When flow increases to 790 GPM, confirms 2E41-F012, Min Flow Vlv, closed.</li> <li>Adjust flow with 2E41-R612, Flow Control to maintain water level.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>If water level is above the auto initiation setpoint the operator may secure HPCI by: <ul style="list-style-type: none"> <li>Reducing speed to 2000 rpm using the flow controller in manual.</li> <li>Depressing the trip pushbutton and holding until the 2E41-F001 is fully closed.</li> <li>Closing the steam supply valve 2E41-F001.</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 8CPage 2 of 3

**Event Description:** HPCI fails to auto start, must be manually started. RCIC trips and cannot be reset.

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>Recognize that RCIC tripped and responds to annunciator RCIC Turbine Trip, 34AR-602-301-2.</li> <li>Confirms RCIC Turbine Tripped per the following indications:               <ul style="list-style-type: none"> <li>2E51-F524, Trip &amp; Throttle Vlv, indicates closed.</li> <li>Turbine Speed decreasing.</li> <li>2E51-F013, Pump Discharge Vlv, indicates closed.</li> <li>2E51-F019, Min Flow Vlv, indicates closed.</li> </ul> </li> </ul> <p>Note: depending on the status of HPCI the team may not attempt to reset RCIC.</p>
	SS	<ul style="list-style-type: none"> <li>Recognizes that the drywell pressure trend is increasing.</li> <li>Dispatches an operator to investigate the failure of the drywell chillers.</li> <li>Enters PC-1 flow chart due to high drywell pressure, 1.85, and/or high drywell temperature of 150 °F.</li> <li>If torus pressure exceeds 1.85 the SS may direct torus sprays.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Verifies ECCS and LOCA actions have occurred by:               <ul style="list-style-type: none"> <li>Verifying a group 2 isolation occurred.</li> <li>ECCS pumps have auto started.</li> <li>Verifying the EDGs have auto started.</li> </ul> </li> <li>If directed will initiate torus sprays per 34SO-E11-010-2 by:               <ul style="list-style-type: none"> <li>IF a LOCA signal is present, Places 2E11-S17A(B), Containment Spray Vlv Control switch, in the MANUAL position.</li> <li>Confirms operating or starts RHR Loop A(B) pump(s).</li> <li>opens 2E11-F028A(B), Torus Spray or Test Vlv.</li> <li>Throttles open 2E11-F027A(B), Torus Spray Vlv.</li> </ul> </li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 8CPage 3 of 3

**Event Description:** HPCI fails to auto start, must be manually started. RCIC trips and cannot be reset.

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>• Attempts to reset RCIC per 34SO-E51-001-2</li> <li>• IF RCIC Initiation Signal can be reset, then performs the following:               <ul style="list-style-type: none"> <li>○ Depresses the RCIC Initiation Reset push button on panel 2H11-P602 and confirms that the white light extinguishes.</li> <li>○ Closes 2E51-F045, Steam to Turbine Valve</li> <li>○ Closes 2E51-F524, Trip &amp; Throttle Vlv controller</li> <li>○ Opens 2E51-F524, Trip &amp; Throttle Valve Controller but recognizes the valve does not open.</li> <li>○ Notifies the SS of the condition of RCIC.</li> </ul> </li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• Attempts to start CRD B by placing the control switch to close, recognizes B CRD will not start.</li> </ul>
		Termination criteria: The scenario may be terminated once water level is being controlled with HPCI and 4160 VAC buses E, F & G are re-energized.

**DRAFT****Facility:** E. I Hatch**Scenario No.:** 2**Op-Test No.:****Examiners:** Ron Aiello**Operators:**

**Initial Conditions:** Unit 2 is operating at 100% power. Core Spray pump "2A" is tagged out for maintenance due to the supply breaker tripping during a Surveillance test.

**Turnover:** The HPCI surveillance is to be performed in 3 hours. RHR "2B" is in Torus Cooling in preparation for the HPCI surveillance. Lower Torus level to 147.5 inches for HPCI Surveillance.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Lower Torus level to 147.5 inches using RHR Loop "2B."
2	mfN21_88B	I (CBO)	Feedwater pump 2B cooling water controller failure. TC repair and return to auto.
3	MfB31_40A	(SRO TS) C (BOP)	Pump Motor A Winding Cooling Water Flow Low, pump should be manually tripped.
4		R (CBO)	Insert control rods to return to safe area of Power to flow map.
5	mfC11_280 mfC12_22	C (CBO)	Control rod 18-35 will not insert, raise CRD DP to insert.
6	mfE51_61	(SRO TS) C (BOP)	RCIC Trip & Throttle valve tripped locally, must be reset and re-latched.
**7	mfB21_131	(SRO TS) I (CBO)	<b>**Optional</b> - ADS Inadvertent Initiation. Must manually override to prevent ADS valves from opening.
8A	mfR22_181 mfB21_229B mfE41_104 diC11B-S4A diC11B-S4B	M (All)	4160 VAC "D" trips causing a loss of 2 condensate and condensate booster pumps, then Feedwater line B breaks, causing a LOCA, HPCI trips on start and will not be returned to service.
8B	diN21-F006B	C (BOP)	2N21-F006B fails to close, must close upstream Feedwater valves causing a loss of all feedwater.
8C	mfB31-248B	C(CBO)	Recirc Pump "B" fails to automatically trip on low reactor water level (RWL)
9		M (All)	Emergency depressurization is required due to low RWL

Total time 1 hour 45 minutes, including optional failure.

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

Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 1Page 1 of 1

Event Description: Lower torus level to 147.5 inches using RHR Loop B

Time	Position	Applicant's Actions or Behavior
12 min	SS	<ul style="list-style-type: none"> <li>Directs the operator to lower torus water level to 147.5" using "B" loop of RHR.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Enters 34SO-E11-010-2, Residual Heat Removal System.</li> <li>Confirms Radwaste is capable of receiving the water to be transferred.</li> <li>Confirms the RHR discharge water temperature is &lt; 200°F, 2T47-R627, point 3.</li> <li>Opens 2E11-F049, RHR To Radwaste Valve.</li> <li>Monitors torus level on 2T48-R607A(B), 2H11-P602 (2H11-P654).</li> <li>Throttles OPEN, 2E11-F040, RHR To Radwaste Valve.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Monitors torus water level and once level has been lowered to approximately 147.5" secures the flow path.</li> <li>Closes 2E11-F040, RHR To Radwaste Valve.</li> <li>Closes 2E11-F049, RHR To Radwaste Valve.</li> <li>Reports to the SS that torus water level has been lowered to 147.5"</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 2Page 1 of 2

Event Description: RFPT 2B lube oil cooling water controller failure.

Time	Position	Applicant's Actions or Behavior
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10 min		<b>While the BOP operator is lowering torus water level, Simulator Operator enters mfN21_88B, Feedwater Pump Lube Oil Cooling System Failure.</b>
	ALL	<ul style="list-style-type: none"> <li>Alarm 34AR-650-315-2, "RFPT 2B Brg Oil Temp High" will illuminate and 34AR-650-112-2, RFP/COND BRG Metal Temp High</li> </ul>
	CBO	<p>Note the operator may place the controller in manual in accordance with 30AC-OPS-003-0, responding to a failed controller.</p> <ul style="list-style-type: none"> <li>Addresses the high temp annunciator, pulling the ARP</li> <li>At panel 2H11-P655, check all temperature indicators on 2N32-R616 to determine actual oil temperatures.</li> <li>Confirm that RFPT 2B Oil Temp controller, 2P41-R606, on panel 2H11-P650 is adjusted for 110 to 130°F</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Recognizes the automatic function of the controller has failed, closing the cooling water valve.</li> <li>Places the controller in manual, depresses the open/increase pushbutton, opening the valve. Oil temperatures begin decreasing and the alarm extinguishes.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Notifies maintenance of the RFPT temperature controller problem.</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 2Page 2 of 2

Event Description: RFPT 2B lube oil cooling water controller failure.

Time	Position	Applicant's Actions or Behavior
		<b>Delete mfN21_88B</b>
		<b>Simulator operator uses time compression and reports the problem was a wiring harness on the temperature sensor. The automatic function of the temperature controller has been repaired and may be returned to service.</b>
	SS	<ul style="list-style-type: none"><li>• Directs the CBO to return 2P41-R606 to automatic operation.</li></ul>
	CBO	<ul style="list-style-type: none"><li>• Depresses the automatic pushbutton on controller 2P41-R606.</li><li>• Verifies the controller responds correctly in automatic.</li><li>• Notifies the SS the Lube Oil Temperature Controller has been returned to automatic.</li></ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 3Page 1 of 5

Event Description: Pump Motor A Winding Cooling Water Flow Low

Time	Position	Applicant's Actions or Behavior
16 min		Once the BOP is available to respond to the event, Insert mfB31_40A, Recirculation Pump Motor High Temperature.
	ALL	<ul style="list-style-type: none"> <li>Annunciator 34AR-602-118-2, "Pump Motor A Winding Cooling Water Flow Low" will illuminate.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Responds to the annunciator</li> <li>At panel 2H11-P650, confirms that RBCCW System is in operation and supplying water to the containment as indicated by 2P42-R603, RBCCW Flow To Drywell indicator.</li> <li>At panel 2H11-P614, checks winding temperatures, on 2B31-R601, Recirc Pump Temp recorder.</li> <li>Trends temperatures, keeping the SS updated.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Directs the operator to reduce pump speed per 34SO-B31-001-2. May reduce both "A" and "B" or just "A" pump.</li> </ul>



**Op-Test No.:** \_\_\_\_\_ **Scenario No.:** 2 **Event No.:** 3

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**Event Description:** Pump Motor A Winding Cooling Water Flow Low

[illegible]

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Time	Position	Applicant's Actions or Behavior
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[illegible]

Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 3Page 4 of 5

Event Description: Pump Motor A Winding Cooling Water Flow Low

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>Enters 34AB-B31-001-2, "Reactor Recirculation Pump(S) Trip, Or Recirc Loops Flow Mismatch."</li> <li>Reduces the Reactor Recirculation Pump "B" flow to less than 100% rated flow for one pump (38.5 Mlbm/hr, 45,200 GPM).</li> </ul>
		<ul style="list-style-type: none"> <li>IF the Region of Potential Instabilities shown on Attachment 1 of 34GO-OPS-005-2 is entered at any time during the performance of this procedure, take actions to exit per the STA's direction, within any limitations needed for equipment protection.</li> <li>Maintain loop to loop differential temperature less than 50°F AND steam dome to bottom drain temperature less than 145°F per 34SO-B31-001-2, Reactor Recirculation System.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Addresses tech specs 3.4.1. A, determining a RAS exist requiring the LCO to be met within 24 hours.</li> <li>Notifies reactor engineering to enable Single Loop Operations on the APRM NUMACS.</li> <li>Notifies Plant Management</li> </ul>



**Op-Test No.:** \_\_\_\_\_ **Scenario No.:** 2 **Event No.:** 3

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**Event Description:** Pump Motor A Winding Cooling Water Flow Low

[illegible]

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Time	Position	Applicant's Actions or Behavior
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[illegible]

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Time	Position	Applicant's Actions or Behavior
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Time	Position	Applicant's Actions or Behavior
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**Op-Test No.:**                      **Scenario No.:**    **2**    **Event No.:**    **5**

Page 2 of 2

**Event Description:** Control rod will not insert, raise CRD DP to insert

[illegible]



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Time	Position	Applicant's Actions or Behavior
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[illegible]



Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 6Page 2 of 3

Event Description: RCIC Trip &amp; Throttle valve tripped locally, must be reset and re-latched.

Time	Position	Applicant's Actions or Behavior
		<b>Once Tech Specs have been addressed, Call the control room as a Systems Operator in training, that while you were in the RCIC room you accidentally bumped a lever on the RCIC pedestal. It changed position along with a long rod attached to the lever.</b>
	SS	<ul style="list-style-type: none"> <li>Notifies the SSS to have the RCIC mechanical overspeed reset.</li> <li>Directs the operator to return RCIC to standby. May use generic guidance of 31GO-OPS-021-0 to open the trip and throttle valve.</li> </ul>
		<b>AFTER the operator has identified the problem as a trip and had RCIC reset locally, Delete malfunction mfE51_61. Simulator operator, call the control room, informing them the RCIC mechanical overspeed has been reset.</b>
	BOP	<ul style="list-style-type: none"> <li>Enters 34SO-E51-001-2, Reactor Core Isolation Cooling (RCIC) System section for resetting the mechanical overspeed. <ul style="list-style-type: none"> <li>At panel 2H11-P602, takes 2E51-F524, Turbine Trip &amp; Throttle Valve control switch to close and holds until valve operator is fully closed.</li> <li>At panel 2H11-P602, takes 2E51-F524, Turbine Trip &amp; Throttle Valve (T&amp;T), control switch to open and holds until the valve is operator is fully open, verifying the valve indication reflects the valve is opening along with the valve operator.</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 6Page 3 of 3**Event Description:** RCIC Trip & Throttle valve tripped locally, must be reset and re-latched.

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"><li>• Notifies the SS that RCIC's Trip &amp; Throttle valve is open And RCIC has been returned to the standby condition.</li><li>• May confirm the remainder of the standby lineup but the only required manipulation is to re-latch and open the T&amp;T valve.</li></ul>
	SS	<ul style="list-style-type: none"><li>• Determines the RASs associated with RCIC no longer exist</li></ul>

Page 1 of 2

Time	Position	Applicant's Actions or Behavior
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6 min		<p>This component failure is OPTIONAL. The Chief Examiner will determine if this Event should be used.</p> <p>Wait until RCIC is returned to Standby prior to starting this event.</p> <p>It may be necessary to send the BOP operator to the back panels to ensure that the CBO gets this event. If so, call the team as a Lab Tech and state that you need a routine reading from 2D11-K615A, Offgas Post Treatment Rad Monitor A NUMAC.</p> <p>While the BOP is getting the reading, start this event.</p> <p>Simulator Operator enters mFB21_131 “Inadvertent ADS Initiation”.</p>
	ALL	<ul style="list-style-type: none"> <li>The following alarms are received: <ul style="list-style-type: none"> <li>Auto Blowdown Timers Initiated</li> <li>Auto Blowdown Relays Energized</li> </ul> </li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Acknowledges the alarms and reports them to the SS.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>May observe the ADS timer on SPDS begin counting down.</li> </ul>
		<p><b>Note:</b> The SS may direct the CBO to inhibit ADS prior to pulling the 34AB-E10-001-2, “Inadvertent Initiation of ECCS/RCIC.”</p>



**Op-Test No.:**                      **Scenario No.:**    **2**    **Event No.:**    **7**

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**Event Description:** \*\*OPTIONAL - ADS Inadvertent initiation

[illegible]



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**Event Description:** 4160 VAC “D” trips causing a loss of 2 condensate and cond. booster pumps, then Feedwater line B breaks, causing a LOCA, HPCI trips on start and will not be returned to service.

[illegible]



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Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 8APage 4 of 4

**Event Description:** 4160 VAC "D" trips causing a loss of 2 condensate and cond. booster pumps, then Feedwater line B breaks, causing a LOCA, HPCI trips on start and will not be returned to service.

Time	Position	Applicant's Actions or Behavior

Page 1 of 4

Time	Position	Applicant's Actions or Behavior
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[illegible]



Page 2 of 4

Time	Position	Applicant's Actions or Behavior
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	BOP	<ul style="list-style-type: none"> <li>Recognizes HPCI has tripped, attempts to diagnose cause, notifies the SS of HPCI's trip.</li> <li>WHEN water level decreases to -100" on the Wide range level instruments, transitions to the fuel zone instruments for reactor water level determination.</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Initiates torus sprays by: <ul style="list-style-type: none"> <li>Places 2E11-S17A(B), Containment Spray Valve Control switch, in the MANUAL position.</li> <li>Confirms operating or starts RHR Loop A(B) pump(s).</li> <li>Opens 2E11-F028A(B), Torus Spray OR Test Valve.</li> <li>Throttles open 2E11-F027A(B), Torus Spray Valve.</li> </ul> </li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Initiates drywell sprays by <ul style="list-style-type: none"> <li>Places 2E11-S17A(B), Containment Spray Valve Control switch, in the MANUAL position if a different loop is used.</li> <li>Verifies Recirc pumps and drywell cooling fans are secured. (See event 8C, if "B" Recirc pump is still operating.)</li> <li>Opens 2E11-F021A(B), Containment Spray Inbd Valve</li> <li>Throttles open 2E11-F016A(B), Containment Spray Outbd Valve.</li> <li>Verifies drywell pressure is decreasing.</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 8BPage 3 of 4

**Event Description:** 2N21-F006B fails to close, must close upstream Feedwater valves causing a loss of all feedwater.

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>• Directs the operator to secure drywell sprays before drywell pressure reaches 0 psig or before reactor water level decreases below TAF.</li> <li>• Directs the operator to secure torus sprays before torus pressure reaches 0 psig before reactor water level decreases below TAF.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>• Once the SS deduces reactor water level cannot be maintained above – 155", transitions to CP-1 flow chart 31EO-EOP-015-2 point "E."</li> <li>• Per CP-1, Directs the following: <ul style="list-style-type: none"> <li>• ADS be inhibited (Already performed if optional component failure was used.)</li> <li>• All available table 8 systems, Condensate and ECCS pumps be started and maximize injection.</li> <li>• May direct table 9 systems be started and used to inject, CP-1 allows this action but does not require it at this time.</li> </ul> </li> </ul>
	SS	<ul style="list-style-type: none"> <li>• Notifies maintenance to begin repairs of HPCI.</li> <li>• As time allows, has the H2O2 analyzers placed in service.</li> <li>• If time allows, briefs the team on plant conditions.</li> </ul>

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Time	Position	Applicant's Actions or Behavior
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Time	Position	Applicant's Actions or Behavior
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Time	Position	Applicant's Actions or Behavior
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25 min	BOP	<ul style="list-style-type: none"><li>Monitors RPV water level as it trends down.</li><li>Informs the SS of water level reaching –155.”</li></ul>
	SS	<ul style="list-style-type: none"><li>Per CP-1</li><li>Orders emergency depressurization once water level decreases below –155” and prior to –185”. (<b>critical task</b>)</li><li>Orders all available table 8 systems injecting until water level raises above –155”.</li></ul>
	CBO	<ul style="list-style-type: none"><li>Opens 7 ADS valves, (<b>critical task</b>)</li></ul>
	BOP	<ul style="list-style-type: none"><li>Verifies RHR and Core Spray injection valves open once the Reactor Pressure Low 500 psig alarm illuminates.</li><li>Verifies injection from Core Spray and RHR pumps begins as soon as reactor pressure decreases below the shut off head of the pumps.</li><li>When water level is restored above Top OF Active Fuel throttles flow for C/S and RHR per the SS directions.</li></ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 9Page 2 of 3

Event Description: Emergency depressurization is required due to low RWL

Time	Position	Applicant's Actions or Behavior
		Note: When drywell sprays are secured, drywell temperatures will increase. Depending on how long DW sprays have been secured and the temperature inside the drywell when emergency depressurization occurs, reactor water level instruments may experience flashing.
	BOP	<ul style="list-style-type: none"> <li>Observes fuel zone water level instruments and the normal 0" to 60" water level instruments for flashing.</li> <li>If flashing occurs notifies the SS.</li> </ul>
		Note the following steps are contingent on whether the water level instruments experience flashing.
	SS	<ul style="list-style-type: none"> <li>If flashing occurs then transitions to CP-2, 31EO-EOP-016-2 point "J" flooding for non-ATWS.</li> <li>Directs the operator to close: <ul style="list-style-type: none"> <li>MSIVs</li> <li>RPV head vents</li> <li>MSL drains</li> <li>RCIC isolation valves</li> <li>HPCI isolation valves.</li> </ul> </li> <li>Directs the operator to raise injection to obtain 50 psid reactor pressure above torus pressure.</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Verifies the following are closed: <ul style="list-style-type: none"> <li>MSIVs</li> <li>RPV head vents</li> <li>MSL drains</li> <li>RCIC isolation valves</li> <li>HPCI isolation valves.</li> </ul> </li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 9Page 3 of 3

Event Description: Emergency depressurization is required due to low RWL

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>Sets a pressure band for the operator to achieve, must be greater than 50 psid above torus pressure.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Continues injecting until reactor pressure is at least 50 psid above torus pressure.</li> <li>If injection had been throttled, the operator will increase flow until all available ECCS is injecting until 50 psid is obtained.</li> <li>Notifies the SS when reactor pressure is at least 50 psid above torus pressure.</li> </ul>
	SS	Starts the flooding interval time limit.
		The scenario should be terminated when the crew has emergency depressurized the reactor and re-established adequate core cooling with water level above TAF or reactor pressure more than 50 psid above torus pressure.

**DRAFT****Facility:** E. I Hatch**Scenario No.:** 3**Op-Test No.:****Examiners:** Ron Aiello**Operators:**

**Initial Conditions:** Unit 2 is at 100% RTP. Drywell pressure is at 0.65psig due to normal pressure increase.

**Turnover:** Vent the Drywell for normal pressure increase using SBGT "2A". Maintain Rated Power.

Event No.	Malf. No.	Event Type*	Event Description
1	diT46-D001A-1	C (BOP) (SRO TS)	Standby Gas Treatment 2A fails to start manually, 2B must be manually started and suction source re-aligned.
2		N (BOP)	Vent Primary Containment
3	mfC32_90	I(CBO)	Feedwater master controller losses power. (time compressed repair, then return to Auto)
4		C(BOP)	Unit Aux Transformer 2B oil leak occurs, Reactor power must be reduced to <2558 MWth, 4160 VAC buses 2A & 2B must be transferred to Start-up transformer 2C
5	mfG31_207A svoG31071 mfG31_52	C(CBO) (SRO TS)	RWCU line break outside containment. Must be manually isolated, with failure of outboard isolation valve to close.
6		R (CBO)	Reduce Recirc flow to decrease power to < 2558 MWth
7**	mfE51_114	C(CBO) (SRO TS)	**OPTIONAL – use if needed. No effect on scenario. RCIC Inadvertent start, repair and return to standby
8	mfC11_211 mfN43_158A mfN43_158B	M (All)	Stator cooling pump 2A trips, 2B will not start. Rx scram with ATWS requiring RWL be maintained between -60" and -90"..
9	C11_30A	C (CBO)	CRD "2A" pump trip. Must start "2B" to continue to insert rods.
10	mfE51_61	C (BOP)	RCIC trips on Mechanical over-speed, must be reset locally and RCIC restarted.
			Scenario is terminated after all Rods are full in.

Total time was 1 hour and 50 minutes including, including optional failure.

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

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Time	Position	Applicant's Actions or Behavior
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[illegible]



**Op-Test No.:**                      **Scenario No.:**    **3**    **Event No.:**    **1**

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**Event Description:** SSGT "2A" fails to start

[illegible]

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Time	Position	Applicant's Actions or Behavior
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Time	Position	Applicant's Actions or Behavior
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[illegible]



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 3Page 2 of 3

Event Description: Feedwater Master Controller losses power

Time	Position	Applicant's Actions or Behavior
		The next set of actions may have been performed prior to 2C32-R600 being returned to service.
	CBO	<p>Enters Recovery From Loss Of Master Feedwater Controller (Power Or Output Signal) subsection of 34SO-N21-007-2</p> <ul style="list-style-type: none"> <li>• Confirms 2C32-R601A M/A Station (PF lamp FLASHING), has assumed the role of 2C32-R600, Master Controller, in Single Element mode (Feedwater Control Mode Select Switch indicating light EXTINGUISHED)</li> <li>• Places Feedwater Control Mode Select Switch in 1 ELEM position</li> <li>• Confirms/Places Reactor Level Mode Select Switch to manual</li> </ul>
	CBO	2C32-R600 restoration:
		<ul style="list-style-type: none"> <li>• Places 2C32-R600 in MANUAL mode</li> <li>• Adjusts output signal of 2C32-R600 to match the output of the RFP B M/A Station</li> <li>• Places 2B M/A Station from MANUAL to AUTO</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>• Adjusts setpoint of 2C32-R600 to agree with actual RWL</li> <li>• Places 2C32-R600 in AUTO</li> </ul>

**Op-Test No.:**                      **Scenario No.:**    **3**    **Event No.:**    **3**

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**Event Description:** Feedwater Master Controller losses power

[illegible]

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 4Page 1 of 3

Event Description: Main Transformer Cooling "A" Fans trip

Time	Position	Applicant's Actions or Behavior
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18 min		<b>Simulator Operator</b> as a Ga Power Company switchyard maintenance supervisor, call the crew and inform them that you are at Unit Auxiliary Transformer 2B performing a visual inspection. You've observed that there is an oil leak on one of the transformer oil pump gaskets and that the oil level is unusually low in the transformer. An oil seal needs replacing and oil added to the transformer. Continued operation could cause permanent damage to the transformer and it should be unloaded as soon as safely possible.
		<b>Simulator operator event coordination note:</b> When the BOP operator starts event 4. The CBO should be the operator that is assigned to reduce reactor power that is required later in this event. Once the CBO has reduced power to <2558 MWth, then, Enter the malfunction for Event 5.
	SS	<ul style="list-style-type: none"> <li>Directs BOP operator to enter 34SO-R22-001-2 for transferring 4160VAC buses from Unit Aux Transformer (UAT) to Start-Up transformer (SUT) 2C.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Enters 34SO-R22-001-2</li> <li>Reviews the precautions and limitations section or the caution at step 7.3.6 of the procedure and determines that reactor power must be lowered to &lt;2558 MWth.</li> <li>Notifies the SS of the required power reduction</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Directs the CBO to lower Rx power to (<math>\approx</math>)2550 MWth</li> </ul>
		<b>The power reduction is performed in event 6, then return here to complete this event.</b>
	SS	<ul style="list-style-type: none"> <li>After Rx power has been reduced, orders the BOP to transfer 4160VAC buses 2A and 2B to the SUT 2C.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 4Page 2 of 3

Event Description: Main Transformer Cooling "A" Fans trip

Time	Position	Applicant's Actions or Behavior
		Note: It is acceptable to swap 2A or 2B 4160VAC buses to the SUT first. The following steps has 2A swapped first.
	BOP	Swapping of 2A 4160VAC from the UAT to the SUT <ul style="list-style-type: none"> <li>• Verifies reactor power <math>\leq</math> 2558 MWth</li> <li>• Confirms power is available to Startup Aux XFmr 2C as indicated by the potential lights on panel 2H11-P651</li> <li>• Confirms OPEN ACBs 135544, 135564 and 135584 (2H11-P652)</li> </ul>
		<ul style="list-style-type: none"> <li>• Places 135434/135454 Station Svc Interlock Cutout switch in OFF-(DOWN)</li> <li>• Places Sync Switch (SSW) ACB 135454 in ON</li> <li>• Confirms the sources of power to 4160V Bus 2A are synchronized and voltage is normal on Start-Up Aux Transformer 2C</li> </ul>
		<ul style="list-style-type: none"> <li>• Closes ACB 135454, 4160V Bus 2A Alternate Supply, AND confirms that current increases from Startup Auxiliary Transformer 2C</li> <li>• Trips ACB 135434, 4160V Bus 2A Normal Supply</li> <li>• Places Sync Switch (SSW) ACB 135454 in OFF</li> <li>• Places 135434/135454 Station Svc Interlock Cutout switch in NORMAL-(UP)</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 4Page 3 of 3

Event Description: Main Transformer Cooling "A" Fans trip

Time	Position	Applicant's Actions or Behavior
	BOP	Swapping of 2B 4160VAC from the UAT to the SUT <ul style="list-style-type: none"> <li>• Verifies reactor power <math>\leq</math> 2558 MWth</li> <li>• Confirms power is available to Startup Aux XFmr 2C as indicated by the potential lights on panel 2H11-P651</li> <li>• Confirms OPEN ACBs 135544, 135564 and 135584 (2H11-P652)</li> </ul>
		<ul style="list-style-type: none"> <li>• Places 135444/135464 Station Svc Interlock Cutout switch in OFF-(DOWN)</li> <li>• Places Sync Switch (SSW) ACB 135464 in ON</li> <li>• Confirms the sources of power to 4160V Bus 2B are synchronized and voltage is normal on Start-Up Aux Transformer 2C</li> </ul>
		<ul style="list-style-type: none"> <li>• Closes ACB 135464, 4160V Bus 2B Alternate Supply, AND confirms that current increases from Startup Auxiliary Transformer 2C</li> <li>• Trips ACB 135444, 4160V Bus 2B Normal Supply</li> <li>• Places Sync Switch (SSW) ACB 135464 in OFF</li> <li>• Places 135444/135464 Station Svc Interlock Cutout switch in NORMAL-(UP)</li> <li>• Notifies the SS that 4160 VAC 2A and 2B buses have been transferred from the UAT to SUT 2C.</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 5Page 1 of 2

Event Description: RWCU line break outside containment

Time	Position	Applicant's Actions or Behavior
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10 min		<p>Simulator Operator, wait until the CBO has completed the power decrease and while the BOP operator is transferring A and B 4160 VAC buses enter the following</p> <ul style="list-style-type: none"> <li>mfG31_207A, G31-F001 Fails to isolate on Group 5</li> <li>svoG31071, G31-F004 Valve position</li> <li>mfG31_52, RWCU System Leak</li> </ul>
	All	<ul style="list-style-type: none"> <li>“RWCU System Leak” Alarm is received.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>May send a RO to Control Room back panel to determine leakage.</li> <li>May direct the CBO operator to trip and isolate RWCU.</li> </ul> <p>If asked to determine leakage, the Simulator Operator reports a delta flow of 78 gpm (2G31-N603A &amp; B).</p>
	CBO	<ul style="list-style-type: none"> <li>Enters 34AR-602-421-2, “RWCU Sys Leak”</li> <li>Determines that RWCU should have tripped and isolated.</li> <li>Trips RWCU Pump “2B”</li> <li>Attempts to close 2G31-F001 and 2G31-F004.</li> <li>Determines that the RWCU System 2G31-F001 DID close. (Critical Task)</li> <li>Determines that the RWCU System 2G31-F004 DID NOT close.</li> <li>Notifies SS that 2G31- F004 will not close.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 5Page 2 of 2

Event Description: RWCU line break outside containment

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> <li>• Enters 34AB-G31-001-2, RWCU System isolation.</li> <li>• ENTER 34AB-T22-001-1, Primary Coolant System Pipe Break Reactor Building.</li> <li>• Contact Chemistry to isolate the autoclave and the Mitigation Monitoring system. (Note the SS may contact Chemistry.)</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>• Enters 34AB-T22-001-2, "Primary Coolant System Pipe Break Reactor Building."</li> <li>• Monitor Reactor level.</li> <li>• Monitor Reactor power.</li> <li>• Confirm all Automatic Actions have occurred.</li> <li>• Investigate the extent of damage to the RWCU System.</li> <li>• Monitor Reactor Chemistry and continue operations, as allowed by TS.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>• Dispatches SO to determine RWCU leak location.</li> <li>• Dispatches SO/Maintenance to determine why 2G31-F004 did not close.</li> <li>• Enters TS for 2G31-F004.</li> <li>• Determines that LCO 3.6.1.3.A applies and that the RWCU Line must be isolated within 4 hours.</li> </ul>
		As the SO sent to investigate the RWCU leak, REPORT that viewing with the camera, there appears to have been a leak on the non-regenerative heat exchanger as there is water on the floor, but there is no leakage at this time

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 6Page 1 of 1

Event Description: Reduce Reactor Power Using Recirc flow

Time	Position	Applicant's Actions or Behavior
15 min		<b>Note:</b> This reactivity change will occur as a result of the need to reduce power to place the 2A and 2B 4160VAC buses on Start-up Transformer 2C (See event #4 of this Scenario for details)
	CBO	<ul style="list-style-type: none"> <li>Reduces Rx power to &lt;2558 MWth using Recirc per SS direction in event #4.</li> </ul>
		<b>Note:</b> The SS may direct the operator to exceed 10MWe/min. This action is allowed in abnormal situations per 34GO-OPS-005-2, "Power Changes."
	CBO	Enters the following procedures <ul style="list-style-type: none"> <li>34GO-OPS-005-2, "Power Changes"</li> <li>34SO-B31-001-2, "Recirculation System"</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Reduces reactor power by lowering Recirc flow per 34SO-B31-001-2.</li> <li>Monitors the Power to Flow map to determine if the Immediate Exit Region is entered.</li> <li>Notifies the SS of the proximity to the Immediate exit region.</li> </ul> NOTE: It is allowable to enter the immediate exit region for protecting equipment, but in this particular event the power reduction should be completed prior to entering the immediate exit region .
		When Reactor power has been reduced to <2558 MWth return to event 4.



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 7Page 1 of 2

Event Description: OPTIONAL - RCIC Inadvertent start

Time	Position	Applicant's Actions or Behavior
13 min		<p>This component failure is OPTIONAL. The Chief Examiner will determine if this Event should be used.</p> <p>Simulator Operator enters mfE51_114</p>
	All	<ul style="list-style-type: none"> <li>Receives SEC System Auto Initiation Signal Present Alarm</li> <li>Recognizes that RCIC has started.</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Determines RCIC has auto started and that RWL is normal.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Tells operator that RWL is normal</li> <li>Directs operator to trip RCIC</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Trips RCIC by depressing the RCIC Trip pushbutton. (This is IAW 34SO-E51-001-2, RCIC System, but the CBO may not enter the procedure prior to performing the step.) (Critical Task)</li> </ul>
		<ul style="list-style-type: none"> <li>Enters 34AB-E10-001-2, Inadvertent Initiation of ECCS/RCIC</li> <li>Enters 34SO-E51-001-2, RCIC System</li> <li>Dispatches RO/Maint to determine cause of initiation signal</li> <li>May attempt to reset the Initiation signal</li> <li>May Close 2E51-F524, Trip and Throttle Vlv</li> </ul>
	SS	<ul style="list-style-type: none"> <li>May have the operator run the Trip and Throttle Valve down to re-latch in case RCIC is needed later.</li> <li>Enters TS for RCIC 3.5.3.A, 14 days for RCIC inoperable.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 7Page 2 of 2

Event Description: OPTIONAL - RCIC Inadvertent start

Time	Position	Applicant's Actions or Behavior
		Simulator Operator – After the SS has determined the Tech Spec actions, as a Maint. Supervisor, call the SS or CBO and inform them that Time Compression is being used and that a relay on RCIC had failed and has been replaced. The RCIC Initiation signal was not valid and RCIC can be returned to standby now.
	SS	Directs the operator to reset RCIC and return it to standby.
	CBO	<ul style="list-style-type: none"> <li>Enters 34SO-E51-001-2, RCIC System Operation</li> <li>Depresses the RCIC Initiation Signal Reset Pushbutton</li> <li>Closes 2E51-F045</li> <li>Verifies 2E51-F004, 2E51-F005, 2E51-F026, 2E51-F025, and 2E51-F026 open.</li> <li>Closes 2E51-F046, turbine cooling water valve</li> <li>Resets the RCIC Trip and Throttle Valve (F524) by closing, verifying latched and re-opening (may have closed earlier)</li> </ul>
		<ul style="list-style-type: none"> <li>The RCIC Trip alarm clears</li> <li>Slowly throttles open the Trip and Throttle Valve</li> <li>Approximately 10 to 15 minutes after 2E51-F045, Steam To Turbine Vlv, is closed, stops 2E51-C002-2, Barom Cndsr Vac Pump.</li> <li>Performs the Standby subsection of the system operating procedure to return RCIC to STANDBY</li> </ul> <p>May use Attachment 1 to verify RCIC Standby lineup</p>
	CBO	Notifies SS that RCIC has been returned to Standby.
		Simulator Operator – With Chief Examiner concurrence, continue to the next event after the trip and throttle valve has been re-opened. It is not necessary for the operator to complete the standby section of the RCIC procedure, it should be available to start automatically as soon as the T & T valve is opened.

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 1 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
29 min		<p>Simulator Operator enters:</p> <p>mfC11_211, mfN43_158A, and 20 seconds later enter mfN43_158B (SDV Hydraulic Lock and Stator Cooling pump "2A" and "2B" trips).</p>
	ALL	<ul style="list-style-type: none"> <li>Stator Cooling pumps "2A" and "2B" trip.</li> </ul>
		<p>Annunciators received:</p> <ul style="list-style-type: none"> <li>34AR-651-201-2, "Generator Inlet Flow Low"</li> <li>34AR-651-211-2, "Generator Protection Ckt Energized"</li> </ul>
		<p>The plant responds to this condition by automatically "running back" the main generator.</p> <p>If the reactor is not manually scrammed the Main Turbine Control Valves begin to close, which reduces MWe, and reactor pressure begins to increase.</p> <p>As reactor pressure increases, the Bypass Valves open to maintain RPV pressure.</p> <p>After all three Bypass Valves fully open, RPV pressure increases rapidly resulting in a reactor scram due to APRM trip setpoints or a High Pressure scram setpoint.</p>
	SS	<ul style="list-style-type: none"> <li>The reactor may automatically scram or may be manually scrammed before the SS has time to order the scram.</li> <li>Enters RC or RC-A EOP Flowchart.</li> <li>Directs CBO to perform RC-1 placard.</li> <li>Directs BOP to perform RC-2 and RC-3 placards.</li> </ul>

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Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 3 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>• IF feed flow is less than the capacity of the S/U level control valve (<math>\approx</math> 1.5 mlbm/hr), then:</li> <li>• Opens 2N21-F125.</li> <li>• Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.</li> <li>• Closes 2N21-F110.</li> <li>• Secures one RFPT if necessary.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• Monitors RPV pressure.</li> <li>• Confirms proper operation of pressure control system (TBV, LLS, etc.).</li> <li>• If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate Low Low Set.</li> <li>• Maintains RPV pressure between 1074 and 800 psig.</li> <li>• As time permits notifies SS of pressure control system operation.</li> </ul>
	SS	Enters RC-A Flowchart (ATWS) and CP3 (ATWS Level Control).
		<ul style="list-style-type: none"> <li>• Directs CBO to: <ul style="list-style-type: none"> <li>• Confirm the reactor Mode Switch in Shutdown.</li> <li>• Confirm ARI Initiation.</li> <li>• Confirm Recirc runback to minimum.</li> </ul> </li> </ul>

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**Event Description:** All Control Rods insert, Transition to non-ATWS

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Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 5 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> <li>• Trips Recirc pumps, if not already tripped</li> <li>• Enters 31EO-EOP-103-2, "EOP Control Rod Insertion Methods".</li> <li>• Directs the SSS to send a SO to place the ARI test switches in test on 2C11-P001 (local panel) per the 103 procedure.</li> <li>• Places the SDV high level trip bypass switch in the "Open" position.</li> <li>• Direct the SSS to override all automatic scram signals per the 103 procedure.</li> <li>• Places the Disch Vol Isol Test Switch to NORM (this action may not be done until the SSS reports back that the automatic scrams have been overridden).</li> </ul>
		If asked, STA will direct the CBO to start in the center of the core and spiral out in a "black and white" pattern.
	CBO	<ul style="list-style-type: none"> <li>• Prepares to manually insert control rods IAW 31EO-EOP-103: (Critical Task – insert rods)</li> <li>• Places the Reactor Mode Switch in "Refuel".</li> <li>• Places the RWM Bypass Switch in "Bypass".</li> <li>• Ask STA which rods have the highest worth or inserts rod in a black and white pattern.</li> <li>• Establishes adequate drive water pressure by adjusting 2C11-F003, Drive Pressure Control Valve.</li> <li>• May start a second CRD pump to establish adequate drive water pressure.</li> <li>• Selects a rod.</li> <li>• Drives selected rod to at least the 02 position using the Emergency In Notch Override switch or Rod Movement Switch.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 6 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
		Simulator Operator – Once the CBO has control rod inserting, go to and enter malfunctions for event # 9, CRD Pump trip. Return to this event after event 9 is complete.
	BOP	<ul style="list-style-type: none"> <li>As time allows, and when generator load goes below 80 MWe, the crew performs TC-1 to trip the Main Turbine.</li> <li>Manually Trip the Turbine.</li> <li>Confirm TSV's, TCV's, and CIV's have properly closed.</li> <li>Confirm the generator PCBs and exciter field breaker tripped.</li> <li>Confirm the 4160 VAC station service busses have transferred to their alternate supply.</li> <li>Confirm/Place TGM in auto. <ul style="list-style-type: none"> <li>Start TG Oil Pump</li> <li>Motor Suction Pump</li> <li>Lift Pumps</li> </ul> </li> <li>Close the RSSV's (2N11-F004A and F004B).</li> </ul>
	SS	<ul style="list-style-type: none"> <li>If the Main Turbine is tripped (manually or automatically), Directs the BOP operator to lower reactor pressure to &lt;845 psig.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Lowers the pressure setpoint to &lt;845 psig using the EHC system.</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 7 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>• May direct CBO to inject SBLC (not initially required).</li> <li>• Orders ADS inhibited.</li> <li>• Directs SSS to override MSIV low RWL closure.</li> <li>• May order BOP to override 2P41-F316 isolation.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• Inhibits ADS by placing both Keylock inhibit switches to "Inhibit"</li> </ul>
	SS	<ul style="list-style-type: none"> <li>• Directs BOP to Lower RWL to &lt; -60 inches, using 31EO-EOP-113-2 as needed.</li> <li>• Directs STA to verify Isolations and ECCS initiations.</li> </ul>
		Simulator Operator – Go to and enter malfunctions for event # 10, RCIC trip, immediately after RCIC injection starts. Return to this event after event 10 is complete.
	BOP	<ul style="list-style-type: none"> <li>• Reduces injection to lower RWL to &lt; -60 inches: (Critical Task – reduce level for power control)</li> <li>• Places the individual RFPT controller in manual and lowers speed as necessary to achieve a lowering RWL trend or trips the RFPT.</li> <li>• Lowers the HPCI setpoint as necessary to achieve a lowering RWL trend. (may trip HPCI or place the HPCI controller in manual and use the manual control to reduce HPCI speed/injection). If HPCI has not started the operator may place HPCI's Aux Oil Pump to PTL Off.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 8 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>When RPV level is below -60 inches, Directs the BOP operator to control RPV level within a level band. Any band between -60 inches and -185 inches is acceptable.</li> </ul> <p>(Typically -60" to -90" to maintain RPV level above -101")</p> <ul style="list-style-type: none"> <li>If RWL is subsequently allowed to increase to &gt;-60 inches and Rx power is &gt;5%, the override will be re-addressed to once again, lower level to &lt; -60.</li> </ul>
		<p>If the MSIVs close due to a Group 1 signal (RPV level decreases below -101") before being overridden, it is possible that Torus temperature and Reactor power may enter the unsafe region of the Boron Injection Initiation Temperature (BIIT) curve. In this case the SS will direct the BOP operator to Terminate and Prevent Injection per 31EO-EOP-113-2.</p> <p>The following 5 pages contain steps that will be taken in the event of MSIV closure and BITT curve entry. Evaluate each action to see which ones apply.</p>
	SS	<ul style="list-style-type: none"> <li>Before Reactor power and Suppression Pool water temperature enter the unsafe region of the BIIT curve:</li> </ul> <p>Directs the CBO to inject boron to the RPV. (Standby Liquid Control (SBLC)).</p>



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 9 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> <li>Initiates SLC Injection</li> <li>Unlocks and places SBLC pump select switch in "Start Sys A" or "Start Sys B" position.</li> <li>Confirms Squib Valve Ready Lights are extinguished.</li> <li>Confirms SBLC Loss of Continuity to Squib Valve annunciator is alarmed.</li> <li>Confirmed the selected SBLC pump started.</li> <li>Confirm that 2G31-F004 (RWCU Isolation Valve) has closed.</li> <li>Report to the SS that SBLC is injecting to the RPV.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Addresses the override located at coordinate C2 on EOP Flowchart CP-3 and determines the need to Terminate and Prevent injection to the RPV based on: <ul style="list-style-type: none"> <li>Reactor power &gt;5%.</li> <li>RWL above TAF.</li> <li>Torus temperature is above the BIIT curve.</li> <li>SRVs are open.</li> </ul> </li> <li>Directs the BOP operator to Terminate and Prevent Injection per 31EO-EOP-113-2, "Terminating and Preventing Injection into the RPV".</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Enters 31EO-EOP-113-2 (the following systems may be addressed in any order).</li> </ul>

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Time	Position	Applicant's Actions or Behavior
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	BOP	<ul style="list-style-type: none"> <li>• Terminates and Prevents Injection from HPCI (any of the following methods is acceptable):</li> <li>• If HPCI is not operating at the time, places the HPCI Aux Oil pump in Pull-to-lock off.</li> <li>• If HPCI is operating, HPCI may be secured by: <ul style="list-style-type: none"> <li>• Pressing and holding the HPCI Trip pushbutton until the turbine rpm = 0.</li> <li>• The Aux Oil Pump switch will then be placed in PTL Off.</li> <li>• The HPCI Trip pushbutton is released after the HPCI low oil pressure is received.</li> </ul> </li> <li>• If HPCI is operating, speed of HPCI may be reduced, with the HPCI turbine still in service by: <ul style="list-style-type: none"> <li>• Placing the HPCI flow controller in "Manual".</li> <li>• Reduce turbine speed as necessary to prevent injection to the RPV, yet maintaining HPCI speed &gt;2000 rpm.</li> </ul> </li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• Terminates and Prevents Condensate and Feedwater</li> <li>• Manually reduce RFPT speed to maintain discharge pressure below reactor pressure.</li> <li>• Close 2N21-F110, "S/U Level Control Bypass".</li> <li>• Close 2N21-F125, "S/U Level Control Isol".</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 11 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>Terminates and prevents Core Spray</li> <li>Core Spray may (it is acceptable) be considered Terminated and Prevented due to RPV pressure &gt; CS shutoff head.</li> <li>The BOP operator may: <ul style="list-style-type: none"> <li>Close 2E21-F005A and F005B.</li> <li>Trip CS Pump A and B.</li> <li>Direct the SSS to open links to override the LOCA open interlock.</li> </ul> </li> </ul>
		Simulator Operator – If directed to open links for CS, <u>insert the override for the links 4 minutes after the direction is given, then report that the links have been opened.</u>
	BOP	<ul style="list-style-type: none"> <li>Terminates and Prevents RHR.</li> <li>Per procedure Note: RHR may be considered Terminated and Prevented due to RPV pressure &gt; RHR shutoff head of 220psig.</li> </ul>
		Simulator Operator – If directed to open links and install jumpers for RHR, <u>insert the override for the links 4 minutes after the direction is given, then report the links have been opened and jumpers installed.</u>



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 12 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> <li>The BOP operator may: <ul style="list-style-type: none"> <li>Close/verify closed 2E11-F016A and F016B.</li> <li>Close/verify closed 2E11-F028A and F028B.</li> <li>Trip RHR pumps "2A", "2B", "2C" and "2D" if immediate termination of injection is required.</li> <li>Close 2E11-F017A and F017B.</li> <li>Direct the SSS to open links and install jumpers to override the LOCA open interlock.</li> </ul> </li> <li>OR <ul style="list-style-type: none"> <li>Close 2E11-F017A and F017B.</li> <li>Direct the SSS to open links and install jumpers to override the LOCA open interlock.</li> </ul> </li> </ul>
	SS	<ul style="list-style-type: none"> <li>Monitors/directs STA to monitor for the following parameters (any one of the parameters being met will allow a RPV level band to be established). <ul style="list-style-type: none"> <li>Reactor power below 5% <u>and</u> RWL below -60 inches.</li> <li>RWL at Top of Active Fuel.</li> <li>Drywell pressure &lt; 1.85 psig <u>and</u> all SRVs closed <u>and</u> RWL below -60 inches.</li> </ul> </li> </ul>
	SS	<ul style="list-style-type: none"> <li>When one of the above conditions have been satisfied, the SS directs the BOP operator to maintain RPV level within a level band.</li> </ul> <p>Any band between the RPV level at the time the condition was satisfied and -185 inches is acceptable.</p>

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 13 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	CBO	<p>When Scram Discharge Volume (SDV) high level trip or SDV not drained alarms clear, the operator inserts a manual scram. (will wait a few minutes between subsequent scrams).</p> <p>The CBO will determine that control rods did are not all fully inserted.</p>
		<p>Simulator Operator – With Chief examiner concurrence, ensure the reactor scram has been reset, then DELETE mfC11_211.</p>
	CBO	<ul style="list-style-type: none"> <li>When Scram Discharge Volume (SDV) high level trip or SDV not drained alarms clear, the operator inserts a manual scram.</li> <li>Determines that all control rods are fully inserted (using Full Core Display indications and RWM).</li> <li>Informs the SS that all control rods are fully inserted.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Transitions to the RC flowchart from RCA and CP-3. (Overrides on RCA and CP-3 provide direction to go to the RC chart).</li> <li>Directs the CBO to stop SBLC (if started)</li> <li>Directs BOP operator to maintain RPV level in a new RWL band (+3 inches to +50 inches)</li> <li>Directs CBO to enter 34AB-C71-001-2, "Scram Procedure".</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 8Page 14 of 14

Event Description: All Control Rods insert, Transition to non-ATWS

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"><li>Enters 34AB-C71-001-2, "Scram Procedure".</li></ul>
	BOP	<ul style="list-style-type: none"><li>Raises injection rate to establish a positive trend on RPV level.</li></ul>
		Scenario is terminated: <ul style="list-style-type: none"><li>All control rods are full-in</li><li>When a new RWL band is given per the RC flowchart</li><li>SBLC is stopped (if started)</li></ul>



Page 1 of 2

Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 9Page 2 of 2

Event Description: CRD Pump 2A trips, CRD 2B started for Control Rod insertion

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> <li>Addresses 34AR-603-128-2, "CRD Pump A Breaker Trip".</li> <li>Enters 34AB-C11-001-2, "Loss of CRD System".</li> <li>Places the CRD Flow Controller in manual.</li> <li>Lowers the controller output to "0".</li> <li>May attempt to re-start the 2A CRD pump, but it will not start</li> <li>Starts "2B" CRD pump.</li> <li>Raises CRD flow to 50 gpm.</li> <li>May send a SO locally to close 2C11-F034, "Charging Water Header Isolation Valve" to establish adequate drive water pressure.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>As time permits, orders SO and Maintenance to investigate the loss of CRD Pump "2A".</li> </ul>
		Return to event # 8

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 10Page 1 of 2

Event Description: RCIC trip and restart with initiation signal present

Time	Position	Applicant's Actions or Behavior
8 min		
		Simulator Operator enters– mfE51_61, RCIC trip, immediately after it has started to inject.
		Annunciators received: “RCIC Turbine Trip”.
	BOP	<ul style="list-style-type: none"> <li>Identifies that RCIC has tripped.</li> <li>Reports to the SS that RCIC has tripped.</li> <li>Refers to 34AR-602-301-2, “RCIC Turbine Trip”.</li> </ul>
	BOP	May perform the following: <ul style="list-style-type: none"> <li>Attempt to reset RCIC per 34SO-E51-001-2 per RCIC Recovery From a Turbine Trip section.</li> <li>Place the RCIC Flow controller in manual.</li> <li>Adjust the RCIC Flow controller output at 50%.</li> <li>Attempt to reset 2E52-F524, “RCIC Trip and Throttle Valve” (will not reset).</li> </ul>
	SS or BOP	<ul style="list-style-type: none"> <li>Sends SO to locally reset the RCIC Trip and Throttle Valve.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 10Page 2 of 2

Event Description: RCIC trip and restart with initiation signal present

Time	Position	Applicant's Actions or Behavior
		<b>Simulator Operator Delete RCIC trip (mfE51_61)</b>
		<b>Report</b> as the SO sent to reset the RCIC Trip and Throttle Valve that "The mechanical overspeed trip linkage was tripped and has been reset".
	BOP	<ul style="list-style-type: none"><li>• RCIC restarted per 34SO-E51-001-2 section for RCIC Recovery From a Turbine Trip start with initiation signal present.</li><li>• Reset the RCIC Trip and Throttle Valve (F524)..</li><li>• Slowly throttle open the Trip and Throttle Valve and concurrently open/verify open the discharge valve 2E51-F013.</li><li>• Transfers the controller to Auto.</li><li>• Adjust the controller setpoint as necessary to control injection.</li></ul>
		<b>Return to event # 8</b>

**DRAFT****Facility:** E. I Hatch**Scenario No.:** 4**Op-Test No.:****Examiners:** Ron Aiello**Operators:****Initial Conditions:** Unit 2 is at 75% RTP following a Control Rod pattern adjustment.

**Turnover:** 34IT-T45-001-2, Reactor Bldg. Instrument Sump Isolation Valve Exercise surveillance is to be performed. Increase Reactor Power to 100% RTP using Rx Recirc system and 34GO-OPS-005-2, Power Changes.

Event No.	Malf. No.	Event Type*	Event Description
1		N (BOP)	Perform 34IT-T45-001-2, Reactor Bldg. Instrument Sump Isolation Valve Exercise surveillance
2	mf60131124 aoE21_R600A	C (CBO)	Core Spray Pump A valve leakage (high discharge pressure) with CS pump in standby
3		R (CBO)	Increase Rx Power with Recirc
4		(SRO TS) C (BOP)	PSW Pump "A" oil leak, must manually Start PSW pump "D" and manually Trip PSW Pump "A"
5**	mfE41_103	(SRO TS) C (CBO)	**Optional -- HPCI Inadvertent initiation.
6	mfB21_130G	C (BOP)	SRV G fails open until fuses are pulled, RHR must be placed in torus cooling
7	mf_113	(SRO TS) C (CBO)	RCIC Auto isolation, E51-F008, due to failed steam line flow instrument. TC repair and un-isolate
8A	mfE51_250 svoE51074 svoE51075 rfC71_279	M (All)	RCIC Steam line break in the Rx bldg. RCIC isolation valves fail to close. SRO directs crew to manually SCRAM the Rx.
8B	mfE41_106	I (BOP)	HPCI Flow control fails and HPCI must be manually controlled after MSIVs close on high temp. from RCIC leak.
9A	mfE51_250	M (All)	Emergency Depress Due to steam leak into Secondary Containment.
9B	mfB21_129A mfB21_129E mfB21_129L	C (CBO)	Three ADS valves fail to open for Emergency Depress
			Scenario is terminated after reactor is emergency depressed.

\* Total time was 1 hour and 45 minutes including, including optional failure.

(N)ormal,

(R)eactivity,

(I)nstrument,

(C)omponent,

(M)ajor



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 1Page 1 of 3

**Event Description:** Perform 34IT-T45-001-2, Reactor Bldg. Instrument Sump Isolation Valve Exercise surveillance

Time	Position	Applicant's Actions or Behavior
8 min	SS	<p><b>Simulator Operator - Inform the SS you will provide an extra operator to perform the restoration section of the procedure when it's required.</b></p> <ul style="list-style-type: none"> <li>Orders the BOP to perform 34IT-T45-001-2, Reactor Bldg. Instrument Sump Isolation Valve Exercise surveillance</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Enters 34IT-T45-001-2</li> </ul> <p>Performs the following actions per Step 7.2</p> <ul style="list-style-type: none"> <li>Confirms that Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001 (below indication for 2T45-F001) is in AUTO, on panel 2H11-P654</li> <li>Confirms that the following valves are OPEN: <ul style="list-style-type: none"> <li>2T45-F005, RHR N-E Inbd Sump Isol.</li> <li>2T45-F003, Torus N-E &amp; S-E Inbd Sump Isol.</li> <li>2T45-F001, HPCI Sump Isol.</li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>Places Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001 in CLOSE, and confirms that the following valves CLOSE: <ul style="list-style-type: none"> <li>2T45-F005, RHR N-E Inbd Sump Isol.</li> <li>2T45-F003, Torus N-E &amp; S-E Inbd Sump Isol.</li> <li>2T45-F001, HPCI Sump Isol.</li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>Places Sump Isol switch for 2T45-F005, 2T45-F003, and 2T45-F001, in AUTO, and confirms that the following valves OPEN: <ul style="list-style-type: none"> <li>2T45-F005</li> <li>2T45-F003</li> <li>2T45-F001</li> </ul> </li> </ul>



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Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 1Page 3 of 3

**Event Description:** Perform 34IT-T45-001-2, Reactor Bldg. Instrument Sump Isolation Valve Exercise surveillance

Time	Position	Applicant's Actions or Behavior
		Performs the following actions per Step 7.4
		<ul style="list-style-type: none"> <li>• Confirms that Sump Isol switch for 2T45-F004 and 2T45-F002, (below indication for 2T45-F002) is in AUTO, on panel 2H11-P654.</li> <li>• Confirms that the following valves are OPEN: <ul style="list-style-type: none"> <li>• 2T45-F004, RHR N-E Outbd Sump Isol.</li> <li>• 2T45-F002, Torus N-E &amp; S-E Outbd Sump Isol.</li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>• Places Sump Isol switch for 2T45-F004 and 2T45-F002 in CLOSE, and confirms that the following valves CLOSE: <ul style="list-style-type: none"> <li>• 2T45-F004, RHR N-E Outbd Sump Isol.</li> <li>• 2T45-F002, Torus N-E &amp; S-E Outbd Sump Isol.</li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>• Places Sump Isol switch for 2T45-F004 and 2T45-F002 in AUTO, and confirms that the following valves OPEN: <ul style="list-style-type: none"> <li>• 2T45-F004</li> <li>• 2T45-F002</li> </ul> </li> <li>• Informs the SS that the surveillance is complete and acceptable and that the restoration section of the procedure needs to be completed by another operator.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>• Requests an operator to perform restoration/verification section of the procedure.</li> </ul> <p>When requested to get another operator to Independently verify the restoration section, inform the SS you will have another operator perform the section when one is available.</p>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 2Page 1 of 2

**Event Description:** Core Spray Pump A valve leakage (high discharge pressure) with CS pump in standby

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, while the BOP is at the back panels, enters mf60131136, "Core Spray A Disch Press" annunciator ON <u>and</u> aoE21_R600A, 2E21-R600A discharge pressure at 450psig.
	All	Receives "Core Spray A Disch Press" annunciator
	CBO	<ul style="list-style-type: none"> <li>Enters 34AR-601-328-2</li> <li>Determines Disch Press indicator, 2E21-R600A, on panel 2H11-P601 is reading 450psig</li> <li>Notifies the SS of high pressure in CS A discharge line</li> </ul>
	SS	Directs the CBO to continue in the annunciator response.
	CBO	<ul style="list-style-type: none"> <li>Confirms that the following valves are CLOSED, using their panel 2H11-P601 position indicating lights: <ul style="list-style-type: none"> <li>2E21-F037A, (Testable Check) Bypass Vlv</li> <li>2E21-F005A, Inbd Discharge Vlv</li> </ul> </li> </ul>
		Simulator Operator – either ensure that the event trigger is activated for the next step or just as soon as the CBO throttles open 2E21-F015A, DELETE mf60131124 and aoE21_R600A



Page 2 of 1

Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 3Page 1 of 1**Event Description:** Increase Rx Power with Recirc

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> <li>Directs RO to increase reactor power to RTP by increasing Recirc flow. Power increases should be made as recommended by the STA/Reactor Engineering at a rate not to exceed 10 MWe/min.</li> </ul>
	CBO	Enters the following procedures <ul style="list-style-type: none"> <li>34GO-OPS-005-2S, "Power Changes"</li> <li>34SO-B31-001-2S, "Recirculation System"</li> </ul>
		<ul style="list-style-type: none"> <li>Increases reactor power with Recirc flow increase per 34SO-B31-001-2S by slowly adjusting Recirc Master Flow Controller.</li> <li>Monitors power increase by observing APRM and generator output indications.</li> </ul>
		Simulator Operator enters the next event after power has been increased by 5% or at the Chief Examiner's request.



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 4Page 1 of 1

Event Description: PSW pump "A" Oil leak

Time	Position	Applicant's Actions or Behavior
		After a 5% power increase, Simulator Operator notifies the Control Room, as a System Operator (SO) that is on rounds, that the 2A Plant Service Water pump has oil leaking down the side of the pump, there is no visible oil in the upper sight glass, and the pump is making a loud squealing noise. If asked about the lower sight glass, oil is visible, but pump should be shutdown as soon as possible.
	SS	<ul style="list-style-type: none"> <li>Orders the BOP operator to start the 2D PSW pump and trip the 2A PSW pump</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Enters 34SO-P41-001-2, Plant Service Water System procedure</li> <li>Depresses the PSW Prelube Solenoid Vlv pushbutton to prelube the pumps</li> <li>Confirms that the red indicator light is ILLUMINATED for approximately 60 seconds on panel 2H11-P650</li> <li>Places the PSW pump 2D control switch to Start</li> <li>Verifies that the Red light above PSW pump 2D illuminates</li> <li>Places the PSW pump 2A control switch to STOP-PTL</li> <li>Notifies the SS that PSW pump 2A is off and that PSW pump 2D is operating.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Enters Tech Specs for PSW pump 2A being inoperable.</li> <li>Determines that a 30 day RAS should be entered for Tech Spec LCO 3.7.2.A</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 5Page 1 of 2

Event Description: OPTIONAL -HPCI inadvertent Initiation

Time	Position	Applicant's Actions or Behavior
		THIS IS OPTIONAL - With Chief Examiner concurrence - Simulator Operator either perform this event while the BOP operator is swapping PSW pumps, OR call the BOP operator and as the Lab request the control room get a routine reading on the Reactor Building Vent recorder 2D11-R605. (This is to get the BOP operator to go to the back panels, allowing the CBO to have to respond to HPCI.)
	ALL	<ul style="list-style-type: none"> <li>Recognize and report HPCI has started from an invalid initiation signal.</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Verifies reactor water level is stable. May receive APRM Hi Alarm and Reactor Water Level Hi alarm.</li> <li>Enters 34AB-E10-001-2</li> <li>Verifies Drywell Pressure is normal.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Direct the operator to secure HPCI per 34SO-E41-001-2S, High Pressure Coolant Injection (HPCI) System.</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Secure HPCI as follows: <b>(Critical Task)</b> <ul style="list-style-type: none"> <li>Depresses and holds the HPCI Turbine Trip push-button.</li> <li>When HPCI turbine has stopped, places the HPCI Aux Oil Pump in Pull To Lock off.</li> <li>When the "HPCI Turbine Brg Oil Press Low" alarm is received, releases the HPCI Turbine Trip push-button.</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 5Page 2 of 2

Event Description: OPTIONAL -HPCI inadvertent Initiation

Time	Position	Applicant's Actions or Behavior
		<b>NOTE: After the SS declares HPCI inop per tech spec 3.5.1.C as I &amp; C techs inform the SS that they inadvertently caused the HPCI initiation. They were supposed to be working on Unit 1.</b>
	SS	<ul style="list-style-type: none"> <li>Declares HPCI inoperable and determines that Tech Spec 3.5.1.C must be met consisting of: <ul style="list-style-type: none"> <li>Verifies within one hour that RCIC is operable by administrative means, and</li> <li>HPCI is restored to operable status within 14 days.</li> </ul> </li> </ul>
	SS	<ul style="list-style-type: none"> <li>May recommend that the SM review 00AC-REG-001-0, Federal and State Reporting requirements for an 8 hour ENS notification being required due to HPCI being declared INOP.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Orders HPCI returned to standby</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Per 34SO-E41-001-2:</li> <li>depresses the HPCI Initiation Signal Reset push-button on panel 2H11-P601 and confirms the white light extinguishes.</li> <li>Closes 2E41-F001.</li> <li>Ensures the aux oil pumps auto starts.</li> <li>Closes 2E41-F059, Lube Oil Clg Wtr Vlv</li> <li>Places 2E41-R612, HPCI Flow Control, in auto and return setpoint to 4250 GPM</li> <li>Resets the SEC coolers on 2H11-P654 and 2H11-P657.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 6Page 1 of 4

Event Description: Safety Relief valve "G" fails open

Time	Position	Applicant's Actions or Behavior
15 min		(This may be performed while the CBO is returning HPCI to standby if the that event was used.) Simulator Operator enters mfB21_130G, SRV G fails open.
	All	<ul style="list-style-type: none"> <li>Receives Safety Blowdown pressure High 34AR-602-311-2 and Safety Blowdown Valves leaking 34AR-603-122-2 alarms</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Directs operator to enter 34AB-B21-003-2, Failure of Safety/Relief valves, and dispatch an operator to pull the fuses for SRV "G".</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Enters 34AB-B21-003-2, Failure of Safety/Relief valves</li> <li>Dispatches an operator to pull the fuses for SRV "G".</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Determines that SRV "G" is open</li> <li>May attempt to reset LLS as follows: <ul style="list-style-type: none"> <li>Depresses the LLS Channel A/C Reset pushbutton.</li> <li>Depresses the LLS Channel B/D Reset pushbutton.</li> </ul> </li> <li>May cycle the SRV Control Switch several times in an attempt to close the SRV</li> <li>Informs SS that the "G" SRV is open and the fuses will have to be pulled for the valve</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 6Page 2 of 4

Event Description: Safety Relief valve "G" fails open

Time	Position	Applicant's Actions or Behavior
		Simulator Operator, once torus temperature is 96°F as indicated by SPDS, enter rfb21_306 to simulate pulling the fuses for SRV "G". Then, Notify the crew that the fuses have been pulled for SRV "G".
	SS	<ul style="list-style-type: none"> <li>May enters a Tracking RAS for TS LCO 3.5.1.E</li> <li>Directs operators to verify that the "G" SRV is closed, after the fuses are pulled.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Confirms that SRV "G" is closed by monitoring: <ul style="list-style-type: none"> <li>SRV tailpipe temperature decrease</li> <li>Torus level stabilizing</li> <li>Torus Temp stabilizing</li> <li>Rx and Generator power returns to the pre-event level</li> </ul> </li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Resets the SRV leak detection by placing the Leak Detection Logic A Reset keylock switch and/or Leak Detection Logic B Reset keylock switch to Reset position and back to Normal position and confirm that the Amber SRV indicating lights have Extinguished.</li> <li>Informs the SS that SRV "G" is closed.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Informs the crew that operability of the suppression chamber-drywell vacuum breakers must be performed within 12 hours per 34SV-T48-002-2, Suppression Chamber To Drywell Vacuum Breaker System Operability.</li> <li>Notifies Chemistry and initiates a CR to initiate increased monitoring of vessel moisture content carryover per 64CH-SAM-025-0.</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 6Page 3 of 4

Event Description: Safety Relief valve "G" fails open

Time	Position	Applicant's Actions or Behavior
	ALL	Recognizes that torus temp has exceeded 95°F.
	BOP	<ul style="list-style-type: none"> <li>Enters 34AB-T23-003-2, Torus Temperature Above 95°F</li> <li>Confirms the high temperature by OBSERVING the Suppression Pool bulk average temperature on the SPDS primary display</li> <li>Places RHR in Suppression Pool cooling per 34SO-E11-010-2, Residual Heat Removal</li> </ul>
		<p>NOTE: The operator may place torus cooling in service by using the Placard that's available or using the appropriate section of the procedure. These steps assume the Placard is used.</p> <p>The A or B loop of RHR may be used. The following steps are written assuming "B" loop and "B" pump is used. If "A" loop is used, substitute "A" for "B" for valves and if "B" pump is not used substitute "A", "C", or "D" for "B" pump.</p>
	BOP	<p>Enters 34SO-E11-010-2, Residual Heat Removal</p> <ul style="list-style-type: none"> <li>Places RHRSW in service</li> <li>Prelube RHRSW pump</li> <li>Overrides 2E11-F068B Low Discharge Pressure Interlock</li> </ul>
		<ul style="list-style-type: none"> <li>Positions 2E11-F068B to 45% OPEN</li> <li>Starts RHRSW pump B</li> <li>Places 2E11-F068B Low Discharge Pressure Interlock switch to normal position.</li> <li>Positions 2E11-F068A(B) to obtain &lt; 4400 GPM AND &lt; 450 PSIG</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 6Page 4 of 4

Event Description: Safety Relief valve "G" fails open

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> <li>• IF desired to start a SECOND RHRSW pump, <ul style="list-style-type: none"> <li>• Throttles 2E11-F068B to achieve max flow rate (not to exceed 4400 GPM).</li> <li>• Opens 2E11-F068B an additional 5%.</li> <li>• Starts second RHRSW Pump.</li> <li>• Positions 2E11-F068B to obtain &lt; 8800 GPM AND &lt; 450 PSIG.</li> </ul> </li> </ul>
	BOP	<p>Places RHR B Loop in Torus cooling per the placard by performing the following steps:</p> <ul style="list-style-type: none"> <li>• Opens 2E11-F048B</li> <li>• Closes 2E11-F047B.</li> <li>• Opens 2E11-F003B.</li> <li>• Starts RHR Loop B pump</li> <li>• Opens 2E11-F028B</li> <li>• Receives annunciator Auto Blowdown CS OR RHR Press</li> <li>• Receives annunciator "SEC System Auto Initiation Signal Present."</li> <li>• Throttles OPEN 2E11-F024B</li> <li>• Opens 2E11-F047B</li> <li>• Ensures RHR flow is &lt; 11,500 GPM, THEN Closes 2E11-F048B</li> <li>• Notifies the SS that RHR "B" loop is in service</li> <li>• May place the second pump in service.</li> </ul>
		Simulator Operator continues to next event while the BOP is still completing this event.



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 7Page 1 of 5

Event Description: RCIC Auto Isolation

Time	Position	Applicant's Actions or Behavior
		Simulator Operator enters: mfE51_113, RCIC Auto isolation E51-F008.
	All	<p>The following alarms are received:</p> <ul style="list-style-type: none"> <li>• RCIC Turbine Trip</li> <li>• RCIC Isolation Signal Logic A</li> <li>• RCIC Steam Line Diff Press High</li> <li>• RCIC Isolation Vlv F007/F008 Not Fully Open</li> </ul> <p>Determines that RCIC has Isolated</p>
	SS	<ul style="list-style-type: none"> <li>• Directs CBO to pull RCIC ARPs and determine the cause of the RCIC isolation.</li> </ul>
		NOTE: The operators may enter different ARPs first. The following actions are for all four ARPs. The evaluator will have to determine which ARP has been entered to follow the correct set of actions.
	CBO	<ul style="list-style-type: none"> <li>• Enters ARP 34AR-602-302-2, for the RCIC Steam Line Diff Press High annunciator and performs the following actions. <ul style="list-style-type: none"> <li>• Confirms 2E51-F008 is closed</li> <li>• May close 2E51-F007 (This valve does not have an isolation signal, but may be closed)</li> <li>• Notifies the SS that RCIC has a HIGH steam flow (steam line DP) signal and that 2E51-N657A&amp;B and 2E51-N660A/B at the ATTS panels provide inputs to this signal.</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 7Page 2 of 5

Event Description: RCIC Auto Isolation

Time	Position	Applicant's Actions or Behavior
		Simulator Operator: Three minutes after being dispatched, Report that for 2E51-N657A is reading +145 inches of Water and the Trip light is illuminated. The remainder of the RCIC Steam Flow DP instruments are reading 0 inches of water and have no trip lights illuminated.
	SS	Dispatches an operator to and requests maintenance help for determining the status of 2E51-N657A/B and 2E51-N660A/B at the ATTS panels.
	SS	<ul style="list-style-type: none"> <li>• Declares RCIC and 2E51-N657A inoperable.</li> <li>• If HPCI is still inop the RAS is be in mode 3 within 12 and reduce reactor press below 150 psig within 36.</li> <li>• If HPCI is operable the SS Determines that HPCI operability should be verified by administrative means within 1 hour and a 14 day RAS exist for RCIC per Tech Spec 3.5.3.A</li> <li>• Determines that 2E51-N657A channel has to be placed in Trip within 24 hours, tech spec 3.3.6.1.A.</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>• Enters ARP 34AR-602-301-2, RCIC Turbine Trip <ul style="list-style-type: none"> <li>• Confirms 2E51-F524, Trip &amp; Throttle Vlv, indicates CLOSED</li> <li>• Confirms 2E51-F013, Pump Discharge Vlv, indicates CLOSED</li> <li>• Confirms 2E51-F019, Min Flow Vlv, indicates CLOSED</li> </ul> </li> </ul>



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Time	Position	Applicant's Actions or Behavior
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Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 7Page 4 of 5

Event Description: RCIC Auto Isolation

Time	Position	Applicant's Actions or Behavior
		Note: The CBO may perform additional confirmations of RCIC status, but only the steps listed below are required to return RCIC to Standby.
	CBO	<ul style="list-style-type: none"> <li>Un-isolates RCIC per 34SO-E51-001-2, RCIC System, starting at step 7.1.1.27 to return RCIC to standby</li> <li>RESETs the Auto Isolation Signal A AND RETURN sthe keylock switch to NORMAL</li> <li>Confirms the annunciator, RCIC ISOLATION SIGNAL LOGIC A (602-307) is clear</li> </ul>
		<ul style="list-style-type: none"> <li>Relatches and opens 2E51-F524, RCIC Trip &amp; Throttle Vlv</li> <li>Confirms the Turbine Trip &amp; Throttle Vlv actuator indicates OPEN</li> <li>Confirms RCIC Turbine Trip annunciator clears.</li> <li>Confirms 2E51-F523, RCIC Governor Vlv, is OPEN</li> </ul>
		<ul style="list-style-type: none"> <li>Warms and Pressurizes the RCIC Steam Line by performing the following steps:               <ul style="list-style-type: none"> <li>Confirms closed 2E51-F008, Steam Supply Line Isol Vlv.</li> <li>Confirms closed/closes 2E51-F007, Steam Supply Isol Vlv.</li> <li>Confirms open/opens 2E51-F054, Steam Line Drain Vlv.</li> </ul> </li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 7Page 5 of 5

Event Description: RCIC Auto Isolation

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> <li>• Opens 2E51-F008, Steam Supply Line Isol Vlv.</li> <li>• Slowly Throttles Open 2E51-F007, Steam Supply Isol Vlv.</li> <li>• When turbine steam inlet pressure is WITHIN 50 PSIG of reactor pressure as monitored on 2B21-R623A(B), Rx Water Level/Rx Press, on panel 2H11-P601, verify 2E51-F007, Steam Supply Isol Vlv, is FULLY OPEN.</li> </ul>
		<ul style="list-style-type: none"> <li>• When RCIC Turbine Inlet Drain Pot Level High (602-308), clears, confirm Closed/Close 2E51-F054, Steam Line Drain Vlv. (Alarm may not come in.)</li> <li>• Has other operator perform independent verification for RCIC Standby lineup.</li> <li>• Notifies SS when RCIC is returned to Standby.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• Declares RCIC Operable</li> </ul>

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Time	Position	Applicant's Actions or Behavior
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		Simulator Operator enters: mfE51_250 (RCIC Steam Line break in Rx Bldg. 10% Ramp 0.5) svoE51074 and svoE51075 (RCIC Isolation valves failed Open) rfC71_279 (Group 1 Isolation Override Jumpers – Installed)
	BOP	<ul style="list-style-type: none"> <li>Enters 34AR-657-006-2, “Stm Chase SEC Clr Auto Started” alarm, and starts investigating the cause of the cooler auto start.</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Acknowledges “Leak Det Diff Temp High” and “Leak Det Amb High” and reports to SS</li> <li>Addresses annunciator responses.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>Has an operator monitor Sec Cont. Temps.</li> <li>Has an operator verify refueling floor and reactor building ventilation is operating.</li> <li>Has operators monitor systems for source of the leak.</li> <li>Enters the Secondary Containment EOP Flowchart on Secondary Containment High Differential Temperature.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Reports Sec Cont. temps are increasing</li> <li>If time allows, enters 34AB-T22-001-2, Primary Coolant Break Rx Bldg.</li> </ul>





**Op-Test No.:**                      **Scenario No.:**    4    **Event No.:**    8A/B

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**Event Description:** RCIC Steam line break in the Rx bldg

[illegible]

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 8A/BPage 4 of 7

Event Description: RCIC Steam line break in the Rx bldg

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> <li>• IF feed flow is less than the capacity of the S/U level control valve (<math>\approx</math> 1.5 mlbm/hr), then: <ul style="list-style-type: none"> <li>• Opens 2N21-F125.</li> <li>• Places 2C32-R619, FW S/U level control valve controller, in Auto, set at approximately 9 inches.</li> <li>• Closes 2N21-F110.</li> <li>• Secures one RFPT if necessary.</li> </ul> </li> </ul>
	SS	<ul style="list-style-type: none"> <li>• The SS may direct 1 operator to perform Rx Power, Level, and Pressure control, so that the other operator can monitor secondary Containment parameters.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• Monitors RPV pressure.</li> <li>• Confirms proper operation of pressure control system (TBV, LLS, etc.).</li> <li>• If necessary, allows RPV pressure to exceed 1074 psig then cycles any SRV to initiate LLS.</li> <li>• Maintains RPV pressure between 1074 and 800 psig. (This will not be possible for the whole scenario due to the leak.)</li> <li>• Notifies SS of pressure control system operation.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>• Assigns a RWL band between 3" and 50"</li> <li>• Directs an Operator to monitor Sec Cont. Temps. and Radiation</li> </ul>
	SS	<ul style="list-style-type: none"> <li>• Directs the operator to operate refueling floor and reactor building ventilation per the SCC flow chart.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 8A/BPage 5 of 7

Event Description: RCIC Steam line break in the Rx bldg

Time	Position	Applicant's Actions or Behavior
	CBO	<ul style="list-style-type: none"> <li>Verifies the ventilation is operating.</li> </ul>
		Simulator Operator enters: mfE41_106, HPCI flow controller fails low
	BOP	<ul style="list-style-type: none"> <li>Controls RWL using HPCI and CRD. Notifies SS if RWL gets outside assigned band. May attempt to use RCIC until it is determined that RCIC is the leakage path. (When LLS is initiated to control Rx pressure, RWL may go above 52", if so, the HPCI high water level trip will have to be reset to inject with HPCI prior to -35".)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Recognizes that HPCI flow controller has failed and takes manual control of HPCI to maintain RWL.</li> </ul>
	CBO/BOP	<ul style="list-style-type: none"> <li>Informs SS that temperatures and radiation levels in the Rx Bldg are still increasing.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs Operator to evacuate the Rx Bldg. due to high temperatures and or radiation.</li> </ul>
	CBO/BOP	<ul style="list-style-type: none"> <li>Makes page announcement to Evacuate the Rx Bldg. (Timing of announcement could vary based on Plant conditions)</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 8A/BPage 6 of 7

Event Description: RCIC Steam line break in the Rx bldg

Time	Position	Applicant's Actions or Behavior
	All	<ul style="list-style-type: none"> <li>Determines that RCIC is the source of the leak.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Directs Operator to close the RCIC isolation valves, 2E51-F007 and 2E51-F008</li> </ul>
	BOP/CBO	<ul style="list-style-type: none"> <li>Places 2E51-F007 and 2E51-F008 to close.</li> <li>Reports to SS that RCIC Isolation valves will not close.</li> <li>May call Maint for help to close the valves.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Calls or confirms Operator called for Maint help to close RCIC isolation valves.</li> </ul>
		Simulator Operator increases mfE51_250 to 75% at 10%/min after plant parameters have been stabilized by the operators. (About 8 to 10 minutes after the scram or as directed by the Chief Examiner.
	CBO	<ul style="list-style-type: none"> <li>Informs SS that Sec Cont. temps are above Max Safe in two areas of the Rx Bldg.</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 8A/BPage 7 of 7

Event Description: RCIC Steam line break in the Rx bldg

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>Progresses down SC flowchart to Emergency Depress required.</li> <li>Transitions from RC Pressure path to CP-1 Flowchart Point G for Emergency Depress.</li> <li>Verifies Torus Level is &gt; 57.5 in</li> <li>Directs Operator to open 7 ADS valves.</li> </ul>
		Prior to the Emergency Depress, but after LLS has been initiated, Simulator Operator enters: mfB21_129A, mfB21_129E, and mfB21_129L (Failure of SRVs A, E, and L to Open.)
		Scenario will be terminated when Rx pressure is within 50 psig of Torus pressure or as directed by the Chief Examiner.



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 9A/BPage 1 of 4

**Event Description:** Emergency Depress Due to steam leak into Secondary Containment With Failure of three SRVs to Open

Time	Position	Applicant's Actions or Behavior
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		Simulator Operator increases mfE51_250 to 75% at 10%/min after plant parameters have been stabilized by the operators. (About 8 to 10 minutes after the scram or as directed by the Chief Examiner.
	CBO	<ul style="list-style-type: none"> <li>• Informs SS that Sec Cont. temps are above Max Safe in two areas of the Rx Bldg.</li> </ul>
	SS	<ul style="list-style-type: none"> <li>• Progresses down SC flowchart to Emergency Depress required.</li> <li>• Transitions from RC Pressure path to CP-1 Flowchart Point G for Emergency Depress.</li> <li>• Verifies Torus Level is &gt; 57.5 in</li> <li>• Directs Operator to open 7 ADS valves.</li> </ul>
		Prior to the Emergency Depress, but after LLS has been initiated, Simulator Operator enters: mfB21_129A, mfB21_129E, and mfB21_129L (Failure of SRVs A, E, and L to Open.)
	CBO	<ul style="list-style-type: none"> <li>• Places 7 ADS valves control switches to Open.</li> <li>• Determines that three ADS valves did not open. (May initially only discover 2 failed valves, if one of the failed valves has lifted earlier in the scenario and the amber light is still lit, but SPDS will show only 4 valves open.)</li> <li>• Either informs SS or continues opening SRVs until 7 SRVs are open, then notifies SS of 7 SRVs open and failure of 3 SRVs to open. (Critical Task)</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 9A/BPage 2 of 4

**Event Description:** Emergency Depress Due to steam leak into Secondary Containment With Failure of three SRVs to Open

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>If Operator notifies the SS that 3 SRVs will not open and that only 4 are open, the SS directs the operator to open 3 more SRVs or Open SRVs until 7 are open.</li> </ul>
	CBO	<ul style="list-style-type: none"> <li>Opens more SRVs, until 7 SRVs are open</li> <li>Verifies that Rx pressure is decreasing</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Starts controlling RWL with low pressure systems (LPCI, Core Spray, or condensate) as Rx pressure decreases. During the Emergency Depress will not be able to maintain inside the RWL band, but should restore RWL to within the band at some point after the Emergency Depress.</li> </ul>
	BOP/CBO	<ul style="list-style-type: none"> <li>Verifies that HPCI isolates when Rx pressure decreases to 128 psig. (2E41-F002 and F003 close)</li> </ul>

Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 9A/BPage 3 of 4

**Event Description:** Emergency Depress Due to steam leak into Secondary Containment With Failure of three SRVs to Open

Time	Position	Applicant's Actions or Behavior
	SS	<ul style="list-style-type: none"> <li>Enters the Primary Containment Control flowchart for either High Torus temperature or High Torus level</li> <li>Directs the operator to place Torus Cooling in service as man power becomes available.</li> </ul>
		<p>Simulator Operator – The scenario can be stopped at any time after emergency depress is performed or as directed by the Chief Examiner. Placing Torus cooling in service is not a required part of this event.</p>
	CBO	<ul style="list-style-type: none"> <li>If time and man power allows, places torus cooling in service per 34SO-E11-010-2, RHR System, using the placard</li> </ul>
		<ul style="list-style-type: none"> <li>Place RHRSW in operation per 34SO-E11-010-2 by performing the following:</li> </ul>
		<ul style="list-style-type: none"> <li>Prelube RHRSW pump.</li> <li>Override 2E11-F068A(B) Low Discharge Pressure Interlock.</li> <li>Position 2E11-F068A(B) to 45% OPEN</li> <li>Start RHRSW pump.</li> <li>Place 2E11-F068A(B) Low Discharge Pressure Interlock switch to NORMAL position.</li> <li>Position 2E11-F068A(B) to obtain &lt; 4400 GPM AND &lt; 450 PSIG.</li> </ul>



Op-Test No.: \_\_\_\_\_ Scenario No.: 4 Event No.: 9A/BPage 4 of 4

**Event Description:** Emergency Depress Due to steam leak into Secondary Containment With Failure of three SRVs to Open

Time	Position	Applicant's Actions or Behavior
		<ul style="list-style-type: none"> <li>• IF desired to start SECOND pump,</li> <li>• Throttle 2E11-F068A(B) to achieve max flow rate (not to exceed 4400 GPM).</li> <li>• Open 2E11-F068A(B) an additional 5%.</li> <li>• Start Second RHRSW Pump.</li> <li>• Position 2E11-F068A(B) to obtain &lt; 8800 GPM AND &lt; 450 PSIG.</li> </ul>
		<ul style="list-style-type: none"> <li>• Open 2E11-F048A(B).</li> <li>• Open 2E11-F003A(B).</li> <li>• Start RHR Loop A(B) pump(s).</li> <li>• Open 2E11-F028A(B).</li> </ul>
		<p>NOTE:RHR system rated flow is 7700 gpm with one pump or 17,000 gpm with two pumps.</p> <p>IF the Hx Bypass Vlv, 2E11-F048A(B) is NOT full OPEN, RHR Flow is limited to <math>\leq 11,500</math> gpm.</p>
		<ul style="list-style-type: none"> <li>• Throttle Open 2E11-F024A(B).</li> <li>• Open 2E11-F047A(B).</li> <li>• Throttle 2E11-F068A(B) to maintain &gt; 20 PSID Hx A(B) dp.</li> <li>• Refer to 34SO-E11-010-2.</li> </ul>
		<i>Scenario will be terminated when Rx pressure is within 50 psig of Torus pressure or as directed by the Chief Examiner.</i>