

# ***Dresden Generating Station***

## **ILT-N-2**

**TRANSFER MCC 28-7/29-7 FROM BUS 28 TO BUS 29**

**RAISE POWER USING CONTROL RODS**

**INSTRUMENT AIR COMPRESSOR TRIP**

**RPS MG SET TRIP**

**SERVICE WATER PUMP TRIP**

**APRM FAILED UPSCALE WITH HALF SCRAM**

**LOCA IN DRYWELL – MANUAL SCRAM**

**ATWS – SEVEN RODS FAIL TO INSERT**

Rev. 00

1/20

Developed By:

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Exam Author

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Date

Approved By:

\_\_\_\_\_  
Facility Representative

\_\_\_\_\_  
Date

## Scenario Outline

<b>Facility:</b> <u>Dresden Generating Station</u>	<b>Scenario No.:</b> <u>2020-301 ILT-N-2</u>	<b>Op-Test No.:</b> <u>2020-301</u>
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<b>Examiners</b>    	<b>Applicants</b> / crew position  / ATC / BOP / CRS
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**Initial Conditions:** Unit 2 is performing a startup and is at 5% Power  
Continuing with startup by raising power with control rods  
APRM #6 is Bypassed due to failed power supply

  

**Turnover:** Transfer MCC 28-7/29-7 from Bus 28 to Bus 29  
TS LCO 3.5.1.E – For LPCI Injection valves powered from reserve power supply

  

**Critical Tasks:** RPV-5.1 - With a reactor scram required and the reactor not shutdown, take action per DEOP 400-5, Failure to Scram, to reduce power by inserting control rods within 15 minutes.  
RPV-5-4 - Per DEOP 400-5, Failure to Scram, with a reactor scram required, the reactor not shutdown, and the automatic ADS timer initiated, inhibit ADS before an automatic actuation occurs. (Not applicable if conditions for ADS initiation are not met)  
PC-1.1 - While executing DEOP 200-1, Primary Containment Control, when drywell pressure exceeds 9 psig and only if operating within the safe region of the drywell spray initiation limit (DSIL), initiate drywell sprays within 15 minutes.  
PC-1.2 - After initiating drywell sprays per the primary containment pressure or temperature legs of DEOP 200-1, Primary Containment Control, terminate drywell sprays before drywell pressure drops to < 0 psig. (May not be applicable if scenario does not run long enough).

  

Event No.	Malf. No.	Event Type*	Event Description #
1	NONE	N      BOP	(New) - AUX POWER – MCC, Transfer MCC 28-7/29-7 from Bus 28 to Bus 29
2	NONE	R      ATC	CRD - Reactivity, Raise Power Using Control Rods
3	NONE	C      BOP	(New) - INST AIR - Compressor, Swap Due To Oil Leak
4	B02	C / C-T      ATC / CRS	(New) - RPS - MG Set, Trips / Re-energize From Reserve Power – Reset ½ Scram
5	Q22	C      BOP	(New) - SERV WATER - Pump, Trip Due To Overcurrent
6	NIA4POT	T      CRS	(New) – NI - APRM Fail Upscale with Half Scram
7	I21	M      ALL	(New) - Manual Scram – LOCA in drywell
8	RODE###ST	C      ATC	(New) ATWS – 7 Stuck rods (4 rods will be able to move, QNE determination will be needed to determine if the Reactor will stay shutdown)

  

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (T)ech Spec  
# (New) – Event not used on previous 2 NRC Exams, (Pre) – Event used on previous 2 NRC Exams

### Scenario Objective

Evaluate the Team's ability to operate the plant with a LOCA in the drywell, resulting in a manual SCRAM with a failure of seven rods to go in.

### Scenario Initial Conditions

1. Unit 2 is at ~5% power. Continuing with startup per DGP 1-1, step G.54
2. Unit 3 is at full power.
3. The following equipment is OOS:
  - a. APRM #6 is bypassed
4. LCOs:
  - a. T.S. 3.5.1 Cond E for LPCI components being powered from Bus 28.

### Scenario Sequence

Event #	Description
1	<b>AUX POWER - MCC, Transfer MCC 28-7/29-7 From Bus 28 To Bus 29:</b> The BOP will transfer power to MCC 28-7/29-7 from Bus 28 to Bus 29
2	<b>CRD - Reactivity, Raise Power Using Control Rods:</b> The NSO, as directed by the SRO, continues the power ascension for unit startup by control rod withdrawal.
3	<b>INST AIR - Compressor, Swap Due To Oil Leak:</b> The 3C IAC develops an oil leak and must be secured. The team will start a standby IAC, and secure the 3C IAC.
4	<b>RPS - MG Set, Trips / Re-energize From Reserve Power:</b> The Team receives a report that the Engineering department determined that EPAs 2B-1 and 2B-2 are inoperable. The CRS determines Tech Spec requirements, and then a trip of RPS EPA 2B-1 causes a loss of RPS Bus A. The Team will reenergize RPS Bus A from reserve power and begin restoration of affected systems to a normal condition.
5	<b>SERV WATER - Pump, Trip Due To Overcurrent:</b> The 2B Service Water pump trips on overload. The Team will start a standby pump.
6	<b>NI – APRM Fails Upscale with Half Scram:</b> APRM 4 will spuriously fail upscale, resulting in a half scram on RPS A. The CRS will review Tech Spec requirements.
7	<b>Manual Scram – LOCA in drywell:</b> A LOCA in the DW causes DW pressure to increase. The Team manually scrams the reactor prior to an automatic scram.
8	<b>ATWS – 7 Stuck rods</b> Seven rods stay out due to being stuck. Four of them can be inserted. QNE determination is needed to determine if the reactor will remain shutdown under all conditions.

### **Event One – Transfer MCC 28-7/29-7 from Bus 28 to Bus 29**

The BOP will transfer MCC 28-7/29-7 from Bus 28 to Bus 29.

Malfunctions required: 0

- None

Success Path:

- The team transfers MCC 28-7/29-7 from Bus 28 to Bus 29

### **Event Two – Power Change with Rods**

The team increases reactor power by withdrawing control rods per DGP 01-01, DOP 0400-01, and DGP 03-04.

Malfunctions required: 0

- None.

Success Path:

- Control rods pulled per applicable procedures..

### **Event Three – Instrument Air Compressor Trip**

The team receives a report that the 3C Instrument Air Compressor has an oil leak. The Standby Instrument Air Compressor 2B is started. If the team delays securing the 3C IAC, it will trip on low lube oil pressure.

Malfunctions required: 0

- 3C Instrument Air Compressor has an oil leak

Success Path:

- Standby Air Compressor 2B is started.

### **Event Four – RPS MG Set Trip / Re-energize from Reserve power**

A trip of RPS EPA 2B-1 causes a loss of RPS Bus A. The crew will re-energize the RPS bus from reserve power.

Malfunctions required: 1

- (RPS EPA 2B-1 trips)

Success Path:

- The CRS determines Tech Spec requirements.
- Re-energize RPS Bus A from Reserve Power.

### **Event Five – Service Water Pump Trip**

2B Service Water pump trips on overload. The crew will start the standby service water pump.

Malfunctions required: 1

- (2B Service Water pump trip)

Success Path:

- The Team starts a standby pump.

### **Event Six – APRM Fails Upscale**

APRM Channel 4 fails upscale, resulting in a half scram. The crew will check Tech Specs and determine there is only 1 APRM available on B RPS and does not meet the required number and enters the Tech Spec.

Malfunctions required: 1

- (APRM Channel 4 Fails Upscale).

Success Path:

- Determines the required number of APRMs are not available and enter TS 3.3.1.1 Condition A.

### **Event Seven - Small Steam Leak in Drywell**

A small steam leak upstream of the restrictors occurs.

Malfunctions required: 1

- (Small steam leak before restrictors)

Success path:

- Performs DOA 0040-01, Slow Leak.
- Performs a manual scram.

### **Event Eight – ATWS - Seven Control Rods Remain Withdrawn**

A small steam leak upstream of the restrictors occurs.

Malfunctions required: 1

- (Stuck control rods)

Success path:

- Performs DEOP 0400-05, Failure to SCRAM

## PRE-SCENARIO ACTIVITIES

1. If applicable, conduct pre-scenario activities in accordance with TQ-AA-155-J040, SIMULATOR EXAMINATION BRIEFING.
  - a. Inform the crew that the QNE is present in the Control Room.
  - b. Direct the crew to perform their briefs prior to entering the simulator.
  - c. Provide the crew with a copy of DGP 01-01, Unit Startup marked up and completed through G.53, and also step G.58 signed off as complete.
  - d. Provide the crew with a copy of the REMA and Control Rod Move Sheets.
  - e. Crew directed to continue with plant startup, per Shift Manager.
  - f. Rod moves have been completed up to and including Step 15. Rod L-03 is the next rod to be moved.
  - g. Provide the crew with a marked up partial copy of DOP 6700-18, BUS 28 OUTAGE; only applicable sections of the procedure are provided to the crew with the Prerequisites, Precautions, and Limitations and Actions marked off.
  - h. Crew directed to return MCC 28-7/29-7 to normal power supply Bus 29 per DOP 6700-18.
2. Simulator Setup (the following steps can be done in any logical order)
  - a. Initialize simulator in an ~5% power IC. (IC 322 used for validation, sequence 21.00 Key 0994)
  - b. Cut in/out Cond Demins as needed, to maintain DP within limits.
  - c. Ensure running Condensate pump amps within limits.
  - d. Ensure DW pressure is approximately 1.20 psig. Vent as necessary to achieve this.
  - e. Verify CRD parameters are in band.
  - f. Advance the chart recorders.
3. Verify the following simulator conditions:
  - a. Verify Reactor Power ~5%, adjust rods or Recirc as appropriate.
  - b. Bypass APRM Channel 6, and place EST card on joystick.
  - c. Verify MCC 28-7/29-7 is powered from Bus 28
  - d. Verify 2B and 3B Service Water pumps running.
  - e. Verify 3C IAC running and 2B IAC secured.
  - f. Ensure that SBGT 2/3A is in Primary and SBGT 2/3B is in Standby.
  - g. Verify that annunciators 923-5 A-6 and B-6, STBY GAS TRT SYS A(B) TROUBLE, are NOT in the alarm state.
  - h. Place LCO Sheet on White Board.
4. Run **Pump\_Sumps.cae**

**NOTE: Do NOT run the initial setup CAEP file until the above setup is completed.**

5. Run the initial setup CAEP file: **19-1 (2020-301) ILT-N-2.cae**
6. Ensure this setup is peer checked.
7. Complete the Simulator Setup Checklist.

Symbols are used throughout the text to identify specific items as indicated below:

- √ Critical Tasks
- Required Actions
- Optional Actions

## Event One – Transfer MCC 28-7/29-7 from Bus 28 to Bus 29

Trigger	Position	Crew Actions or Behavior
<b>28</b>		<p><b><u>SIMULATOR OPERATOR ROLE PLAY:</u></b></p> <p>If requested to set gains to 1, (wait 3 min) activate <b>TRIGGER 28</b>, then report “gains set to 1”. (This trigger can be triggered OFF, then back ON to adjust gains more than once).</p> <p><b><u>SIMULATOR OPERATOR ROLE PLAY:</u></b></p> <p>As Shift Manager:</p> <p>Acknowledge report that the Team is ready to transfer MCC 28-7/29-7 from Bus 28 to Bus 29.</p> <p>Acknowledge report that the transfer is complete, and that the Tech Spec LCO has been exited.</p>
	<b>CRS</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Notifies Shift Manager that the Team is ready to transfer MCC 28-7/29-7 from Bus 28 to Bus 29.</li> <li><input checked="" type="checkbox"/> Directs NSO to transfer MCC 28-7/29-7 from Bus 28 to Bus 29.</li> </ul>
	<b>BOP</b>	<p>Performs DOP 6700-18, Bus 28 Outage, steps G.5.d through G.5.f:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Hold MCC 29-7/28-7 FEED from BUS 28 in TRIP.</li> <li><input checked="" type="checkbox"/> Close MCC 29-7/28-7 FEED from BUS 29.</li> <li><input type="checkbox"/> Release MCC 29-7/28-7 FEED FROM BUS 28.</li> </ul>
	<b>ATC</b>	Assists as directed.
	<b>CRS</b>	Declares both LPCI subsystems operable and notifies Shift Manager that the Team completed transferring MCC 28-7/29-7 from Bus 28 to Bus 29.

### **Event 1 Completion Criteria:**

➤ MCC 28-7/29-7 transferred from Bus 28 to Bus 29,

-- AND/OR --

At the discretion of the Lead Examiner.

## Event Two – Continue raising power by control rod withdrawal

Trigger	Position	Crew Actions or Behavior
	<b>CRS</b>	<p>Directs pulling control rods.</p> <ul style="list-style-type: none"> <li>■ Reviews REMA.</li> <li>■ Designates second verifier.</li> <li>■ Directs NSO to pulls rods.</li> </ul>
	<b>ATC</b>	<p>Performs the following actions per DOP 0400-01, REACTOR MANUAL CONTROL SYSTEM OPERATION, and DGP 03-04, CONTROL ROD MOVEMENTS, as directed</p> <p><u>Verifies the following prior to moving first control rod:</u></p> <ul style="list-style-type: none"> <li>■ Control rod selected on the select matrix is correct rod.</li> <li>■ Verifies rod pattern</li> <li>■ States the following: <ul style="list-style-type: none"> <li>• Controlling document</li> <li>• Step and array</li> <li>• RWM status</li> <li>• CRD selected</li> <li>• Initial position</li> <li>• Movement (single or continuous)</li> <li>• Direction</li> <li>• Target Position</li> </ul> </li> </ul> <p><u>Verifies the following on subsequent control rods:</u></p> <ul style="list-style-type: none"> <li>■ Control rod selected on the select matrix is correct rod.</li> <li>■ States the following: <ul style="list-style-type: none"> <li>• CRD selected</li> <li>• Initial position</li> <li>• Movement (single or continuous)</li> <li>• Direction</li> <li>• Target Position</li> </ul> </li> <li>□ Second Verification requirements satisfied.</li> <li>□ Rod Out Permit light is illuminated.</li> <li>□ Drive water pressure at nominal 260 psid.</li> </ul> <p><u>Withdraws rods as follows:</u></p> <ul style="list-style-type: none"> <li>■ Moves Rod Out Notch Override (RONOR) Switch to NOTCH OVERRIDE position (use of RONOR switch is optional) and the Rod Movement Control switch to ROD OUT.</li> <li>□ Verifies ON light illuminated and proper Control Rod Timer operation.</li> <li>■ Releases switches before target position is reached. (If rod is being withdrawn to 48, then switches are held to 48 with coupling check)</li> <li>■ Verifies rod settles to target position and proper response of nuclear instrumentation.</li> </ul>



## Event Two – Continue raising power by control rod withdrawal

Trigger	Position	Crew Actions or Behavior
	<b>BOP</b>	<p>Performs second verification checks.</p> <p><u>For first rod in a step:</u></p> <ul style="list-style-type: none"><li>■ Verifies correct control rod pattern</li><li>■ Verifies correct step and array.</li><li>■ Compares CRD and intended movement with controlling document: point to, touch, or mark controlling document.</li><li>■ State the following:<ul style="list-style-type: none"><li>• Repeat back and agree with intended movement</li></ul></li></ul> <p><u>For all rods moved:</u></p> <ul style="list-style-type: none"><li>■ Verifies correct control rod selected.</li><li>■ Verifies planned control rod motion is correct.</li><li>■ Immediately notify the NSO of errors during rod motion.</li><li>■ Verifies control rod at target position.</li></ul>

### Event 2 Completion Criteria:

- Sufficient power increase,  
-- AND/OR --

At the direction of the Lead Examiner.

## Event Three – Oil Leak on Instrument Air Compressor

Trigger	Position	Crew Actions or Behavior
1		<p><b>ROLE PLAY:</b> Call in as the U2 2 EO and report “During my rounds I noticed that there is a large oil leak on the 3C IAC”.</p> <p>If asked about the status of the 3C IAC, say “The oil level is below the bottom of the normal band and rapidly lowering.”.</p> <p>If the crew has not moved to swapping IACs within 2 minutes make the following report: “The 3C IAC oil level is now out of the sight glass low and is making abnormal noises.”</p> <p><b>SIMULATOR OPERATOR:</b> After communication about the 3C IAC, activate <b>TRIGGER 1</b>, which trips the 3C Instrument Air Compressor after 10 minutes.</p> <p><b>ROLE PLAY:</b> EO to investigate 3C IAC trip: (Wait 4 min) Report “the 3C IAC tripped on low lube oil pressure. There is nothing else abnormal at the compressor”.</p> <p>EO to check 3C IAC breaker: (Wait 2 min) Report “the 3C IAC breaker is closed and looks normal”.</p> <p><b>Note:</b> The compressor will NOT be restored to operation.</p> <p><b>SIMULATOR OPERATOR / ROLE PLAY:</b> EO to lineup 2B IAC to U2 Instrument Air System, wait 2 min, then report “2B IAC is lined up to U2 Instrument Air System”.</p> <p><b>ROLE PLAY:</b> EO to verify proper operation of 2B IAC: (Wait 2 min) Report “the 2B IAC is operating normally”.</p>
	CRS	<ul style="list-style-type: none"> <li>■ Enters DOA 4700-01, INSTRUMENT AIR SYSTEM FAILURE, <u>OR</u> DOP 4700-01, INSTRUMENT AIR SYSTEM STARTUP</li> <li>□ May enter DOP 6700-20, 480 Volt Breaker Trip.</li> <li>□ May designate Instrument Air Pressure a Critical Parameter.</li> <li>□ Notifies the SM and WWM</li> </ul>
		<p><b>ROLE PLAY:</b> <u>If DOP 4700-01 is used to start 2B IAC:</u> If the U2 EO is asked to verify 2B IAC oil level, per DOP 4700-01 step G.5.a, (wait 2 min) respond with “2B IAC oil level is at the maximum line on the dipstick”</p> <p>If asked to verify other field actions in DOP 4700-01 are met, call in as the U2 2 EO and report “DOP 4700-01 step _____ is complete”.</p>
	BOP	<p>Performs DOA 4700-01 <u>OR</u> DOP 4700-01 as directed: If DOP 4700-01 is performed:</p> <ul style="list-style-type: none"> <li>□ May verify STBY lineup of 2B IAC per DOP 4700-01, steps G.5a, 5b, 5c, 5e, 5f, 5g, 5j and 5k.</li> <li>□ Verifies the 2B IA COMP switch is in normal-after-trip.</li> <li>■ Starts the 2B IAC.</li> <li>■ Secures the 3C IAC.</li> <li>□ Directs an EO to verify proper operation of 2B IAC and align to the instrument air header.</li> </ul>

## Event Three – Oil Leak on Instrument Air Compressor

Trigger	Position	Crew Actions or Behavior
	<b>BOP</b>	<p>If DOA 4700-01 is performed:</p> <ul style="list-style-type: none"><li>■ Starts the 2B IAC.</li><li>■ Secures the 3C IAC.</li><li>❑ Dispatches an operator to verify proper operation of 2B IAC and align to the instrument air header.</li></ul> <p>If appropriate, announces alarm 923-1 B-5, U2 OR U3 INST AIR COMP TRIP: Reports 3C IAC tripped.</p> <ul style="list-style-type: none"><li>❑ Directs an EO to investigate the cause of the 3C Instrument Air Compressor trip.</li><li>❑ May send a EO to check 3C IAC breaker.</li></ul>

### Event 3 Completion Criteria:

- Unit 2 Standby IAC started,
- Unit 3 IAC is shutdown/tripped,
- AND/OR --

At the discretion of the Floor Instructor / Lead Evaluator.

## Event Four – RPS MG Set Trip / Re-energize From Reserve Power

Trigger	Position	Crew Actions or Behavior
		<p><b><u>ROLE PLAY:</u></b></p> <p>At the discretion of the Lead Examiner, call the CRS as the Shift Manager and inform him that “Engineering has determined that defective components were installed in RPS EPAs 2B-1 and 2B-2 during their last preventative maintenance. RPS EPAs 2B-1 and 2B-2 may not trip when required. All other EPAs are expected to operate as expected”.</p>
	CRS	<ul style="list-style-type: none"> <li>■ References Licensing Documents and determines the following applies: <ul style="list-style-type: none"> <li>• TS 3.3.8.2.A: Remove associated in-service power supply(s) from service within 72 hours.</li> <li>• TS 3.3.8.2.B: Remove associated in-service power supply from service within 1 hour.</li> </ul> </li> <li>□ Directs WEC to brief an operator to transfer RPS Bus A to Reserve Power.</li> <li>□ May direct Team to review DOA 0500-05, LOSS OF REACTOR PROTECTION SYSTEM BUS.</li> <li>□ Notifies the SM and WWM</li> </ul>
	ATC/BOP	<ul style="list-style-type: none"> <li>□ Reviews DOA 0500-05 as directed.</li> </ul>
2		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>After the CRS has addressed Tech Specs and / or at the discretion of the Lead Examiner, activate <b>TRIGGER 2</b>, which inserts a 2B RPS MG Set overcurrent trip. This simulates RPS EPA 2B-1 tripping.</p> <p><b>NOTE:</b> Communications from the AEER should be over the phone (not the radio)</p> <p><b><u>ROLE PLAY:</u></b></p> <p><u>EO to check RPS power supplies:</u> wait 2 min. and call and report, “the RPS EPA 2B-1 is tripped”.</p> <p>If asked about the status of lights on EPA 2B-1 and 2B-2: report, “the incoming light is lit on RPS EPA 2B-1, all other lights are out on RPS EPA’s 2B-1 and 2B-2”</p> <p><u>EO to power the 2A RPS bus from the reserve power:</u> wait five minutes, call the U2 NSO on the phone and report “Steps G.3.I.(1) thru (4) of DOP 0500-03, for supplying power to RPS 2A bus are your steps.”</p>
3		<p><b><u>FLOOR INSTRUCTOR ROLE PLAY:</u></b></p> <p>When the crew gets to DOP 0500-03 Step G.3.I.5 inform them the step was completed by another NSO.</p> <p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b></p> <p>When notified that Steps G.3.I (1) thru 4 are complete, and requested to re-energize RPS Bus 2A, wait a minute, and then activate <b>TRIGGER 3</b>. Report “RPS Bus 2A has been reenergized from the alternate power supply”. If asked: “AC voltage is 120 V”.</p>
	ATC	<p>Announces loss of 2A RPS Bus.</p> <p>Performs the following:</p> <ul style="list-style-type: none"> <li>■ Perform actions of DOA 0500-05.</li> <li>■ Directs an EO to restore power to the 2A RPS Bus per DOP 0500-03, RPS POWER SUPPLY OPERATION.</li> <li>□ Bypass APRM 6. (Condition met per initial conditions)</li> <li>■ Resets the RPS CH A half scram per DOP 0500-07, INSERTION/RESET OF MANUAL HALF SCRAM.</li> </ul>

## Event Four – RPS MG Set Trip / Re-energize From Reserve Power

Trigger	Position	Crew Actions or Behavior
	<b>BOP</b>	<ul style="list-style-type: none"> <li>❑ May Restore Reactor Building Ventilation IAW DOP 5750-02, REACTOR BUILDING VENTILATION and secures SBTG IAW DOP 7500-01, SBTG OPERATION.</li> <li>❑ May reset ACAD/CAM system per DOP 2400-01, CAM SYSTEM H2 AND O2 DETECTION SUBSYSTEM OPERATION, to re-close the 2-2499-3B and 4B valves.</li> <li>❑ If directed, performs actions of DGA-7.</li> </ul>
	<b>CRS</b>	<ul style="list-style-type: none"> <li>■ Enters DOA 0500-05 and directs actions.</li> <li>❑ Enters DGA-7, Unexpected Reactivity Change.</li> <li>❑ Coordinates restoration of affected plant systems.</li> <li>■ References Licensing Documents and determines the following applies:                             <ul style="list-style-type: none"> <li>• TS 3.3.7.1, Control Room Emergency Ventilation (CREV) System Instrumentation Condition A: Declare CREV System Inoperable within 1 hour.</li> <li>• TS 3.3.6.2, Secondary Containment Isolation Instrumentation Condition A: Place Channel in Trip in 24 hours (Condition Met)</li> </ul> </li> </ul>

### Event 4 Completion Criteria:

- Tech Specs referenced,
  - RPS Bus A reenergized and restoration of affected plant systems in progress,
  - AND/OR --
- At the discretion of the Lead Examiner.

## Event Five – Service Water Pump Trip

Trigger	Position	Crew Actions or Behavior
<b>4</b>		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the Lead Examiner, activate <b>TRIGGER 4</b>, which trips the 2B Service Water Pump.</p>
		<p><b><u>FLOOR INSTRUCTOR / EVALUATOR:</u></b></p> <p>When the 2/3 DFP pump starts, announce the XL-3 is alarming and hand the XL-3 sheet to the responding operator.</p>
		<p><b><u>ROLE PLAY:</u></b></p> <p><u>EO at Service Water Pump just started: (wait 2 min.)</u> Report: “The Service Water Pump (just started) is operating normally and 2B Service Water Pump shows no sign of damage”.</p> <p><u>EO at 2B Service Water Pump: (wait 2 min.)</u> Report: “The 2B Service Water Pump is at rest and is not rotating in reverse.”</p> <p><u>EO at 2B Service Water Pump at Bus 24: (wait 2 min.)</u> Report: “2B Service Water Pump Breaker is open with an overcurrent target up”.</p> <p><u>EMD:</u> Acknowledges need to go to Bus 24 and troubleshoot overcurrent flag at 2B Service Water Pump breaker.</p> <p><u>EO at 2/3 DFP: (wait two min.)</u> Report “The 2/3 DFP is running normally”.</p> <p><u>If requested to secure the 2/3 DFP:</u> Report “The Unit 3 Supervisor will address actions needed to secure the 2/3 DFP”.</p>
	<b>BOP</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Announces 2B Service Water Pump trip.</li> <li><input type="checkbox"/> May announce 2/3 DFP started.</li> <li><input type="checkbox"/> Refers to DAN 923-1 C-3, U2 OR U3 SERV WATER PP TRIP.</li> <li>■ Starts an available Service Water Pump (DOA 3900-01 Immediate Operation Action). (May start more than one)</li> </ul> <p>Refers to DOA 6500-10, 4KV CIRCUIT BREAKER TRIP, and:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Directs an EO to the Cribhouse to check the Service Water Pump just started and inspect 2B Service Water Pump.</li> <li><input type="checkbox"/> Direct an EO to check the breaker of 2B Service Water Pump.</li> <li>■ Places 2B Service Water Pump control switch in Pull to Lock.</li> <li><input type="checkbox"/> May dispatches an operator to the Crib House to check 2/3 DFP operation</li> <li><input type="checkbox"/> Notifies Ops Shift Supervisor.</li> <li><input type="checkbox"/> Requests EMD to troubleshoot.</li> </ul>
	<b>CRS</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Notifies Shift Manager, WWM and may notify EMD.</li> <li>■ Enters DOA 3900-01, LOSS OF COOLING BY SERVICE WATER SYSTEM.</li> <li><input type="checkbox"/> Enters DOA 6500-10.</li> <li><input type="checkbox"/> May refer to TRM 3.7.i, Fire Water Supply System, and determine no action is required.</li> </ul>
	<b>ATC</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Assists as directed.</li> </ul>

### **Event 5 Completion Criteria:**

- An available Service Water pump is started,  
-- AND / OR --

At the discretion of the Lead Examiner.

## Event Six – APRM 4 Fails Upscale

Trigger	Position	Crew Actions or Behavior
<b>5</b>		<p><b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b></p> <p>At the discretion of the Lead Examiner, activate <b>TRIGGER 5</b>, which fails APRM 4 upscale.</p>
	<b>ATC</b>	<p>Responds to alarms:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 902-5 A-6, APRM Hi.</li> <li><input type="checkbox"/> 902-5 B-4, OPRM Trouble/Inop.</li> <li><input type="checkbox"/> 902-5 B-11, Channel A/B Neutron Monitor.</li> <li><input type="checkbox"/> 902-5 C-3, Rod Out Block.</li> <li><input type="checkbox"/> 902-5 D-13, Channel 4-6 APRM HI-Hi/Inop.</li> <li><input type="checkbox"/> 902-5 D-15, Channel B RX Scram.</li> </ul> <p>Announces:</p> <ul style="list-style-type: none"> <li>■ The half scram condition on the B RPS channel.</li> <li>■ That APRM 4 has failed high</li> </ul>
	<b>CRS</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Notifies the SM and WWM</li> <li>■ References Technical Specifications and determines: <ul style="list-style-type: none"> <li>• TS 3.3.1.1 Condition A - With APRM 4 and APRM 6 bypassed, there are not sufficient APRMs on B RPS channel. Required to place channel in trip within 12 hours. Condition met with the B Half Scram in.</li> <li>○ TRM 3.3.a – Determines not applicable due to needing 4 of the 6 APRMS operable.</li> </ul> </li> </ul>

### **Event 6 Completion Criteria:**

➤ Appropriate Tech Specs referenced,

-- AND / OR --

At the direction of the Lead Examiner.

## Event Seven - Small Steam Leak in Drywell

Trigger	Position	Crew Actions or Behavior
6		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the NRC chief examiner, activate <b>TRIGGER 6</b>, which causes a small Main Steam line leak to develop in the Drywell.</p> <p><b><u>Role Play:</u></b></p> <p>U-3 NSO to report Drywell pressure status: Report "U-3 Drywell pressure is 1.2 psig and steady".</p>
	TEAM	<ul style="list-style-type: none"> <li>■ Recognizes and announces that Drywell pressure is slowly rising.</li> <li>□ May direct an operator to check the Unit 2 Drywell CAM.</li> <li>□ May direct operators to search for leaks.</li> </ul>
		<p><b><u>Role Play:</u></b></p> <p>EO to check Drywell CAM: (wait 2 min.)</p> <p>Report, "The Drywell CAM is 4700 counts and trending up at a faster rate than earlier in the shift".</p> <p>EO to check Cribhouse inlet temperature: (wait 5 min.)</p> <p>Report, "Cribhouse inlet temp is 70°F".</p>
	CRS	<ul style="list-style-type: none"> <li>■ Enters and directs performance of DOA 0040-01, SLOW LEAK.</li> <li>□ Set Scram contingency of 1.5 psig DW pressure.</li> <li>■ Prior to reaching the Drywell Pressure scram setpoint, directs a manual reactor scram per DGP 02-03.</li> </ul>
	ATC	<p>Performs the following actions per DOA 0040-01 as directed:</p> <ul style="list-style-type: none"> <li>□ Maintain Level with FWLCS (immediate action).</li> <li>□ Monitors leakage rate, reactor water level, and Drywell pressure.</li> <li>■ Inserts manual reactor scram prior to 1.5 psig DW pressure (See next event for scram actions)</li> </ul>
	BOP	<p>Performs the following actions per DOA 0040-01 as directed:</p> <ul style="list-style-type: none"> <li>□ Notifies Shift Supervisor and Rad Protection.</li> <li>□ Directs search for leak.</li> <li>□ Shutdown H2 Addition.</li> <li>□ Makes PA announcement.</li> <li>□ Verify Crib House inlet temperature is &lt;95°F.</li> <li>□ Initiates Torus cooling per "Hard Card".</li> </ul>

### Event 7 Completion Criteria:

➤ Manually Scrammed Reactor

--AND/OR--

Or at the discretion of the NRC Chief Examiner.



## Event Eight – ATWS - Seven Stuck Rods

Trigger	Position	Crew Actions or Behavior
<b>18</b>		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>Verify <b>TRIGGER 18</b> automatically activates when the MODE switch is placed in SHUTDOWN, this will increase the size of the steam leak to force DW &gt; 9 psig.</p> <p><b><u>ROLE PLAY:</u></b></p> <p>EO sent to check EDG operation: wait 3 min, then report: "Both EDGs are operating normally".</p> <p><b><u>ROLE PLAY:</u></b></p> <p>Acknowledge other requests; delay as necessary.</p>
	<b>ATC</b>	<p>Performs the following actions per DGP 02-03 as directed:</p> <ul style="list-style-type: none"> <li>■ Presses scram pushbuttons</li> <li>■ Places mode switch in shutdown</li> <li>■ Check rods inserted.</li> <li>■ Determines that seven control rods are not inserted.</li> <li>■ Initiates ARI</li> <li>■ Announces ATWS condition and RX power is &lt;6%.</li> <li>■ Places MSIV LO-LO LVL BYPASS KEYLOCKS to BYPASS</li> <li>❑ Inserts SRM/IRMs.</li> </ul>
	<b>BOP</b>	<ul style="list-style-type: none"> <li>❑ Check auxiliary power transferred to RAT.</li> <li>❑ May start maximum torus cooling per DOP 1500-02, TORUS WATER COOLING MODE OF LOW PRESSURE COOLANT INJECTION SYSTEM, Hardcard.</li> </ul>
	<b>TEAM</b>	<p>Verifies the following as time allows:</p> <ul style="list-style-type: none"> <li>❑ Group Isolations</li> <li>❑ Automatic start of ECCS systems</li> <li>❑ Automatic start of EDGs.</li> </ul>
	<b>CRS</b>	<ul style="list-style-type: none"> <li>■ Enters DEOP 100, RPV CONTROL, from DGP 02-03, REACTOR SCRAM, or if DW &gt;2.0 psig. Due to ATWS report, exits DEOP 100, enters DEOP 0400-05, FAILURE TO SCRAM and performs/directs the following:.</li> <li>■ <b>√ Inhibiting ADS.</b></li> <li>❑ Placing Core Spray in PTL.</li> <li>❑ Verification of all isolations, ECCS and EDGs start.</li> <li>❑ Holding Reactor water level between TAF and +48".</li> <li>■ <b>√ Inserting control rods.</b> <ul style="list-style-type: none"> <li>• May direct the WEC to vent the CRD over-piston areas on the remaining 3 rods that cannot be moved (Rods D-7, K-7, N-4)</li> </ul> </li> <li>❑ Maintaining RPV pressure &lt;1060 psig.</li> </ul>
	<b>BOP</b>	<ul style="list-style-type: none"> <li>■ <b>√ Inhibits ADS.</b></li> <li>❑ Places Core Spray in PTL.</li> <li>❑ Controls RPV pressure as directed.</li> </ul>

## Event Eight – ATWS - Seven Stuck Rods

Trigger	Position	Crew Actions or Behavior
	<b>ATC</b>	<p>√ <b>Performs manual control rod insertion per DEOP 500-5, ALTERNATE INSERTION OF CONTROL RODS</b>, as directed (three of the seven rods will NOT insert):</p> <ul style="list-style-type: none"> <li>■ Bypasses the RWM</li> <li>■ Starts the available CRD pump or use CRD x-tie from Unit 3.</li> <li>■ Maximizes drive water pressure using one or more of the methods in DEOP 500-05.</li> <li>■ Inserts rods using RONOR in EMERG ROD IN or the normal rod movement control switch</li> </ul>
	<b>CRS</b>	<p>Enters DEOP 0200-01, Primary Containment Control, when PC/P reaches 2 psig and performs/directs:</p> <ul style="list-style-type: none"> <li>□ Monitoring of PC/P.</li> <li>□ Initiation of torus sprays before PC/P of 9 psig.</li> <li>■ When PC/P is above 9 psig or before DW/T reaches 281°F: <ul style="list-style-type: none"> <li>• Verification of DSIL.</li> <li>• Tripping of recirc pumps.</li> <li>• Tripping of DW coolers.</li> <li>• √ <b>Initiation of DW sprays.</b></li> </ul> </li> <li>□ Monitoring of DW/T. (D/W sprays may be initiated for temp control)</li> <li>■ Monitoring of SP/T and initiation of torus cooling.</li> <li>□ Monitors SP/L.</li> <li>■ √ <b>Securing Drywell and Torus Sprays before Drywell or Torus reach 0 psig (if applicable)</b></li> </ul>
	<b>BOP</b>	<p>Performs DEOP 0200-01, Primary Containment Control, actions as directed:</p> <ul style="list-style-type: none"> <li>□ Monitors PC/P and initiates torus sprays as directed:</li> <li>■ <b>Initiates drywell sprays per Hard Card LPCI/CCSW OPERATION</b>, as directed: <ul style="list-style-type: none"> <li>❖ Opens the 27A/B and 28A/B valves in desired loop.</li> <li>❖ Adjusts sprays to maintain &lt; 9 psig, but high enough to ensure ECCS NPSH by any combination of the following: <ul style="list-style-type: none"> <li>○ Open or close 27A/B <u>AND</u> 28A/B valves in the desired containment spray loop.</li> <li>○ Throttling 21A/B <u>OR</u> 38A/B valves in the desired containment spray loop. (Maintain LPCI pump discharge pressure &gt; 125 psig.)</li> </ul> </li> </ul> </li> <li>□ Monitors DW/T.</li> <li>□ Monitors SP/T and initiates torus cooling per Hard Card LPCI/CCSW OPERATION as directed. (May already be initiated for previous Event)</li> <li>□ Monitors SP/L.</li> <li>□ Verifies initiation of drywell and torus H<sub>2</sub>/O<sub>2</sub> monitors.</li> <li>■ √ <b>Secures Drywell and Torus Sprays before Drywell or Torus reach 0 psig (if applicable)</b></li> </ul>

## Event Eight – ATWS - Seven Stuck Rods

Trigger	Position	Crew Actions or Behavior
8  9  17		<p><b><u>Simulator Operator / Role Play:</u></b></p> <p>When requested: Wait three min, activate the appropriate trigger and report completed.</p> <p><b>TRIGGER 8:</b> installs scram jumpers. (Wait 3 min)</p> <p>At the discretion of the Lead Evaluator, report “SCRAM jumpers are installed on U2 per DEOP 500-05”</p> <p><b>TRIGGER 9:</b> bypasses Offgas High Rad. (Wait 3 min)</p> <p>At the discretion of the Lead Evaluator, report “Offgas High Rad isolations bypassed on U2 per DEOP 500-02”</p> <p><b>TRIGGER 17:</b> removes ARI fuses (Wait 3 min)</p> <p>At the discretion of the Lead Evaluator, report “ATWS ARI Fuses are removed on U2 per DEOP 0500-05”</p>
13 14 15 16		<p><b><u>Simulator Operator:</u></b></p> <p>Verify the following triggers automatically activate when the associated rod is selected, drive water pressure is restored to &gt; 200 psig and an “insert” signal is given:</p> <p><b>TRIGGER 13:</b> deletes the stuck malfunction for CRD F-09.</p> <p><b>TRIGGER 14:</b> deletes the stuck malfunction for CRD H-05.</p> <p><b>TRIGGER 15:</b> deletes the stuck malfunction for CRD L-14</p> <p><b>TRIGGER 16:</b> deletes the stuck malfunction for CRD P-07</p> <p><b><u>Simulator Operator / Role Play:</u></b></p> <p>At the discretion of the Lead Evaluator, report as the QNE: “I have performed an evaluation of the current core configuration, and confirmed that the reactor will remain shutdown under all conditions.”</p>
	CRS	<p><input type="checkbox"/> May contact QNE to determine if reactor will remain shutdown under all conditions.</p> <p><input checked="" type="checkbox"/> If informed that the reactor will remain shutdown under all conditions, exits DEOP 0400-05 and enters DEOP 100.</p>

### **Event 7/ Scenario Completion Criteria:**

- Rods being manually driven,
- DW Sprays are initiated,
- AND/OR--

Or at the discretion of the NRC Chief Examiner.

## REFERENCES

PROCEDURE	TITLE
DAN 902(3)-5 A-6	APRM Hi
DAN 902(3)-5 B-4	OPRM Trouble / Inop
DAN 902(3)-5 B-11	Channel A-B Neutron Monitor
DAN 902(3)-5 C-3	Rod Out Block
DAN 902(3)-5 C-12	Channel 1-3 APRM Hi-Hi / Inop
DAN 902(3)-5 D-10	Channel A Rx Scram
DAN 923-1 B-5	U2 or U3 Inst Air Comp Trip
DAN 923-1 C-3	Service Water Pump Trip
DEOP 0100	RPV Control
DEOP 0200-01	Primary Containment Control
DEOP 0400-05	Failure to SCRAM
DEOP 0500-02	Bypassing Interlocks and Isolations
DEOP 0500-05	Alternate Insertion of Control Rods
DGA-07	Unexpected Reactivity Change
DGP 01-01	Unit Startup
DGP 02-03	Reactor Scram
DGP 03-04	Control Rod Movements
DOA 0040-01	Slow Leak
DOA 0500-05	Loss of Reactor Protection System Bus
DOA 3900-01	Loss of Cooling by Service Water System
DOA 4700-01	Instrument Air System Failure
DOA 6500-10	4kV Circuit Breaker Trip
DOP 0400-01	Reactor Manual Control System Operation
DOP 0500-03	Reactor Protection System Power Supply Operation
DOP 0500-07	Insertion/Reset of Manual Half Scram
DOP 2400-01	CAM System H2 and O2 Detection Subsystem Operation
DOP 4700-01	Instrument Air System Startup
DOP 5750-02	Reactor Building Ventilation
DOP 6700-18	Bus 28 Outage
DOP 6700-20	480V Circuit Breaker Trip
DOP 7500-01	STANDBY GAS TREATMENT SYSTEM OPERATION
TS 3.3.1.1	Reactor Protection System (RPS) Instrumentation
TS 3.3.6.2	Secondary Containment Isolation Instrumentation
TS 3.3.7.1	Control Room Emergency Ventilation (CREV) System Instrumentation
TS 3.3.8.2	Reactor Protection System (RPS) Electric Power Monitoring
TRM 3.7.i	Fire Water Supply System

## Simulator Scenario Review Checklist

ILT-N-2 Quantitative Attributes	
6	Total malfunctions (5 to 8)
1	Malfunctions after EOP entry (1 to 2)
4	Abnormal events (2 to 4)
1	Major transients (1 to 2)
2	EOPs entered/requiring substantive actions (1 to 2)
1	EOPs contingency requiring substantive actions (0 to 2)
3	Crew critical tasks (2 to 3)

## CAEP FILES

# 19-1 (2020-301) ILT-N-2.cae  
# For ILT Class 19-1 NRC Exam  
# Written by FDW  
# Rev 00  
# Date 01/20

### ##### INITIAL CONDITIONS #####

# Sets APRM Master Gain pot to 1.0  
irf niagain 1.0 |2

# Sticks 7 rods, Example for CRD D-07 is "imf rodd07st"  
# Rods are D-07, F-09, H-05, K-07, L-14, N-04, and P-07  
imf rodd07st |2  
imf rod09st |2  
imf rodh05st |4  
imf rodk07st |4  
imf rodl14st |4  
imf rodn04st |4  
imf rodp07st |6

### ##### EVENT TRIGGERS #####

# Event Trigger 1 inserts an IAC trip - Event #3  
trgset 1 "0"|6  
imf n33 (1 10:00)|6

# Event Trigger 2 causes 2B RPS MG Set to trip simulating trip of 2B RPS MG SET 2B-1 EPA Bkr – Event #4  
trgset 2 "0"|10  
imf b02 (2)|10

# Event Trigger 3 places 2A RPS Bus on reserve power – Event #4  
trgset 3 "0"|10  
irf b03 (3) true|10

# Event Trigger 4 inserts a trip of the 2B service water pump. (takes several seconds to occur) – Event #5  
trgset 4 "0"|12  
imf q22 (4)|12

# Event Trigger 5 fails APRM #4 upscale  
trgset 5 "0"|14  
imf nia4pot (5) 125 60|14

# Event Trigger 6 Inserts a 0.01% steam leak upstream of the restrictors  
trgset 6 "0"|14  
imf i21 (6) 0.01|14

# Event Trigger 8 installs scram jumpers  
trgset 8 "0"|18  
irf rpjumpas (8) on|18

# Event Trigger 9 installs Offgas High Radiation bypass jumpers  
trgset 9 "0"|18  
irf ogogjp (9) in|18

```
# Event Trigger 13 clears stuck rod F-09
trgset 13 "rdlselw(102) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|20
trg 13 "dmf rodf09st"|20

# Event Trigger 14 clears stuck rod H-05
trgset 14 "rdlselw(45) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|20
trg 14 "dmf rodh05st"|20

# Event Trigger 15 clears stuck rod L-14
trgset 15 "rdlselw(171) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|22
trg 15 "dmf rodL14st"|22

# Event Trigger 16 clears stuck rod P-07
trgset 16 "rdlselw(80) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|20
trg 16 "dmf rodP07st"|20

# Event Trigger 17 Removes ARI fuses
trgset 17 "0"|26
irf aw4 (17) true|26

# Event Trigger 18 increases the size of the steam leak
trgset 18 "rpdmode4"|26
trg 18 "mmf i21 4.0 1:00"|26

# Event Trigger 28 sets gain for all 6 APRMs.
trgset 28 "0"|28
trg 28 "irf niagainf true"|28

#### END ####
```

### Unit 2 Risk: GREEN

Unit 2 is in Mode 2 at 5% power

Leading Thermal Limit: MFLCPR @ 0.881

Action limit: 0.980

Equipment Unavailable: APRM #6

Protected Equipment: None

### Unit 3 Risk: GREEN

Unit 3 is in Mode 1 at 100% power

Leading Thermal Limit: MAPRAT @ 0.885

Action Limit: 0.980

Equipment Unavailable: None

Protected Equipment: None

### Current Action Statements

**Both LPCI Subdivisions**

LCO Started: 6 Hour ago

LCO Expires: 66 Hours from now

**TS 3.5.1, Cond E**

Cause: MCC 28-7/29-7 is not powered from the normal source

### Unit 2 Plant Status

Today

Unit 2 Activities

\*\*\*\* Shift 1 Activities \*\*\*\*

\*\*\*\* Shift 2 Activities \*\*\*\*

- Transfer MCC 28-7/29-7 from Bus 28 to Bus 29.
- Continue with Startup per DGP 01-01

\*\*\*\* Shift 3 Activities \*\*\*\*

Other Info

Last shift the 28-7/29-7 breaker on Bus 29 faulted. EMD has replaced the breaker and it is ready to be returned to Bus 29.



## XL-3 Alarms

.....

Sensor 51-20 in alarm      2/3 FIRE PUMP RUNNING

.....

# LPCI

## BOTH LPCI SUBSYSTEMS INOPERABLE

<b>LCORA:</b> 3.5.1.E	<b>Clock Started:</b> 6 hour ago	<b>Clock Expires:</b> 66 hours from now	<b>Contingencies / Compensatory Actions:</b> None
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**Entry Reason:**

LPCI swing bus (MCC 28-7/29-7) not on Bus 29.

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# ***Dresden Generating Station***

## **ILT-N-4**

**SWAP TBCCW PUMPS**

**STUCK CONTROL ROD**

**LOSS OF RFP / RECIRC RUNBACK**

**RB FUEL POOL UPSCALE - FAILURE OF RB VENT DAMPERS TO  
CLOSE**

**HP HEATER TRIP**

**ISO CONDENSER TUBE LEAK**

**RECIRC LEAK IN DW – MANUAL SCRAM**

**LOSS OF ALL FWRV'S AND HPCI WITH RECIRC LEAK –  
EMERGENCY DEPRESSURIZATION DUE TO RPV LVL AT TAF**

Rev. 00

01/20

Developed By:

\_\_\_\_\_  
Exam Author

\_\_\_\_\_  
Date

Approved By:

\_\_\_\_\_  
Facility Representative

\_\_\_\_\_  
Date

## Scenario Outline

<b>Facility:</b> <u>Dresden Generating Station</u>	<b>Scenario No.:</b> <u>2020-301 ILT-N-4</u>	<b>Op-Test No.:</b> <u>2020-301</u>
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<b>Examiners</b>  <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/>	<b>Applicants</b> /   crew position <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> / ATC <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> / BOP <hr style="border: 0; border-top: 1px solid black; margin: 5px 0;"/> / CRS
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**Initial Conditions:**    Unit 2 is at 100% Power.  
2A EHC Pump OOS

  

**Turnover:**                Swap TBCCW pumps per DOP 3800-01  
Exercise CRDs A-06, D-09, and N-08 per DOS 0300-01

  

**Critical Tasks:**        RPV-1.1 – If the RPV level trend is not reversible with an RPV injection source lined up with a pump running, initiate emergency depressurization with RPV water level between the Top-of-Active Fuel and the Minimum Steam Cooling RPV Water Level or within two and ½ minutes after TAF is reached, whichever is later.  
RPV-1.2 – When high and low pressure systems are available for RPV injection, Maximizes injection flow with minimum ECCS Pump lineups prescribed by the transient mitigation guidelines (OP-DR-103-102-1002) into the RPV until level is restored to above the Top-of-Active Fuel (TAF).  
RPV-1.5 - Per DEOP 100, RPV CONTROL, with the automatic ADS timer initiated, inhibit ADS before an automatic actuation occurs.  
RPV-2.1 – When conditions are met per DEOP 400-2, EMERGENCY DEPRESSURIZATION, within 15 minutes the minimum number of available SRV's required for emergency depressurization (MNSRED) are opened.  
PC-1.1 – While executing DEOP 200-1, PRIMARY CONTAINMENT CONTROL, when drywell pressure exceeds 9 psig and only if operating within the safe region of the drywell spray initiation limit (DSIL), initiate drywell sprays within 15 minutes.

  

Event No.	Malf. No.	Event Type*	Event Description #
1	NONE	N      BOP	(New) – TBCCW – Swap TBCCW pumps
2	RODXXST	C      ATC	(New) - CRD - Control Rod, Stuck And Requires Higher Pressure To Move
3	RLMRFBP	C      ATC	(New) – FW – Recirc Runback, due to loss of RFP
4	RMARMPPFAILF(1) RMARMPPFAILD(1) VRMISO42A VRMISO42B MRGFPB	I/ I-T      BOP/ CRS	(New) - PRM – RB Fuel Pool Channel B Rad detector fails upscale causing RB Vent to isolate with failure of 2 isolation dampers to close. CRS will reference Tech Specs.
5	HDD3202C2 HDD3202O2 HDD3202S2	R      ATC	(New) – FW – High Pressure Feedwater Heater trip (Reactivity Move)
6	ICTUBLK	C/ C-T      BOP/ CRS	(New) ISO COND – System, Tube leak
7	F41	M      ALL	MANUAL SCRAM – Recirc leak in Drywell.
8	RLMFAFC RLMFBFC RLMLFFC HPPMGDG	C      ATC C      BOP M      ALL	(New) - Loss of All Feedwater Reg Valves  HPCI degraded  EMERGENCY DEPRESSURIZE - On Lowering Reactor Water Level

  

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (T)ech Spec  
# (New) – Event not used on previous 2 NRC Exams,      (Pre) – Event used on previous 2 NRC Exams

## Scenario Objective

Evaluate the Team's ability to operate the plant with a drywell leak and degraded high pressure injection systems.

## Scenario Initial Conditions

1. Unit 2 is at ~100% power.
2. The following equipment is OOS:
  - a. 2A EHC Pump
3. LCOs:
  - a. None

## Scenario Sequence

Event #	Description
1	<b>TBCCW – Swap TBCCW pumps:</b> The BOP will start 2A TBCCW pump and secure 2B TBCCW pump per DOP 3800-01.
2	<b>CRD - Control Rod, Stuck And Requires Higher Pressure To Move:</b> ATC will perform monthly rod exercising. The first rod will perform as expected. The second rod will stick requiring drive water pressure to be increased to >325 psid in order for the rod to move.
3	<b>FW - Recirc Runback, Due To Loss of RFP:</b> The 2B RFP loses oil pressure and trips. Insufficient feedwater flow causes RPV level to drop and the crew to respond to a Recirc runback. ATC will insert CRAM rods to reduce the FCL below the MELLLA boundary.
4	<b>PRM – RB Fuel Pool upscale, with failure of 2 RB Vent Dampers to close.</b> The RB Fuel Pool Channel B Rad detector will fail upscale causing RB Vent to isolate. 2 of the RB Vent Isolation Dampers will fail to close. The BOP will be able to close the dampers manually. The CRS will reference the Tech Specs.
5	<b>High Pressure Feedwater Heater trip (Reactivity move):</b> 2D2 Feedwater Heater extraction valve fails closed. The crew will address the loss of feedwater heating and evaluate which region of feedwater heating they are operating in. The ATC will reduce power by 60 MWe with core flow.
6	<b>ISO COND - System, Tube Leak:</b> The Isolation Condenser develops a tube leak and must be isolated. With the Isolation Condenser inoperable the CRS will reference Tech Specs.
7	<b>MANUAL SCRAM - Recirc leak in Drywell:</b> A leak will develop in the Recirc line causing Drywell pressure to rise. The crew may take scram prep actions per DGP 02-03, but will manually scram the reactor by 1.5 psig in the Drywell. Drywell pressure will rise above 9 psig and this drives the crew to spray the Drywell.
8	<b>EMERGENCY DEPRESSURIZE - On Lowering Reactor Water Level Due To Recirc System Leak, Loss of All Feedwater Reg Valves, and HPCI being degraded:</b> After the crew stabilizes the plant following the manual scram the Recirc leak will get bigger, the FWRVs will fail closed and with HPCI degraded (malfunction put in during scenario setup), Reactor water level will lower. When RWL reaches TAF (-170") the crew will enter DEOP 0400-02, Emergency Depressurization, and blowdown the reactor.

### **Event One – Swap TBCCW Pumps**

The BOP will start the 2A TBCCW pump and secure the 2B TBCCW pump.

Malfunctions required: 0

- None

Success Path:

- 2A TBCCW pump is running and 2B TBCCW pump is secured.

### **Event Two – Stuck Control Rod**

A control rod sticks and requires higher pressure to move.

Malfunctions required: 1

- (Control rod stuck)

Success Path:

- Performs DOP 0400-01, Reactor Manual Control System Operation .
- Determines Technical Specifications requirements.

### **Event Three – Recirc Runback**

The crew recognizes and responds to failure of the 2B RFP lube oil system. Low feedwater flow causes RPV level to drop and a recirc runback to occur.

Malfunctions required: 1

- (RFP trip with low feedwater flow)

Success Path:

- Take action for recirc runback.

### **Event Four – Fuel Pool Channel B Fails Upscale**

The RB Fuel Pool Channel B Rad detector fails upscale, causing RB Vent to isolate. 2 of the RB Vent Isolation Dampers will fail to close.

Malfunctions required: 2

- (Failure of 2B Fuel Pool Radiation Detector upscale)
- (Failure of two RB Vent Dampers to go closed)

Success Path:

- Team manually isolates the RB Vent Dampers manually.
- Determines Technical Specifications requirements.

### **Event Five – High Pressure Feedwater Heater trip (Reactivity move)**

2D2 Feedwater Heater level fails upscale

Malfunctions Required: 1

- (2D2 Heater level fails upscale)

Success Path:

- Inserts CRAM rods per DGP 03-04 to clear APRM Highs OR to reduce power below MELLTA boundary
- Reduces power with core flow to maintain CTP below 100%, or at the initial power level (does NOT decrease flow  $\leq$  55 Mlbm/hour with FCL  $\geq$  58%)
- Reduces power by 60 MWE with core flow due to “D” Heater being tripped

#### **Event Six – Isolation Condenser Tube Leak**

Isolation condenser develops a tube leak.

Malfunctions required: 1

- (Isolation Condenser Tube Leak)

Success Path:

- Team isolates the Isolation Condenser
- Determines Technical Specifications requirements.

#### **Event Seven – Recirc Leak in Drywell - Manual Scram**

A LOCA in the Drywell occurs, causing DW pressure to rise, and requiring a manual scram.

Malfunctions required: 1

- (Recirc loop leak)

Success Path:

- Performs DGP 02-03, Reactor Scram.
- Performs DEOP 0100, RPV Control
- Performs DEOP 0200-01, Primary Containment Control.

#### **Event Eight – Loss of All FWRV's and HPCI with Recirc Leak – Emergency Depressurization due to RPV Lvl at TAF**

Emergency Depressurization is required when it is determined that RPV/L cannot be maintained above TAF. RPV/L is restored using low pressure ECCS pumps.

Malfunctions Required: 2

- (FWRVs failed closed)
- (HPCI degraded)

Success Path:

- Performs DEOP 0400-02, Emergency Depressurization

## PRE-SCENARIO ACTIVITIES

- 1 If applicable, conduct pre-scenario activities in accordance with TQ-AA-155-J040, SIMULATOR EXAMINATION BRIEFING.
  - a. Direct the crew to perform their briefs prior to entering the simulator.
  - b. Provide the Team a marked up copy of DOP 3800-01, Turbine Building Closed Cooling Water System Operation.
  - c. Provide the Team a marked up copy of DOS 0300-01, Control Rod Exercise.
  - d. Have a clean copy of DOP 0400-01, REACTOR MANUAL CONTROL SYSTEM OPERATION, to give to the crew if/when they reference the book.
- 2 Simulator Setup (the following steps can be done in any logical order)
  - a. Initialize simulator in an ~100% power IC. (IC 323 used for validation, sequence 2S.0.0 Key 758C)
  - b. Cut in/out Cond Demins as needed, to maintain DP within limits.
  - c. Ensure running Condensate pump amps within limits.
  - d. Ensure CRD parameters are normal, and CRD Drive Pressure is 250 to 280 psid.
  - e. Advance the chart recorders.
- 3 Verify the following simulator conditions:
  - a. Verify Reactor Power ~100%, adjust rods or Recirc as appropriate.
  - b. 2B TBCCW pump is running.
  - c. 2A TBCCW pump is secured.
- 4 Run **Pump\_Sumps.cae**

**NOTE: Do NOT run the initial setup CAEP file until the above setup is completed.**

- 5 Run the initial setup CAEP file: **19-1 (2020-301) ILT-N-4.cae**
- 6 Place the following equipment out of service:
  - a. 2A EHC Pump
- 7 Place a Protected Pathway donut on 2B EHC Pump.
- 8 Ensure this setup is peer checked.
- 9 Complete the Simulator Setup Checklist.

Symbols are used throughout the text to identify specific items as indicated below:

- √ Critical Tasks
- Required Actions
- Optional Actions



## Event One – Swap TBCCW Pumps

Trigger	Position	Crew Actions or Behavior
28		<p><b><u>SIMULATOR OPERATOR ROLE PLAY:</u></b></p> <p>If requested to set gains to 1, (wait 3 min) activate <b>TRIGGER 28</b>, then report “gains set to 1”. (This trigger can be triggered OFF, then back ON to adjust gains more than once).</p> <p><b><u>SIMULATOR OPERATOR ROLE PLAY:</u></b></p> <p>EO at TBCCW pumps:</p> <ul style="list-style-type: none"> <li>• If asked, pre-start checks are complete for the 2A TBCCW pump</li> <li>• When told the 2A TBCCW pump is being started, report: “I understand 2A TBCCW pump is being started, everyone is clear of the area.”</li> <li>• When asked about 2A TBCCW pump operation, wait 1 minute and report: “the 2A TBCCW pump is operating normally.”</li> <li>• When asked about 2B TBCCW pump after pump is secured, report: “the 2B TBCCW pump is at rest.”</li> <li>• When asked about TBCCW system parameters locally, wait 1 minute and report: “TBCCW system parameters are normal.”</li> </ul>
	CRS	<ul style="list-style-type: none"> <li>■ Directs BOP to start the 2A TBCCW pump and secure the 2B TBCCW pump IAW DOP 3800-01, Turbine Building Closed Cooling Water System Operation.</li> </ul>
	BOP	<p>Performs DOP 3800-01, steps G.4.a through g:</p> <ul style="list-style-type: none"> <li>❑ May contact EO at TBCCW pumps for status of the 2A TBCCW pump.</li> <li>❑ Informs the EO the 2A TBCCW pump is being started.</li> <li>■ Starts the 2A TBCCW pump by taking control switch on the 923-1 panel to START.</li> <li>■ Directs the EO to check for proper operation of the 2A TBCCW pump.</li> <li>■ Secures the 2B TBCCW pump by taking control switch on the 923-1 panel to TRIP.</li> <li>❑ Verifies TBCCW system parameters.</li> <li>❑ Notifies CMO to perform vibration monitoring on the running 2A TBCCW PP at the next opportunity.</li> </ul>

### **Event 1 Completion Criteria:**

- 2A TBCCW pump is running,
- 2B TBCCW pump is secured,
- AND/OR --

At the discretion of the Lead Examiner.

## Event Two – Stuck Control Rod

Trigger	Position	Crew Actions or Behavior
1		<p><b>NOTE:</b></p> <p>The crew will start exercising control rods per DOS 0300-01, Control Rod Exercise. When CRD D-09 is exercised they will experience a stuck rod.</p> <p>If/when the crew references DOP 0400-01, REACTOR MANUAL CONTROL SYSTEM OPERATION, provide them the prepared copy.</p> <p><b>SIMULATOR OPERATOR:</b></p> <p>Verify <b>TRIGGER 1</b> automatically activates when:</p> <ul style="list-style-type: none"> <li>Control rod D-09 is selected;</li> <li>Drive water pressure is greater than 325 psig; and,</li> <li>Either the Rod Movement Control switch is placed to the ROD IN position, or the Rod Out Notch Override is placed to the EMERG ROD IN position.</li> </ul> <p>This deletes Control Rod D-09 stuck malfunction.</p> <p><b>ROLE PLAY:</b></p> <p>EO to check D-09 accumulator: Wait 2 min, then report “I see nothing abnormal at D-09 accumulator”.</p> <p>Shift Manager / QNE to concur with raising drive water pressure: advise the CRS that “I concur with raising drive water pressure”.</p>
	CRS	<ul style="list-style-type: none"> <li>Directs ATC to exercise CRDs A-06, D-09, and N-08.</li> </ul>
		<p><b>NOTE:</b></p> <p>The following section describes actions taken when CRDs A-06 and N-08 are exercised.</p>
	ATC	<ul style="list-style-type: none"> <li>Places RWM is in ROD EXERCISE mode per DOP 0400-02, ROD WORTH MINIMIZER.</li> <li>Places FIC 2(3)-340-1, CRD FLOW CONTRL, on Panel 902-5 in MANUAL.</li> <li>Obtains an edit of control rod positions, if the computer is available.</li> <li>Selects the CRD to be exercised.</li> <li>Insert control rod one notch AND verify latched</li> <li>Verify indicated control rod position changes during movement.</li> <li>While withdrawing the control rod to position 48, perform the following: <ul style="list-style-type: none"> <li>Apply a continuous withdrawal signal utilizing the Rod Out Notch Override switch.</li> <li>Verify indicated control rod position changes during movement.</li> <li>Verify the control rod does NOT go to the overtravel position.</li> </ul> </li> <li>Observe stall flow reading on FI 2(3)-340-8, DRIVE WTR FLOW, on Panel 902(3)-5.</li> <li>Remove continuous withdrawal signal.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>Verifies RWM is in ROD EXERCISE mode</li> <li>Verifies FIC 2(3)-340-1, CRD FLOW CONTRL, is in MANUAL.</li> <li>Verifies the CRD to be exercised.</li> <li>Verifies the ATC operator is set to move the Rod Movement Switch in the proper direction.</li> <li>Performs the following actions to record Stall Flows: <ul style="list-style-type: none"> <li>Records Stall Flow after it stabilizes, on Checklist 1, CRD Exercise Checklist.</li> <li>Records MINIMUM drive water pressure observed on DPI 2(3)-340-4, DRIVE WTR PRESS, on Panel 902-5, WHILE drive water flow rate was stable, on Checklist 1, CRD Exercise Checklist.</li> </ul> </li> </ul>

## Event Two – Stuck Control Rod

Trigger	Position	Crew Actions or Behavior
		<b>NOTE:</b> The following section describes actions taken when CRD D-09 is exercised and is discovered to be stuck.
	<b>ATC</b>	<input type="checkbox"/> Observes and announces that Control Rod D-09 did not move using normal drive pressure. <input type="checkbox"/> Requests permission from CRS to raise drive water pressure per DOP 0400-01, Reactor Manual Control System Operation, to attempt to move the control rod.
	<b>CRS</b>	<input type="checkbox"/> May contact Shift Manager and/or QNE for concurrence to raise drive water pressure. <input type="checkbox"/> Directs ATC to raise drive water pressure per DOP 0400-01, Reactor Manual Control System Operation, to attempt to move the control rod.
		<b>NOTE:</b> The pressure is to be raised incrementally to the following ranges for each attempt to move the rod: <ul style="list-style-type: none"> <li>• 280 to 320 psid (~300 psid)</li> <li>• 320 to 380 psid (~350 psid; the control rod will move)</li> </ul>
	<b>ATC</b>	Repeats the following until the control rod moves: <ul style="list-style-type: none"> <li>■ Raises drive water pressure per DOP 0400-01, REACTOR MANUAL CONTROL SYSTEM OPERATION, (Attachment B) as follows:               <ul style="list-style-type: none"> <li>○ May place FIC 2-0340-01, CRD FLOW CONTRL, in MAN if desired.</li> <li>• Throttles closed MO 2-0302-08, DRIVE WTR PCV, to establish the desired drive water pressure.</li> </ul> </li> <li>■ Attempts to move the control rod.</li> <li>□ Observes and announces that the stuck control rod moved with ~350 psid.</li> <li>■ Returns the drive water pressure to the normal band by throttling open MO 2-302-8, DRIVE WTR PCV. (250 to 280 psid)</li> <li>□ May place FIC 2-340-1, CRD FLOW CONTRL, back to AUTO if desired.</li> <li>■ Completes moving the rod to its target position.</li> </ul>

### Event 2 Completion Criteria:

- Control Rod D-09 Has Been moved to its original target position

-- AND/OR--

At the direction of the Lead Examiner.

## Event Three – 2B RFP TRIP / RECIRC RUNBACK

Trigger	Position	Crew Actions or Behavior
2  21  3 & 4  5 & 6		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the Floor Instructor / Lead Evaluator, activate <b>TRIGGER 2</b>, which inserts 2B RFP low oil pressure, causes failure of its auxiliary oil pump to start and trips the pump 30 seconds later. Also insert failure to cause level to drop slowly to less than 25 inches to cause the Recirc runback.</p> <p><b>NOTE:</b> Verify <b>TRIGGER 21</b> automatically activates to remove 2B RR Pump speed hold override, once runback is complete. If it does not work, manually delete digital override “rrdbspdhdres”.</p> <p>Verify <b>TRIGGERS 3 &amp; 4</b> automatically activate when 2B RFP’s breaker opens. This causes:</p> <ul style="list-style-type: none"> <li>• Sets the FRV Isol MO 2-3206A&amp;B to 25% open to reduce FW flow enough to cause RPV level to drop.</li> <li>• Overrides the valves’ CLOSED lights OFF so they still appear full open.</li> </ul> <p>■ Verify <b>TRIGGERS 5 &amp; 6</b> automatically activate when Recirc Pump Runback light comes ON. This causes FRV Isol MO 3206A &amp; B to ramp back to 100% open.</p> <p><b><u>ROLE PLAY:</u></b></p> <p><u>EO to check 2B RFP:</u> (wait 2 min), Report, “2B RFP Oil reservoir level is low. There is a large amount of oil on the pump base-plate The oil had not reached the base plate drain yet. I plugged the base plate drain”.</p> <p><u>EO to check 2B RFP breaker:</u> (Wait 2 min), Report, “2B RFP breaker is open and no targets are up”.</p> <p><u>EO to check 2B RFP Aux Oil pump breaker:</u> (wait 2 min), Report, “I see no problems with 2B RFP Aux Oil pump breaker”.</p> <p><u>EO (if requested) to verify 2B RFP is at rest:</u> Report “2B RFP is at rest”.</p> <p><u>EO (if requested) to report status of oil leak after the 2B RFP has tripped:</u> Report: “the oil leak is down to a trickle.”</p> <p><u>If QNE is contacted:</u> Report, “I will come to the control room”</p> <p><u>If QNE is asked about ore parameters:</u> Report, “All core parameters are within limits.”</p>
	ATC	<p>Performs the following actions per DAN 902-6 H-8, 2B RFP BRG OIL PRESS LO:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Attempts to start 2B RFP Auxiliary Oil Pump.</li> <li><input type="checkbox"/> Directs EO to report 2B RFP oil pressure, oil reservoir level and check for oil leaks.</li> <li><input type="checkbox"/> Informs US 2B RFP is running with low oil pressure and the auxiliary oil pump will not start.</li> <li><input type="checkbox"/> Announces trip of 2B RFP.</li> <li><input type="checkbox"/> Announces runback of the Recirc pumps.</li> <li><input type="checkbox"/> Enters DAN 902-4 H-6, RECIRC PUMP RUNBACK.</li> <li><input type="checkbox"/> If directed, enters DGA-7, Unexpected Reactivity Addition</li> </ul>

## Event Three – 2B RFP TRIP / RECIRC RUNBACK

Trigger	Position	Crew Actions or Behavior
	<b>ATC</b>	<p><u>DAN 902-4 H-6 actions;</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> IF required to control Reactor Level, <u>THEN</u> ENTER and perform DOA 0600-01, TRANSIENT LEVEL Control, concurrently with this procedure.</li> <li><input type="checkbox"/> Verify the REACTOR RECIRC RUNBACK indicating light is ON at Panel 902(3)-4.</li> <li><input type="checkbox"/> Verify BOTH Reactor Recirc pumps have runback to 68% speed.</li> <li><input type="checkbox"/> Verifies not operating above MELLLA boundary, if operating above boundary inserts CRAM arrays.</li> <li>■ WHEN the condition(s) requiring Recirc Pump Runback has cleared, <u>THEN</u> resets the runback per DOP 0202-03, REACTOR RECIRCULATION FLOW CONTROL SYSTEM OPERATION.</li> </ul>
	<b>CRS</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> May direct entry into DOA 0600-01, Transient Level Control.</li> <li><input type="checkbox"/> Directs entry into DOA 6500-10, 4KV Circuit Breaker Trip</li> <li><input type="checkbox"/> May direct performance of DOP 0202-03.</li> <li><input type="checkbox"/> Directs insertion of CRAM arrays if operating above MELLLA boundary.</li> <li><input type="checkbox"/> Contacts the Shift Manager, and appropriate maintenance departments.</li> <li><input type="checkbox"/> Directs entry into DGA-7, Unexpected Reactivity Addition</li> </ul>

### Event 3 Completion Criteria:

➤ Crew has taken the actions of the DANs for RR runback

-- AND/OR --

At the discretion of the Floor Instructor/Lead Evaluator.

## Event Four – 2B Fuel Pool Rad Monitor Fails Upscale With Failure of RB Vent Dampers to Isolate

Trigger	Position	Crew Actions or Behavior
7, 8		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the Floor Instructor / Lead Evaluator, activate <b>TRIGGER 7</b>. This fails 2B Fuel Pool Rad monitor upscale. <b>TRIGGER 8</b> will auto activate with <b>TRIGGER 7</b> to allow the malfunction to work properly.</p> <p><b>Note:</b> One set of U2 RBV Isolation Dampers fail to close.</p> <p><b><u>CUE:</u></b></p> <p>If an operator checks the 2B Fuel Pool Rad Monitor recorder on the back panel, cue the operator the 2B Fuel Pool Rad Mon is pegged high.</p>
18, 19		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>Verify <b>TRIGGERS 18 &amp; 19</b> auto activate when the operator takes the 2-5742A &amp; B control switch to CLOSE, this deletes the malfunction that bound them open.</p>
20		<p>Activate <b>TRIGGER 20</b> after the scenario has been completed prior to going to FREEZE. This will reset the necessary variable in the background of the simulator.</p> <p><b><u>ROLE PLAY:</u></b></p> <p><u>EO (if requested) sent to check RX Bldg to Atmosphere D/P on the Refuel floor:</u> wait 2 min, then report “the RX Bldg to Atmosphere D/P is (Insert the value from Instructor Station drawing 923-5-03 OR variable VRP4)”.</p> <p><u>EO (if requested) sent to check SBTG operation:</u> wait 2 min, then report “2/3A SBTG is running normally”.</p> <p>Acknowledge requests as plant support groups.</p>
	<b>BOP</b>	<p>Announces alarms indicating 2B Fuel Pool Rad high and a Secondary Containment Isolation have occurred:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 902-3 E-16, RX BLDG FUEL POOL CH B RAD HI.</li> <li><input type="checkbox"/> 923-5 A-1, U2 RX BLDG VENT/EXH FAN TRIP.</li> <li><input type="checkbox"/> 923-5 C-1, RX BLDG DP LO (may not come in if dampers are closed quickly).</li> <li><input type="checkbox"/> Checks back panels and determines that 2B Fuel Pool Rad monitor has failed high (all other monitors are indicating normal levels).</li> </ul> <p>Verifies expected automatic actions have occurred. Discovers and announces the following:</p> <ul style="list-style-type: none"> <li>■ RX Bldg Vent Outlet Dampers AO 2-5742A &amp; B failed to close.</li> <li><input type="checkbox"/> May take actions per DAN 902(3)-3 E-16 <ul style="list-style-type: none"> <li>○ Place control switches for U2 and U3 DW and Torus Purge Fans to PTL</li> <li>○ Place Control Room Isolation switch, CRM ISOL on Panel 923-5 to ISOLATE position.</li> <li>○ Place CRM AIR FILT UNIT BOOSTER FANS control switch on Panel 923-5 to FAN A <u>OR</u> FAN B position.</li> </ul> </li> </ul>

## Event Four – 2B Fuel Pool Rad Monitor Fails Upscale With Failure of RB Vent Dampers to Isolate

Trigger	Position	Crew Actions or Behavior
	<b>CRS</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Acknowledges reports of failed 2B Fuel Pool Rad monitor and the Secondary Containment Isolation.</li> <li><input type="checkbox"/> Acknowledges report of RX Bldg Vent Outlet Dampers AO 2-5742A &amp; B failure to close.</li> <li><input type="checkbox"/> Notifies SM and WWM</li> <li><input type="checkbox"/> May direct that CREVs be isolated</li> </ul>
	<b>BOP</b>	<p>Performs the following to complete the Secondary Containment Isolation:</p> <ul style="list-style-type: none"> <li>■ Places RX Bldg Vent Outlet Isol Damper control switch to the CLOSE position and observes that the RX Bldg Vent Outlet Dampers AO 2-5742A &amp; B close.</li> <li><input type="checkbox"/> Dispatches an operator to check SGBT for normal operation.</li> </ul>
	<b>CRS</b>	<p>Refers to Technical Specifications and determines:</p> <ul style="list-style-type: none"> <li>■ Technical Specification 3.3.6.2.A Table 3.3.6.2-1 Function 4: Place channel in trip within 24 hrs. (Condition met)</li> <li>■ Technical Specification 3.6.4.1.A: Restore secondary containment to OPERABLE status within 4 hrs.</li> <li>■ Technical Specification 3.6.4.2.A: Isolate the affected penetration flow path by at least one closed and de-activated automatic valve within 8 hours. (Entered individually on AO 2-5742A AND on 2-5742B)</li> <li>■ Technical Specification 3.6.4.2.B: Isolate the affected penetration flow path by at least one closed and de-activated automatic valve within 4 hours. (Entered for BOTH AO 2-5742A &amp; B)</li> </ul>

### Event 4 Completion Criteria:

- Secondary Containment Isolation completed; AND,
  - Technical Specifications have been referenced and required LCOs identified.
- AND/OR --

At the discretion of the Floor Instructor/Lead Evaluator.

## Event Five – High Pressure Feedwater Heater Trip

Trigger	Position	Crew Actions or Behavior
9		<p><b>FLOOR INSTRUCTOR/ SIMULATOR OPERATOR:</b></p> <p>When directed, activate <b>TRIGGER 9</b> which causes 2D2 FW Heater extraction valve MO 2-3103-B to close.</p> <p><b>ROLE PLAY:</b></p> <p>If EO is asked to check MO 2-3103-B breaker: wait 3 min, then report “the feed breaker to MO 2-3103-B is closed and there appears to be no problem”.</p> <p>If EO is asked to check heaters locally: wait 3 min, then report “2D2 heater level is 18 inches, both normal and emergency drain controllers indicate that they are full open. All other heaters are operating normally.”</p> <p>If EO is asked to check 2A and 2B MSDTs: wait 3 min, then report “the 2A and 2B MSDT normal drains to 2D2 heater are closed.”</p> <p>If QNE is asked for assistance: Report “I will come to the control room”</p> <p>EO sent to cut out Cond Demin beds: wait 3 min, cutout Demin beds as needed (using instructor station), then report: “Cond Demin beds cutout”.</p>
	ATC	<ul style="list-style-type: none"> <li><input type="checkbox"/> Either discovers MO 2-3103-B closed or closing, or observes that plant parameters are changing</li> <li><input type="checkbox"/> Announces that 2-3103-B Heater extraction valve is closing or closed.</li> <li><input type="checkbox"/> Monitors feedwater temperature and heater levels.</li> <li><input type="checkbox"/> Places 2-3103-B Heater extraction valve control switch in pull to stop for 2D2 heater with level indication still on scale (as desired) to minimize feedwater temperature decrease.</li> <li>■ Reduces power with flow as necessary to maintain CTP &lt; 100% OR at the initial power level if operating at off-rated conditions (Does NOT decrease flow ≤ 55 M#/hr with FCL ≥ 58%)</li> <li>■ Due to high pressure heater trip, reduces power by 60 MWe (OR 170 MWth) with core flow.</li> <li>■ Inserts CRAM rods per DGP 03-04 to clear APRM highs OR to reduce power below the MELLLA boundary OR to reduce power below the unstable power/flow region boundaries. (as applicable)</li> <li><input type="checkbox"/> Performs DOA 3500-02, LOSS OF FEEDWATER HEATERS, as directed.</li> <li><input type="checkbox"/> Verifies operating within limitations of the Power to Flow Map. (Requires determining which region of the Feedwater Temperature Operating Domain the unit is operating)</li> <li><input type="checkbox"/> Performs DOP 3500-03, Removing High Pressure Heaters From Operation, for the 2D2 heater, if directed.</li> <li><input type="checkbox"/> Performs DGA-07, UNEXPECTED REACTIVITY CHANGE, as directed.</li> </ul>
	CRS	<ul style="list-style-type: none"> <li>■ Enters DOA 3500-02 and directs actions.</li> <li>■ Directs reducing load to by 60 MWe per DGP 03-01, POWER CHANGES.</li> <li><input type="checkbox"/> Directs performing DOP 3500-03, REMOVING HIGH PRESSURE HEATERS FROM SERVICE. Verifies immediate operator actions complete.</li> <li><input type="checkbox"/> Notifies the QNE and TSO of power change.</li> <li><input type="checkbox"/> Directs insertion of CRAM rods per DGP 03-04, CONTROL ROD MOVEMENTS, to reduce power below MELLLA or to clear APRM highs (as applicable).</li> <li><input type="checkbox"/> May direct entry into DGA-07, UNEXPECTED REACTIVITY ADDITION.</li> </ul>



## Event Five – High Pressure Feedwater Heater Trip

Trigger	Position	Crew Actions or Behavior
	<b>BOP</b>	<input type="checkbox"/> Peer checks DOA 3500-02 activities. <input type="checkbox"/> If directed, performs DGA-7.

### Event 5 Completion Criteria:

➤ DOA 3500-02 actions complete

-- AND/OR --

At the direction of the Lead Examiner.

## Event Six – Isolation Condenser Tube Leak

Trigger	Position	Crew Actions or Behavior
<b>10</b> <b>22-27</b>		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the Floor Instructor/Evaluator, activate <b>TRIGGER 10</b> which initiates a tube leak in the Isolation Condenser.</p> <p>Verify <b>TRIGGERS 22-27</b> activate automatically when the IC is isolated and ramps the parameters back to the normal numbers.</p> <p><b><u>ROLE PLAY:</u></b></p> <p>EO to IC Area: (wait 3 min.) Report, “there is no evidence of steam leakage in the area but the Isolation Condenser is making noises. It sounds like metal parts expanding (creaking)”.</p> <p><b><u>ROLE PLAY:</u></b></p> <p><b>NOTE:</b> (IC temps may be viewed on RNI display IC1, Isolation Condenser)</p> <p>EO to check IC Vent outside: (WAIT 3 MIN.)</p> <p>If IC shell temp is &gt; 190°F, report “some fog/steam exiting from the vent”</p> <p>If IC shell temp is &lt; 190°F, report “NO steam exiting vent”.</p> <p><b><u>ROLE PLAY:</u></b></p> <p>Chemistry to sample IC shell side: Report “shell side sample results will take approximately 90 minutes”.</p> <p>Rad Protection to survey IC Vent outside: Report “the radiological surveys will be initiated”.</p> <p>Security to control access to IC Vent outside: Report “the area will be roped off”.</p> <p>If Security is notified that the IC is unavailable: Report “I acknowledge that the IC is unavailable.”</p>
	<b>BOP</b>	<p>Announces alarms for the Isolation Condenser (IC) and refers to the following DANs:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 902-3 B-3, IC HI RAD</li> <li><input type="checkbox"/> 902-3 C-4, IC HI TEMP</li> <li><input type="checkbox"/> Monitors temperature and radiation levels for the Isolation Condenser</li> </ul>
	<b>CRS</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Directs/verifies Operators take action per DAN 902-3 C-4.</li> <li>■ After determining there is a leak in the IC, enters DOA 1300-01, ISOLATION CONDENSER TUBE LEAK.</li> <li>■ Declares the Isolation Condenser Inoperable.</li> <li><input type="checkbox"/> Requests Chemistry to sample Iso-Condenser shell side for change in activity.</li> <li><input type="checkbox"/> Notifies SM and WWM</li> </ul>
	<b>BOP</b>	<p>Performs DOA 1300-01 as directed and monitors:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> IC vent rad levels.</li> <li><input type="checkbox"/> IC shell side water level.</li> <li><input type="checkbox"/> IC temperatures from TR 1340-1.</li> <li><input type="checkbox"/> IC area temperatures from 902-21 panel.</li> <li><input type="checkbox"/> IC area rad levels from 902-2 panel</li> <li><input type="checkbox"/> Reports IC vent rad above 3 mr/hr and IC shell side level and temperatures rising.</li> </ul>

## Event Six – Isolation Condenser Tube Leak

Trigger	Position	Crew Actions or Behavior
	<b>BOP</b>	<p>Isolates the IC by closing the following valves per DAN 902-3 B-3 or DOA 1300-01.</p> <ul style="list-style-type: none"> <li>■ MO 2-1301-1</li> <li>■ MO 2-1301-2</li> <li>□ MO 2-1301-3 (May place control switch in Pull To Lock)</li> <li>■ MO 2-1301-4</li> <li>■ AO 2-1301-17</li> <li>■ AO 2-1301-20</li> <li>□ MO-2-1301-10</li> <li>□ MO 2-4399-74</li> <li>□ May dispatch an EO to the Isolation Condenser area.</li> <li>□ May bypass the IC area hi rad input to the Rx Bldg Hi Rad alarm.</li> </ul>
	<b>TEAM</b>	<ul style="list-style-type: none"> <li>□ Dispatches personnel outside to investigate discharge from the vent.</li> <li>□ Calls Chemistry and requests a sample of the shell side water to analyze for a change in activity.</li> <li>□ Directs Rad Protection to conduct radiological surveys.</li> <li>□ Directs Security to limit access underneath the IC vent.</li> </ul>
	<b>CRS</b>	<p>References Tech Specs and determines:</p> <ul style="list-style-type: none"> <li>■ LCO 3.5.3.A.1: Verify HPCI is OPERABLE immediately.</li> <li>■ LCO 3.5.3.A.2: Restore IC System to OPERABLE status within 14 days.</li> </ul>

### Event 6 Completion Criteria:

- DOA 1300-01 is addressed,
- The IC is isolated,
- Tech Spec requirements are determined,
- AND/OR --

At the discretion of the Lead Examiner.

## Event Seven – Recirc Leak in DW – Manual Scram

Trigger	Position	Crew Actions or Behavior
<b>11</b>		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>At the discretion of the Lead examiner, activate <b>TRIGGER 11</b>, which causes a small Recirc Loop leak to develop in the Drywell.</p> <p><b><u>ROLE PLAY:</u></b></p> <p>U-3 NSO to report Drywell pressure status: Report “U-3 Drywell pressure is 1.2 psig and steady”.</p>
	<b>TEAM</b>	<ul style="list-style-type: none"> <li>■ Recognizes and announces that Drywell pressure is slowly rising.</li> <li>□ May direct an operator to check the Unit 2 Drywell CAM.</li> <li>□ May direct operators to search for leaks.</li> </ul>
		<p><b><u>ROLE PLAY:</u></b></p> <p><u>EO to check Drywell CAM:</u> (wait 2 min.) Report, “The Drywell CAM is reading 4700 counts and trending up”.</p> <p><u>EO to search for leak:</u> Report, “I am on my way out to check for leaks”.</p> <p><u>EO to check Cribhouse inlet temperature:</u> (wait 5 min.) Report, “Cribhouse inlet temp is 70°F”.</p> <p><u>If NSO checks Hydrogen Addition flow:</u> Cue the NSO that “Hydrogen Addition flows are normal”.</p>
	<b>CRS</b>	<ul style="list-style-type: none"> <li>■ Enters and directs performance of DOA 0040-01, SLOW LEAK.</li> <li>□ Set Scram contingency of 1.5 psig DW pressure. (Since DW pressure starts much lower than normal, may set a lower pressure Scram contingency.</li> <li>□ May enter DGP 02-03, REACTOR SCRAM, and direct taking scram preparatory actions.</li> <li>■ Prior to reaching the Drywell Pressure scram setpoint, directs a manual reactor scram per DGP 02-03.</li> </ul>
	<b>ATC</b>	<ul style="list-style-type: none"> <li>■ Performs the following actions per DOA 0040-01 as directed:</li> <li>□ Maintain Level with FWLCS (immediate action).</li> <li>□ Monitors leakage rate, reactor water level, and Drywell pressure.</li> <li>■ Inserts manual reactor scram prior to 1.5 psig DW pressure.</li> </ul>
	<b>BOP</b>	<ul style="list-style-type: none"> <li>■ Performs the following actions per DOA 0040-01 as directed:</li> <li>□ Notifies Shift Supervisor and Rad Protection.</li> <li>□ Directs search for leak.</li> <li>□ Shutdown H<sub>2</sub> Addition.</li> <li>□ Makes PA announcement.</li> <li>□ Verify Crib House inlet temperature is &lt;95°F.</li> <li>□ Initiates Torus cooling per DOP 1500-02, TORUS WATER COOLING MODE OF LOW PRESSURE COOLANT INJECTION SYSTEM, Hard Card.</li> </ul>
	<b>ATC / BOP</b>	<ul style="list-style-type: none"> <li>□ Performs scram preparatory actions per DGP 02-03 as directed.</li> <li>□ Starts MSP and TGOP.</li> <li>□ Trips H<sub>2</sub> addition.</li> </ul>

## Event Seven – Recirc Leak in DW – Manual Scram

Trigger	Position	Crew Actions or Behavior
	<b>ATC</b>	Performs the following actions per DGP 02-03 as directed: <ul style="list-style-type: none"><li>■ Presses scram pushbuttons</li><li>■ Places mode switch in shutdown</li><li>□ Check rods inserted.</li><li>□ Verifies Recirc Pumps run back.</li><li>□ Maintains RPV/L between +25 and +35 inches or as directed by Unit Supervisor.</li><li>□ Inserts SRM/IRMs.</li></ul>
	<b>CRS</b>	Enters DEOP 100, RPV Control, and directs actions: <ul style="list-style-type: none"><li>■ Verification of all isolations, ECCS and EDG starts.</li><li>■ Holding RPV/L +8 to +48 inches.</li><li>■ Maintaining RPV/P &lt;1060 psig using the BPV's.</li></ul>

### Event 7 Completion Criteria:

- Team has performed a reactor scram,  
-- AND / OR --

At the discretion of the Lead Examiner.

## Event Eight – Loss of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
12		<b><u>SIMULATOR OPERATOR:</u></b> At the discretion of the Lead examiner, activate <b>TRIGGER 12</b> , which increases the size of the Recirc Loop leak in the Drywell.
14		Verify <b>TRIGGER 14</b> , automatically activates when the Mode Switch is placed to S/D. After 1 min, this causes all feedwater regulating valves to fail closed.
15		<b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b> <u>EO sent to lineup CRD crosstie</u> : wait 4 min, activate <b>TRIGGER 15</b> , then report: “the CRD crosstie is lined up”.
16		<b><u>SIMULATOR OPERATOR / ROLE PLAY:</u></b> <u>EO sent to lineup makeup to SBLC Boron tank</u> : wait 4 min, activate <b>TRIGGER 16</b> , and report: “makeup lined up to SBLC Boron tank”.
17		<u>EO sent to lineup makeup to SBLC Test tank</u> : wait 4 min, activate <b>TRIGGER 17</b> , and report: “makeup lined up to SBLC Test tank”.
		<b><u>ROLE PLAY:</u></b> <u>EO sent to check EDG operation</u> : wait 3 min, then report: “Both EDGs are operating normally”. <u>EO sent to cut out Cond Demin beds</u> : wait 3 min, cutout Demin beds as needed (using instructor station), then report: “Cond Demin beds cutout”. <u>BOP checks OIS</u> : Inform BOP that “the OIS display lost power”. <b><u>ROLE PLAY:</u></b> Acknowledge other requests; delay as necessary.
	<b>ATC</b>	<ul style="list-style-type: none"> <li>■ Determines/announces all feedwater regulating valves are failed closed.</li> <li>■ Starts SBLC for level control as directed.</li> <li>■ Maximizes CRD for level control as directed.</li> </ul>
	<b>TEAM</b>	<ul style="list-style-type: none"> <li>■ Determines/announces Drywell pressure rapidly rising.</li> <li>■ Determines/announces RPV level is dropping.</li> </ul>
	<b>CRS</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Directs starting HPCI to maintain level.</li> <li>■ Directs starting Alternate High Pressure Injection Systems: <ul style="list-style-type: none"> <li>• SBLC for level control</li> <li>• Maximize CRD for level control</li> </ul> </li> </ul>
	<b>BOP</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Starts HPCI as directed.</li> <li>■ Determines/announces HPCI is degraded.</li> </ul>
	<b>CRS</b>	<p>Determines insufficient high pressure feed is available, then performs/directs:</p> <ul style="list-style-type: none"> <li>■ <b>√ Inhibiting ADS before -59 inches.</b></li> <li><input type="checkbox"/> Verifying at least two low pressure injection systems available.</li> <li><input type="checkbox"/> Waiting until RPV level drops to TAF.</li> <li><input type="checkbox"/> Verifying any low pressure system lined up with a pump running.</li> </ul>
	<b>BOP</b>	<ul style="list-style-type: none"> <li>■ <b>√ Inhibits ADS as directed.</b></li> </ul>

## Event Eight – Loss of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
	<b>CRS</b>	<p>Enters DEOP 0200-01, Primary Containment Control, when PC/P reaches 2 psig and performs/directs:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Monitoring of PC/P.</li> <li><input type="checkbox"/> Initiation of torus sprays before PC/P of 9 psig.</li> <li>■ <b>When PC/P is above 9 psig or before DW/T reaches 281°F:</b> <ul style="list-style-type: none"> <li>• Verification of DSIL.</li> <li>• Tripping of Recirc pumps.</li> <li>• Tripping of DW coolers.</li> <li>• ✓ <b>Initiation of DW sprays.</b></li> </ul> </li> <li><input type="checkbox"/> Monitoring of DW/T. (D/W sprays may be initiated for temp control)</li> <li><input type="checkbox"/> Monitoring of SP/T and initiation of torus cooling.</li> <li><input type="checkbox"/> Monitors SP/L.</li> <li><input type="checkbox"/> Verifies initiation of drywell and torus H<sub>2</sub>/O<sub>2</sub> monitors.</li> <li><input type="checkbox"/> Orders Torus / DW Spray secured before Torus / DW pressure drops to 0 psig</li> </ul>
	<b>BOP</b>	<p>Performs DEOP 0200-01, Primary Containment Control, actions as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Monitors PC/P</li> <li>■ ✓ <b>Initiates torus sprays and drywell sprays per Hard Card LPCI/CCSW OPERATION, as directed.</b></li> <li><input type="checkbox"/> Monitors DW/T.</li> <li><input type="checkbox"/> Monitors SP/T and initiates torus cooling per Hard Card LPCI/CCSW OPERATION as directed.</li> <li><input type="checkbox"/> Monitors SP/L.</li> <li><input type="checkbox"/> Verifies initiation of drywell and torus H<sub>2</sub>/O<sub>2</sub> monitors.</li> <li><input type="checkbox"/> Secures Torus / DW Spray before Torus / DW pressure drops to 0 psig</li> </ul>
		<p><b>NOTE:</b></p> <p>Above a RPV pressure of 500 psig, TAF is -170 inches, and MSCRWL is -185 inches on the Fuel Zone indicators. Below 500 psig, TAF is -143 inches and MSCRWL is -162 inches on the Fuel Zone Indicators.</p>
	<b>CRS</b>	<p>If the RPV level trend is not reversible with an RPV injection source lined up, with a pump running, with RPV level between TAF and the MSCRWL directs entering DEOP 0400-02, Emergency Depressurization, and directs:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Verification that SP/L &gt;6 feet.</li> <li>■ ✓ <b>Opening all ADS valves.</b></li> <li><input type="checkbox"/> Verification all relief valves are open.</li> </ul>
	<b>BOP</b>	<p>Performs DEOP 0400-02, Emergency Depressurization, as directed:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Verifies SP/L &gt;6 feet.</li> <li>■ ✓ <b>Opens all ADS valves.</b></li> <li>■ Verifies all relief valves are open.</li> </ul>
	<b>CRS</b>	<ul style="list-style-type: none"> <li>■ ✓ <b>Directs ATC/BOP to maximizes injection flow with minimum ECCS Pump lineups prescribed by the transient mitigation guidelines (OP-DR-103-102-1002) to the reactor when pressure drops below 350 psig to restore level to above TAF.</b></li> </ul>

## Event Eight – Loss of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
	ATC / BOP	<ul style="list-style-type: none"> <li>■ √ Maximizes injection flow with minimum ECCS Pump lineups prescribed by the transient mitigation guidelines (OP-DR-103-102-1002) to the reactor when pressure drops below 350 psig to restore level to above TAF.</li> </ul>
20		<p><b><u>SIMULATOR OPERATOR:</u></b></p> <p>Prior to going to FREEZE activate <b>TRIGGER 20</b>, this will reset the necessary variable that was changed in the background of the simulator.</p>

### **Event 8 / Scenario Completion Criteria:**

- Sprays the Drywell
  - Emergency Depressurization in progress.
- AND / OR --

At the direction of the Lead Examiner.



## References

PROCEDURE	TITLE
DAN 902-3 B-3	IC Hi Rad
DAN 902-3 C-4	IC Hi Temp
DAN 902-4 H-6	Recirc Loop Runback
DAN 902-6 H-8	2B RFP Brg Oil Press Lo
DEOP 100	RPV Control
DEOP 200-01	Primary Containment Control
DEOP 400-2	Emergency Depressurization
DGP 02-03	Reactor Scram
DGP 03-01	Power Changes
DGP 03-04	Control Rod Movements
DOA 0040-01	Slow Leak
DOA 0600-01	Transient Level Control
DOA 1300-01	Isolation Condenser Tube Leak
DOA 3500-02	Loss of Feedwater Heaters
DOA 6500-10	4kV Circuit Breaker Trip
DOP 0400-01	Reactor Manual Control System Operation
DOP 0202-03	Reactor Recirculation Flow Control System Operation
DOP 0202-16	Reactor Recirculation System Manual Hold and Local Manual Operation
DOP 1500-02	Torus Water Cooling Mode of Low Pressure Coolant Injection System
DOP 3500-03	Removing High Pressure Heaters from Operation
DOP 3800-01	Turbine Building Closed Cooling Water System Operation
DOP 6700-20	480V Circuit Breaker Trip
DGA-7	Unpredicted Reactivity Addition
OP-DR-103-102-1002	Strategies for Successful Transient Mitigation
DOS 0300-01	Control Rod Exercise
TS 3.3.6.2	Secondary Containment Isolation Instrumentation
TS 3.5.3	IC System
TS 3.6.4.1	Secondary Containment
TS 3.6.4.2	Secondary Containment Isolation Valves (SCIVs)

Simulator Scenario Review Checklist

ILT-N-4 Quantitative Attributes	
7	Total malfunctions (5 to 8)
2	Malfunctions after EOP entry (1 to 2)
3	Abnormal events (2 to 4)
1	Major transients (1 to 2)
2	EOPs entered/requiring substantive actions (1 to 2)
1	EOPs contingency requiring substantive actions (0 to 2)
5	Crew critical tasks (2 to 3)

## CAEP Files

# 19-1 (2020-301) ILT-N-4.cae  
# For ILT Class 19-1 NRC Exam  
# Written by FDW  
# Rev 00  
# Date 01/20

### ##### INITIAL CONDITIONS #####

# Sets APRM Master Gain pot to 1.0  
irf niagain 1.0

# Degrades HPCI  
imf hppmpdg 0.90

# Fails the RBV Isolation.  
imf vrmiso42a  
imf vrmiso42b

# Inserts malfunction to have control rod D-09 stuck  
imf rodd09st|2

# Overrides 2B RR pump to prevent spurious speed hold  
ior rrdbspdhldres hold\_reset|2

### ##### EVENT TRIGGERS #####

# Event Trigger 1 Activates when control rod D-09 is selected – Event #2  
# drive water pressure is greater than 325 psig and  
# when either the Rod Movement Control switch is placed to the ROD IN position,  
# or the Rod Out Notch Override is placed to the EMERG ROD IN position.  
# Deletes the control rod D-09 stuck rod malfunction to allow the rod to move.  
trgset 1 "rdlslw(100) .and. (rddpdriv .gt. 325.0) .and. (rds302in .or. rds303em)"|2  
trg 1 "dmf rodd09st"|2

# Event Trigger 2 Simulates a lube oil leak on 2B RFP causing trip of the pump – Event #3  
# Fails its aux oil pump breaker control SW to prevent pump start.  
# Insert 2B RFP low oil pressure  
# After 30 sec. trips 2B RFP.  
trgset 2 "0"|4  
trg 2 ""|4  
ior fwdop2 (2) off|4  
ior fwdop5 (2) trip|4  
imf ser1375 (2) on|6  
ior fwdopnc2 (2 30) off|6  
imf h32 (2 30)|6

# Event Trigger 3 Activates when 2B RFP breaker opens Event #3  
# Sets the FRV Isol MO 3206A to 30% open to reduce FW flow enough to cause RPV level to drop.  
# Overrides the valves CLOSED light off so it still appears full open.  
trgset 3 ".not. fwsacbf(2)"|6  
trg 3 "set fwv3206a(1) = 0.25"|8  
ior fwl32061 (3) off|8

# Event Trigger 4 Activates when 2B RFP breaker opens.- Event #3  
# Sets the FRV Isol MO 3206B to 30% open to reduce FW flow enough to cause RPV level to drop.  
# Overrides the valves CLOSED light off so it still appears full open.  
trgset 4 ".not. fwsacbf(2)"|8  
trg 4 "set fwv3206a(2) = 0.25"|8  
ior fwl32062 (4) off|10

# Event Trigger 5 Activates when Recirc Pump Runback light comes on.- Event #3  
# Returns the FRV Isol MO 3206A to 100% open.  
trgset 5 "rrlrcp191"|10  
trg 5 "ramp fwv3206a(1) 0.25 1.0 1:00"|10

# Event Trigger 6 Activates when Recirc Pump Runback light comes on.- Event #3  
# Returns the FRV Isol MO 3206B to 100% open.  
trgset 6 "rrlrcp191"|10  
trg 6 "ramp fwv3206a(2) 0.25 1.0 1:00"|12

# Event Trigger 7 fails 2B Fuel Pool Rad monitor upscale. – Event #4  
# Closes all but one set of RBV dampers.  
trgset 7 "0"|12  
trg 7 "set rmarmfpfaild(2) = true"|12

# Event Trigger 8 works with Trigger 7 to fail the 2B Fuel Pool Rad monitor  
trgset 8 "et\_array(7)"|12  
trg 8 "set rmarmfpfaild(2) = 70.0"|12  
ior mrgfpb (8) 1.0|14  
ior vrp4 (8) -0.3|14

# Event Trigger 9 Inserts an closes the extraction valve to the 2D1 HP Heater - Event 5  
trgset 9 "0"|14  
ior hdd3103c2 (9) close|14  
ior hdd3103s2 (9) off|16

# Event Trigger 10 inserts an IC tube to shell leak at 1% severity - Event 6  
trgset 10 "0"|16  
imf ictublk (10) 5.0|16  
imf ser0011 (10 3:00) on|16  
imf ser0018 (10 3:00) on|18  
ior ua113000 (10) 0.85 5:00|18  
ior ua113001 (10) 0.52 5:00|18  
ior ua024501 (10) 0.75 5:00|18  
ior ua024500 (10) 0.95 5:00|20

# Event Trigger 11 Inserts a small recirc loop leak. – Major – Event 7  
trgset 11 "0"|20  
imf f41 (11) 0.01 2:00|20

# Event Trigger 12 Increases the recirc loop leak. - Post Major – Event 7  
trgset 12 "0"|20  
trg 12 "mmf f41 2.0"|22

# Event Trigger 14 Activates when Mode Switch is placed to S/D – Event 8  
# After 1:00 min, fails ALL FW Reg valves closed.  
trgset 14 "rpdmode4"|22  
imf rlmfadc (14 1:00)|22  
imf rlmfbfc (14 1:00)|22  
imf rlmffcc (14 1:00)|22

# Event Trigger 15 opens U3/U2 CRD cross-tie valve  
trgset 15 "0"|24  
irf rdxtieu3 (15) true|24

# Event Trigger 16 lines up makeup to SBLC Main Boron tank.  
trgset 16 "0"|24  
irf scmumntk (16) true|24

# Event Trigger 17 lines up SBLC pumps to test tank and makeup to test tank  
trgset 17 "0"|26  
irf scoppttk (17) true|26

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# Event Trigger 18 allows the RB Vent Dampers to close that were failed open
trgset 18 "hwvrd5742c"|26
trg 18 "dmf vrmiso42a"|26

# Event Trigger 19 allows the RB Vent Dampers to close that were failed open
trgset 19 "et_array(18)"|28
trg 19 "dmf vrmiso42b"|28

# Event Trigger 20 resets the variable that was set to allow the 2B FP Rad Monitor to fail
trgset 20 "0"|28
trg 20 "set rmarmfpfailf(2) = false"|28

# Event Trigger 21 removes the override for the 2B RR pump speed hold
trgset 21 "et_array(6)"|30
trg 21 "dor rrdbspdhldres (0 10)"|30

# Event Triggers 22-27 work together to simulate the IC Tube Leak being isolated
trgset 22 "(.not. hwiclop1m) .or. (.not. hwiclop2m)"|30
trg 22 "ior ua113000 0.30 10:00"|30

trgset 23 "et_array(22)"|32
trg 23 "ior ua113001 0.0 10:00"|32

trgset 24 "et_array(22)"|32
trg 24 "ior ua024501 0.2 10:00"|32

trgset 25 "et_array(22)"|34
trg 25 "ior ua024500 0.2 10:00"|34

trgset 26 "et_array(22) .and. (hwua113000 < 0.5)"|34
trg 26 "dmf ser0011"|34

trgset 27 "et_array(26)"|36
trg 27 "dmf ser0018"|36

# Event Trigger 28 sets gain for all 6 APRMs.
trgset 28 "0"|36
trg 28 "irf niagainf true"|36

#### END ####

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### Unit 2 Risk: GREEN

Unit 2 is in Mode 1 at 100% power,  
Leading Thermal Limit: MFLCPR @ 0.881  
Action limit: 0.980  
Equipment Unavailable: 2A EHC Pump  
Protected Equipment: 2B EHC Pump

### Unit 3 Risk: GREEN

Unit 3 is at 100% power.  
Leading Thermal Limit: MFLCPR @ 0.883  
Action Limit: 0.980  
Equipment Unavailable: None  
Protected Equipment: None

### Current Action Statements

None	LCO Started:	N/A	LCO Expires: N/A
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Cause: N/A

### Unit 2 Plant Status

Today	<div>Unit 2 Activities</div> <div>**** Shift 1 Activities ****</div> <div><div></div></div> <div><div></div></div> <div>**** Shift 2 Activities ****</div> <div><div>☑ Start 2A TBCCW pump and secure 2B TBCCW pump IAW DOP 3800-01 step G.4, pre-start checks for the 2A TBCCW pump are complete .</div></div> <div><div>☑ Exercise CRDs A-06, D-09 and N-08 per DOS 0300-01. Stall flows are required to be recorded.</div></div> <div>**** Shift 3 Activities ****</div> <div><div></div></div> <div><div></div></div>
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