

Dresden Generating Station

ILT-N-1

RAISE POWER USING CONTROL RODS

CONTROL ROD RPIS FAILURE

INSTRUMENT AIR COMPRESSOR TRIP

IRM CHANNEL FAILS UPSCALE

CORE SPRAY SYSTEM INOPERABLE

SMALL STEAM LEAK IN DRYWELL / MANUAL SCRAM

ATWS (STUCK CONTROL RODS) / DRYWELL LEAK WORSENS

Rev. 00

10/07

Developed By:

Exam Author

Date

Approved By:

Facility Representative

Date

| Facility: <u>Dresden</u> | | Scenario No: <u>ILT-N-1</u> | | Op-Test No: <u>2008-301</u> | |
|---|-------------------|-----------------------------|------------------|--|--|
| Examiners: _____ | | | Operators: _____ | | |
| _____ | | | _____ | | |
| _____ | | | _____ | | |
| Initial Conditions: Rx Power ~ 2%. | | | | | |
| Turnover: Continue with Unit startup per DGP 1-1. | | | | | |
| Event No. | Malf. No. | Event Type* | | Event Description | |
| 1 | NONE | R | NSO SRO | Raise power using Control Rods | |
| 2 | RDFAILF5 | C | NSO SRO | Control Rod RPIS Failure ^T | |
| 3 | N33 | C | ANSO SRO | Instrument Air Compressor Trip / Start Standby | |
| 4 | NII12POT | I | NSO SRO | IRM channel fails upscale | |
| 5 | CSV4A SCAFILOF | C | ANSO SRO | Core Spray System Develops Low Keep Fill Pressure ^T | |
| 6 | I21 | M | TEAM | Steam Leak in Drywell / Manual Reactor Scram | |
| 7 | RODST I21 | M | TEAM | Several control rods remain withdrawn (ATWS) The leak in drywell gets worse | |

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

Scenario Objective

Evaluate the crew's ability to control the plant during an ATWS condition with a steam leak in the Drywell..

Scenario Summary

1. Unit is in Mode 2 at ~2% power.
2. Startup in progress per DGP 01-01, DGP 03-04, and DOP 0400-02
3. The following equipment is OOS:
 - a. None
4. LCOs:
 - a. None

Scenario Description

- The NSO, as directed by the SRO, continues the power ascension for unit startup by control rod withdrawal.
- A control rod RPIS failure occurs. The Team will insert the control rod, reference Tech Specs and direct taking it OOS.
- 3C Instrument Air Compressor (IAC) trips. Instrument Air pressure begins slowly dropping. Standby Air Compressor 2B is started to restore air pressure.
- IRM channel 12 fails upscale. The SRO references licensing documents, authorizes bypassing IRM 12 and resetting the half scram. The NSO bypasses IRM 12 and resets the half scram.
- Fuel Pool Rod Mon CH A fails downscale as indicated by annunciator, SER and backpanel indication. The team references Tech Specs.
- A CS System low-pressure alarm is received and the SRO must review Tech Specs and declare the loop INOP.
- A small steam leak upstream of the restrictors occurs. The Team will begin to execute the DOA for slow leak. Eventually the Team will scram the reactor.
- Several rods stick out during the scram. The Team manually inserts them. The steam leak worsens requiring the Team to spray the Drywell to control Primary Containment pressure.

Scenario Sequence

Event One – Power Change with Rods

- The crew 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 Two –Control Rod RPIS Failure

- While Control Rod F-05 is being withdrawn, it loses RPIS indication.

Malfunctions required: 1

- (Loss of RPIS for Control Rod F-05)

Success Path:

- Inserts Control Rod F-05 and references Tech Specs.

Event Three – Instrument Air Compressor Trip

- 3C Instrument Air Compressor trips. Instrument Air pressure begins slowly dropping. Standby Air Compressor 2B is started.

Malfunctions required: 1

- (3C Instrument Air Compressor trips)

Success Path:

- Standby Air Compressor 2B is started.

Event Four – IRM Channel 12 Fails Upscale

- IRM channel 12 fails upscale resulting in a half scram.

Malfunctions required: 1

- (IRM failure upscale).

Success Path:

- The crew references appropriate licensing documents, bypasses IRM 12 and resets the half scram.

Event Five – A CS System Low Pressure Alarm

- A CS System low-pressure alarm is received.

Malfunctions required: 1

- (A CS System low-pressure)

Success Path:

- SRO declares the system INOP and references Tech Specs.

Event Six - Small Steam Leak in Drywell / Manual Reactor Scram

- A small steam leak upstream of the restrictors occurs.

Malfunctions required: 1

- (Small steam leak in Drywell)

Success path:

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

Event Seven - ATWS (Stuck Control Rods) / Drywell Leak Worsens

- Several rods stick out during the scram. The Team manually inserts them. The steam leak worsens requiring the Team to spray the Drywell to control Primary Containment pressure.

Malfunctions required: 2

- (Steam leak worsens)
- (Stuck control rods)

Success Path:

- Manually drives in stuck control rods.
- Sprays the Drywell.

PRE-SCENARIO ACTIVITIES

- 1 If applicable, conduct pre-scenario activities in accordance with TQ-AA-106-0107, SIMULATOR EXAMINATION BRIEFING.
 1. Provide the team with a copy of DGP 01-01, Unit Startup, which is marked up to the point of “verifying main turbine bypass valves open and maintaining pressure at 920 psig”.
 2. Provide the team with a copy of DOP 5600-06, UNIT 2 MAIN TURBINE STARTUP.doc, which is marked up to the point of “Final checks prior to rolling the main turbine”.
 3. Also provide an unmarked copy of the following:
 - 1) DGP 03-04, Control Rod Movements.
 - 2) DOP 0400-01, Reactor Manual Control System Operation.
 - 3) DOP 0400-02, Rod Worth Minimizer.
 4. Inform the crew that the QNE (Floor Instructor) is present in the Control Room.
 5. Direct the crew to perform their briefs prior to entering the simulator.
 6. If the crew inquires about a startup plan, inform them the Shift Manager is maintaining it.
 7. Provide the crew with a copy of the REMA and Control Rod Move Sheets.
- 2 Simulator Setup (the following steps can be done in any logical order)
 - a. Initialize simulator in a BOL IC which allows establishing the following conditions: (IC 151 was used to develop this scenario)
 - 1) Rx startup in progress with a turbine bypass valve partially open.
 - 2) Primary Containment inerted and setup for normal operating pressure control.
 - 3) Rod withdrawal completed thru step 34 of sequence XH.0. (This point was chosen so control rod F-05 is at position 48 for the RPIS failure event)
 - a. Verify 2A RFP is running.
 - b. Verify 2B RFP is in STBY.
 - c. Verify 2A and 2C Condensate pumps are running.
 - d. Place 2D Condensate pump in STBY.
 - e. Verify 2A and 3C IACs running with 2B IAC off. (The CAEP file will close 2B IAC disc vlv per OPS)
 - f. Place one IRM/APRM recorder in FAST in each RPS channel.
 - g. Establish Drywell pressure between 1.15 to 1.20 psig with Drywell to Torus DP between 1.10 to 1.15 psig.
NOTE: Complete the above setup before running the CAEP file.
 - h. Run the initial setup CAEP file: ILT-N-1.cae (**Note;** CAEP file takes 1 minute to run)
 - i. Advance the chart recorders.
- 3 Verify the following simulator conditions:
 - a. Reactor Power ~ 2%.
 - b. Master Recirc controller set at 30% and individual controllers balanced.
 - c. Verify Isolation Condenser level in band.
- 4 Complete the Simulator Setup Checklist.

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

- √ Critical Tasks
- ⌚ Time Critical Tasks
- 🔑 PRA Key Operator Actions
- Required Actions
- Optional Actions

| Event One – Power Change with Rods | | |
|------------------------------------|-------------|---|
| Trigger | Position | Crew Actions or Behavior |
| 1 | | <p>Floor Instructor / Simulator Operator / Role Play:</p> <p>If the team announces that they will adjust gains, inform them an extra NSO will perform the adjustment. Then:</p> <ul style="list-style-type: none"> ❖ Tell the team you are time compressing. ❖ Direct the simulator operator to activate trigger 1 and verify gains within limits. ❖ Inform the team the gains are adjusted. <p>(Note: Toggle trigger 1 OFF, then back ON as many times as necessary to adjust gains)</p> |
| | NSO | <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 any control rod:</u></p> <ul style="list-style-type: none"> ■ Control rod selected on the select matrix is correct rod. ■ Second Verification requirements satisfied. ■ Rod Out Permit light is illuminated. ■ Drive water pressure at nominal 260 psid. <p><u>Withdraws rods as follows:</u></p> <ul style="list-style-type: none"> ■ 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. ■ Verifies ON light illuminated and proper Control Rod Timer operation. ■ Releases switches before target position is reached. ■ Verifies rod settles to target position and proper response of nuclear instrumentation. |
| | ANSO | <p>Performs second verification checks.</p> <p><u>For first rod in a step:</u></p> <ul style="list-style-type: none"> ■ Verifies correct control rod pattern ■ Verifies correct step and array. ■ Verifies RWM rod blocks enabled <p><u>For all rods moved:</u></p> <ul style="list-style-type: none"> ■ Verifies correct control rod selected. ■ Verifies planned control rod motion is correct. □ Immediately notify the NSO of errors during rod motion. ■ Verifies control rod at target position. |

Event One – Power Change with Rods

| Trigger | Position | Crew Actions or Behavior |
|---------|------------|--|
| | SRO | Directs pulling control rods. <ul style="list-style-type: none">■ Reviews REMA.■ Designates second verifier.■ Directs NSO to pulls rods. |

Event 1 Completion Criteria:

- Sufficient power increase, OR
- At the direction of the Lead Examiner.

| Event Two – Control Rod RPIS Failure | | |
|--------------------------------------|-------------|--|
| Trigger | Position | Crew Actions or Behavior |
| 2 | | <p><u>Simulator Operator:</u></p> <p>When no control rod motion is in progress AND at the direction of the Lead Examiner, activate trigger 2. This inserts a RPIS failure for control rod F-05.</p> |
| | NSO | <p>Reports and responds to DANs 902-5 A-3 ROD DRIFT, and B-3 ROD WORTH MIN BLOCK.</p> <ul style="list-style-type: none"> ■ Views Full Core Display and identifies CRD with Rod Drift light. ■ Recognizes loss of control rod F-05 position indication on Full Core Display, Four Rod Display, RWM, and/or Process Computer. |
| | SRO | <ul style="list-style-type: none"> ■ Enters DOA 0300-06, RPIS Failure. |
| | TEAM | <ul style="list-style-type: none"> □ May enter DOA 0300-12, Mispositioned Control Rod. |
| | NSO | <p>Performs subsequent actions of DOA 0300-06, RPIS Failure:</p> <ul style="list-style-type: none"> ■ Stops any power change or control rod motion in progress. □ May insert Rod F-05 to 00 prior to entering DOA 0300-06. □ Enter substitute position of 48 (last known position) for F-05. □ Inserts control rod F-05 one notch. □ Determines no control rod position indication at alternate position. ■ Drives rod F-05 to fully inserted position. □ May enter a substitute position and take OOS on the RWM per DOP 0400-02, Rod Worth Minimizer. |
| | SRO | <ul style="list-style-type: none"> ■ References appropriate plant licensing documents: <ul style="list-style-type: none"> • TS 3.1.3., condition C, required actions C.1: Fully insert inoperable control rod within 3 hours AND C.2. Disarm the associated CRD within 4 hours. |
| | SRO | <ul style="list-style-type: none"> ■ Directs electrically or hydraulically isolating control rod F-05 HCU. □ Notifies the Shift Manager, QNE, Work Week Manager, Fin team, IMD, OR EMD. |
| | ANSO | <ul style="list-style-type: none"> □ Monitors panel, provides assistance as directed. |
| | | <p><u>Role Play:</u></p> <p>When NLO directed to disarm control rod F-05, report: "I'll disarm F-05 after I receive a pre-job brief" (it is not intended for this to be completed).</p> |
| | NSO | <ul style="list-style-type: none"> □ Records failed RPIS indication per DOS 0300-06, CRD Abnormality Record. |

Event Two – Control Rod RPIS Failure

| Trigger | Position | Crew Actions or Behavior |
|--|----------|--------------------------|
| <p style="text-align: center;"><u>Event 2 Completion Criteria:</u></p> <ul style="list-style-type: none">• DOA 0300-06 actions have been taken.• Technical Specifications have been referenced. <p>OR, at the direction of the NRC Lead Examiner.</p> | | |

| Event Three – Loss of Instrument Air | | |
|--------------------------------------|-------------|---|
| Trigger | Position | Crew Actions or Behavior |
| 3 | | <p><u>Simulator Operator:</u> At the direction of the Lead Examiner, activate trigger 3, which trips the 3C Instrument Air Compressor and inserts a small IA leak to cause pressure to slowly drop.</p> |
| | | <p><u>Role Play:</u> NLO 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>NLO to check 3C IAC breaker: (Wait 2 min) Report “the 3C IAC breaker is closed and looks normal”.</p> |
| 4 | | <p><u>Simulator Operator / Role Play:</u> NLO to lineup 2B IAC to U2 Instrument Air System, wait 2 min, activate trigger 4 and then report “2B IAC is lined up to U2 Instrument Air System”.</p> |
| | | <p><u>Role Play:</u> NLO to verify proper operation of 2B IAC: (Wait 2 min) Report “the 2B IAC is operating normally”.</p> |
| 5 | | <p><u>Simulator Operator:</u> Verify trigger 5 automatically activates when 2B IAC is started AND its discharge valve is opened. This deletes the small IA leak.</p> |
| | ANSO | <p>Announces alarm 923-1 B-5, U2 OR U3 INST AIR COMP TRIP:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Reports 3C IAC tripped <input type="checkbox"/> Directs an NLO to investigate the cause of the 3C Instrument Air Compressor trip. <input type="checkbox"/> May send a NLO to check 3C IAC breaker. |
| | SRO | <ul style="list-style-type: none"> <input type="checkbox"/> May enter DOA 4700-01, Instrument Air System Failure. <input type="checkbox"/> Directs ANSO to perform DOP 6700-20, 480 Volt Breaker Trip. |
| | ANSO | <p>Performs DOA 4700-01, Instrument Air System Failure, as directed:</p> <ul style="list-style-type: none"> ■ Directs NLO to lineup 2B IAC to the Instrument Air system. ■ Starts the 2B IAC. <input type="checkbox"/> Directs an NLO to verify proper operation of 2B IAC. <input type="checkbox"/> Performs DOP 6700-20, 480 Volt Breaker Trip. |
| | | <p><u>Note:</u> If actions are delayed long enough, the U-2 service air to instrument air x-tie valve may open. Then the following actions apply.</p> |

Event Three – Loss of Instrument Air

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|--|
| | ANSO | Announces alarm 923-1 F-4, U2 INST AIR PRESS LO: <input type="checkbox"/> Sends a NLO to verify AO 2-4701-500, U2 Serv air to Inst Air Auto X-tie Vlv, opened. <input type="checkbox"/> After U2 Instrument Air header pressure returns to normal, sends a NLO to reset AO 2-4701-500. |
| | | <p><u>Role Play:</u> NLO to reset verify AO 2-4701-500, U2 Serv air to Inst Air Auto X-tie Vlv, opened: wait 1 min, then report “AO 2-4701-500, is open”.</p> |
| 6 | | <p><u>Simulator Operator / Role Play:</u> NLO to reset the U-2 service air to instrument air x-tie, wait 2 min, activate trigger 6 and then report “the U-2 service air to instrument air x-tie is closed”.</p> |

Event 3 Completion Criteria:

Unit 2 Standby IAC started,

OR,

At the discretion of the Floor Instructor / Lead Evaluator.

Event Four – IRM Channel 12 Fails Upscale.

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------------|---|
| 7 | | <p><u>Simulator Operator:</u> At the discretion of the Lead Examiner, activate trigger 7, which fails IRM 12 channel upscale and prevents a full RPS CH A half scram (setup in initial conditions) from coming in.</p> |
| | NSO / ANSO | <p>Acknowledges, announces, and performs actions for 902-5 DANs A-5, B-11, C-3, and C-15.</p> <ul style="list-style-type: none"> ■ Stop control rod movements. ■ Verifies IRM 12 readings against other IRMs on 902-36 panel. ■ Identifies failure to get a full RPS CH A half scram and reports to SRO. □ Verify IRM range switch is in the correct position. □ Verify IRM 12 function switch in operate. □ Verifies power supplies operating properly. □ Bypasses IRM 12 |
| | SRO | <ul style="list-style-type: none"> ■ Directs inserting RPS CH A half scram per DOA 500-02, Partial ½ or Full Scram Actuation. □ May direct bypassing IRM 12 □ Notifies the Shift Manager. □ Notify Work Week Manager, Fin team, IMD, OR EMD. |
| | SRO | <ul style="list-style-type: none"> ■ References appropriate plant licensing documents: □ TS 3.3.1.1 condition A, required action A.1 OR A.2, Place channel in 1 trip system in trip within 6 hours OR Place 1 trip system in trip within 6 hours. □ TS 3.3.1.1 condition C, Restore RPS trip capability within 1 hour. |
| | NSO | <ul style="list-style-type: none"> ■ Inserts RPS CH A half scram per DOA 500-02, Partial ½ or Full Scram Actuation. |

Event 4 Completion Criteria:

- **Applicable Tech Spec has been referenced and RPS CH A half scram inserted.**
- **OR, at the direction of the Lead Examiner.**

Event Five – Core Spray System Low Pressure Alarm

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|---|
| 8 | | <p><u>Simulator Operator:</u></p> <p>At the discretion of the NRC Lead Examiner, activate trigger 8, which closes ECCS Keep Fill to 2A Core Spray loop and cracks open CS 4A valve to bleed the pressure down.</p> |
| | | <p><u>Role Play:</u></p> <p>NLO to investigate ECCS Jockey pump. (wait 3 min.) Report, “the ECCS jockey pump appears to be operating normally”.</p> <p>If asked, wait 2 minutes Report, “The 2A Core Spray relief valve RV 2-1402-28A appears to be leaking by”.</p> <p>If asked local CS system pressure, Wait 1 minute, Report, “Local CS system pressure is approximately (Use pressure from instructor station drawing CS1) psig.</p> <p>If sent to vent system: Report, “No water is coming out the vent.”</p> <p>If calling radwaste to ask about RBEDT levels: Report, “The input rate to the Unit 2 RBEDT has increased, level is currently 60%.”</p> |
| | ANSO | <p>Reports alarm to SRO.</p> <p>Carries out actions of DAN 902-3 D-7, 2A/B CORE SPRAY HDR PRESS LO:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Verify FLOW TEST VLV MO 2-1402-4A is fully closed. <input type="checkbox"/> Verify PP DISCH VLV MO 2-1402-24A is fully open. <input type="checkbox"/> Check for relief valve RV 2-1402-28A 2A CORE SPRAY PMP DISCH HDR RV leaking to Reactor Building Equipment Drain Tank OR valves leaking into Torus. <input type="checkbox"/> Notify Operations Shift Supervisor. <input type="checkbox"/> Directs an Equipment Attendant to inspect ECCS jockey pump for proper operation. ■ Places 2A CS pump in PTL. |
| | NSO | <ul style="list-style-type: none"> <input type="checkbox"/> Assists ANSO with carrying out actions of DAN as necessary. |
| | SRO | <ul style="list-style-type: none"> <input type="checkbox"/> Directs carrying out actions of the DAN. ■ References Tech Spec 3.5.1 Condition B1. Required action, restore Low pressure ECCS injection/spray subsystem to OPERABLE status within 7 days. (Surveillance Requirement SR 3.5.1.1.) ■ Orders 2A CS pump placed in PTL. <input type="checkbox"/> Notifies Shift manager and maintenance groups. |

Event 5 Completion Criteria:

– **2A Core Spray system declared inoperable.**

AND,

At the discretion of the Lead Examiner.

Event Six - Small Steam Leak in Drywell / Manual Reactor Scram

| Trigger | Position | Crew Actions or Behavior |
|---------|------------|--|
| 9 | | <p><u>Simulator Operator:</u> At the discretion of the NRC chief examiner, activate trigger 9, which causes a small Main Steam line leak to develop in the Drywell.</p> |
| | NSO / ANSO | <ul style="list-style-type: none"> ■ Recognizes and announces that Drywell pressure is slowly rising. Performs the following actions per DOA 0040-01 Slow Leak, as directed: <ul style="list-style-type: none"> <input type="checkbox"/> Maintain Level with FWLCS (immediate action). <input type="checkbox"/> Notifies Shift Supervisor and Rad Protection. <input type="checkbox"/> Monitors for EP conditions. <input type="checkbox"/> Directs search for leak. <input type="checkbox"/> Shutdown H₂ Addition. <input type="checkbox"/> Makes PA announcement. <input type="checkbox"/> Monitors leakage rate, reactor water level, and Drywell pressure. <input type="checkbox"/> Verify Crib House inlet temperature is <95°F. <input type="checkbox"/> Initiates Torus cooling per “Hard Card”. ■ Inserts manual reactor scram as directed. |
| | | <p><u>Role Play:</u> NLO to search for leak Report, “I am on my way out to check for leaks”. NLO to check Cribhouse inlet temperature: (wait 5 min.) Report, “ Cribhouse inlet temp is 70°F”.</p> |
| | SRO | <ul style="list-style-type: none"> <input type="checkbox"/> Enters and directs performance of DOA 0040-01, Slow Leak. <input type="checkbox"/> Sets Scram contingency of 1.5 psig DW pressure. ■ Prior to reaching the Drywell Pressure scram setpoint, directs a manual reactor scram per DGP 02-03, Reactor Scram. |
| | NSO | <p>Performs the following actions per DGP 02-03, Reactor Scram, as directed:</p> <ul style="list-style-type: none"> ■ Presses scram pushbuttons ■ Places mode switch in shutdown ■ Check rods inserted. ■ Determines several control rods are not inserted. <input type="checkbox"/> Initiates ARI ■ Announces ATWS condition and RX power is <6%. <input type="checkbox"/> Verifies Recirc Pumps run back. <input type="checkbox"/> Maintains RPV/L between +25 and +35 inches or as directed by Unit Supervisor. <input type="checkbox"/> Inserts SRM/IRMs. |

Event Six - Small Steam Leak in Drywell / Manual Reactor Scram

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|--|
| | ANSO | <input type="checkbox"/> Performs DGP 02-03, Reactor Scram, as directed. |
| | TEAM | Verifies the following as time allows: <input type="checkbox"/> Group Isolations <input type="checkbox"/> Automatic start of ECCS systems <input type="checkbox"/> Automatic start of EDGs. |

Event 6 Completion Criteria:

- **Reactor manually scrammed.**
- **OR,**
- **Or at the discretion of the NRC Chief Examiner.**

Event Seven - ATWS (Stuck Control Rods) / Drywell Leak Worsens

| Trigger | Position | Crew Actions or Behavior |
|--------------------------|--------------------|---|
| | | <p>NOTE: This event starts automatically when the TEAM manually scrams in the previous Event.</p> |
| | <p>SRO</p> | <ul style="list-style-type: none"> ■ Enters DEOP 100, RPV Control, due to high Drywell Pressure. <p>Due to ATWS report, exits DEOP 100, enters DEOP 0400-05, Failure to Scram and performs/directs the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inhibiting ADS. ■ Placing Core Spray in PTL. <input type="checkbox"/> Verification of all isolations, ECCS and EDGs start. <input type="checkbox"/> Holding Reactor water level +8" to +48". ■ √ Inserting control rods. (RPV 6.1) <input type="checkbox"/> Maintaining RPV pressure <1060 psig. |
| | <p>ANSO</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Inhibits ADS. ■ Places Core Spray in PTL. <input type="checkbox"/> Controls RPV pressure as directed. |
| | <p>NSO</p> | <ul style="list-style-type: none"> √ Performs manual control rod insertion per DEOP 500-5, Alternate Insertion of Control Rods, as directed (this method will be successful): (RPV 6.1) ■ Bypasses the RWM ■ Starts the available CRD pump or use CRD x-tie from Unit 3. ■ Maximizes drive water pressure using one or more of the methods in DEOP 500-05. ■ Inserts rods using RONOR in EMERG ROD IN or the normal rod movement control switch |
| | | <p>Note: If directed to install scram jumpers and -59 in. GP 1 and Offgas Rad jumpers, acknowledge the request. If later asked about progress, report the operators were just dispatched to install the jumpers.</p> |
| <p>14 thru 29</p> | | <p>Simulator Operator:</p> <p>Verify the following triggers automatically activate when the associated rod is selected, drive water pressure is restored to > 200 psig and an "insert" signal is given:</p> <p>Triggers 14 thru 29: deletes the stuck malfunction for associated rod. See the CAEP file towards the back of this guide to see which trigger should activate as drives are selected.</p> |
| | <p>SRO</p> | <ul style="list-style-type: none"> ■ When control rods are inserted, exits DEOP 0400-05 and enters DEOP 100. |
| <p>10</p> | | <p>Simulator Operator:</p> <p>After the Team has inserted several of the control rods and / or at the discretion of the Lead Examiner, activate Triggers 10 which increases the leak size enough to drive the Team to spray the Drywell.</p> |
| | <p>TEAM</p> | <p>Reports Drywell pressure increasing at a faster rate.</p> |

Event Seven - ATWS (Stuck Control Rods) / Drywell Leak Worsens

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|---|
| | SRO | Enters DEOP 0200-01, Primary Containment Control, when Drywell pressure reaches 2 psig and performs/directs: <ul style="list-style-type: none"> <input type="checkbox"/> Verifying of Torus water level <27.5 ft. <input type="checkbox"/> Initiation of Torus sprays. <input type="checkbox"/> Monitoring of Drywell temperature (Drywell sprays may be initiated for temperature control) <input type="checkbox"/> Monitoring Torus Temperature and initiation of Torus cooling. <input type="checkbox"/> Monitors Torus level. |
| | ANSO | Performs DEOP 0200-01, Primary Containment Control, actions as directed: <ul style="list-style-type: none"> <input type="checkbox"/> Monitors Drywell temperature and pressure and initiates torus sprays per Hard Card LPCI/CCSW OPERATION, as directed. |
| | SRO | When PC/P is above 9 psig, performs/directs: <ul style="list-style-type: none"> <input type="checkbox"/> Verification of DSIL <input type="checkbox"/> Tripping of recirc pumps <input type="checkbox"/> Tripping of DW coolers <input checked="" type="checkbox"/> √ Initiation of DW sprays (PC-5.1) |
| | ANSO | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> √ Initiates drywell sprays per Hard Card LPCI/CCSW OPERATION, as directed (PC-5.1) |
| | SRO | May contact any/all of the following to inform of situation or request assistance: <ul style="list-style-type: none"> <input type="checkbox"/> Operations Manager <input type="checkbox"/> Shift Operating Supervisor <input type="checkbox"/> Duty Maintenance Supervisor <input type="checkbox"/> Duty Engineering Manager <input type="checkbox"/> Work Week Manager |

Event 7 / Scenario Completion Criteria:

- **Control Rods inserted,**
- **Drywell Sprays initiated,**
- OR,**
- **At the discretion of the NRC Lead Examiner.**

Critical Tasks:

| | |
|-----------|---|
| (RPV-6.1) | With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by injecting boron and/or inserting control rods, to prevent exceeding the primary containment design limits. |
| (PC 5.1) | When drywell pressure exceeds 9 psig, INITIATE drywell sprays, while in the safe region of the spray initiation limit. |

REFERENCES

| PROCEDURE | TITLE |
|----------------|---|
| DAN 902-3 D-7 | 2A/B CORE SPRAY HDR PRESS LO |
| DAN 902-3 D-16 | RX BLDG FUEL POOL CH A DOWNSCALE |
| DAN 902-5 A-3 | ROD DRIFT |
| DAN 902-5 A-5 | IRM HI |
| DAN 902-5 B-3 | ROD WORTH MIN BLOCK |
| DAN 902-5 B-11 | CHANNEL A/B NEUTRON MONITOR |
| DAN 902-5 C-3 | ROD OUT BLOCK |
| DAN 902-5 C-10 | CHANNEL A IRM HI HI/INOP |
| DAN 923-1 B-5 | U2 OR U3 INST AIR COMP TRIP |
| DAN 923-1 F-4 | U2 INST AIR PRESS LO |
| DEOP 0100 | RPV CONTROL |
| DEOP 0200-01 | PRIMARY CONTAINMENT CONTROL |
| DEOP 0400-05 | FAILURE TO SCRAM |
| DEOP 0500-05 | ALTERNATE INSERTION OF CONTROL RODS |
| DGP 01-01 | UNIT STARTUP |
| DGP 02-03 | REACTOR SCRAM |
| DGP 03-04 | CONTROL ROD MOVEMENTS |
| DOA 0040-01 | SLOW LEAK |
| DOA 0300-06 | RPIS FAILURE |
| DOA 0300-12 | MISPOSITIONED CONTROL ROD |
| DOA 4700-01 | INSTRUMENT AIR SYSTEM FAILURE |
| DOP 0400-01 | REACTOR MANUAL CONTROL SYSTEM OPERATION |
| DOP 0400-02 | ROD WORTH MINIMIZER |
| DOP 0500-07 | INSERTION/RESET OF MANUAL HALF SCRAM |
| DOP 6700-20 | 480 VOLT BREAKER TRIP |
| DOS 0300-06 | CONTROL ROD DRIVE ABNORMALITY RECORD |
| TS 3.1.3 | CONTROL ROD OPERABILITY |
| TS 3.5.1 | ECCS-OPERATING |

| ILT-N-1 QUANTITATIVE ATTRIBUTES | |
|--|---|
| 7 | Total malfunctions inserted (4 to 8) / (10 to 14) |
| 2 | Malfunctions that occur after EOP entry (1 to 4) / (3 to 6) |
| 3 | Abnormal events (1 to 2) / (2 to 3) |
| 1 | Major transients (1 to 2) / (2 to 3) |
| 2 | EOPs used beyond primary scram response EOP (1 to 3) / (3 to 5) |
| 1 | EOPs contingency procedures used (0 to 3) / (1 to 3) |
| 60 | Approximate scenario run time (45 to 60 min) / (one scenario may approach 90 minutes) |
| 40% | EOP run time (40 to 70% of scenario run time) |
| 2 | Crew critical tasks (2 to 5) / (5 to 8) |
| Yes | Technical Specifications exercised (Yes or No) |

Computer Aided Exercise Programs

```
# NRC Exam ILT 07-1
# SCENARIO ILT-N-1.cae
# Written by MP
# Rev 00
# Date 10/07
```

INITIAL CONDITIONS

```
# Inserts RPS CH A partial half scram
imf b14
```

```
# Sticks several control rods from HCU rows 7 & 8.
```

```
imf rod05st
imf rodh05st
imf rode06st
imf rodg06st
imf rod07st|2
imf rodg07st|2
imf rodh07st|2
imf rode08st|2
imf rodg08st|4
imf rod09st|4
imf rodg09st|4
imf rodh09st|4
imf rodg10st|6
imf rode11st|6
imf rod011st|6
imf rodh11st|6
```

```
# Overrides Iso Cond Rad Mon Dnscl OFF.
```

```
imf ser0004 off|8
imf ser0019 off|8
```

```
# Sets APRM Master gain pot to 1.0
```

```
irf niagain 1.0|8
```

```
# Closes 2B IAC disch valve.
```

```
irf vp2 0.0|8
```

EVENT TRIGGERS

```
# Event Trigger 1 sets gain for all 6 APRMs.
```

```
trgset 1 "0"|10
trg 1 "irf niagainf true"|10
```

```
# Event Trigger 2 Inserts a RPIS failure for rod F-05
```

```
trgset 2 "0"|10
imf rdfailf5 (2)|10
imf cr043s (2) bad|10
```

```
# Event trigger 3 inserts an IAC trip and IA leak to cause pressure to slowly drop.
```

```
trgset 3 "0"|12
imf n33 (3)|12
imf np2 (3) 12.0|12
```

```
# Event trigger 4 Opens 2B IAC Disch vlv.
```

trgset 4 "0"|12
irf vp2 (4) 100.0|12

Event trigger 5 Activates when trigger 3 is active, 2B IAC is started and its disch vlv is open.
Deletes the IA leak malfunction.
trgset 5 "et_array(3) .and. iascomp(2) .and. (iar471d .gt. 0.9)"|14
trg 5 "dmf np2"|14

Event Trigger 6 Resets U2 SA to IA X-tie valve.
trgset 6 "0"|14
irf ia1 (6) reset|14

Event Trigger 7 fails IRM 12 upscale
trgset 7 "0"|14
imf nii12pot (7) 125|14

Event Trigger 8 causes 2A/B Core System Low Pressure Alarm (902-3 D-7)
Cracks open 4A VLV and isolates Keep Fill to 2A Loop
trgset 8 "0"|18
trg 8 "set csv4a = 0.002"|18
irf csafilof (8) closed|18

Event Trigger 9 Inserts a steam leak upstream of the restrictors
trgset 9 "0"|20
imf i21 (9) 0.003 5:00 0.002|20

Event Trigger 10 Increases the size of the steam leak upstream of the restrictors.
trgset 10 "0"|20
trg 10 "mmf l21 0.25"|20

Event Trigger 11 installs scram jumpers
trgset 11 "0"|20
irf rpjumpas (11) on|20

Event Trigger 12 installs MSL Group 1 RPV level byp and Offgas High Rad byp jumpers.
trgset 12 "0"|20
irf ci59jp (12) in|22
irf ogogjp (12) in|22

Event Trigger 14 clears stuck rod H-11.
trgset 14 "rdlselw(133) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|30
trg 14 "dmf rodh11st"|22

Event Trigger 15 clears stuck rod F-05.
trgset 15 "rdlselw(43) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|32
trg 15 "dmf rodf05st"|22

Event Trigger 16 clears stuck rod H-05.
trgset 16 "rdlselw(45) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|34
trg 16 "dmf rodh05st"|22

Event Trigger 17 clears stuck rod E-06.
trgset 17 "rdlselw(56) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|36
trg 17 "dmf rode06st"|22

Event Trigger 18 clears stuck rod G-06.
trgset 18 "rdlselw(58) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|38
trg 18 "dmf rodg06st"|24

Event Trigger 19 clears stuck rod F-07.

trgset 19 "rdlselw(72) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|40
trg 19 "dmf rod07st"|24

Event Trigger 20 clears stuck rod G-07.
trgset 20 "rdlselw(73) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|42
trg 20 "dmf rodg07st"|24

Event Trigger 21 clears stuck rod H-07.
trgset 21 "rdlselw(74) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|44
trg 21 "dmf rodh07st"|24

Event Trigger 22 clears stuck rod E-08.
trgset 22 "rdlselw(86) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|46
trg 22 "dmf rode08st"|26

Event Trigger 23 clears stuck rod G-08.
trgset 23 "rdlselw(88) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|48
trg 23 "dmf rodg08st"|26

Event Trigger 24 clears stuck rod F-09.
trgset 24 "rdlselw(102) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|50
trg 24 "dmf rod09st"|26

Event Trigger 25 clears stuck rod G-09.
trgset 25 "rdlselw(103) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|52
trg 25 "dmf rodg09st"|26

Event Trigger 26 clears stuck rod H-09.
trgset 26 "rdlselw(104) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|54
trg 26 "dmf rodh09st"|28

Event Trigger 27 clears stuck rod G-10.
trgset 27 "rdlselw(118) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|56
trg 27 "dmf rodg10st"|28

Event Trigger 28 clears stuck rod E-11.
trgset 28 "rdlselw(130) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|58
trg 28 "dmf rode11st"|28

Event Trigger 29 clears stuck rod F-11.
trgset 29 "rdlselw(131) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|60
trg 29 "dmf rod011st"|28

END

Date: TODAY

Unit 2 Turnover

Online Information

0 MWe
Online Risk: Green
Risk Equipment:

Protected Pathway(s)

Shutdown Information

Time to Boil: N/A
Shutdown Risk: N/A

Reactivity Management

Limit: MFLCPR N/A
Action Level: N/A
S/D Method: DGP 02-01

Unit 2 Priorities

Continue Unit startup.

LCORAs

| | |
|-------------|------|
| LCORA Title | None |
|-------------|------|

Start
Clock Ends

Compensatory Actions

| Degradation Documentation | Frequency Responsible | Compensatory Action |
|---------------------------|-----------------------|---------------------|
|---------------------------|-----------------------|---------------------|

Unit 2 Conditions, Status, Abnormalities

Reactor Power on IRM range 8 with one bypass valve partially open.

Unit 2 Abnormal Component Position

U2 Open Operability Determinations with Compensatory Actions

Shift 1 Activities (X = Completed)

Shift 2 Activities

 DGP 01-01
 DOP 5600-06

Shift 3 Activities

Common Unit Activities

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Unit 2 Procedures in Progress (Non-Surveillance)

DGP 01-01, Unit Startup
DOP 5600-06, Main Turbine Startup

Unit 2 Surveillances in Progress

None

Date: TODAY

Unit 3 Turnover

Online Information

912 MWe

Online Risk: Green

Risk Equipment:

Protected Pathway(s)

Shutdown Information

Time to Boil: 0

Shutdown Risk: N/A

Reactivity Management

Limit: MFLCPR 0.78

Action Level: 0.980

S/D Method: DGP 02-01

Unit 3 Priorities

Maintain load per TSO direction.

LCORAs

LCORA # None
Title

Start
Clock Ends

Compensatory Actions

Degradation
Documentation

Frequency
Responsible

Compensatory Action

Unit 3 Conditions, Status, Abnormalities

None

Unit 3 Abnormal Component Position

U3 Open Operability Determinations with Compensatory Actions

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Common Unit Activities

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Unit 3 Procedures in Progress (Non-Surveillance)

None

Unit 3 Surveillances in Progress

None

Dresden Generating Station

ILT-N-2

SWAP RBCCW PUMPS

CONTROL ROD DRIFTS IN

DRYWELL TO TORUS DIFFERENTIAL PRESSURE CONTROLLER FAILURE

MASTER RECIRC FLOW CONTROLLER FAILS DOWNSCALE

2/3 CRIBHOUSE INTAKE CLOGGING

LOSS OF MAIN CONDENSER VACUUM / MANUAL SCRAM

ECCS SUCTION LINE BREAK

Rev. 00

10/07

Developed By:

Exam Author

Date

Approved By:

Facility Representative

Date

Facility: Dresden Scenario No: ILT-N-2 Op-Test No: 2008-301

Examiners: _____ Operators: _____

Initial Conditions: Rx Power ~ 90%.

Turnover: Swap RBCCW Pumps, maintain load per TSO direction.

| Event No. | Malf. No. | Event Type* | | Event Description |
|-----------|-----------|-------------|-------------|--|
| 1 | NONE | N | ANSO SRO | Swap RBCCW pumps |
| 2 | RODL06DI | I | NSO SRO | Control Rod Begins to drift in ^T |
| 3 | PCVDMD14 | I | ANSO SRO | Drywell to Torus differential pressure controller failure ^T |
| 4 | RRMASDND | I | NSO SRO | Master Recirc Flow Controller fails downscale |
| 5 | CWMSCDEP | C | ANSO SRO | 2/3 Cribhouse Intake Clogging |
| 6 | HP5 | M | TEAM | Loss of Main Condenser Vacuum Causing a Manual Scram |
| 7 | CSBRKSEV | M | TEAM | Lowering Torus level from ECCS suction line break |

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (T)ech Spec call

Scenario Objective

Evaluate the operators in using the Emergency Depressurization DEOP contingency procedure.

Scenario Summary

Initial Conditions:

- Mode 1 at approximately 90% reactor power.
- Holding load per TSO

Scenario Sequence

- The Team swaps RBCCW pumps.
- Control rod L06 will begin drifting in.
- Drywell to torus differential pressure controller demand fails downscale. Pressure control is regained when the ANSO directs an operator to open the drywell to torus differential pressure control valve bypass or vents the torus. Action will be delayed so the DP drops to <1.0 psid requiring Tech Spec LCO entry.
- The Master Recirc Flow Controller fails downscale. The NSO will lockout both recirc scoop tubes.
- Debris begins entering the 2/3 Cribhouse intake. Failure of the traveling screens for Circulating water pump 2A causes its bay level to drop. The 2A Circulating Water pump will begin cavitating. The Team starts 2B Circulating Water pump and shuts down 2A.
- Air leakage causes a loss of Main Condenser Vacuum. The Team manually scrams the reactor.
- An ECCS suction line break occurs resulting in a lowering torus water level. The HPCI System operation should be prevented and an emergency depressurization performed as directed by the DEOP for primary containment control. If HPCI operation is not prevented, it will spuriously initiate as Torus level drops.

Event One – Swap RBCCW Pumps

- The crew swaps RBCCW pumps.

Malfunctions required: 0

- None.

Success Path:

- Performs DOP 3700-02, Reactor Building Closed Cooling Water System Operation

Event Two – Control Rod Begins to drift in

- Control rod L-06 will begin drifting in.

Malfunctions required: 1

- (Rod L-06 Drifts In)

Success Path:

- Executes DOA 0300-05, Inoperable or Failed CRDs.
- Executes DOA 0300-12, Mispositioned CRD.
- SRO references Tech Specs and determines the control rod must be inserted and disarmed.

Event Three – Drywell to Torus Differential Pressure Controller Failure

- The team recognizes and responds to a failure of the drywell to torus differential pressure controller.

Malfunctions required: 1

- (Controller demand fails downscale)

Success Path:

- Directs an operator to open the drywell to torus differential pressure control valve bypass or vents the torus.

Event Four – Master Recirc Flow Controller failure

- Master Recirc Flow Controller fails downscale. The NSO will lock out scoop tubes.

Malfunctions Required: 1

- (Master Recirc Flow Controller fails down)

Success Path:

- Locks out both scoop tubes.
- Performs DOA 0202-03, Reactor Recirc System Flow Control Failure.

Event Five – 2/3 Cribhouse Intake Clogging

- Debris begins entering the 2/3 Cribhouse intake. Failure of the traveling screens for Circulating water pump 2A causes its bay level to drop. The 2A Circulating Water pump will begin cavitating.

Malfunctions required: 1

- (2/3 Cribhouse Intake Clogging)

Success Path:

- The Team starts 2B Circulating Water pump and shuts down 2A.

Event Six – Loss of Main Condenser Vacuum

- A loss of Main Condenser Vacuum occurs due to increased air in-leakage. The Team will manually scram the reactor

Malfunctions required: 1

- (Main Condenser Air Leak)

Success Path:

- Perform a Manual Scram.

Event Seven – Torus Leak

- The crew should recognize and respond to a lowering torus water level. If the Team does not prevent HPCI operation, a spurious HPCI initiation will occur while Torus level is dropping.

Malfunctions required: 1

- (Torus Leak)

Success Path:

- Prevent HPCI operation.
- Emergency Depressurize.

PRE-SCENARIO ACTIVITIES

- 1 If applicable, conduct pre-scenario activities in accordance with TQ-AA-106-0107, SIMULATOR EXAMINATION BRIEFING.
 - a. Provide the crew with a copy of DOP 3700-02, Reactor Building Closed Cooling Water System Operation.
 - b. Direct the crew to perform their briefs prior to entering the simulator.

- 2 Simulator Setup (the following steps can be done in any logical order)
 - a. Initialize simulator in an IC 12 (full power), then perform the following:
 - 1) Insert the current control rod step one notch to reduce FCL.
 - 2) Adjust recirculation flow to establish ~830 MWe.
 - b. Establish the following equipment lineup:
 - 1) 2A and 2/3 (on bus 24) RBCCW pumps running.
 - 2) 2B RBCCW pump OFF.
 - 3) 2A and 2C Circulating Water pumps running.
 - 4) 2B Circulating Water pump OFF.
 - c. Establish Drywell pressure between 1.15 to 1.20 psig with Drywell to Torus DP between 1.10 to 1.15 psig.
 - d. Run the initial setup CAEP file: ILT-N-2.cae
 - e. Add variable ppc232 to a Monitor program screen.
 - f. Advance the chart recorders.

- 3 Verify the following simulator conditions:
 - a. Reactor Power ~ 90%.

- 4 Complete the Simulator Setup Checklist.

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

- √ Critical Tasks
- ⌚ Time Critical Tasks
- 🔑 PRA Key Operator Actions
- Required Actions
- Optional Actions

| Event One – Swap RBCCW Pumps | | |
|--|-------------|---|
| Trigger | Position | Actions or Behavior |
| 1 | | <p><u>Floor Instructor / Simulator Operator / Role Play:</u></p> <p>If the team announces that they will adjust gains, inform them an extra NSO will perform the adjustment. Then:</p> <ul style="list-style-type: none"> ❖ Tell the team you are time compressing. ❖ Direct the simulator operator to activate trigger 1 and verify gains within limits. ❖ Inform the team the gains are adjusted. <p>(Note: trigger 1 can be toggled OFF, then back ON as many times as necessary to adjust gains)</p> |
| | | <p><u>Role Play:</u></p> <p>NLO to Verify proper oil levels for the 2B RBCCW pump: wait 1 min, then report “2B RBCCW pump oil levels are normal”</p> <p>NLO to verify RBCCW system parameters are normal: wait 1 min, and then report “RBCCW system parameters are normal”.</p> |
| | US | <input type="checkbox"/> Directs the ANSO to start 2B RBCCW pump and shutdown the 2/3 RBCCW pump. |
| | ANSO | <p>Performs DOP 3700-02, Reactor Building Closed Cooling Water System Operation:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Directs NLO to verify proper oil levels for the on-coming RBCCW pump. ■ Starts 2B RBCCW pump AND verifies proper operation. ■ Stops 2/3 RBCCW pump. <input type="checkbox"/> Directs NLO to verify RBCCW system parameters are normal. |
| <p><u>Event 1 Completion Criteria:</u></p> <ul style="list-style-type: none"> • RBCCW Pump swap completed. • OR, at the direction of the Lead Examiner. | | |

| Event Two – Control Rod Begins to drift in. | | |
|---|------------|---|
| Trigger | Position | Crew Actions or Behavior |
| 2 | | <p>Simulator Operator:</p> <p>At the discretion of the Lead Examiner, activate trigger 2, which initiates Control Rod L-06 to drift in.</p> |
| | | <p>Role Play:</p> <p>As the NLO sent to investigate CRD L-06: (wait 3 min.) then report: “the lines with the 102 and 112 valves for the HCU are hot to the touch. Everything else appears normal”.</p> <p>If asked Temp: 240°F with heat gun.</p> |
| | NSO | <p>Announces alarms for the Control Rod L-06 and refers to the following DANs:</p> <ul style="list-style-type: none"> ■ 902-5 A-3, Rod Drift alarm. ■ Views Full Core Display AND identifies CRD with Rod Drift light illuminated. ■ Selects drifting control rod. ■ Observes selected CRD position on four rod display. |
| | NSO | <p>Performs actions of DOA 0300-05, Inoperable or Failed CRDs</p> <ul style="list-style-type: none"> ■ Takes the RWM switch to Bypass. ■ Inserts the rod to 00 using Emergency Rod In switch. |
| | NSO | <p>May take L-06 out of service on RWM as directed by Unit Supervisor:</p> <ul style="list-style-type: none"> □ On RWM, select SECONDARY FUNCTION. □ On RWM, select ROD OUT OF SERVICE □ On RWM, select inoperable CRD □ On RWM, verify correct inoperable CRD selected, and then select ENTER REQUEST. □ Continuously insert inoperable CRD to “00”. □ On RWM, select EXIT FUNCTION. |
| | NSO | <p>Performs actions of DOA 0300-12, Mispositioned CRD:</p> <ul style="list-style-type: none"> □ Discontinues reactivity changes. □ Compares Off-Gas readings. □ Refers to DGA 07, Unpredicted Reactivity Addition, as directed. □ Refers to DOA 0500-04, Thermal Limits and Fuel Conditioning Violation, and DGA 16, Coolant Activity/ Fuel Element Failure. |
| | NSO | <ul style="list-style-type: none"> □ Dispatches an Operator to investigate the cause of the drifting control rod. ■ Dispatches an operator to hydraulically isolate and electrically disarm the CRD per DOP 0300-08, CRD System HCU isolation. |

Event Two – Control Rod Begins to drift in.

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|--|
| | SRO | <ul style="list-style-type: none"> ■ Enters DOA 0300-05, Inoperable or Failed CRDs, and directs NSO actions. ■ Enters DOA 0300-12 and contacts QNE to evaluate core. □ May enter DGA 07, Unpredicted Reactivity Addition. □ References appropriate plant licensing documents and determines : <ul style="list-style-type: none"> ■ TS 3.1.3 condition C, required action: <ul style="list-style-type: none"> ❖ C.1, Fully insert inoperable control rod within 3 hrs; AND ❖ C.2, Disarm the associated CRD within 4 hrs. □ Directs/verifies Operators take action per DOA 0300-12. |
| | ANSO | <ul style="list-style-type: none"> □ Monitors panels and assists as directed. |

Event 2 Completion Criteria:

- **Applicable TS has been referenced.**
- **OR, at the direction of the Lead Examiner.**

| Event Three – Drywell to Torus Differential Pressure Controller Failure. | | |
|--|-------------|--|
| Trigger | Position | Crew Actions or Behavior |
| | | Note: After activating the Trigger to start this Event, depending on how high the DW to Torus D/P is to start with, it may take several minutes for D/P to drop enough to receive the alarm at 1.05 psid. |
| 3 | | Simulator Operator: At the discretion of the Lead Examiner, activate trigger 3 , which causes drywell to torus differential pressure controller demand to fail downscale. (NOTE: The demand meter on the controller will appear to be operating normally, but the demand sent to the PCV is what is failed downscale) |
| | | Role Play: NLO to check PCV 2-8599-556: Wait 2 min, then report that “2-8599-556 is closed” |
| | ANSO | Acknowledges and announces alarm 902-4 B-15, DW to Torus DP Hi/Lo, and performs the following: <ul style="list-style-type: none"> ■ Diagnoses that the drywell to torus differential pressure controller appears to be operating normally. ■ Sends an operator to check operation of PCV 2-8599-556. |
| | SRO | To maintain Primary Containment pressures to those specified in DOP 1600-05, Primary Containment Inerting and Atmosphere Control, should direct performance of any of the following: <ul style="list-style-type: none"> <input type="checkbox"/> Placing the drywell torus differential pressure controller to MAN and controlling Drywell to Torus differential pressure manually; (is unsuccessful) ■ AND / OR, performing step 14 of Reactor Building Ventilation per DOP 1600-05, Primary Containment Inerting and Atmosphere Control, to maintain the required differential pressure. ■ AND / OR, directs an operator to open Drywell to Torus DP PCV bypass 2-8599-558. <input type="checkbox"/> May direct opening/closing AO 2-1601-58 per DOP 1600-05, Primary Containment Inerting and Atmosphere Control, as necessary. <input type="checkbox"/> May notify Work Week Manager. |

Event Three – Drywell to Torus Differential Pressure Controller Failure.

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|--|
| | ANSO | <p>Performs any of the following as directed:</p> <ul style="list-style-type: none"> ❑ Places the drywell to torus differential pressure controller to MAN and observes demand appears to follow. However, DP continues to drop. ■ AND / OR, vents the torus to Reactor Building Ventilation per DOP 1600-05, Primary Containment Inerting and Atmosphere Control: <ul style="list-style-type: none"> • Closes or verifies closed TORUS M-U VLV, AO 2(3)-1601-58. • Verifies the DW PRESS CONTRL, PIC 2(3)-8540-1 is in AUTO with the setpoint at approximately 1.1 psig. • At the DW/TORUS DP CONTRL, PIC 2(3)-1602-14 reduces the auto setpoint to 0.0 psid OR places PIC 2(3)-1602-14 in MAN with full closed demand. • Vents the torus as necessary to control drywell-to-torus DP between 1.05 to 1.3 psid (DOP 1600-01). • Open/close TORUS M-U VLV, AO 2(3)-1601-58 as necessary to relieve excess negative torus pressure. ■ AND / OR, directs an operator to open Drywell to Torus DP PCV bypass 2-8599-558. |
| | NSO | Monitors panels and assists as directed. |
| | | <p><u>Role Play:</u> As Plant Support called to assist, respond: "I will send a team to investigate". NLO to open Drywell to Torus DP PCV bypass 2-8599-558: Wait until Drywell to Torus DP drops to <1.0 psid, (Stall as necessary) then operate 2-8599-558 as directed. (Use Instructor Station drawing PC2)</p> |
| | SRO | <ul style="list-style-type: none"> ■ Determines following Technical Specifications apply: <ul style="list-style-type: none"> • TS 3.6.2.5: Restore differential pressure to within limit within 24 hours. • TRM 3.6.c: Restore differential pressure to within limit within 67 hours. |

Event 3 Completion Criteria:

- Drywell to Torus differential pressure control in progress,
 - Tech Spec Referenced,
- OR;
- At the direction of the Lead Examiner.

Event Four – Master Recirc Flow Controller Fails Downscale

| Trigger | Position | Crew Actions or Behavior |
|---------|----------|--|
| 4 | | <p>Simulator Operator: At the discretion of the Lead Examiner, activate trigger 4, which will cause Master Recirc Flow Controller to fail downscale.</p> |
| | NSO | <ul style="list-style-type: none"> ■ Determines and announces Recirculation Flow transient occurring by observing any of the following: <ul style="list-style-type: none"> ○ Decrease in Recirc Loop Flow as indicated on FR 2-260-7. ○ Decrease in Rx Power indicated on WI 2-6040-59. ○ Decrease in Core Flow and DP on DPR/FR 2-263-110. ○ Decrease in Total Stm Flow on UR 2-640-27. ○ Decrease in Rx Pressure on P/FR 2-640-28. ○ Decrease in Total Feedwater Flow on UR 2-640-26. ○ Decrease in Power Level on RR 2-750-10A/D, & RR 2-750-10B/C. |
| | SRO | <ul style="list-style-type: none"> ■ Enters DOA 0202-03 Reactor Recirc System Flow Control Failure. □ May enter DGA 07, Unpredicted Reactivity Addition. |
| | NSO | <p>Performs the following actions per DOA 0202-03, Reactor Recirc System Flow Control Failure:</p> <ul style="list-style-type: none"> ■ Places 2A & B M-G Set Scoop Tube Power Lockout Reset Switches in the Lockout position. □ Verifies Core thermal power <2957 MWt. □ Verifies Recirc Pump NOT operating in the instability region of the MG Set voltage regulator AND uncontrolled pump flow AND speed oscillations are NOT occurring. □ Verifies NOT operating in the unstable region of the Power / Flow Map. |
| | NSO | <p>Completes actions of Recirc M-G Lockout in DOP 0202-12, Recirculation Pump Motor Generator Set Scoop Tube Operation.</p> <ul style="list-style-type: none"> □ Verifies alarm is received on annunciator 902-4 C-1(5), 2A(B) RECIRC M-G SCOOP TUBE PWR FAILURE. □ Places BOTH recirc pump speed control transfer stations in manual (MAN) at panel 902-4: <ul style="list-style-type: none"> • 2A(B) RECIRC PP SPEED CONTLR, 2-262-25A(B) □ Verify MASTER RECIRC FLOW CONTLR, 2-262-22, is in manual (MAN). ■ At the recirc pump speed control transfer station with the locked out scoop tube, rotate the potentiometer counterclockwise to set speed demand to minimum: <ul style="list-style-type: none"> • 2A(B) RECIRC PP SPEED CONTLR, 2-262-25A(B) □ At panel 902-4, place an Equipment Status Tag on 2A(B) M-G SET SCOOP TUBE POWER LOCKOUT RESET switch stating the reason the recirc MG set scoop tube is locked out. |
| | ANSO | <ul style="list-style-type: none"> □ Assist NSO as directed. |

Event Four – Master Recirc Flow Controller Fails Downscale

| Trigger | Position | Crew Actions or Behavior |
|---------|------------|---|
| | SRO | <input type="checkbox"/> Verifies actions of DOA 0202-03 and DOP 0202-12 carried out. |
| | SRO | May contact any/all of the following to inform of situation or request assistance: <ul style="list-style-type: none"> <input type="checkbox"/> Shift Manager <input type="checkbox"/> WEC Supervisor <input type="checkbox"/> Operations Manager <input type="checkbox"/> Shift Operating Supervisor <input type="checkbox"/> Duty Maintenance Supervisor <input type="checkbox"/> Duty Engineering Manager <input type="checkbox"/> Work Week Manager |

Event 4 Completion Criteria:

- **Appropriate Tech Specs referenced**
 - **2A & 2B Recirc Scoop Tubes locked out**
- AND,**
- At the discretion of the Lead Examiner.**

| Event Five – 2/3 Cribhouse Bay 1 Screen Plugging | | |
|--|-------------|---|
| Trigger | Position | Crew Actions or Behavior |
| 5 | | <p>Simulator Operator:</p> <p>At the discretion of the Floor Instructor / Lead Evaluator, activate trigger 5. This inserts 2/3 Intake clogging and traveling screen shear pin failure for Bay 1. (2A Circ Water PP)</p> |
| 6 | | <p>When 2A Circ Water pump is manually tripped, verify trigger 6 automatically activates. This stops the intake clogging.</p> |
| 7 | | <p>Simulator Operator:</p> <p>If the reactor is scrammed in this Event, verify trigger 7 automatically activates when the mode switch is placed to SHUTDOWN. Then proceed to the next Event.</p> |
| | ANSO | <ul style="list-style-type: none"> ■ Announces alarm 902-7 B-15, Screen Wash Control Panel Trouble. ■ Sends an operator to investigate. |
| | SRO | <ul style="list-style-type: none"> ■ Enters DOA 4400-06, 2/3 Cribhouse Screen Plugging, and directs actions. □ May enter DOA 4400-01, Circulating Water System Failure. □ May enter DOA 0010-19, Partial or Complete Loss of Cribhouse. |
| | ANSO | <ul style="list-style-type: none"> ■ Performs DOA 4400-06, 2/3 Cribhouse Screen Plugging, and DOA 4400-01, Circulating Water System Failure, actions as directed: ■ Monitors: <ul style="list-style-type: none"> • Condenser Vacuum • Circ Water Pump/System operation • Service Water Pump operation. |
| | | <p>Role Play:</p> <p>NLO to cribhouse: Wait 2 min. then report:</p> <ul style="list-style-type: none"> • “There is a lot of debris passing through the 2/3 Cribhouse intake bar racks and accumulating on the traveling screens”. • “The traveling screens are all operating in fast speed and are keeping up with the debris except the 2A Circ Water pump bay screens. The 2A Circ Water pump bay screen motors are running, but the screens are not moving”. • The level in the 2A Circ Water pump bay has dropped several feet and is continuing to drop. |
| | ANSO | <ul style="list-style-type: none"> □ Announces that 2A Circ Water pump current is fluctuating and other Circ Water system parameters are affected also. (Note: This occurs ~4-5 min. after the Event starts, so the Team may have swapped pumps before this based on field reports) ■ Starts 2B Circ Water pump and secures 2A. |

Event Five – 2/3 Cribhouse Bay 1 Screen Plugging

| Trigger | Position | Crew Actions or Behavior |
|---------|----------|--|
| | | <p><u>Role Play:</u> NLO at cribhouse about 2B Circ Water pump operation after it is started: wait 1 min. then report, “the 2B Circ Water pump is operating normally”.</p> <p>NLO at cribhouse about 2A Circ Water pump discharge valve status after the pump is secured: wait 1 min. then report, “the 2A Circ Water pump discharge valve is closed”.</p> |
| | | <p><u>Role Play:</u> NLO at cribhouse: about 2min. after 2A Circ Water pump is tripped, report, “the amount of debris entering the 2/3 intake has almost stopped and the traveling screens are beginning to clear up.”</p> |

Event 5 Completion Criteria:

2B Circ Water pump is started and 2A secured;

OR,

At the discretion of the Floor Instructor/Lead Evaluator.

Events Six –Loss of Main Condenser Vacuum / Manual Scram

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------------|---|
| 7 | | <p><u>Simulator Operator:</u> At the direction of the Lead Examiner activate trigger 7, which causes an air leak into the Main Condenser.</p> |
| | | <p><u>Role Play:</u> Acknowledge requests as support personnel.</p> |
| | NSO / ANSO | <ul style="list-style-type: none"> <input type="checkbox"/> May diagnose slowly decreasing vacuum by observing condenser vacuum recorder or increase in SJAE / Off Gas flow. |
| | NSO / ANSO | <p>Announces the following alarms indicating continued air leakage:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 902-54 B-6, ADSORBER VESSELS DP HI <input type="checkbox"/> 902-54 C-7, OFF GAS FLOW HI/LO <input type="checkbox"/> 902-7 C-13, 2A OFF GAS SYS FLOW HI/LO. <input type="checkbox"/> 902-7 D-13, OFF GAS FILT DP HI <input type="checkbox"/> 902-7 H-3, TURB VACUUM LO. <input type="checkbox"/> 902-5 F-5, CONDR VACUUM LO. |
| | US | <ul style="list-style-type: none"> <input type="checkbox"/> Directs team to enter and execute DOA 3300-02, Loss of Condenser Vacuum |
| | NSO | <p>If directed, performs DOA 3300-02, Loss of Condenser Vacuum:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Trips Hydrogen addition, <input type="checkbox"/> Checks condenser water box DP, <input type="checkbox"/> Verifies Turbine Vacuum Breaker closed. |
| | US | <ul style="list-style-type: none"> ■ Directs team to scram the reactor per DGP 02-03, Reactor Scram, before the vacuum scram setpoint is reached. |
| | NSO | <p>Performs the following actions per DGP 02-03, Reactor Scram, and DEOP 100, RPV Control, as directed:</p> <ul style="list-style-type: none"> ■ Places Mode Switch to Shutdown and depresses the Scram pushbuttons. ■ Checks rods inserted. ■ Announces: <ul style="list-style-type: none"> • All Rods In. • RPV level and pressure. ■ Resets Scoop Tubes and verifies Recirc pumps run back to minimum. ■ Inserts SRMs and IRMs. ■ Controls RPV level as directed... |

Events Six –Loss of Main Condenser Vacuum / Manual Scram

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|--|
| | ANSO | Performs DGP 02-03, Reactor Scram, actions as directed: <ul style="list-style-type: none"> <input type="checkbox"/> Silences annunciators at Panel 902(3) 8, until the NSO reports reactor level and pressure trends. <input type="checkbox"/> Silences Panels 902(3) 54 and 902(3) 65 annunciator alarms. <input type="checkbox"/> Verifies turbine tripped. <input type="checkbox"/> Verifies generator tripped. <input type="checkbox"/> Verifies aux power transfers. |
| | US | Enters DEOP 100, RPV Control: <ul style="list-style-type: none"> ■ Directs actions of DEOP 100. ■ Directs actions of DGP 02-03. ■ Verification of all isolations, ECCS and EDGs starts. ■ Holding RPV/L +8 to +48 inches. ■ Maintaining RPV/P <1060 psig. |

Events 6 Completion Criteria:

- **Reactor scram, with plant stabilized.**
- **OR, at the direction of the Lead Examiner.**

Events Seven – An ECCS suction line break occurs resulting in a lowering torus water level.

| Trigger | Position | Crew Actions or Behavior |
|---------|----------|--|
| 8 | | <p><u>Simulator Operator:</u></p> <p>At the discretion of the Lead Examiner, activate trigger 8, which starts an ECCS suction line break in the torus basement.</p> <p><u>Note:</u></p> <p>It takes about 20 minutes for torus level to reach 11 feet. <i>At the discretion of the lead examiner, use the cues later in this event to jump ahead in time to expedite the level drop if desired.</i></p> |
| | ANSO | <ul style="list-style-type: none"> ■ Reports the following alarms: <ul style="list-style-type: none"> • 923 A-3 (B-2), U2 E(W) Rbfd Sump Lvl Hi-Hi • 902-4 C-23, Torus Narrow Range Wtr Lvl Lo ■ Checks the torus narrow range level indicator. Reports level dropping. □ Directs NLO to perform DOS 1600-02, Torus Level Verification Using Local Sight Glass. ■ Directs NLO to investigate leakage to torus basement. ■ Verifies proper operation of the Rbfd Sump pumps. (Will require resetting the Group 2 isolation at both the 902-5 panel and the 923-4 panel for the sump pumps to operate if a Group 2 Isolation occurs). |
| | | <p><u>Role Play:</u></p> <p>As the NLO sent to verify Torus level locally using sight glass (wait 4 min), then report: "Local Torus level is ... (use value from variable ppc232, unless it is <20", then report it is below the sightglass)".</p> <p>As the NLO sent to investigate leakage (wait 2 min), then report: "there is a large rupture from a pipe attached between the Torus shell and the Torus suction ring header near the East LPCI Corner room. The Torus basement floor is covered with water". There is no valve on the line".</p> <p>As the NLO sent to report LPCI corner status (wait 2 min), then report: "there is no water in either LPCI corner room".</p> <p>As Maintenance sent to determine if the leak can be stopped (wait 3 min), then report: "Maintenance cannot stop the leak".</p> |
| | SRO | <ul style="list-style-type: none"> □ May enter DOA 0040-02, Localized Flooding in Plant. |
| | ANSO | <p>Performs the following actions per DOA 0040-02, Localized Flooding in Plant, as directed:</p> <ul style="list-style-type: none"> ■ Makes PA announcement. ■ Directs NLO to investigate leakage to torus basement. □ Notifies Radiation Protection and Security as time permits. |
| | | <p><u>Cue: (if desired for time compression) (to be handled by Lead Examiner)</u></p> <p>When torus level is < 14.5 feet and/or at the discretion of the lead examiner, cue the crew that we are taking a time jump and that both torus wide range level meters indicate 12.5 feet and are dropping at about 1 foot per 10 minutes.</p> |

Events Seven – An ECCS suction line break occurs resulting in a lowering torus water level.

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|--|
| 9 | | <p><u>Simulator Operator:</u></p> <p>If the Team has not prevented HPCI operation prior to reaching a Torus level of 12 feet and at the discretion of the Lead Examiner, activate trigger 9, which causes a spurious initiation of HPCI.</p> |
| | SRO | <p>Enters and directs performance of DEOP 0200-01, Primary Containment Control:</p> <ul style="list-style-type: none"> ❑ May attempt to add water to the Torus by opening the HPCI 14 valve. ❑ May decide to anticipate RPV Blowdown: <ul style="list-style-type: none"> • Directs opening turbine bypass valves. ■ √ Directs ANSO to prevent HPCI from operating before torus level reaches 12 feet. |
| | ANSO | <p>Performs the following actions per DEOP 200-01, Primary Containment Control, as directed:</p> <ul style="list-style-type: none"> ❑ May attempt to add water to the torus by opening the HPCI 14 valve. ■ Monitors/Reports DEOP 200-01 entry parameters. ■ √ Prevents HPCI from operating. |
| | SRO | <p>Enters DEOP 0300-01, Secondary Containment Control, and directs:</p> <ul style="list-style-type: none"> ❑ If Reactor Building Ventilation isolates when unit is scrammed, directs restarting Reactor Building Ventilation. |
| | ANSO | <p>Performs DEOP 300-01, Secondary Control, as directed:</p> <ul style="list-style-type: none"> ❑ Time permitting, restarts Reactor Building Ventilation (if it isolates when the reactor is scrammed). |
| | ANSO | <ul style="list-style-type: none"> ■ Opens turbine bypass valves. (if directed) |
| | | <p><u>Cue: (if time compression was used above)</u></p> <p>10 minutes after the initial time compression cue was given and/or at the discretion of the lead examiner, cue the crew that both the Torus wide range level meters indicate 11.5 feet and are dropping at a rate of about 1 foot per 10 minutes.</p> |
| | SRO | <p>When informed that torus level is approaching 11 feet:</p> <p>Enters DEOP 0400-02, Emergency Depressurization, and directs:</p> <ul style="list-style-type: none"> ■ Initiation of Iso Condenser to maximum flow. ■ Verification that SP/L >6 feet. ■ √ Opening all ADS valves. ■ Verification all relief valves are open. |

Events Seven – An ECCS suction line break occurs resulting in a lowering torus water level.

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------|--|
| | ANSO | Performs DEOP 0400-02, Emergency Depressurization, actions as directed: <ul style="list-style-type: none">■ Initiates Iso Condenser to maximum flow■ Verifies that SP/L >6 feet.■ √ Opens all ADS valves■ Verifies all relief valves are open. |

Events 7 / Scenario Completion Criteria:

- **HPCI operation prevented, AND**
- **RPV depressurization in progress, OR**
- **At the direction of the Lead Examiner.**

| Critical Tasks: | |
|------------------------|---|
| (PC-3.2) | When suppression pool level cannot be maintained above top elevation of the HPCI Exhaust (12'), TRIP AND PREVENT HPCI operation irrespective of adequate core cooling. |
| (PC-3.3) | When it is determined that suppression pool water level cannot be held above 11 feet wide range, INITIATE emergency depressurization |

REFERENCES

| PROCEDURE | TITLE |
|-------------------|--|
| DAN 902-4 B-15 | DW TO TORUS DP HI/LO |
| DAN 902-4 C-23 | TORUS NARROW RANGE WTR LVL LO |
| DAN 902-5 A-3 | ROD DRIFT ALARM |
| DAN 902-5 B-3 | ROD WORTH MIN BLOCK |
| DAN 902-5 C-3 | ROD OUT BLOCK |
| DAN 902-5 F-5 | CONDR VACUUM LO |
| DAN 902-54 B-6 | ADSORBER VESSELS DP HI |
| DAN 902-54 C-7 | OFF GAS FLOW HI/LO |
| DAN 902-7 C-13 | 2A OFF GAS SYS FLOW HI/LO |
| DAN 902-7 D-13 | OFF GAS FILT DP HI |
| DAN 902-7 B-15 | SCREEN WASH CONTROL PANEL TROUBLE |
| DAN 902-7 H-3 | TURB VACUUM LO |
| DAN 923 A-3 (B-2) | U2 E(W) RBFD SUMP LVL HI-HI |
| DEOP 0100-00 | RPV CONTROL |
| DEOP 0200-01 | PRIMARY CONTAINMENT CONTROL |
| DEOP 0300-01 | SECONDARY CONTAINMENT CONTROL |
| DEOP 0400-02 | EMERGENCY DEPRESSURIZATION |
| DGA 07 | UNPREDICTED REACTIVITY ADDITION |
| DGP 02-03 | REACTOR SCRAM |
| DOA 0010-19 | PARTIAL OR COMPLETE LOSS OF CRIBHOUSE |
| DOA 0040-02 | LOCALIZED FLOODING IN PLANT |
| DOA 0202-03 | REACTOR RECIRC SYSTEM FLOW CONTROL FAILURE |
| DOA 0300-05 | INOPERABLE OR FAILED CONTROL ROD DRIVES |
| DOA 0300-12 | MISPOSITIONED CONTROL ROD |
| DOA 3300-02 | LOSS OF CONDENSER VACUUM |
| DOA 4400-01 | CIRCULATING WATER SYSTEM FAILURE |
| DOA 4400-06 | 2/3 CRIBHOUSE SCREEN PLUGGING |
| DOP 3700-02 | REACTOR BUILDING CLOSED COOLING WATER SYSTEM OPERATION |
| DOS 1600-02 | TORUS LEVEL VERIFICATION USING LOCAL SIGHT GLASS |
| T.S. 3.1.3 | CONTROL ROD OPERABILITY |
| TS 3.4.1 | RECIRCULATION LOOPS OPERATING |
| TS 3.4.2 | JET PUMPS |
| TS 3.6.2.5 | DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESZSURE |
| TRM 3.6.c | DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESZSURE |

| EXAM ILT-N-2 QUANTITATIVE ATTRIBUTES | |
|---|---|
| 6 | Total malfunctions inserted (4 to 8) / (10 to 14) |
| 1 | Malfunctions that occur after EOP entry (1 to 4) / (3 to 6) |
| 4 | Abnormal events (1 to 2) / (2 to 3) |
| 1 | Major transients (1 to 2) / (2 to 3) |
| 2 | EOPs used beyond primary scram response EOP (1 to 3) / (3 to 5) |
| 1 | EOPs contingency procedures used (0 to 3) / (1 to 3) |
| 60 | Approximate scenario run time (45 to 60 min) / (one scenario may approach 90 minutes) |
| 40% | EOP run time (40 to 70% of scenario run time) |
| 2 | Crew critical tasks (2 to 5) / (5 to 8) |
| Yes | Technical Specifications exercised (Yes or No) |

Computer Aided Exercise Programs

NRC Exam ILT 07-1
SCENARIO ILT-N-2.cae
Written by FRF
Rev 00
Date 10/07

INITIAL CONDITIONS

Sets APRM Master gain pot to 1.0
irf niagain 1.0

Overrides W. LPCI/CS sump alarm OFF
imf ser0557 off

EVENT TRIGGERS

Event Trigger 1 sets gain for all 6 APRMs.
trgset 1 "0"
trg 1 "irf niagainf true"

Event Trigger 2 Drifts CRD L-06 into the core.
Trgset 2 "0"
imf rod106di (2)

Event Trigger 3 fails drywell to torus DP controller demand downscale.
trgset 3 "0"|2
ior pcvdmd14 (3) 0.0|2

Event Trigger 4 Causes master recirc flow controller to fail downscale.
trgset 4 "0"|2
imf rmasdnd (4) 0.3 2:00 0.8|2

Event Trigger 5 inserts the following malfunctions:
Forces up alarm 902-7 B-15, SCREEN WASH CONTROL PANEL TROUBLE, on high screen DP.
Shear pin failure of both Circ Water Bay 1 traveling screens.
2/3 Intake clogging.
trgset 5 "0"|2
imf ser0803 (5) on|2
imf cwmsc01f (5)|4
imf cwmsc07f (5)|4
imf cwmscdep (5 2:00) 10.0 2:00 100.0|4

Event Trigger 6 Activates when 2A Circ Wtr PP is stopped.
Deletes 2/3 Intake clogging.
trgset 6 "(.not. cwscwp(1))"|4
trg 6 "dmf cwmscdep"|4

Event Trigger 7 causes air leak into main cond.
trgset 7 "rpdmode4_drw"|6
imf hp5 (7) 5.0|6

Event Trigger 8 inserts an ECCS suction line break.
trgset 8 "0"|6
trg 8 "ramp wamwips 200.0 201.0 1:00:00"|6
imf csbrksev (8) 100.0|6
imf cspbbbrk (8) 100.0|6

```
# Event Trigger 9 Inserts a spurious HPCI initiation.  
trgset 9 "0"|8  
imf hpinit (9)|8  
  
# END
```

Date: TODAY

Unit 2 Turnover

Online Information

830 MWe

Online Risk: Green

Risk Equipment:

Protected Pathway(s)

Shutdown Information

Time to Boil: 0

Shutdown Risk: N/A

Reactivity Management

Limit: MFLCPR 0.78 Increasing slowly

Action Level: 0.98

S/D Method: DGP 02-01

Unit 2 Priorities

Start 2B RBCCW Pump and secure 2/3.
Operate for TSO.

LCORAs

LCORA None
Title

Start
Clock Ends

Compensatory Actions

Degradation
Documentation

Frequency
Responsible

Compensatory Action

Unit 2 Conditions, Status, Abnormalities

Load was dropped per the TSO. Expected to remain at this load until next shift.
2B RBCCW pump oil has been changed; need to start 2B and secure 2/3 for oil change.

Unit 2 Abnormal Component Position

None

U2 Open Operability Determinations with Compensatory Actions

Shift 1 Activities (X = Completed)

Shift 2 Activities

 DOP 3700-02

Shift 3 Activities

Common Unit Activities

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Unit 2 Procedures in Progress (Non-Surveillances)

None

Unit 2 Surveillances in Progress

None

Date: TODAY

Unit 3 Turnover

Online Information

912 MWe

Online Risk: Green

Risk Equipment:

Protected Pathway(s)

Shutdown Information

Time to Boil: 0

Shutdown Risk: N/A

Reactivity Management

Limit: MFLCPR 0.78 Increasing slowly

Action Level: 0.980

S/D Method: DGP 02-01

Unit 3 Priorities

Maintain load per TSO direction.

LCORAs

LCORA # None
Title

Start
Clock Ends

Compensatory Actions

Degradation
Documentation

Frequency
Responsible

Compensatory Action

Unit 3 Conditions, Status, Abnormalities

Unit 3 Abnormal Component Position

U3 Open Operability Determinations with Compensatory Actions

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Common Unit Activities

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Unit 3 Procedures in Progress (Non-Surveillance)

None

Unit 3 Surveillances in Progress

None

Dresden Generating Station

ILT-N-3

REDUCE REACTOR POWER USING RECIRCULATION FLOW

CRD FLOW CONTROLLER FAILURE

EMERGENCY DIESEL GENERATOR INOPERABLE

HPCI ISOLATION WITH FAILURE TO ISOLATE

LOSS OF CRD PUMP

LOSS OF FEEDWATER / MANUAL SCRAM

LOSS OF RPV LEVEL INDICATION / RPV FLOODING

Rev. 00

10/07

Developed By:

Exam Author

Date

Approved By:

Facility Representative

Date

Facility: Dresden Scenario No: ILT-N-3 Op-Test No: 2008-301

Examiners: _____ Operators: _____

Initial Conditions: Rx Power ~ 75%.

Turnover: Reduce power with Recirc flow per DGP 3-1, to accommodate TSO request.

| Event No. | Malf. No. | Event Type* | | Event Description |
|-----------|---|-------------|-------------|---|
| 1 | NONE | R | NSO SRO | Reduce power with Recirc flow |
| 2 | RDFCFHI | I | NSO SRO | CRD Flow Controller Fails Low |
| 3 | SER1589 SER0710 T18 | C | ANSO SRO | U2 Emergency Diesel Generator Inoperable due to cooling water pump failure ^T |
| 4 | HPPG4RLY AT46 | I | ANSO SRO | HPCI Isolation with Failure to Isolate ^T |
| 5 | RDPPBTRP | C | NSO SRO | CRD Pump Trip |
| 6 | H32/H33/H34 | M | TEAM | Loss of Feedwater Causing a Manual Scram |
| 7 | AT1 NVM100AP NVML29AP NVML29BP NVM106BP NVML112P | M | TEAM | Loss of level indication / Flooding |

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (T)ech Spec call

Scenario Objective

Evaluate the crew's ability to perform during a loss of RPV water level instrumentation.

Scenario Summary

Initial Conditions:

- ~75% power.

Scenario Sequence

- The Team reduces reactor power using recirculation flow as directed by the TSO.
- The indicated flow to the CRD Flow Controller fails high. This causes the controller demand to the CRD FCV to fail low. If the team does not recognize the failure quickly and restore CRD cooling flow, the ROD DRVE HI TEMP alarm comes up. The Team takes manual control of the CRD Flow Controller to restore system parameters to normal.
- The Unit 2 Emergency Diesel Generator (EDG) cooling water pump breaker fails rendering the EDG Inoperable.
- A HPCI steam flow GP 4 isolation instrument fails causing an isolation signal. The HPCI steam valves fail to isolate and the Team manually closes them. The SRO addresses Tech Spec requirements.
- 2B CRD pump begins to degrade. (Simulated binding of the pump) The NSO will swap CRD pumps, placing 2A CRD pump in service.
- A trip of a RFP with failure of the standby RFP results in dropping RPV level. The Team manually scrams the reactor.
- After the Team has the plant stabilized, RPV level indication will fail. The Team will perform RPV flooding.

Event One – Reduces Reactor Power Using Recirculation Flow

- The Team reduces reactor power using recirculation flow as directed by the TSO.

Malfunctions required: 0

- None

Success Path:

- Reduces reactor power using recirculation flow.

Event Two – CRD Flow Controller Failure

- Indicated flow to the CRD Flow Controller fails high. This causes the controller demand to the CRD FCV to fail low.

Malfunctions required: 1

- (Indicated flow to the CRD Flow Controller fails high)

Success Path:

- The crew takes manual control of the CRD Flow Controller.

Event Three – Emergency Diesel Generator Inoperable

- The Unit 2 EDG cooling water pump breaker fails rendering the EDG Inoperable.

Malfunctions required: 1

- (U2 EDG cooling water pump breaker trip)

Success Path:

- Places U2 EDG control switch to STOP.
- Determines Technical Specifications requirements.

Event Four – Spurious HPCI Initiation

- HPCI steam flow GP 4 isolation instrument fails causing an isolation signal. The HPCI steam valves fail to isolate.

Malfunctions required: 1

- (HPCI Isolation with Failure to Isolate)

Success Path:

- The Team isolates the HPCI steam supply.

Event Five – Loss of CRD Pump

- 2B CRD pump begins to degrade as evidenced by changing CRD system parameters and an accumulator charging water low pressure alarm. When sent to check, the NLO reports that the 2B CRD pump is making a loud grinding noise. The NSO will swap CRD pumps, placing 2A CRD pump in service. If the operators do not swap CRD pumps in a timely manner, 2B CRD pump eventually trips.

Malfunctions required: 1

- (CRD pump binding) (Trip if NSO does not swap pumps in a timely manner.)

Success Path:

- NSO swaps running CRD pumps.

Event Six - Loss of Feedwater / Manual Scram

- A small steam leak upstream of the restrictors occurs.

Malfunctions required: 1

- Small steam leak before restrictors.

Success path:

- Performs a manual scram.

Event Seven – Loss of RPV Water Level Indication / RPV Flooding

- The Team recognizes and responds to loss of RPV level indication.

Malfunctions required: 1

- (Failure Of RPV Level Indication)

Success Path:

- The Team performs RPV Flooding.

PRE-SCENARIO ACTIVITIES

- 1 If applicable, conduct pre-scenario activities in accordance with TQ-AA-106-0107, SIMULATOR EXAMINATION BRIEFING.
 - a. Provide the crew with a copy of DGP 03-01, Power Changes.
 - b. Direct the crew to perform their briefs prior to entering the simulator.

- 2 Simulator Setup (the following steps can be done in any logical order)
 - a. Initialize simulator in an IC 12.
 - b. Insert Step 27 (Seq. XS.1.1) to position 12.
 - c. Adjust recirculation flow to establish ~680 MWe.
 - a. Verify 2A RFP is running.
 - b. Verify 2C RFP is running on Bus 22.
 - c. Verify 2B RFP is in STBY.
 - d. Verify 2A, 2B and 2C Condensate pumps are running.
 - e. Place 2D Condensate pump in STBY.
 - f. Verify 2B CRD pump running with 2A CRD pump off.
 - g. Verify condensate demin DP is within the normal band. (cut demins in or out as necessary)

NOTE: Complete the above setup before running the CAEP file.

- 3 Run the initial setup CAEP file: ILT-N-3.cae
- 4 Verify the following simulator conditions:
 - a. CRD drive water pressure ~260 psid.
- 5 Complete the Simulator Setup Checklist.
- 6 Advance the chart recorders.

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

- √ Critical Tasks
- ⌚ Time Critical Tasks
- 🔑 PRA Key Operator Actions
- Required Actions
- Optional Actions

| Event One – Reduce Reactor Power using Recirculation Flow | | |
|---|-------------|---|
| Trigger | Position | Crew Actions or Behavior |
| | | <p><u>Role Play:</u></p> <p>At the discretion of the Lead examiner, call as the TSO and direct the crew to “reduce load to 620 MWe”.</p> |
| 1 | | <p><u>Floor Instructor / Simulator Operator / Role Play:</u></p> <p>If the team announces that they will adjust gains, inform them an extra NSO will perform the adjustment. Then:</p> <ul style="list-style-type: none"> ❖ Tell the team you are time compressing. ❖ Direct the simulator operator to activate trigger 1 and verify gains within limits. ❖ Inform the team the gains are adjusted. <p>(Note: trigger 1 can be toggled OFF, then back ON as many times as necessary to adjust gains)</p> |
| | | <p><u>Simulator Operator / Role Play:</u></p> <p>NLO to cut out a condensate demin bed: wait 1 min, on simulator instructor station screen FW4 cut out the desired condensate demin bed and then report that “condensate demin bed is cut out”.</p> |
| | US | <ul style="list-style-type: none"> ■ Directs NSO to reduce load with recirc flow to 620 MWe. |
| | NSO | <p>Performs the following actions per DGP 03-01, Power Changes, and DOP 0202-03, Reactor Recirculation Flow Control System Operation, as directed:</p> <ul style="list-style-type: none"> ■ Uses MASTER RECIRC FLOW CONTRL, 2(3)-262-22, potentiometer to reduce flow AND control reactor power. |
| | ANSO | Monitors Panels. |
| <u>Event 1 Completion Criteria:</u> | | |
| <ul style="list-style-type: none"> • Sufficient power decrease as determined by the Lead Examiner. | | |

Event Two – CRD Flow Controller Failure

| Trigger | Position | Applicant's Actions or Behavior |
|---------|-------------|---|
| 2 | | <p><u>Simulator Operator:</u></p> <p>At the discretion of the NRC Chief Examiner, Activate trigger 2, which causes the indicated flow to the CRD Flow Controller to fail high. This causes the controller demand to the CRD FCV to fail low.</p> <p>NOTE: If the team does not recognize the failure quickly and restore CRD cooling flow, the ROD DRIVE HI TEMP alarm comes up after ~ 5 min.</p> <p><u>Simulator Operator:</u></p> <p>If CRD Temperature variable rdgtemp(21) reaches 250.0 deg. F, verify the following automatic triggers:</p> |
| 3 | | <ul style="list-style-type: none"> ❖ Trigger 3: automatically activates when variable rdgtemp(21) is >250.0 deg. F. Forces up alarm 902-5 F-3, ROD DRIVE HI TEMP. |
| 4 | | <ul style="list-style-type: none"> ❖ Trigger 4: automatically activates alarm 902-5 F-3 is up and variable rdgtemp(21) is <245.0 deg. F. Returns alarm 902-5 F-3, ROD DRIVE HI TEMP, TO NORMAL. |
| | NSO | <ul style="list-style-type: none"> ■ From panel monitoring or alarm 902-5 F-3, ROD DRVE HI TEMP, notices and announces loss of CRD system flow. ■ Performs DOA 0300-01, Control Rod Drive System Failure actions as directed: ■ Diagnoses failure of the CRD Flow Controller and takes manual control of it. ■ Restores CRD system flows and pressures to normal. |
| | US | <ul style="list-style-type: none"> ■ Enters and directs performance of DOA 0300-01, Control Rod Drive System Failure. <input type="checkbox"/> Notifies Shift Manager and IMD of CRD Flow Controller failure. |
| | | <p><u>Role Play:</u></p> <p>NLO to check CRD FCV operation: (wait 2 min) Report “ the CRD FCV appears to be operating normally and is at position (Use position displayed on Instructor Station drawing RD2; report as percent)”.</p> <p>NLO to check CRD system flow locally (FI 2-302-56); (wait 1 min) Report “CRD system flow indicates >100 gpm (pegged high)”.</p> <p>NLO to check drive water flow locally (FI 2-302-64): (wait 1 min) Report “CRD drive water flow indicates (same as control room meter)”.</p> <p>NLO to check cooling water flow locally (FI 2-302-65): (wait 1 min) Report “CRD cooling water flow indicates (same as control room meter)”.</p> <p>Respond as groups notified.</p> |
| | ANSO | Monitors panels and assists as directed. |

- Event 2 Completion Criteria:**
- **Team has taken manual control of the CRD Flow Controller.**
 - **OR, at the discretion of the NRC Chief Examiner.**

Event Three – Emergency Diesel Generator Inoperable

| Trigger | Position | Crew Actions or Behavior |
|---------|-----------|--|
| | US | <ul style="list-style-type: none"> ■ Determines following Technical Specifications apply: <ul style="list-style-type: none"> • TS 3.7.2, Diesel Generator Cooling Water (DGCW) System, Condition A.1: Declare associated DG inoperable immediately. • TS 3.8.1, AC Sources—Operating, Condition: <ul style="list-style-type: none"> ❖ B.1: Perform SR 3.8.1.1 for OPERABLE required offsite circuit(s) within 1 hour and once per 8 hours thereafter. ❖ B.3.1: Determine OPERABLE DG(s) are not inoperable due to common cause failure OR B.3.2: perform SR 3.8.1.2 for OPERABLE DG(s) within 24 hours. ❖ B.4: Restore required DG to OPERABLE status within 7 days. |
| | US | <ul style="list-style-type: none"> ❑ Directs performance of DOS 0040-08, Unit 2 Operating Power Sources and Distribution. ❑ Directs Engineering to determine the EDG is not inoperable due to common cause failure OR directs performing operability surveillance for the 2/3 EDG. |

Event 3 Completion Criteria:

- **U2 EDG declared inoperable; and,**
 - **Technical Specification determination completed.**
- OR, at the direction of the Lead Examiner.**

Event Four – HPCI Isolation with Failure to Isolate

| Trigger | Position | Applicant's Actions or Behavior |
|---------|-------------|---|
| 7 | | <p>Simulator Operator:</p> <p>At the discretion of the Lead examiner, activate trigger 7, which causes a HPCI steam flow GP 4 isolation instrument failure resulting in an isolation signal. The HPCI steam valves fail to isolate.</p> |
| | ANSO | <ul style="list-style-type: none"> ■ Announces alarm 902-3 C-12, HPCI Stm Line Flow Hi. |
| | TEAM | <ul style="list-style-type: none"> ■ Determines HPCI GP 4 isolation should have occurred. |
| | US | <ul style="list-style-type: none"> ■ Directs ANSO to close the HPCI GP 4 isolation valves. |
| | ANSO | <ul style="list-style-type: none"> ■ Isolates HPCI as directed: <ul style="list-style-type: none"> ❖ Closes MO 2-2301-4. ❖ Closes MO 2-2301-5. |
| | TEAM | <ul style="list-style-type: none"> <input type="checkbox"/> May enter DEOP 0300-01, Secondary Containment Control. |
| | US | <ul style="list-style-type: none"> <input type="checkbox"/> Notifies Shift Manager and IMD of Event. |
| | NSO | <ul style="list-style-type: none"> <input type="checkbox"/> Monitors panels and assists as directed. |
| | US | <ul style="list-style-type: none"> ■ References Technical Specifications and determines: <ul style="list-style-type: none"> ❖ TS 3.5.1 Action F applies. Verify Isolation Condenser is OPERABLE immediately AND restore HPCI System to OPERABLE status within 14 days. |

Event 4 Completion Criteria:

- **Actions taken to isolate HPCI steam line,**
- **And, Tech Specs addressed**
- **OR, at the direction of the Lead examiner.**

| Event Five – Loss of CRD Pump. | | |
|--------------------------------|-------------|--|
| Trigger | Position | Crew Actions or Behavior |
| 8 | | Simulator Operator: At the discretion of the Lead Examiner, activate trigger 8 . This will cause a simulated binding of the 2B CRD pump over a nine minute period, and finally trip the pump on overcurrent if amps get too high and the crew has not swapped the pump yet. |
| 9 | | Verify trigger 9 automatically activates when the 2B CRD pump breaker opens. This stops the pump binding simulation. |
| | | Role Play: As the NLO, if asked, wait 2 min. and then report: “The 2B CRD pump is making a loud metallic grinding noise, I cannot see any oil in the pump, smoke is starting to come from the pump, and it is very hot”. NSO may follow DOP 0300-01 and have the NLO vent the pump. Wait 1 min, then report: “2A CRD pump has been vented”. |
| | NSO | <ul style="list-style-type: none"> ■ Announces alarm 902-5 F-2, ACCUMULATOR CHARGING WTR PRESS LO, and / or degrading CRD system parameters. Carries out actions of DOA 0300-01, Control Rod Drive System Failure: <ul style="list-style-type: none"> <input type="checkbox"/> Stops any rod motion or power changes. ■ Starts 2A CRD pump. ■ Secures 2B CRD pump. <input type="checkbox"/> Verifies normal CRD system pressures and flow. <input type="checkbox"/> Identifies and reports increasing CRD pump amps. |
| | | Role Play: As the NLO, if asked, report: “2A CRD pump is operating normally”. |
| | SRO | <input type="checkbox"/> Enters DOA 0300-01, Control Rod Drive System Failure, due to failure of 2B CRD pump. |
| | ANSO | Monitors panels and assists as directed. |
| | | Note: If the Team waits until the 2B CRD pump trips, the following actions apply: |
| | NSO | <ul style="list-style-type: none"> ■ Announces 2B CRD pump trip. ■ Per immediate action of DOA 0300-01, Control Rod Drive System Failure, starts the standby CRD pump. |
| | SRO | <ul style="list-style-type: none"> ■ Enters DOA 6500-10, 4KV Circuit Breaker Trip, due to trip of 2B CRD pump. <input type="checkbox"/> May reference TRM 3.3.h, Reactor Vessel Water Level Instrumentation System (RVWLIS) Backfill System, due to short loss of RVWLIS supply. |

Event Five – Loss of CRD Pump.

Trigger

Position

Crew Actions or Behavior

Event 5 Completion Criteria:

- **2A CRD pump has been started and the immediate actions of DOA 300-01 are complete, OR**
- **At the direction of the Lead Examiner.**

Event Six and Seven – Loss of Feedwater / Manual Scram / Loss of RPV Level Indication / RPV Flooding

| Trigger | Position | Crew Actions or Behavior |
|-----------|-------------|--|
| 10 | | <p><u>Simulator Operator:</u> After completion of the previous Event, and at the discretion of the Lead Evaluator, activate trigger 10, which trips 2C RFP. Note: 2B RFP is prevented from starting.</p> |
| | ANSO | <ul style="list-style-type: none"> ■ Reports annunciator 902-6 F-7, RFP Trip. □ Determines Standby RFP did not auto start as expected. □ Attempts to start the Standby RFP. (Unsuccessful) |
| | TEAM | <ul style="list-style-type: none"> ■ Determines that reactor will scram automatically on low RPV level due to insufficient Feedwater flow. |
| | US | <ul style="list-style-type: none"> ■ Directs team to perform a manual reactor scram per DGP 02-03, Reactor Scram. |
| | NSO | <p>Performs DGP 02-03, Reactor Scram, actions as directed:</p> <ul style="list-style-type: none"> ■ Depresses BOTH Scram buttons. ■ Places RX MODE SW in SHUTDOWN. ■ Announces: <ul style="list-style-type: none"> • All Rods In. • RPV level and pressure. □ Verifies Recirc pumps run back to minimum. □ Inserts SRMs and IRMs. □ Controls RPV level as directed. |
| | ANSO | <p>Performs DGP 02-03, Reactor Scram, actions as directed:</p> <ul style="list-style-type: none"> □ Silences annunciators at Panel 902(3) 8, until the NSO reports reactor level and pressure trends. □ Silences Panels 902(3) 54 and 902(3) 65 annunciator alarms. □ Verifies turbine tripped. □ Verifies generator tripped. □ Verifies aux power transfers. |
| 11 | | <p><u>Simulator Operator:</u> After the team has stabilized the unit following the reactor scram, and at the discretion of the Lead Evaluator, activate trigger 11, which:</p> <ul style="list-style-type: none"> • Simulates a trip of the MCC 28-1 supply to ATS Panel 2202-73A which causes loss of MR B and FZ A RPV level instruments. • After 2 min, fails the remaining RPV level instruments. |

Event Six and Seven – Loss of Feedwater / Manual Scram / Loss of RPV Level Indication / RPV Flooding

| Trigger | Position | Crew Actions or Behavior |
|-----------|-------------|---|
| | | <p><u>Role Play:</u></p> <p>When dispatched to the ATS Panel, wait a few minutes, and then report that “all instruments in the top row of panel 2202-73A are downscale and no indicating lights on the top row are lit. All other indications are normal”.</p> <p>NLO sent to MCC 28-1. Wait two minutes then report from MCC 28-1 that “the breaker for circuit 15 is tripped”.</p> <p>If sent to 125 VDC Main Bus Dist. Panel 2A-1 to check breaker 27, report that it is closed.</p> <p>When/if directed to close the ATS Panel supply breaker, wait ~20 seconds, then report that you attempted to reclose the breaker and it immediately tripped again.</p> |
| | ANSO | <ul style="list-style-type: none"> ■ Reports annunciator 902-4 G-20, ATS Div I 2202-73A Trouble, in alarm and references DAN. □ Sends an NLO to inspect ATS panel 2202-73A. □ May direct an NLO to MCC 28-1 to check the feed breaker (circuit 15) to ATS. □ May direct the closure of the ATS Panel power supply breaker. |
| | TEAM | <ul style="list-style-type: none"> □ Begins to determine the equipment affected by loss of the ATS feed. |
| | US | <ul style="list-style-type: none"> □ May refer to DOP 6800-05, Power Restoration to Analog Trip System Feeds to check for restoration requirements. Refers to 12E6822 for affected equipment. |
| | TEAM | <ul style="list-style-type: none"> ■ Determines that RPV level indications are diverging. |
| | US | <ul style="list-style-type: none"> □ Exits DEOP 100 and enters DEOP 0400-01, RPV Flooding, and performs / directs: <ul style="list-style-type: none"> □ Verifying Torus level above 6 feet. ■ √ Opening all 5 ADSVs. ■ Isolating the following steam lines: <ul style="list-style-type: none"> ❖ MSIVs. ❖ Main Steam line drains. ❖ IC. ❖ HPCI. ■ √ Flooding the RPV to the Main Steam lines. ■ Directs defeating the RFP trips. ■ Keeping the RPV flooded to the Main Steam lines with injection flow as low as possible. |
| 12 | | <p><u>Simulator Operator / Role Play:</u></p> <ul style="list-style-type: none"> • Operator to defeat RFP trips: wait 2 min, activate Trigger 12 and the report that “the RFP trips are defeated” |

Event Six and Seven – Loss of Feedwater / Manual Scram / Loss of RPV Level Indication / RPV Flooding

| Trigger | Position | Crew Actions or Behavior |
|---------|-------------------|---|
| | NSO / ANSO | Performs DEOP 400-1, RPV Flooding, as directed: <ul style="list-style-type: none"> <input type="checkbox"/> Verifies Torus level above 6 feet. ■ √ Opens all 5 ADSVs. ■ Isolates the following steam lines: <ul style="list-style-type: none"> ❖ MSIVs. ❖ Main Steam line drains. ❖ IC. ❖ HPCI. ■ √ Floods the RPV to the Main Steam lines. ■ Keeps the RPV flooded to the Main Steam lines with injection flow as low as possible. |
| | NSO / ANSO | <ul style="list-style-type: none"> ■ Slows down RPV injection once ERV tailpipe temperatures drop below saturation and pressure is steady. |
| | US | <ul style="list-style-type: none"> <input type="checkbox"/> Requests IMD to restore RPV level instruments. |

Event 6 & 7 / Scenario Completion Criteria:

- **RPV has been flooded**
- OR,**
- **At the discretion of the Lead Examiner.**

| Critical Tasks: | |
|------------------------|---|
| (RPV 2.1) | When RPV water level cannot be determined, INITIATE emergency depressurization. |
| (RPV 2.2) | When reactor water level cannot be determined, INJECT into the RPV to flood up to the Main Steam Lines. |

REFERENCES

| PROCEDURE | TITLE |
|----------------|--|
| DAN 902-3 C-12 | HPCI STM LINE FLOW HI |
| DAN 902-4 G-20 | ANALOG TRIP SYSTEM TROUBLE |
| DAN 902-5 F-2 | ACCUMULATOR CHARGING WTR PRESS LO |
| DAN 902-5 F-3 | ROD DRIVE HI TEMP |
| DAN 902-6 F-7 | RFP TRIP |
| DAN 902-7 G-8 | U2 DIESEL GEN CLG WTR PP TRIP/LKOUT |
| DAN 902-8 A-7 | U2 DIESEL GEN TROUBLE |
| DEOP 100 | RPV CONTROL |
| DEOP 0300-01 | SECONDARY CONTAINMENT CONTROL |
| DEOP 0400-01 | RPV FLOODING |
| DEOP 0500-02 | BYPASSING INTERLOCKS AND ISOLATIONS |
| DGP 02-03 | REACTOR SCRAM |
| DGP 03-01 | POWER CHANGES |
| DOA 0300-01 | CONTROL ROD DRIVE SYSTEM FAILURE |
| DOA 6500-10 | 4KV CIRCUIT BREAKER TRIP |
| DOA 6600-01 | DIESEL GENERATOR FAILURE |
| DOP 0202-03 | REACTOR RECIRCULATION FLOW CONTROL SYSTEM OPERATION |
| DOS 0040-08 | UNIT 2 OPERATING POWER SOURCES AND DISTRIBUTION |
| TS 3.5.1 | ECCS-OPERATING |
| TS 3.7.2 | DIESEL GENERATOR COOLING WATER (DGCW) SYSTEM |
| TS 3.8.1 | AC SOURCES—OPERATING |
| TRM 3.3.H | REACTOR VESSEL WATER LEVEL INSTRUMENTATION SYSTEM (RVWLIS) BACKFILL SYSTEM |

| EXAM ILT-N-3 QUANTITATIVE ATTRIBUTES | |
|---|---|
| 6 | Total malfunctions inserted (4 to 8) / (10 to 14) |
| 1 | Malfunctions that occur after EOP entry (1 to 4) / (3 to 6) |
| 3 | Abnormal events (1 to 2) / (2 to 3) |
| 2 | Major transients (1 to 2) / (2 to 3) |
| 2 | EOPs used beyond primary scram response EOP (1 to 3) / (3 to 5) |
| 1 | EOPs contingency procedures used (0 to 3) / (1 to 3) |
| 60 | Approximate scenario run time (45 to 60 min) / (one scenario may approach 90 minutes) |
| 40% | EOP run time (40 to 70% of scenario run time) |
| 2 | Crew critical tasks (2 to 5) / (5 to 8) |
| Yes | Technical Specifications exercised (Yes or No) |

Computer Aided Exercise Programs

```
# NRC Exam ILT 07-1
# SCENARIO ILT-N-3.cae
# Written by FRF
# Rev 00
# Date 10/07
```

INITIAL CONDITIONS

```
# Inserts a 2B RFP trip.
imf h32
```

```
# Sets APRM Master Gain pot to 1.0|4
irf niagain 1.0
```

```
# Lifts leads to HPCI GP 4 Isolation Relays
irf hpgp4rly lifted
```

#EVENT TRIGGERS

```
# Event Trigger 1 sets gain for all 6 APRMs to 1.0
trgset 1 "0"
trg 1 "irf niagainf true"
```

```
# Event Trigger 2 inserts a failure high of the indicated flow to the CRD flow controller.
# Sets one of the CRD's enthalpy higher, so alarm 902-5 F-3 comes up sooner.
trgset 2 "0"|2
imf rdcfhi (2)|2
trg 2 "set rdhmech(21) = 190.0"|2
```

```
# Event trigger 3 Activates when CRD temp high is reached.
# Forces alarm 902-5 F-3 up.
trgset 3 "rdgtemp(21) .gt. 250.0"|2
imf ser0973 (3) on|2
```

```
# Event trigger 4 Returns alarm 902-5 F-3 to normal.
trgset 4 "sezpoint(973) .and. (rdgtemp(21) .lt. 245.0)"|4
trg 4 "imf ser0973 normal"|4
```

```
# Event trigger 5 Simulates U2 EDG cooling water pump breaker control power transformer failure:
# Forces up alarm 902-8 A-7, U2 Diesel Gen Trouble.
# Forces up alarm 902-7 G-8, U2 Diesel Gen Clg Wtr PP Trip/lkout.
# Inserts U2 Diesel Gen Clg Wtr PP Trip malfunction.
Trgset 5 "0"|4
imf ser1589 (5) on|4
imf ser0710 (5) on|4
imf t18 (5)|4
```

```
# Event trigger 6 Clears alarm 902-8 A-7, U2 Diesel Gen Trouble.
Trgset 6 "0"|6
trg 6 "imf ser1589 normal"|6
```

```
# Event Trigger 7 Fails HPCI steam flow switch to insert a GP 4 isolation signal.
trgset 7 "0"|6
imf at46 (7) 1038.5|6
```

```
# Event Trigger 8 ramps 2B CRD PP speed lower over 9:00 min.
# This simulates binding of the pump and will result in the pump tripping on overcurrent.
trgset 8 "0"|8
```

```
trg 8 "ramp rdnpump(2) 0.95 0.87 9:00"|6  
imf rdppbtrp (8 8:58)|8
```

```
# Trigger 9 Stops the 2B CRD PP speed ramp when the pump breaker opens.  
trgset 9 "et_array(8) .and. (.not. rdrpump(2))"|8  
trg 9 "ramp rdnpump(2) 0.87 0.10 2"|8
```

```
# Event trigger 10 Trips 2C RFP.  
Trgset 10 "0"|10  
imf h33 (10)|10  
imf h34 (10)|10
```

```
# Event Trigger 11 Blows the fuse for the MCC 28-1 feed to ATS panel 2202-73A.  
# This causes a loss of RPV MR B and FZ A.  
# After 2 min, fails RPV MR A level instrument upscale on 10-minute ramp.  
# After 2 min, fails RPV NR A level instrument to upscale inches on 5-minute ramp.  
# After 2 min, fails RPV NR B level instrument to downscale on 10-minute ramp.  
# After 2 min, fails RPV Wide Range and FZ B level instruments upscale.  
trgset 11 "0"|12  
imf at1 (11)|12  
imf nvm100ap (11 2:00) 150.0 10:00|12  
imf nvml29ap (11 2:00) 75.0 5:00|12  
imf nvml29bp (11 2:00) -75.0 10:00|12  
imf nvm106bp (11 2:00) -400.0|14  
imf nvml112p (11 2:00) 400.0|14
```

```
# Event Trigger 12 bypasses the RFP high level trip.  
trgset 12 "0"|14  
irf fwknife (12) closed|14
```

```
# END
```

Date: TODAY

Unit 2 Turnover

Online Information

680 MWe

Online Risk: N/A

Risk Equipment:

Protected Pathway(s)

Shutdown Information

Time to Boil: N/A

Shutdown Risk: Green

Reactivity Management

Limit: MFLCPR 0.78 Increasing slowly

Action Level: 0.980

S/D Method: DGP 02-01

Unit 2 Priorities

Maintain Load as requested by TSO

LCORAs

| | |
|-------------|------|
| LCORA Title | None |
|-------------|------|

Start
Clock Ends

Compensatory Actions

Degradation
Documentation

Frequency
Responsible

Compensatory Action

Unit 2 Conditions, Status, Abnormalities

At the end of last shift an emergency load drop was performed per DGP 03-01 due to unplanned 345KV line outages at other locations. Reverse sequence was used to insert control rods. The TSO is expected to direct an additional load drop early in the shift. The QNE and the Shift Manager concur that the Emergency Load Drop section of DGP 03-01 should be used for any additional load drop.

Unit 2 Abnormal Component Position

U2 Open Operability Determinations with Compensatory Actions

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Common Unit Activities

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Unit 2 Procedures in Progress (Non-Surveillance)

DGP 03-01, Power Changes

Unit 2 Surveillances in Progress

None

Date: TODAY

Unit 3 Turnover

Online Information

912 MWe

Online Risk: Green

Risk Equipment:

Protected Pathway(s)

Shutdown Information

Time to Boil: 0

Shutdown Risk: N/A

Reactivity Management

Limit: MFLCPR 0.78 Increasing slowly

Action Level: 0.980

S/D Method: DGP 02-01

Unit 3 Priorities

Maintain load per TSO direction.

LCORAs

LCORA # None
Title

Start
Clock Ends

Compensatory Actions

Degradation
Documentation

Frequency
Responsible

Compensatory Action

Unit 3 Conditions, Status, Abnormalities

None

Unit 3 Abnormal Component Position

U3 Open Operability Determinations with Compensatory Actions

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Common Unit Activities

Shift 1 Activities (X = Completed)

Shift 2 Activities

Shift 3 Activities

Unit 3 Procedures in Progress (Non-Surveillance)

None

Unit 3 Surveillances in Progress

None