Dresden Generating Station

ILT-N-1

RAISE POWER USING CONTROL RODS

CONTROL ROD DRIVE OVER TRAVEL

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: _____

               _____   _____

               _____   _____

<u>Initial Conditions</u>: Rx Power ~ 2%.

<u>Turnover</u>: Continue with Unit startup per DGP 01-01.

Event No.	Malf. No.	Event Type*		Event Description
1	NONE	R	NSO SRO	Raise power using Control Rods
2	RODN09UC	C	NSO SRO	Control rod drive over travel ^{T}
3	N33	C	ANSO SRO	Instrument Air Compressor Trip / Start Standby
4	NII12POT	I	NSO SRO	IRM channel fails upscale with partial half scram
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7	RODST I21	M	TEAM	Several control rods remain withdrawn (ATWS) The leak in drywell gets worse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 over travels during control rod withdrawal. The Team fully inserts the control rod and references Technical Specifications.
- 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. A partial half scram occurs and the NSO successfully inserts a manual half scram in RPS CH A. The SRO references licensing documents and authorizes bypassing IRM 12. The NSO bypasses IRM 12.
- A Core Spray 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 Drive Over Travel

- A control rod over travels during control rod withdrawal.

Malfunctions required: 1

- (Over Travel)

Success Path:

- Inserts the Control Rod 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 partial half scram.

Malfunctions required: 1

- (IRM failure upscale with partial half scram).

Success Path:

- The NSO successfully inserts a half scram in RPS CH A manually.
- The crew references appropriate licensing documents and bypasses IRM 12.

Event Five – A Core Spray 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
		Note: The malfunction for control rod N-09 over travel is inserted during scenario set up. Go to the next Event when control rod N-09 is withdrawn.
1		**Floor Instructor / Simulator Operator / Role Play:** If the team announces that they will adjust gains, inform them an extra NSO will perform the adjustment. Then: ❖ 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. (Note: Toggle trigger 1 OFF, then back ON as many times as necessary to adjust gains)
	SRO	Directs pulling control rods. ■ Reviews REMA. ■ Designates second verifier. ■ Directs NSO to pulls rods.
	NSO	Performs the following actions per the following reference use procedures: ❖ DGP 01-01, Unit Startup ❖ DGP 03-04, Control Rod Movements ❖ DOP 0400-01, Reactor Manual Control System Operation Verifies the following prior to moving any control rod: ■ 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. Withdraws rods as follows: ■ 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.

Event One – Power Change with Rods		

Trigger	Position	Crew Actions or Behavior
	XNSO	Performs second verification checks. For first rod in a step: ■ Verifies correct control rod pattern ■ Verifies correct step and array. ■ Verifies RWM rod blocks enabled For all rods moved: ■ 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 1 Completion Criteria:

- **Sufficient power increase, OR**

- **At the direction of the Lead Examiner.**

Event Two – Control Rod Over Travel		
Trigger	Position	Crew Actions or Behavior
		Note: The malfunction for control rod N-09 over travel is inserted during scenario set up.
	NSO	Reports and responds to DANs: • 902-5 A-3 ROD DRIFT • 902-5 B-3 ROD WORTH MIN BLOCK • 902-5 E-3 ROD OVER TRAVEL
	SRO	■ Enters DOA 0300-05, Inoperable or Failed Control Rod Drives. ❑ May reference DOA 0300-12, Mispositioned Control Rod
	NSO	Performs subsequent actions (uncoupled rod with power <10% section) of DOA 0300-05, Inoperable or Failed Control Rod Drives: ■ Bypasses the Rod Worth Minimizer ■ Drives rod N-09 to fully inserted position. ■ Directs electrically AND hydraulically isolating control rod N-09 HCU. ❑ Logs CRD condition per DOS 0300-06, CRD Abnormality Record. ❑ May take rod N-09 OOS on the RWM per DOP 0400-02, Rod Worth Minimizer.
	SRO	■ Declares control rod N-09 inoperable. ■ References appropriate plant licensing documents: • 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	❑ Notifies the Shift Manager, QNE, Work Week Manager, Fin team, IMD, OR EMD.
	ANSO	❑ Monitors panel, provides assistance as directed.
		Role Play: When NLO directed to disarm and isolate control rod N-09, report: "I'll disarm and isolate N-09 after I receive a pre-job brief" (it is not intended for this to be completed). QNE to evaluate core and continuing rod moves: respond "I will evaluate the current core condition and impact on control rod moves".

Event 2 Completion Criteria:

• **DOA 0300-05 actions have been taken.**

• **Technical Specifications have been referenced.**

OR, at the direction of the NRC Lead Examiner.

		Event Three – Loss of Instrument Air

Trigger	Position	Crew Actions or Behavior
2		**Simulator Operator:** At the direction of the Lead Examiner, **activate trigger 2**, which trips the 3C Instrument Air Compressor and inserts a small IA leak to cause pressure to slowly drop.
		Role Play: 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". NLO to check 3C IAC breaker: (Wait 2 min) Report "the 3C IAC breaker is closed and looks normal".
		Role Play: NLO to verify proper operation of 2B IAC: (Wait 2 min) Report "the 2B IAC and 2B IA dryer are operating normally. Valve 2-47359-500, 2B INST AIR DRYER DISCH HDR SV, is closed".
3		**Simulator Operator / Role Play:** NLO to lineup 2B IAC to U2 Instrument Air System, wait 2 min, **activate trigger 3** (simulates opening 2-47359-500) and then report "2B IAC is lined up to U2 Instrument Air System".
4		**Simulator Operator:** Verify **trigger 4 automatically activates** when 2B IAC is started **AND** its discharge valve is opened. This deletes the small IA leak.
	ANSO	Announces alarm 923-1 B-5, U2 OR U3 INST AIR COMP TRIP: ❑ Reports 3C IAC tripped ❑ Directs an NLO to investigate the cause of the 3C Instrument Air Compressor trip. ❑ May send a NLO to check 3C IAC breaker.
	SRO	❑ May enter DOA 4700-01, Instrument Air System Failure. ❑ Directs ANSO to perform DOP 6700-20, 480 Volt Breaker Trip. ❑ May direct performing DOP 4700-01, Instrument Air System Startup to start 2B IAC.
	ANSO	Performs DOA 4700-01, Instrument Air System Failure, as directed: ■ Directs NLO to lineup 2B IAC to the Instrument Air system per DOP 4700-01, Instrument Air System Startup. ■ Starts the 2B IAC. ❑ Directs an NLO to verify proper operation of 2B IAC. ❑ Performs DOP 6700-20, 480 Volt Breaker Trip.
		Note: If actions are delayed long enough, the U-2 service air to instrument air x-tie valve may open. Then the following actions apply.

		Event Three – Loss of Instrument Air

Trigger	Position	Crew Actions or Behavior
	ANSO	Announces alarm 923-1 F-4, U2 INST AIR PRESS LO: ❑ Sends a NLO to verify AO 2-4701-500, U2 Serv air to Inst Air Auto X-tie Vlv, opened. ❑ After U2 Instrument Air header pressure returns to normal, sends a NLO to reset AO 2-4701-500.
		Role Play: 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".
5		**Simulator Operator / Role Play:** NLO to reset the U-2 service air to instrument air x-tie, wait 2 min, **activate trigger 5** and then report "the U-2 service air to instrument air x-tie is closed".

Event 3 Completion Criteria:

Unit 2 Standby IAC started and supplying IA system,

   OR,

At the discretion of the Floor Instructor / Lead Evaluator.

Event Four – IRM Channel 12 Fails Upscale.

Trigger	Position	Crew Actions or Behavior
6		**Simulator Operator:** At the discretion of the Lead Examiner, activate **trigger 6**, which fails IRM 12 channel upscale and prevents a full RPS CH A half scram (setup in initial conditions) from coming in.
	NSO / ANSO	Acknowledges, announces, and performs actions for 902-5 DANs A-5, B-11, C-3, and C-15. ■ 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. ■ Manually inserts RPS CH A half scram per DOA 500-02, Partial ½ or Full Scram Actuation. ❑ 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	■ 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	■ 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.

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
7		**Simulator Operator:** At the discretion of the NRC Lead Examiner, activate **trigger 7**, which closes ECCS Keep Fill to 2A Core Spray loop and cracks open CS 4A valve to bleed the pressure down.
		Role Play: NLO to investigate ECCS Jockey pump. (wait 3 min.) Report, "the ECCS jockey pump appears to be operating normally but I hear flow noise". If asked, wait 2 minutes Report, "The 2A Core Spray relief valve RV 2-1402-28A appears to be leaking by". If asked local CS system pressure, Wait 1 minute, Report, "Local CS system pressure is approximately (Use pressure from instructor station drawing CS1) psig. If sent to vent system: Report, "No water is coming out the vent." If calling radwaste to ask about RBEDT levels: Report, "The input rate to the Unit 2 RBEDT has increased, level is currently 60%."
	ANSO	Reports alarm to SRO. Carries out actions of DAN 902-3 D-7, 2A/B CORE SPRAY HDR PRESS LO: ❑ Verify FLOW TEST VLV MO 2-1402-4A is fully closed. ❑ Verify PP DISCH VLV MO 2-1402-24A is fully open. ❑ 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. ❑ Notify Operations Shift Supervisor. ❑ Directs an Equipment Attendant to inspect ECCS jockey pump for proper operation. ■ Places 2A CS pump in PTL.
	NSO	❑ Assists ANSO with carrying out actions of DAN as necessary.
	SRO	❑ 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. ❑ May direct closing keepfill to 2A Core Spray system. (2-1425-500 or 2-1402-36A) ❑ 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
8		<u>**Simulator Operator:**</u> At the discretion of the NRC chief examiner, activate **trigger 8**, which causes a small Main Steam line leak to develop in the Drywell.
	NSO / ANSO	■ Recognizes and announces that Drywell pressure is slowly rising. Performs the following actions per DOA 0040-01 Slow Leak, as directed: ❑ Maintain Level with FWLCS (immediate action). ❑ Notifies Shift Supervisor and Rad Protection. ❑ Monitors for EP conditions. ❑ Directs search for leak. ❑ Shutdown H_2 Addition. ❑ Makes PA announcement. ❑ Monitors leakage rate, reactor water level, and Drywell pressure. ❑ Verify Crib House inlet temperature is <95°F. ❑ Initiates Torus cooling per "Hard Card". ■ Inserts manual reactor scram as directed.
		<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".
	SRO	❑ Enters and directs performance of DOA 0040-01, Slow Leak. ❑ Sets Scram contingency of 1.5 psig DW pressure. ■ Prior to reaching the Drywell Pressure scram setpoint, enters DGP 02-03, Reactor Scram, and directs a manual reactor scram.
	NSO	Performs the following actions per DGP 02-03, Reactor Scram, as directed: ■ Presses scram pushbuttons ■ Places mode switch in shutdown ■ Check rods inserted. ■ Determines several control rods are not inserted. ❑ Initiates ARI ■ Announces ATWS condition and RX power is <6%. ❑ Verifies Recirc Pumps run back. ❑ Maintains RPV/L between +25 and +35 inches or as directed by Unit Supervisor. ❑ Inserts SRM/IRMs.

Event Six - Small Steam Leak in Drywell / Manual Reactor Scram		
Trigger	Position	Crew Actions or Behavior
	ANSO	❑ Performs DGP 02-03, Reactor Scram, as directed.
	TEAM	Verifies the following as time allows: ❑ Group Isolations ❑ Automatic start of ECCS systems ❑ Automatic start of EDGs.

<div align="center">

Event 6 Completion Criteria:

</div>

- **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
		NOTE: This event starts automatically when the TEAM manually scrams in the previous Event.
	SRO	■ Enters DEOP 100, RPV Control, as directed by DGP 02-03, Reactor Scram. Due to ATWS report, exits DEOP 100, enters DEOP 0400-05, Failure to Scram and performs/directs the following: ■ Inhibiting ADS. ■ Placing Core Spray in PTL. ❑ Verification of all isolations, ECCS and EDGs start. ■ Holding Reactor water level +8" to +48". ■ √ Inserting control rods. **(RPV 6.1)** ■ Maintaining RPV pressure <1060 psig.
	ANSO	■ Inhibits ADS. ■ Places Core Spray in PTL. ■ Controls RPV pressure as directed.
	NSO	√ 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
10 11		<u>Simulator Operator / Role Play:</u> Operator to install scram jumpers: wait 3 min, activate **trigger 10**, and then report ´the scram jumpers are installed". Operator to install GP 1 -59 in. and Off Gas Hi Hi Rad jumpers: wait 3 min, activate **trigger 11**, and then report "the GP 1 -59 in. and Off Gas Hi Hi Rad jumpers are installed".
14 thru 29		<u>Simulator Operator:</u> 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: **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.
	SRO	■ When control rods are inserted, exits DEOP 0400-05 and enters DEOP 100.

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

Trigger	Position	Crew Actions or Behavior
9		**Simulator Operator:** After the Team has inserted several of the control rods and / or at the discretion of the Lead Examiner, activate **Trigger 9** which increases the leak size enough to drive the Team to spray the Drywell.
	TEAM	Reports Drywell pressure increasing at a faster rate.
	SRO	Enters DEOP 0200-01, Primary Containment Control, when Drywell pressure reaches 2 psig and performs/directs: ❑ Verifying of Torus water level <27.5 ft. ❑ Initiation of Torus sprays. ❑ Monitoring of Drywell temperature (Drywell sprays may be initiated for temperature control) ❑ Monitoring Torus Temperature and initiation of Torus cooling. ❑ Monitors Torus level.
	ANSO	Performs DEOP 0200-01, Primary Containment Control, actions as directed: ❑ 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: ❑ Verification of DSIL ❑ Tripping of recirc pumps ❑ Tripping of DW coolers ■ √ Initiation of DW sprays **(PC-5.1)**
	ANSO	■ √ 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: ❑ Operations Manager ❑ Shift Operating Supervisor ❑ Duty Maintenance Supervisor ❑ Duty Engineering Manager ❑ 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 902-5 E-3	ROD OVER TRAVEL
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 0300-05	INOPERABLE OR FAIL CONTROL ROD DRIVES
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 4700-01	INSTRUMENT AIR SYSTEM STARTUP
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 rodf05st
imf rodh05st
imf rode06st
imf rodg06st
imf rodf07st|2
imf rodg07st|2
imf rodh07st|2
imf rode08st|2
imf rodg08st|4
imf rodf09st|4
imf rodg09st|4
imf rodh09st|4
imf rodg10st|6
imf rode12st|6
imf rodf11st|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

Inserts control rod N-09 uncoupled malfunction.
imf rodn09uc|10

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 an IAC trip and IA leak to cause pressure to slowly drop.
trgset 2 "0"|12
imf n33 (2)|12
imf np2 (2) 12.0|12

Event trigger 3 Opens 2B IAC Disch vlv.
trgset 3 "0"|12
irf vp2 (3) 100.0|12

Event trigger 4 Activates when trigger 3 is active, 2B IAC is started and its disch vlv is open.
Deletes the IA leak malfunction.
trgset 4 "et_array(2) .and. iascomp(2) .and. (iar471d .gt. 0.9)"|14
trg 4 "dmf np2"|14

Event Trigger 5 Resets U2 SA to IA X-tie valve.
trgset 5 "0"|14
irf ia1 (5) reset|14

Event Trigger 6 fails IRM 12 upscale
trgset 6 "0"|14
imf nii12pot (6) 125|14

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

Event Trigger 8 Inserts a steam leak upstream of the restrictors
trgset 8 "0"|20
imf i21 (8) 0.003 5:00 0.002|20

Event Trigger 9 Increases the size of the steam leak upstream of the restrictors.
trgset 9 "0"|20
trg 9 "mmf I21 0.25"|20

Event Trigger 10 installs scram jumpers
trgset 10 "0"|20
irf rpjumpas (10) on|20

Event Trigger 11 installs MSL Group 1 RPV level byp and Offgas High Rad byp jumpers.
trgset 11 "0"|20
irf ci59jp (11) in|22
irf ogogjp (11) 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 rodf07st"|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 rodf09st"|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-12.
trgset 28 "rdlselw(143) .and. (rds303em .or. rds302in) .and. (rddpdriv .gt. 250.0)"|58
trg 28 "dmf rode12st"|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 rodf11st"|28


# END
```

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** | None | | **Start** |
| **Title** | | | **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.
The QNE recommends single notching control rod move step 36 out to rod position 32. This is to avoid short periods due to proximity of the rods to the SRMs.

Unit 2 Abnormal Component Position

U2 Open Operability Determinations with Compensatory Actions

Shift 1 Activities (X = Completed)	**Shift 2 Activities**	**Shift 3 Activities**
☐	☐ DGP 01-01	☐
☐	☐ DOP 5600-06	☐

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

Unit 3 Turnover

Online Information	Protected Pathway(s)	Shutdown Information

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

<u>Unit 3 Priorities</u>

Maintain load per TSO direction.

LCORAs

| **LCORA #** None | **Start** |
| **Title** | **Clock Ends** |

<u>Compensatory Actions</u>

<u>Degradation</u> **Documentation**	**<u>Frequency</u>** **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: <u>Dresden</u>   Scenario No: <u>ILT-N-2</u>   Op-Test No: <u>2008-301</u>

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

<u>**Scenario Objective**</u>

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

<u>**Scenario Summary**</u>

Initial Conditions:

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

<u>**Scenario Sequence**</u>

- 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.

<u>**Event One – Swap RBCCW Pumps**</u>

- The crew swaps RBCCW pumps.

Malfunctions required: 0

- None.

Success Path:

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

<u>**Event Two – Control Rod Begins to drift in**</u>

- 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.   Perform the following to establish conditions necessary for the "Drywell to Torus Differential Pressure Controller Failure" Event to work best:

        1)   Change the setpoint for the Drywell to Torus Differential Pressure Controller to 1.10 psid.

        2)   Change the setpoint for the Drywell Pressure Controller to 1.10 psig.

        3)   If Drywell pressure is <1.20 psig, then:

            a)   Place the Drywell Pressure Controller in MAN and adjusts the controller for full demand (100%)

            b)   When Drywell pressure reaches 1.20 psig, place the Drywell Pressure Controller in AUTO.

    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		**Floor Instructor / Simulator Operator / Role Play:** If the team announces that they will adjust gains, inform them an extra NSO will perform the adjustment. Then: ❖ 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. (Note: trigger 1 can be toggled OFF, then back ON as many times as necessary to adjust gains)
		Role Play: NLO to Verify proper oil levels for the 2B RBCCW pump: wait 1 min, then report "2B RBCCW pump oil levels are normal" NLO to verify RBCCW system parameters are normal: wait 1 min, and then report "RBCCW system parameters are normal".
	US	❑ Directs the ANSO to start 2B RBCCW pump and shutdown the 2/3 RBCCW pump.
	ANSO	Performs DOP 3700-02, Reactor Building Closed Cooling Water System Operation: ❑ 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. ❑ Directs NLO to verify RBCCW system parameters are normal.

Event 1 Completion Criteria:

- **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		**Simulator Operator:** At the discretion of the Lead Examiner, activate **trigger 2**, which initiates Control Rod L-06 to drift in.
		Role Play: 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". If asked Temp: 240°F with heat gun.
	NSO	Announces alarms for the Control Rod L-06 and refers to the following DANs: ■ 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	Performs actions of DOA 0300-05, Inoperable or Failed CRDs ■ Takes the RWM switch to Bypass. ■ Inserts the rod to 00 using Emergency Rod In switch.
	NSO	After rod L-06 has been fully inserted, may take rod L-06 out of service on RWM per DOP 0400-02, Rod Worth Minimizer, as directed by Unit Supervisor: ❑ 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	Performs actions of DOA 0300-12, Mispositioned CRD: ❑ 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	❑ 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	■ 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 :
		
		■ TS 3.1.3 condition C, required action:
		
		   ❖ 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	❑ 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. If the Team responds quickly, the Tech Spec entry condition will not be reached. A Tech Spec call is included at the end of this Event to be used if needed.
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: ■ 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: ❏ Placing the drywell torus differential pressure controller to MAN and controlling Drywell to Torus differential pressure manually; (is unsuccessful) **Note:** Any of the 3 actions below will be successful. ■ May direct opening/closing AO 2-1601-58 per DOP 1600-05, Primary Containment Inerting and Atmosphere Control, as necessary. ■ AND / OR, venting to 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. ❏ May notify Work Week Manager.
		Role Play: Chemistry for most recent Drywell sample results: Wait 2 min, the call and report "The more recent Drywell sample results are one hour old and are: ❖ Beta Gamma 7.5×10^{-10} ❖ Iodine 5.5×10^{-10}

Event Three – Drywell to Torus Differential Pressure Controller Failure.		

Trigger	Position	Crew Actions or Behavior

	ANSO	Performs any of the following as directed:
		
		❑ Places the drywell to torus differential pressure controller to MAN and observes demand appears to follow. However, DP continues to drop. (Unsuccessful)
		
		Note: Any of the 3 actions below will be successful.
		
		■ AND / OR, Open/close TORUS M-U VLV, AO 2(3)-1601-58 per DOP 1600-05, Primary Containment Inerting and Atmosphere Control, as necessary.
		
		■ AND / OR, vents the torus to Reactor Building Ventilation per DOP 1600-05, Primary Containment Inerting and Atmosphere Control:
		
		   • Closes or verifies closed TORUS M-U VLV, AO 2(3)-1601-58.
		
		   • Verifies the DW PRESS CONTLR, PIC 2(3)-8540-1 is in AUTO with the setpoint at approximately 1.1 psig.
		
		   • At the DW/TORUS DP CONTLR, 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).
		
		■ AND / OR, directs an operator to open Drywell to Torus DP PCV bypass 2-8599-558.

	NSO	Monitors panels and assists as directed.
		Role Play: 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)

	SRO	■ Determines following Technical Specifications apply:
		
		   • 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.

		Note: If a Tech Spec entry condition was not reached, then continue below to force a Tech Spec entry.
		Role Play: Call the control as the U2 NLO and report, "Both the inner and outer U2 Reactor Building Truck Interlock doors are blocked open with an air hose running through them". NLO to have the doors unblocked and closed: Wait 5 min, then report, Both the inner and outer U2 Reactor Building Truck Interlock doors are blocked closed".
	NSO	■ Receives report that both the inner and outer U2 Reactor Building Truck Interlock doors are blocked open. ■ Directs NLO to close the doors.

	Event Three – Drywell to Torus Differential Pressure Controller Failure.	

Trigger	Position	Crew Actions or Behavior
	SRO	■ References Technical Specifications and determines: ❖ TS 3.6.4.1.A: Determines must restore Secondary Containment within 4 hours.
	SRO	❑ Notifies appropriate departments.

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		**Simulator Operator:** When the ANSO is NOT near the 902-4 panel and at the discretion of the Lead Examiner, activate **trigger 4**, which will cause Master Recirc Flow Controller to fail downscale.

	NSO	▪ Determines and announces Recirculation Flow transient occurring by observing any of the following:
		
		    o Decrease in Recirc Loop Flow as indicated on FR 2-260-7.
		
		    o Decrease in Rx Power indicated on WI 2-6040-59.
		
		    o Decrease in Core Flow and DP on DPR/FR 2-263-110.
		
		    o Decrease in Total Stm Flow on UR 2-640-27.
		
		    o Decrease in Rx Pressure on P/FR 2-640-28.
		
		    o Decrease in Total Feedwater Flow on UR 2-640-26.
		
		    o Decrease in Power Level on RR 2-750-10A/D, & RR 2-750-10B/C.

	SRO	▪ Enters DOA 0202-03 Reactor Recirc System Flow Control Failure. ❑ May enter DGA 07, Unpredicted Reactivity Addition.
	NSO	Performs the following actions per DOA 0202-03, Reactor Recirc System Flow Control Failure: ▪ 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	Completes actions of Recirc M-G Lockout in DOP 0202-12, Recirculation Pump Motor Generator Set Scoop Tube Operation.
		
		❑ 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:
		
		    • 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 (30%):
		
		    • 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.

Event Four – Master Recirc Flow Controller Fails Downscale		
Trigger	Position	Crew Actions or Behavior
	ANSO	❑ Assist NSO as directed.
	SRO	❑ 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: ❑ Shift Manager ❑ WEC Supervisor ❑ Operations Manager ❑ Shift Operating Supervisor ❑ Duty Maintenance Supervisor ❑ Duty Engineering Manager ❑ Work Week Manager

<div align="center">

Event 4 Completion Criteria:

</div>

- **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 **6**		**Simulator Operator:** 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) When 2A Circ Water pump is manually tripped, verify **trigger 6** automatically activates. This stops the intake clogging.
7		**Simulator Operator:** 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.
	ANSO	■ Announces alarm 902-7 B-15, Screen Wash Control Panel Trouble. ■ Sends an operator to investigate.
	SRO	■ 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	■ Performs DOA 4400-06, 2/3 Cribhouse Screen Plugging, and DOA 4400-01, Circulating Water System Failure, actions as directed: ■ Monitors: 　• Condenser Vacuum 　• Circ Water Pump/System operation 　• Service Water Pump operation.
		Role Play: NLO to cribhouse: Wait 2 min. then report: • "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	❑ 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
		Role Play: 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". 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".
		Role Play: NLO at cribhouse: about 2 min. after 2A Circ Water pump is tripped, report, "the amount of debris entering the 2/3 intake is unchanged.
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		**Simulator Operator:** At the direction of the Lead Examiner activate **trigger 7**, which causes an air leak into the Main Condenser.
		Role Play: Acknowledge requests as support personnel.
	NSO / ANSO	❑ May diagnose slowly decreasing vacuum by observing condenser vacuum recorder or increase in SJAE / Off Gas flow.
	NSO / ANSO	Announces the following alarms indicating continued air leakage: ❑ 902-54 B-6, ADSORBER VESSELS DP HI ❑ 902-54 C-7, OFF GAS FLOW HI/LO ❑ 902-7 C-13, 2A OFF GAS SYS FLOW HI/LO. ❑ 902-7 D-13, OFF GAS FILT DP HI ❑ 902-7 H-3, TURB VACUUM LO. ❑ 902-5 F-5, CONDR VACUUM LO.
	SRO	❑ Directs team to enter and execute DOA 3300-02, Loss of Condenser Vacuum
	NSO	If directed, performs DOA 3300-02, Loss of Condenser Vacuum: ❑ Trips Hydrogen addition, ❑ Checks condenser water box DP, ❑ Verifies Turbine Vacuum Breaker closed.
	SRO	❑ May direct team to perform scram preparations per DGP 02-03, Reactor Scram.
	NSO	If directed, performs scram preparations per DGP 02-03, Reactor Scram: ❑ Reduces FCL to <93%. ❑ Scoop tubes are locked, so recirc flow CANNOT be reduced. ❑ Starts motor suction pump and turning gear oil pump. ❑ Trips hydrogen addition.
	SRO	❑ May direct team to insert CRAM rods for Emergency Load Reduction per DGP 03-04, Control Rod Movements.
	NSO	❑ If directed, inserts CRAM rods.
	SRO	▪ Directs team to scram the reactor per DGP 02-03, Reactor Scram, before the vacuum scram setpoint is reached.
		Note: When the Mode Switch is place to SHUTDOWN, the next Event automatically begins.

Events Six –Loss of Main Condenser Vacuum / Manual Scram		

Trigger	Position	Crew Actions or Behavior

	NSO	Performs the following actions per DGP 02-03, Reactor Scram, and DEOP 100, RPV Control, as directed:
		
		■ Places Mode Switch to Shutdown and depresses the Scram pushbuttons.
		
		■ Checks rods inserted.
		
		■ Announces*:*
		
		    • 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.**.**

	ANSO	Performs DGP 02-03, Reactor Scram, actions as directed: ❑ 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.
	SRO	Enters DEOP 100, RPV Control: ■ 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		**Simulator Operator:** Verify **trigger 8** automatically activates when the Mode Switch is placed to S/D. This starts an ECCS suction line break in the torus basement. **Note:** It takes about 20 minutes for torus level to reach 11 feet. *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.*
	ANSO	■ Reports the following alarms: • 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).
		Role Play: 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)". 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". As the NLO sent to report LPCI corner status (wait 2 min), then report: "there is no water in either LPCI corner room". As Maintenance sent to determine if the leak can be stopped (wait 3 min), then report: "Maintenance cannot stop the leak".
	SRO	❑ May enter DOA 0040-02, Localized Flooding in Plant.
	ANSO	Performs the following actions per DOA 0040-02, Localized Flooding in Plant, as directed: ■ Makes PA announcement. ■ Directs NLO to investigate leakage to torus basement. ❑ Notifies Radiation Protection and Security as time permits.
		Cue: (if desired for time compression) (to be handled by Lead Examiner) 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.

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

Trigger	Position	Crew Actions or Behavior
9		**Simulator Operator:** 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.
	SRO	Enters and directs performance of DEOP 0200-01, Primary Containment Control: ❑ May attempt to add water to the Torus by opening the HPCI 14 valve. ❑ May decide to anticipate RPV Blowdown: • Directs opening turbine bypass valves. ■ √ Directs ANSO to prevent HPCI from operating before torus level reaches 12 feet.
	ANSO	Performs the following actions per DEOP 200-01, Primary Containment Control, as directed: ❑ 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	Enters DEOP 0300-01, Secondary Containment Control, and directs: ❑ If Reactor Building Ventilation isolates when unit is scrammed, directs restarting Reactor Building Ventilation.
	ANSO	Performs DEOP 300-01, Secondary Control, as directed: ❑ Time permitting, restarts Reactor Building Ventilation (if it isolates when the reactor is scrammed).
	ANSO	■ Opens turbine bypass valves. (if directed)
		Cue: (if time compression was used above) 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.
	SRO	When informed that torus level is approaching 11 feet: Enters DEOP 0400-02, Emergency Depressurization, and directs: ■ 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: ■ 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
DGP 03-04	CONTROL ROD MOVEMENTS
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 0400-02	ROD WORTH MINIMIZER
DOP 3700-02	REACTOR BUILDING CLOSED COOLING WATER SYSTEM OPERATION
DOP 4400-02	CIRCULATING WATER SYSTEM STARTUP AND SHUTDOWN
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

PROCEDURE	TITLE
TS 3.6.2.5	DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESZSURE
TRM 3.6.c	DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE

	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 rodl06di (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 rrmasdnd (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) 15.0 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 3:00|6

Event Trigger 8 Automatically activates when the Mode Switch is placed to S/D.
Inserts an ECCS suction line break.
trgset 8 "rpdmode4_drw"|6
trg 8 "ramp wamwlps 200.0 201.0 1:00:00"|6
imf csbrksev (8) 100.0|6

imf csppbbrk (8) 100.0|6

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

END

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	**Start**
Title		**Clock Ends**

Compensatory Actions

Degradation	**Frequency**	**Compensatory Action**
Documentation	**Responsible**	

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**	**Shift 3 Activities**
☐	☐ DOP 3700-02	☐
☐	☐	☐

Common Unit Activities

Shift 1 Activities (X = Completed)	**Shift 2 Activities**	**Shift 3 Activities**
☐	☐	☐
☐	☐	☐

Unit 2 Procedures in Progress (Non-Surveillance)

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	**Start**
Title	**Clock Ends**

Compensatory Actions

Degradation	**Frequency**	**Compensatory Action**
Documentation	**Responsible**	

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: <u>Dresden</u>   Scenario No: <u>ILT-N-3</u>   Op-Test No: <u>2008-301</u>

Examiners: _____   Operators: _____

          _____   _____

          _____   _____

<u>Initial Conditions</u>: Rx Power ~ 75%.

<u>Turnover</u>: Reduce power with Recirc flow per DGP 03-01.

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	HPGP4RLY 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	AT5 NVM100BP NVML29AP NVML29BP 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.
- Engineering received report that Bailey FWLC circuit cards for RPV level may be defective.

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 following failures are simulated:

  ❖ ATS feed from MCC 29-1 trips causing loss of MR A and FZ B.

  ❖ Common sensing leg leak for the 2202-5 instrument rack (MR B, NR A & WR) causing them to ramp downscale.

  ❖ Bailey System NR B circuit card fails causing it to ramp upscale.

- 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 Isolation

- 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 trip of a RFP with failure of the standby RFP results in dropping RPV level.

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
		Note: The turnover directs the crew to reduce load to 620 MWe.
1		**Floor Instructor / Simulator Operator / Role Play:** If the team announces that they will adjust gains, inform them an extra NSO will perform the adjustment. Then: ❖ 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. (Note: trigger 1 can be toggled OFF, then back ON as many times as necessary to adjust gains)
		Simulator Operator / Role Play: 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".
	SRO	■ Directs NSO to reduce load with recirc flow to 620 MWe.
	NSO	Performs the following actions per DGP 03-01, Power Changes, and DOP 0202-03, Reactor Recirculation Flow Control System Operation, as directed: ■ Uses MASTER RECIRC FLOW CONTLR, 2(3)-262-22, potentiometer to reduce flow AND control reactor power.
	ANSO	Monitors Panels.
Event 1 Completion Criteria:		
• **Sufficient power decrease as determined by the Lead Examiner.**		

Event Two – CRD Flow Controller Failure		

Trigger	Position	Applicant's Actions or Behavior
2		**Simulator Operator:** 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. **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. **Simulator Operator:** If CRD Temperature variable **rdgtemp(21)** reaches 250.0 deg. F, verify the following automatic triggers:
3 4		❖ **Trigger 3**: automatically activates when variable **rdgtemp(21)** is >250.0 deg. F. Forces up alarm 902-5 F-3, ROD DRIVE HI TEMP. ❖ **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	■ 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.
	SRO	■ Enters and directs performance of DOA 0300-01, Control Rod Drive System Failure. ❑ Notifies Shift Manager and IMD of CRD Flow Controller failure. ❑ May reference TRM 3.3.h, Reactor Vessel Water Level Instrumentation System (RVWLIS) Backfill System, due to short loss of RVWLIS supply.
		Role Play; 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)". NLO to check CRD system flow locally (FI 2-302-56); (wait 1 min) Report "CRD system flow indicates >100 gpm (pegged high)". 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)". 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)". Respond as groups notified.
	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
5 **6**		**Simulator Operator:** At the discretion of the Lead Examiner, activate **trigger 5**, which simulates Unit 2 EDG cooling water pump breaker control power transformer failure. **Simulator Operator / Role Play:** HVO/NLO to U2 EDG to check Trouble alarm: wait 3 min, activate **trigger 6**, which clears the U2 EDG Trouble alarm. Then report "I acknowledged the local alarm on panel DG2A Tile C-3 which is 'Diesel Clg Wtr Pump Failure Or Locked Out'. It will not reset". **Role Play:** HVO/NLO in U2 EDG room to check cooling water pump control switch: report "the cooling water pump control switch is in its normal position and all control switch indicating lights are OFF". NLO to verify fuse 2-3903-F1 in EDG 2 Aux Control Panel: wait 2 min, the report that "fuse 2-3903-F1 is NOT blown". NLO to check the U2 EDG cooling water pump breaker: Wait 2 min, then report "the U2 EDG cooling water pump breaker is closed, but there is an acrid smell coming from the cubicle". Support personnel: Acknowledge requests.

	ANSO	■ Announces alarms:
		  ❖ 902-8 A-7, U2 Diesel Gen Trouble.
		  ❖ 902-7 G-8, U2 Diesel Gen Clg Wtr PP Trip/Lkout
		■ Sends an operator to check the U2 EDG Trouble alarm.
		❑ Directs operator to verify fuse 2-3903-F1 in EDG 2 Aux Control Panel.
		■ Sends an operator to check the U2 EDG cooling water pump breaker.
		■ Performs DOA 6600-01, Diesel Generator Failure, as directed:
		  ❖ Places the U2 EDG output breaker to the Pull-To-Lock position. (Optional / required only if EDG is running)
		  ❖ Places the U2 EDG control switch to STOP.
		■ Informs the Unit Supervisor of the field reports.

	NSO	❑ Monitors panels, provide assistance as directed.
	SRO	■ Enters DOA 6600-01, Diesel Generator Failure, and directs actions. ■ Declares the U2 EDG inoperable.
	TEAM	❑ May enter DOP 6700-20, 480V Circuit Breaker Trip

		Event Three – Emergency Diesel Generator Inoperable
Trigger	Position	Crew Actions or Behavior
	SRO	■ Determines following Technical Specifications apply: 　• 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: 　　❖ 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.
	SRO	❑ 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		**Simulator Operator:** 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.
		Support Personnel to investigate: wait several min, then report "There is relay damage which will take 12 hrs to repair".
	ANSO	■ Announces alarm 902-3 C-12, HPCI Stm Line Flow Hi.
	TEAM	■ Determines HPCI GP 4 isolation should have occurred.
	SRO	■ Directs ANSO to close the HPCI GP 4 isolation valves.

	ANSO	■ Isolates HPCI as directed:
		  ❖ Closes MO 2-2301-4.
		  ❖ Closes MO 2-2301-5.

	TEAM	❑ May enter DEOP 0300-01, Secondary Containment Control.
	SRO	❑ Notifies Shift Manager and IMD of Event.
	NSO	❑ Monitors panels and assists as directed.
		Note: The Tech Spec LCOs apply once the Team learns the length of time to repair.

	SRO	■ References Technical Specifications and determines:
		  ❖ TS 3.5.1 Action A.1, Place Channel in trip within 24 hrs.
		  ❖ TS 3.5.1 Action B.1, Restore Isolation capability within one hour.
		  ❖ TS 3.5.1 Action F.1, 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. |

Event Five – Loss of CRD Pump.

Trigger	Position	Crew Actions or Behavior
8 9		**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. 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	■ 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: ❑ Stops any rod motion or power changes. ■ Starts 2A CRD pump. ■ Secures 2B CRD pump. ❑ Verifies normal CRD system pressures and flow. ❑ Identifies and reports increasing CRD pump amps.
		Role Play: As the NLO, if asked, report: "2A CRD pump is operating normally".
	SRO	❑ Enters DOA 0300-01, Control Rod Drive System Failure, due to failure of 2B CRD pump.
	TEAM	❑ May reference/perform DOP 0300-01, Control Rod Drive System Start Up and Operation, for swap of CRD pumps.
	ANSO	Monitors panels and assists as directed.
		Note: If the Team swaps CRD pumps before the 2B CRD pump trips, the following actions do NOT apply:
	NSO	■ Announces 2B CRD pump trip. ■ Per immediate action of DOA 0300-01, Control Rod Drive System Failure, starts the standby CRD pump.
	SRO	■ Enters DOA 6500-10, 4KV Circuit Breaker Trip, due to trip of 2B CRD pump.

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		**Simulator Operator:** 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.
		Simulator Operator / Role Play: NLO to open/close the CRD 25 valve: On Instructor Station drawing RD2, change the CRD 25 valve position to the requested position and then report its position.
	ANSO	■ 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	■ Determines that reactor will scram automatically on low RPV level due to insufficient Feedwater flow.
	SRO	■ Directs team to perform a manual reactor scram per DGP 02-03, Reactor Scram.
	NSO	Performs DGP 02-03, Reactor Scram, actions as directed: ■ Depresses BOTH Scram buttons. ■ Places RX MODE SW in SHUTDOWN. ■ Announces*:* • All Rods In. • RPV level and pressure. ❑ Verifies Recirc pumps run back to minimum. ❑ Inserts SRMs and IRMs. ❑ Controls RPV level as directed.
	ANSO	Performs DGP 02-03, Reactor Scram, actions as directed: ❑ 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.
	SRO	Enters DEOP 100, RPV Control, due to RPV low level and directs: ❑ Verifying Isolations and Actuations. ❑ Maintaining RPV level +8 to +48 inches. ❑ Maintaining RPV Pressure <1060 psig.

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

Trigger	Position	Crew Actions or Behavior
11		**Simulator Operator:** After the team has stabilized the unit following the reactor scram, and at the discretion of the Lead Evaluator, activate **trigger 11**, which: • Simulates a trip of the MCC 29-1 supply to ATS Panel 2202-73B which causes loss of MR A and FZ B RPV level instruments. • After 2 min, fails the remaining RPV level instruments in a way that simulates a leak in the common sensing leg for the 2202-5 instrument rack (MR B, NR A & WR) causing them to ramp downscale. Bailey System NR B circuit card fails causing it to ramp upscale.
		Role Play: When dispatched to the ATS Panel, wait a few minutes, and then report that "all instruments in the top row of panel 2202-73B are downscale and no indicating lights on the top row are lit. All other indications are normal". NLO sent to MCC 29-1. Wait two minutes then report from MCC 29-1 that "the breaker for circuit 4 is tripped". If sent to 125 VDC Main Bus Dist. Panel 2B-1 to check breaker 17, report that it is closed. 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.
	ANSO	▪ Reports annunciator 902-4 H-20, ATS Div 2 2202-73B Trouble, in alarm and references DAN. ❑ Sends an NLO to inspect ATS panel 2202-73B. ❑ May direct an NLO to MCC 29-1 to check the feed breaker (circuit 4) to ATS. ❑ May direct the closure of the ATS Panel power supply breaker.
	TEAM	❑ Begins to determine the equipment affected by loss of the ATS feed.
	SRO	❑ May refer to DOP 6800-05, Power Restoration to Analog Trip System Feeds to check for restoration requirements.
	TEAM	▪ Determines that RPV level indications are diverging.
	TEAM	❑ May send operators to local instrument panels.
		Role Play: NLO to Reactor Bldg to get local RPV level indication: wait 2 min, and then report "there is steam around all the instrument racks and I am unable to get local RPV level readings".

Event Six and Seven – Loss of Feedwater / Manual Scram / Loss of RPV Level Indication / RPV Flooding		
Trigger	Position	Crew Actions or Behavior
	SRO	❑ Exits DEOP 100 and enters DEOP 0400-01, RPV Flooding, and performs / directs:
		❑ Verifying Torus level above 6 feet.
		■ √ Opening all 5 ADSVs.
		■ Isolating the following steam lines:
		❖ MSIVs.
		❖ Main Steam line drains.
		❖ IC.
		❖ HPCI. (Previously isolated)`
		■ √ 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		**Simulator Operator / Role Play:** • Operator to defeat RFP trips: wait 2 min, activate **Trigger 12** and the report that "the RFP trips are defeated"
	NSO / ANSO	Performs DEOP 400-01, RPV Flooding, as directed:
		❑ Verifies Torus level above 6 feet.
		■ √ Opens all 5 ADSVs.
		■ Isolates the following steam lines:
		❖ MSIVs.
		❖ Main Steam line drains.
		❖ IC.
		❖ HPCI. (Previously isolated)`
		■ √ 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	■ Slows down RPV injection once ERV tailpipe temperatures drop below saturation and pressure is steady.
	SRO	❑ 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 H-20	ATS DIV 2 2202-73B 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
DAN DG2A C-3	DIESEL CLG WTR PUMP FAILURE OR LOCKED OUT'
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
DOP 0300-01	CONTROL ROD DRIVE SYSTEM START UP AND OPERATION
DOP 6700-20	480V CIRCUIT BREAKER TRIP
DOP 6800-05	POWER RESTORATION TO ANALOG TRIP SYSTEM FEEDS
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 rdfcfhi (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 29-1 feed to ATS panel 2202-73B.
This causes a loss of RPV MR A and FZ B.
After 2 min, fails RPV MR B level instrument downscale on 5 min. ramp.
After 2 min, fails RPV NR A level instrument to downscale on 5 min. ramp.
After 2 min, fails RPV NR B level instrument to upscale on 5 min. ramp.
After 2 min, fails RPV Wide Range level instrument to downscale on 5 min. ramp.
trgset 11 "0"|12
imf at5 (11)|12
imf nvm100bp (11 2:00) -150.0 5:00|12
imf nvml29ap (11 2:00) -75.0 5:00|12
imf nvml29bp (11 2:00) 75.0 5:00|12
imf nvml112p (11 2:00) -400.0 5:00|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

Drop Load to 620 MWe.

LCORAs

LCORA	None
Title	

Start

Clock Ends

Compensatory Actions

Degradation Documentation	**Frequency Responsible**	**Compensatory Action**

Unit 2 Conditions, Status, Abnormalities

Engineering received a manufacturer's report that Bailey FWLC circuit cards for RPV level may be defective. For this reason, at the end of last shift an emergency load drop was performed per DGP 03-01 to 680 MWe. Reverse sequence was used to insert control rods. Senior management has directed that an additional load drop to 620 MWe should be performed immediately after shift turnover. The QNE and the Shift Manager concur that recirc flow should be used for the load drop per the Emergency Load Drop section of DGP 03-01.

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

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 | Start |
| Title | Clock Ends |

Compensatory Actions

| Degradation | Frequency | Compensatory Action |
Documentation	Responsible	

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