Dresden Generating Station

ILT-N-1

LOWER REACTOR POWER USING RECIRCULATION FLOW

REMOVE 345KV L0302 POWERTON FROM SERVICE

INSTRUMENT AIR COMPRESSOR TRIP

CONTROL ROD RPIS FAILURE

ISOLATION CONDENSER INADVERTENT INITIATION

FWLC CONTROLLER SETPOINT DRIFTS HIGH

LOSS OF INSTRUMENT AIR / REACTOR SCRAM

STEAM LEAK IN THE DRYWELL / EMERGENCY DEPRESSURIZATION

Rev. 00

10/09

Developed By: _____ _____
Exam Author Date

Approved By: _____ _____
Facility Representative Date

Scenario Outline

Station: Dresden Generating Station **Scenario No.:** ILT-N-1 **Class ID:** 2010-301

Evaluators	Operators	/ crew position
		/ ATC
		/ BOP
		/ CRS

Initial Conditions: 91% power.

Turnover: Lower power with Recirc flow.
Switching orders received to remove 345KV L0302 from service.

Event No.	Malf. No.	Event Type*		Event Description
1	NONE	R	ATC	RECIRC - Lower Reactor Power using Recirculation Flow.
2	NONE	N	BOP	SWITCHYARDS - Remove 345KV L0302 Powerton From Service.
3	N33	C	BOP	INST AIR - Instrument Air Compressor Trip.
4	RDFAILF5	I	ATC	CRD - RPIS failure for rod F-05. [T]
5	ICSPDFT	I	BOP	ISO COND - Inadvertent Initiation. [T]
6	RLLMLS	I	ATC	FW - FWLC Controller Drifts High.
7	NP2	M	TEAM	Instrument Air System Leak / Team Takes a Manual Scram.
8	I21 K23 K40	M	TEAM	Steam Leak inside the Drywell & Loss of Bus 23-1 & 28, Losing Ability to Spray Drywell / Team Emergency Depressurizes.

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

Scenario Objective

Evaluate the Team's ability to operate the plant with a Drywell Steam Leak requiring Emergency Depressurization.

Scenario Summary

1. Unit is at 91% power.
2. The following equipment is OOS:
   a. None
3. LCOs:
   a. None

Scenario Sequence

- The Team continues reactor power reduction using recirculation flow.
- The TSO directs the Team to remove 345KV L0302 Powerton from service.
- 3C Instrument Air Compressor (IAC) trips. Instrument Air pressure begins slowly dropping. Standby Air Compressor 2B is started to restore air pressure.
- Control rod F-05 loses all RPIS indication. The Team will insert the control rod, reference Tech Specs and direct taking it OOS.
- The Isolation Condenser initiates due to setpoint drift. The Team will stop operation of the Isolation Condenser and reference Tech Specs.
- The FWLC setpoint drifts high. The Team will take manual control of the FWLC system.
- A large leak develops in the Instrument Air system. The Team will scram the reactor due to the leak severity.
- A short time after the scram, a steam leak in the Drywell begins. When the Team attempts to spray the Drywell, Bus 23-1 trips resulting in a loss of one Division of Drywell Spray. The leak worsens and Primary Containment pressure will exceed the PSP limit and require the Team to Emergency Depressurize.

Event One – Lower Reactor Power Using Recirculation Flow

- The Team continues reactor power reduction using recirculation flow.

Malfunctions required: 0

- (None)

Success Path:

- The Team continues reactor power reduction using recirculation flow.

Event Two – Remove 345KV L0302 Powerton from Service

- The Team will remove 345KV L0302 Powerton from Service.

Malfunctions required: 0

- (None)

Success Path:

- Removes 345KV L0302 Powerton from Service per the switching orders.

Event Three – Instrument Air Compressor Trip

- 3C Instrument Air Compressor trips. Instrument Air pressure begins slowly dropping.

Malfunctions required: 1

- (3C Instrument Air Compressor trips)

Success Path:

- Standby Air Compressor 2B is started.

Event Four – Control Rod RPIS Failure

- Control rod F-05 will lose all RPIS indication.

Malfunctions required: 1

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

Success Path:

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

Event Five – Isolation Condenser Inadvertent Initiation

- The Isolation Condenser initiates due to setpoint drift.

Malfunctions required: 1

- (Isolation Condenser initiation setpoint drift)

Success Path:

- The Team will stop operation of the Isolation Condenser and reference Tech Specs.

Event Six – FWLC Setpoint Drifts High

- The FWLC setpoint will drift high.

Malfunctions required: 1

- (FWLC setpoint failure)

Success Path:

- The Team performs DOA 0600-01, Transient Level Control, and takes manual control of FWLC.

Event Seven – Loss of Instrument Air / Reactor Scram

A large leak develops in the Instrument Air system.

Malfunctions required: 1

- (Instrument Air Leak)

Success Path:

- Performs a manual scram.

Event Eight – Steam Leak Inside the Drywell / Emergency Depressurization

A steam leak develops in the Drywell. When the Team attempts to spray the Drywell, Bus 23-1 trips on overcurrent. The leak worsens and Primary Containment pressure exceeds the PSP limit. The Team performs an Emergency Depressurization.

Malfunctions required: 2

- (Steam leak in the Drywell).
- (Loss of Drywell Sprays).

Success Path:

- The Team performs an Emergency Depressurization.

PRE-SCENARIO ACTIVITIES

1 If applicable, conduct pre-scenario activities in accordance with TQ-JA-150-08, SIMULATOR EXAMINATION BRIEFING.

   a. Direct the crew to perform their briefs prior to entering the simulator.

   b. Provide the Team a copy of DGP 03-01, Power Changes, marked up for load drop through inserting control rods to reduce FCL prior to reducing recirc flow.

   c. Provide a marked up CRSP for the rod insertion including a REMA for routine load drop.

   d. Provide the Team with switching orders to remove 345KV Line 0302 from service.

   e. Provide the Team a copy of DOP 6400-13, Electrical Yard Switching.

2 Simulator Setup (the following steps can be done in any logical order)

   a. Initialize simulator in an IC which allows establishing the following:

      1) FCL @ 90-94%.

      2) Recirc flow adjusted to establish ~840 MWe.

   b. Cut in/out Cond Demins as needed, to maintain DP within limits.

   c. Ensure running Condensate pump amps within limits.

   d. Advance the chart recorders.

3 Verify the following simulator conditions:

   a. Verify control rod F-05 at position 48.

   b. Verify 2A and 2C IAC running with 2B IAC off.

   c. Verify TR 86 LTC in MANUAL.

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

4 Run the initial setup CAEP file: ILT-N-1.cae

5 Place the following equipment out of service:

   a. None

6 Complete the Simulator Setup Checklist.

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

- √ Critical Tasks
- ■ Required Actions
- ❑ Optional Actions

Event One – Lower Reactor Power Using Recirculation Flow		
Trigger	Position	Crew Actions or Behavior
		NOTE: The turnover directs the crew to reduce load to 775 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)
2		**SIMULATOR OPERATOR / ROLE PLAY:** EO to cut out a condensate demin bed: wait 1 min, and then activate **Trigger 2** which isolates 2G condensate demin bed. After the Instructor Station indicates 2G condensate demin bed is isolated, then report that "2G condensate demin bed is cut out".
	CRS	❑ Directs NSO to reduce load to 775 MWe using recirculation flow.
	ATC	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. ❑ Notifies CRS when at 775 MWe.
	BOP	❑ Monitors Panels.
Event 1 Completion Criteria: • **Load dropped to 775 MWe,** **AND / OR,** • **At the discretion of the Lead Examiner.**		

Event Two– Remove 345KV L0302 Powerton From Service		
Trigger	Position	Crew Actions or Behavior
		NOTE: This event starts when Event 1 is complete.
		ROLE PLAY: As the **EO** in 345KV Switchyard: Check the 345KV Instructor Station drawing for equipment status and then report its status to the control room, with the following nomenclature: • 345KV BT 4-8 CB • 345KV BT 4-5 CB • 345KV BT 3-4 CB • ELOT number 4444-999
3		**SIMULATOR OPERATOR:** Operator directed to open 345KV L0302 line disconnect and hang an ELOT card on it: activate **trigger 3**, which opens the 345KV L0302 disconnect. Wait 2 min and then report "the 345KV L0302 line disconnect is open and the ELOT card, with number 4444-999, is hung".
	BOP	Acknowledges the TSO directions and performs the following per the switching orders and DOP 6400-13, Electrical Yard Switching, step G.3: ❑ Checks 345KV ring bus normal. ❑ Checks open 345KV BT 4-8 CB. ■ Opens 345KV BT 4-5 CB. ■ Opens 345KV BT 3-4 CB. ■ Directs operator to open 345KV L0302 disconnect and hang an ELOT card on it. ■ Closes 345KV BT 4-5 CB. ■ Closes 345KV BT 3-4 CB. ❑ Reports to TSO and CRS that switching is complete.
	ATC	❑ Monitors the panels.
	CRS	❑ Directs control room activities.

Event 2 Completion Criteria:

- **345KV L0302 Powerton removed from service,**

AND/OR,

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

Event Three – Instrument Air Compressor Trip		
Trigger	Position	Applicant's Actions or Behavior
4		**SIMULATOR OPERATOR:** At the direction of the Lead Examiner, activate trigger 4, which trips the 3C Instrument Air Compressor and inserts a small IA leak to cause pressure to slowly drop. **ROLE PLAY:** EO to investigate 3C IAC trip: (Wait 2 min) Report "the 3C IAC tripped on low lube oil pressure. There is nothing else abnormal at the compressor". EO to check 3C IAC breaker: (Wait 2 min) Report "the 3C IAC breaker is closed and looks normal". NOTE: The compressor will NOT be restored to operation.
5		**SIMULATOR OPERATOR / ROLE PLAY:** EO to lineup 2B IAC to U2 Instrument Air System, wait 2 min, activate **trigger 5** and then report "2B IAC is lined up to U2 Instrument Air System".
		ROLE PLAY: EO to verify proper operation of 2B IAC: (Wait 2 min) Report "the 2B IAC is operating normally". If not yet directed to line up 2B IAC to U2 Instrument Air System, then also report that "2B IAC Dryer is not lined up to the Instrument Air header".
	BOP	Announces alarm 923-1 B-5, U2 OR U3 INST AIR COMP TRIP: ❑ Reports 3C IAC tripped ❑ Directs an EO to investigate the cause of the 3C Instrument Air Compressor trip. ❑ May send an EO to check 3C IAC breaker.
	CRS	❑ May enter DOA 4700-01, Instrument Air System Failure. ❑ Directs BOP to perform DOP 6700-20, 480 Volt Breaker Trip.
	BOP	Performs DOA 4700-01, Instrument Air System Failure, as directed: ■ Starts the 2B IAC. ❑ Directs an EO to verify proper operation of 2B IAC. ■ Directs an EO to line up 2B IAC to the IA header. ❑ Performs DOP 6700-20, 480 Volt Breaker Trip.

Event 3 Completion Criteria:

- **Team has started 2B IAC,**

AND/OR

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

Event Four – Control Rod RPIS Failure		
Trigger	Position	Crew Actions or Behavior
6		**SIMULATOR OPERATOR:** At the direction of the Lead Examiner, activate **trigger 6**, RPIS failure for control rod F-05.
		ROLE PLAY: Respond as Support Groups notified.
	ATC	Reports and responds to DANs 902-5 A-3 ROD DRIFT, and B-3 ROD WORTH MIN BLOCK. ■ Views Full Core Display and identifies CRD with Rod Drift light. ■ Selects Control Rod F-05 and reports no indication on Four Rod Display for Control Rod F-05.
	ATC	Recognizes loss of control rod F-05 position indication on Full Core Display, Four Rod Display, RWM, and/or Process Computer.
	CRS	Enters DOA 0300-06, RPIS Failure, and directs its actions.
	ATC	Performs subsequent actions of DOA 0300-06, RPIS FAILURE: ■ Stops any power change or control rod motion in progress. ❑ May insert Rod F-05 to 00 prior to entering DOA 0300-06. ❑ Enters substitute position of 48 for F-05. ❑ Inserts control rod F-05 one notch. ❑ Determines no control rod position indication at alternate position. ■ Drives rod F-05 to fully inserted position. ❑ Calls WEC to electrically or hydraulically isolate the control rod F-05 HCU. ❑ May enter a substitute position and take OOS on the RWM per DOP 0400-02, Rod Worth Minimizer.
	CRS	References appropriate plant licensing documents and determines: ■ 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. ❑ Directs electrically or hydraulically isolating control rod F-05 HCU.
		ROLE PLAY As QNE acknowledge reports. If concurrence is requested for any action, report “I concur with (insert requested action here)”
	BOP	❑ Monitors panel, provides assistance as directed.

Event Four – Control Rod RPIS Failure		
Trigger	Position	Crew Actions or Behavior
	TEAM	❑ May enter DOA 0300-12, Mispositioned Control Rod. ❑ Notifies the Shift Manager, QNE, Work Week Manager, Fin team, IMD, OR EMD.
		ROLE PLAY: When EO directed to disarm control rod F-05, report: "I'll disarm F-05 after I receive a pre-job brief" (it is not intended for this to be completed).
	ATC	❑ Records failed RPIS indication per DOS 0300-06, CRD Abnormality Record.

Event 4 Completion Criteria:

- **DOA 0300-06 actions have been taken,**
- **Technical Specifications have been referenced,**

AND/OR,

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

Event Five – Isolation Condenser Inadvertent Initiation		
Trigger	Position	Crew Actions or Behavior
7		**SIMULATOR OPERATOR:** At the direction of the Lead Examiner, activate **trigger 7**, which drifts the Isolation Condenser Initiation setpoint.
		ROLE PLAY: Respond as Support Groups notified.
	BOP	Reports and responds to DANs: ❑ 902-3 B-4, ISOL CONDR VLVS OFF NORM. ❑ 902-3 C-4, ISOL CONDR TEMP HI. ❑ 902-4 A-15, ISOL CONDR CH A/B INITIATION. ■ Determines Isolation Condenser in operation due to MO 2-1301-3 valve open.
	TEAM	■ Determines Isolation Condenser initiation spurious due to RPV pressure in normal band.
	CRS	■ Directs removing the Isolation Condenser from service.
	BOP	■ Places MO 2-1301-3 in PTL. ❑ When MO 2-1301-3 indicates closed, reports that the Isolation Condenser is removed from service.
	ATC	❑ Monitors reactor water level, pressure, and power.
	TEAM	❑ May enter DGA 07, Unpredicted Reactivity Addition.
	CRS	References appropriate plant licensing documents and determines: ■ TS 3.53, condition A. required actions: ❖ A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE immediately, AND, ❖ A.2 Restore IC System to OPERABLE status within 14 days. ❑ TS 3.3.5.2, condition A. required actions: (May wait for IMD investigation) ❖ A.1 Declare IC System inoperable within 1 hour; AND, ❖ A.2 Place channel(s) in trip within 24 hours.
	TEAM	❑ Notifies Security to limit access to area under Isolation Condenser vent. ❑ Notifies Radiation Protection to survey under the Isolation Condenser vent.

Event Five – Isolation Condenser Inadvertent Initiation		
Trigger	Position	Crew Actions or Behavior
Event 5 Completion Criteria: • **Isolation Condenser removed from operation,** • **Technical Specifications have been referenced,** **AND/OR,** • **At the direction of the Lead Examiner.**		

Event Six – FWLC Controller Setpoint Drifts High		
Trigger	Position	Crew Actions or Behavior
8		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **trigger 8**, which causes the FWLC setpoint to drift high.
		ROLE PLAY: Support Personnel: respond you will assist as directed.
	TEAM	❑ Determines RPV level is increasing.
	CRS	❑ Enters DOA 0600-01, Transient Level Control. ■ Directs ATC to control RPV level manually.
	ATC	■ Places FWLC in MAN and manually controls RPV level.
	BOP	❑ Assists as directed.
	TEAM	❑ May enter DGA 07, Unpredicted Reactivity Addition.
	CRS	❑ Contacts support personnel for assistance.
Event 6 Completion Criteria: • **RPV level stabilized,** **AND/OR,** • **At the direction of the Lead Examiner.**		

Event Seven – Instrument Air Leak / Reactor Scram		
Trigger	Position	Applicant's Actions or Behavior
9		**SIMULATOR OPERATOR:** At the direction of the Lead Examiner, activate **trigger 9** to initiate a large Instrument Air leak. **ROLE PLAY:** EO sent to check air compressor and air dryer operation, wait 3 min. then report, "The air compressors are all running loaded and there are no problems at the air dryers." Personnel sent to inspect IA system for rupture, acknowledge the order. If asked, U1 air system is not is service
	BOP	❑ Announces alarm 923-1 F-4, U2 INST AIR PRESS LOW. ❑ Verifies U2 SA to IA Auto Crosstie Valve opens at 85 psig
	CRS	■ Announces entry into DOA 4700-01, Instrument Air System Failure, and directs team actions. ■ Briefs team to be prepared to manually scram the reactor and close the outboard MSIVs IF Instrument Air pressure drops to 55 psig. ❑ Announces entry into DOA 0600-01, Transient Level Control, and directs concurrent performance with DOA 4700-01, IA System Failure.
	BOP	❑ Directs EO(s) to check air compressors and air dryers for proper operation ❑ Directs in-plant personnel to inspect U2 IA system for proper lineup and leaks. ❑ May direct EO to cross-connect U2 to U3 IA Systems per DOP 4700-03, U2/3 IA Cross-Connect Operation. ❑ May direct EO to cross-connect U2 to U3 SA Systems
	CRS	❑ May direct scram preparations per DGP 02-03, Reactor Scram.
	ATC	❑ Performs scram preparations per DGP 02-03, Reactor Scram, as directed: o Reduces power with Recirc flow to 56 Mlbm/hr core flow o Starts the turbine motor suction pump AND turning gear oil pump. o Trips H2 addition.
	CRS	When IA pressure drops to 55 psig, directs team to: ■ Scram the reactor per DGP 02-03, Reactor Scram. ■ Close the outboard MSIVs.

Event Seven – Instrument Air Leak / Reactor Scram		
Trigger	Position	Applicant's Actions or Behavior
	ATC	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. ■ Determines all rods are inserted. ❑ Maintains RPV level as directed by CRS. ❑ Inserts SRMs and IRMs.
	CRS	Enters DEOP 100, RPV Control, ❑ Directs actions of DEOP 100. ❑ Directs actions of DGP 02-03. ❑ Verification of all isolations, ECCS and EDG starts. ❑ Holding RPV/L +8 to +48 inches. ❑ Maintaining RPV/P <1060 psig using the Isolation Condenser.
	BOP	■ Closes the outboard MSIVs. ❑ If directed, maintains RPV/P <1060 psig using the Iso Cond to control RPV/P (may use Hardcard) ❑ Performs Reactor Scram actions per his Hardcard.
<u>Event 7 Completion Criteria</u>: • **Team has performed a reactor scram and stabilized the plant,** **AND/OR** • **At the discretion of the Lead Examiner.**		

Event Eight –Steam Leak Inside The Drywell / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
10		**SIMULATOR OPERATOR:** At the discretion of the Lead Evaluator, activate **trigger 10**, which causes a steam leak in the DW that is large enough to require initiating Drywell sprays.
	TEAM	■ Recognizes and announces that Drywell pressure is rising rapidly.
	CRS	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. ❑ Monitors Torus level.
		ROLE PLAY: EO to check operation of the EDGs after auto start: Wait 3 minutes and then report "the EDGs are operating normally".
	CRS	Per DEOP 0200-01, Primary Containment Control, when Drywell pressure reaches 9 psig directs: ❑ Verifying Recirc Pumps and Drywell Coolers tripped. ❑ Verifies the Drywell spray initiation curve prior to the operator manually opening any of the Drywell spray valves. Then directs the Operator to initiate Drywell Sprays. ■ **√ Initiation of Drywell sprays.**
	BOP	Performs DEOP 0200-1, Primary Containment Control, actions as directed: ❑ Monitors Drywell temperature and pressure and attempts to initiate torus sprays and drywell sprays pre Hard Card LPCI/CCSW OPERATION, as directed.
11		**SIMULATOR OPERATOR:** Verify **trigger 11 automatically activates** when MO 1501-27A begins to open. This trips Bus 23-1 on overcurrent. As a result, Div. I of Drywell sprays cannot be initiated.
	ATC / BOP	■ **√ Initiates Drywell Sprays.** ❑ Notices and reports the loss of ECCS equipment powered from Bus 23-1. ❑ Reports the loss of Bus 23-1 and 28. ■ Reports the "B" LOOP of Drywell Spray is initiated, but "A" LOOP could not be initiated.
	US	❑ Directs Operators to investigate the loss of Bus 23-1. Directs entry into DGA-12 for Partial Loss of AC Power.

Event Eight –Steam Leak Inside The Drywell / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
	BOP	❑ Refers to DAN 902-8 F-5, 4KV Bus 23-1 Overcurrent, annunciator. As directed, Performs DGA-12, Partial or Complete Loss of AC power: ❑ Takes actions per DGA 12 for any faulted buses. ❑ Recognizes the loss of Bus 28. ❑ Dispatches EO to Bus 23-1 to investigate the loss of Bus 23-1. ❑ May enter DOA 6500-01, 4kV Breaker Trip.
		NOTE: If team crossties Bus 28 and 29 and Bus 29 trips, allow the team to re-energize Bus 29 from Bus 24-1.
		ROLE PLAY: EO to bus 23-1: Wait 2 min. then report “The feed breaker to Bus 23-1 from Bus 23 has an overcurrent flag up on it and will not reset”. EO to Bus 28: Wait 2 min. then report “Bus 28 has an overcurrent flag up and will not reset”
		ROLE PLAY: If contacted as EMD Foreman: Respond, “I will report to Bus 23-1”. **NOTE**: EMD personnel will not report back. DO NOT REPORT BACK ON ATTEMPTS TO OPEN DW SPRAY VALVE TILL after Torus bottom pressure is > 20 #.
	ATC / BOP	❑ May dispatch an Operator to attempt to manually open “A” LOOP of drywell spray.
		ROLE PLAY: EO to open “A” LOOP of drywell spray: Wait 2 min, then report “The handwheel for MO 2-1501-28A will not engage”.
12		**SIMULATOR OPERATOR:** After the Team has attempted to put on Drywell Sprays and at the discretion of the Lead Evaluator, activate **trigger 12**, which increases the Main Steam line leak enough to require the Team to Emergency Depressurize due to exceeding PSP curve.

Event Eight –Steam Leak Inside The Drywell / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
	CRS	■ Recognizes that Emergency Depressurization per DEOP 0400-02 is necessary due to one of the below: o Drywell temperature cannot be maintained below 281°F. o Exceeding the PSP. **√ Enters DEOP 400-02, Emergency Depressurization, and directs**: ■ If Drywell pressure >2 psig, prevention of injection from LPCI/CS pumps not needed for core cooling. ❑ Initiation of Iso Condenser to maximum flow. ❑ Verification of Torus level > 6ft. ■ Opening all ADS valves. ❑ Verifying all relief valves open.
	BOP	**√ Performs DEOP 400-02, Emergency Depressurization, as directed.** ❑ If Drywell pressure is greater than +2 psig, prevents injection from LPCI/CS pumps not needed for Core cooling per Hard Card, LPCI INJ/CC CONTROL/SHUTDOWN. ❑ Initiates Iso Condenser to maximum flow per Hard Card, ISOLATION CONDENSER. ❑ Verifies Torus level >6 feet. ■ **√ Open all ADS valves** ❑ Verifies all relief valves open.

Scenario Completion Criteria:

- **Emergency depressurization in progress.**
- **Or at the discretion of the Lead Evaluator.**

Critical Tasks	
(RPV-5.1)	When drywell pressure exceeds the suppression chamber spray initiation pressure or before containment pressure exceeds the Pressure Suppression Pressure, ***INITIATE*** drywell/containment sprays, while in the safe region of the drywell spray initiation limit or above the containment spray initiation pressure.
(PC-6.1)	When suppression chamber pressure cannot be maintained below the pressure suppression pressure limit, ***INITIATE*** emergency depressurization before drywell design pressure is exceeded.

REFERENCES

PROCEDURE	TITLE
DAN 902-3 B-4	ISOL CONDR VLVS OFF NORM
DAN 902-3 C-4	ISOL CONDR TEMP HI
DAN 902-4 A-15	ISOL CONDR CH A/B INITIATION
DAN 902-5 A-3	ROD DRIFT
DAN 902-5 B-3	ROD WORTH MIN BLOCK
DAN 902-8 F-5	4KV BUS 23-1 OVERCURRENT
DAN 923-1 B-5	U2 OR U3 INST AIR COMP TRIP
DAN 923-1 F-4	U2 INST AIR PRESS LOW
DEOP 0100	RPV CONTROL
DEOP 0200-01	PRIMARY CONTAINMENT CONTROL
DEOP 0400-02	EMERGENCY DEPRESSURIZATION
DGA 07	UNPREDICTED REACTIVITY ADDITION
DGA 12	PARTIAL OR COMPLETE LOSS OF AC POWER
DGP 02-03	REACTOR SCRAM
DGP 03-01	POWER CHANGES
DOA 0300-06	RPIS FAILURE
DOA 0300-12	MISPOSITIONED CONTROL ROD
DOA 0600-01	TRANSIENT LEVEL CONTROL
DOA 4700-01	INSTRUMENT AIR SYSTEM FAILURE
DOA 6500-10	4KV CIRCUIT BREAKER TRIP
DOP 0202-03	REACTOR RECIRCULATION FLOW CONTROL SYSTEM OPERATION
DOP 0400-02	ROD WORTH MINIMIZER
DOP 4700-03	U2/3 IA CROSS-CONNECT OPERATION
DOP 6400-13	ELECTRICAL YARD SWITCHING
DOP 6700-20	480 VOLT BREAKER TRIP
DOS 0300-06	CRD ABNORMALITY RECORD
TS 3.1.3	CONTROL ROD OPERABILITY
TS 3.3.5.2	ISOLATION CONDENSER (IC) SYSTEM INSTRUMENTATION
TS 3.5.3	IC SYSTEM

Simulator Scenario Review Checklist (cont'd)

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

CAEP Files

```
# ILT-N-1.cae
# For ILT Class 09-1 NRC Exam
# Written by DRDR9
# Rev 00
# Date 10/09


# INITIAL CONDITIONS

# Sets APRM Master Gain pot to 1.0
irf niagain 1.0

# Close 2B IAC Disch Vlv (OPS says it would be closed if the Comp is OFF)
irf vp2 0.0

# Opens 345 KV Line 0302 Remote breaker
irf kvr302t open


# EVENT TRIGGERS

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

# Event trigger 2 Cuts out 2G Cond Demin Bed.
trgset 2 "0"|2
irf s47 (2) false|2

# Event trigger 3 Opens 345 KV Line 0302 disconnect.
trgset 3 "0"|2
irf kvr302d (3) open|2

# Event trigger 4 inserts an IAC trip and IA leak to cause pressure to slowly drop.
trgset 4 "0"|4
imf n33 (4)|4
imf np2 (4) 12.0|4

# Event trigger 5 # Opens 2B IAC Disch Vlv.
# Deletes IA leak.
trgset 5 "0"|6
trg 5 "dmf np2"|6
irf vp2 (5) 100.0|6

# Event Trigger 6 Fails all control rod F-05 RPIS indications.
trgset 6 "0"|6
imf rdfailf5 (6)|8
imf cr043s (6) bad|8

# Event Trigger 7 Drifts the Iso Cond Initiation setpoint.
trgset 7 "0"|8
imf icspdft (7) 0.0|8

# Event Trigger 8 Drifts the FWLCS setpoint.
trgset 8 "0"|10
irf rllmls (8) 40.0 5:00|10
# Event trigger 9 Inserts a large IA leak.
```

```
trgset 9 "0"|10
trg 9 "imf np2 87.0 10:00 40.0"|10

# Event Trigger 10 Inserts a DW MSL leak of 0.5%.
trgset 10 "0"|12
imf i21 (10) 0.5|12

# Event Trigger 11 Activates when DW Spray valve MO 1501-27A starts to open.
# Trips Bus 23-1 on over current.
trgset 11 "lpv27a .gt. 0.01"|12
imf k23 (11)|12
imf k40 (11)|12

# Event Trigger 12 Increases the steam leak from 2.0% to 6.0% over 5 minutes.
trgset 12 "0"|14
trg 12 "mmf i21 6.0 5:00 2.0"|14

# END
```

Unit 2 Risk: GREEN

Unit 2 is in Mode 1 at 840 MWe,

Leading Thermal Limit: MFLCPR @ 0.881

Action limit: 0.980

Equipment Unavailable: None

Protected Equipment: None

Unit 3 Risk: GREEN

Unit 3 is in Mode 1 at 913 MWe

Leading Thermal Limit: MAPRAT @ 0.819

Action Limit: 0.980

Equipment Unavailable: None

Protected Equipment: None

Current Action Statements

None	LCO Started:	LCO Expires:
TS		
Cause:		

Unit 1 Plant Status

Today	U1 Diesel Oil Storage Tank Transfer House has grating removed. Currently roped off with pump installed to pump to U1 Oil Seperator Pit as required. Outside operator monitor and pump as necessary.
Today	Chem Cleaning ventilation status: HV-1A/EF-1A are secured due to HV-1A inlet and outlet dampers being shut with fan on, IR# 913157, WO 1239746. HV-1B/EF-1B are secured due to HV-1B throwing its belts. WO 1156150. HVAC -1 ON. HV-2 running.

Switchyard Status

Today	138 KV Bus 1 Feed To TR 22 Combi Units has low oil in the 'C' phase, ComEd WO #276162
Today	HVO: Exercise CAUTION while in the 345 kV Yard due to excavation being performed in the area. Marv Evans reports holes being dug near manual switch disconnects 345kV Blue Bus. Plywood will be installed over the holes if access is needed, but be aware there are holes under the plywood. SSC called from the 345Kv yard reporting that the cable trough covers are removed to prep for upcoming work. Be careful.
Today	Switching orders have been received for removing 345KV L0302 from service. Backfeed is off. An operator is standing by in the 345KV Switchyard.

Unit 2 Plant Status

Today	Unit 2 Activities **** Shift 1 Activities **** **** Shift 2 Activities **** Load was dropped last shift with control rods. Drop load to 775 MWe using recirc flow at beginning of shift. Do not secure a RFP or a condensate/booster pump. Load is expected to be picked up early next shift. Switching orders have been received for removing L0302 from service. After the load drop is complete, perform the switching orders as received. No further communication with TSO is required prior to performing the switching orders **** Shift 3 Activities ****
Today	**** Unit 2 Procedures In-Progress **** Do Not Delete **** DGP 03-01, Power Changes.

Dresden Generating Station

ILT-N-2

UNLOAD 2/3 EDG FROM BUS 33-1 AND LOAD TO BUS 23-1

DRYWELL EQUIPMENT SUMP LEVEL ALARM FAILURE

DRYWELL TO TORUS DIFFERENTIAL PRESSURE CONTROLLER FAILURE

LOSS OF A FEEDWATER HEATER

SERVICE WATER PUMP TRIP

RECIRC MG SET MOTOR HIGH TEMPERATURE / MG SET TRIP

TRIP OF SECOND RECIRC PUMP / REACTOR SCRAM

UNISOLABLE RWCU SYSTEM LEAK /
EMERGENCY DEPRESSURIZATION

Rev. 00

10/09

Developed By: _____ _____
Exam Author Date

Approved By: _____ _____
Facility Representative Date

Scenario Outline

Station: Dresden Generating Station **Scenario No.:** ILT-N-2 **Class ID:** 2010-301

Evaluators	Operators / crew position
	/ ATC
	/ BOP
	/ CRS

Initial Conditions: 60% Power
Power Was Reduced Last Shift Per BPO Request.

Turnover: Hold Current Power Level Per BPO Direction.

Event No.	Malf. No.	Event Type*		Event Description
1	NONE	N	BOP	EDG - Unload 2/3 EDG from Bus 33-1 and Load to Bus 23-1.
2	SER0512	C	ATC	DWEDS – Drywell Equipment Sump Level Alarm Failure.
3	PCVDMD14	I	BOP	CONTAINMENT - Drywell to Torus Differential Pressure Controller Failure. T
	ADSRFE	C	CRS	ERV - Loss of Power to ADS Valve. T (Used if Tech Spec condition not reached in above Event)
4	FW3502AU FWHDRO1B	C	ATC	FW - Loss of a Feedwater Heater.
5	Q22	C	BOP	SERV WATER - Pump Trip.
6	RRMGMAHI RRMGMAOC	I	ATC	RECIRC - MG Set Motor High Temperature / MG Set Trip. T
7	RRDB1STP RRDB2STP	M	TEAM	Trip of Second Recirc Pump / Team Takes a Manual Scram.
8	CIRWCUJP U34 / U71	M	TEAM	Unisolable RWCU System Leak, Flooding LPCI/CS Corner Rooms / Team Emergency Depressurizes.

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

Scenario Objective

Evaluate the Team's ability to operate the plant with an unisolable leak into the reactor building from a primary system requiring an emergency depressurization.

Scenario Summary

1. Unit is at ~60%.
2. The following equipment is OOS:
   a. None
3. LCOs:
   a. Tech Spec 3.8.1 for 2/3 EDG surveillance

Scenario Sequence

- 2/3 EDG has just completed the one hour loaded run on Bus 33-1 and is running unloaded. The Team will load the 2/3 EDG to Bus 23-1 for at least 5 minutes and then shut down the 2/3 EDG following surveillance completion.
- The Drywell Equipment Drain Sump level alarm fails which requires the Drywell Sumps pumped. The Team determines from the sump pumping that actual Drywell leakage has not increased.
- Drywell to torus differential pressure controller demand fails downscale. Pressure control is regained when the BOP 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. If Team actions are fast enough to prevent DP from dropping below 1.0 psid, a loss of power to an ADSV will occur requiring the Team to address Tech Specs.
- 2B1 HTR Normal Drain unlatches due to mechanical failure of the latch. 2B1 HTR level rises and the Emergency drain opens. However level continues to slowly rise until a 2B1 HTR trip occurs. The operator places the 2B1 HTR Extraction valve in PTS to prevent it from closing or re-opens it after it closes. This results in the 2B1 HTR level dropping with the Emergency drain controlling.
- The 2B Service Water pump trips on overload. The Team will start a standby pump.
- The 2A Recirc MG Set motor stator temperature will increase. The Team will manually shutdown 2A Recirc MG Set. If the Team does not shut it down manually, it eventually trips on overcurrent. The Team performs DOA 202-01, Recirculation (Recirc) Pump Trip One or Both Pumps, and references Tech Specs.
- 2B Recirc MG Set loses its lube oil system and trips. The Team will manually scram the Reactor. If the Team does not manually scram the reactor, reactor core oscillations will begin requiring the Team to manually scram the reactor. If the Team does not manually scram the reactor, eventually the core oscillations will automatically scram the reactor. The RWCU system will fail to isolate. Attempts to isolate RWCU will be unsuccessful.
- A RWCU system leak which cannot be isolated occurs in the RWCU pump room. Failure of the Reactor Building floor drains results in the LPCI/CS Corner Rooms filling with water. Eventually level in both LPCI/CS Corner Rooms will fill to above Max Safe levels. The Team will perform an Emergency Depressurization.

Event One – Unload 2/3 EDG from Bus 33-1 and Load to Bus 23-1

- The Team will continue surveillance of the 2/3 EDG.

Malfunctions required: 0

- (None)

Success Path:

- Loads the 2/3 EDG to Bus 23-1 for at least 5 minutes and then shuts down the 2/3 EDG per DOS 6600-01, Diesel Generator Surveillance Tests.

Event Two – Drywell Equipment Sump Level Alarm Failure

- The Drywell Equipment Drain Sump level alarm fails.

Malfunctions required: 1

- (Drywell Equipment Drain Sump level alarm fail)

Success Path:

- Pumps the Drywell Equipment Sump.
- Determines from the sump pumping that actual Drywell leakage has not increased

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. If Team actions are fast enough to prevent DP from dropping below 1.0 psid, a loss of power to an ADSV will occur requiring the Team to address Tech Specs.

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.
- References Tech Specs.

Event Four – Loss of a Feedwater Heater

- 2B1 HTR Normal Drain unlatches due to mechanical failure of the latch. 2B1 HTR level rises and the Emergency drain opens. However level continues to slowly rise until a 2B1 HTR trip occurs.

Malfunctions required: 1

- (2B1 HTR trip)

Success Path:

- Places the 2B1 HTR Extraction valve in PTS to prevent it from closing or re-opens it after it closes.

Event Five – Service Water Pump Trip

- 2B Service Water pump trips on overload.

Malfunctions required: 1

- (2B Service Water pump trip)

Success Path:

- The Team starts a standby pump.

Event Six – Recirc MG Set Motor High Temperature / MG Set Trip

- The 2A Recirc MG Set motor stator temperature will increase. If the Team does not shut it down manually, it eventually trips on overcurrent.

Malfunctions required: 1

- (Recirc MG Set Motor High Temperature)

Success Path:

- Performs DOA 202-01, Recirculation (Recirc) Pump Trip One or Both Pumps.
- References Tech Specs.

Event Seven – Trip of Second Recirc Pump / Reactor Scram

- 2B Recirc MG Set loses its lube oil system and trips. If the Team does not manually scram the reactor, eventually core oscillations will automatically scram the reactor. The RWCU system will fail to isolate. Attempts to isolate RWCU will be unsuccessful.

Malfunctions required: 2

- (Loss of 2B Recirc MG Set lube oil system)
- (Unisolable RWCU system)

Success Path:

- Manually scram the Reactor per DGP 02-03, Reactor Scram

Event Eight – Unisolable RWCU System Leak / Emergency Depressurization

- An unisolable leak occurs in the RWCU pump room which fills the LPCI/CS Corner Rooms to above MAX Safe water level.

Malfunctions required: 1

- (RWCU system leak)

Success Path:

- Performs an Emergency Depressurization.

PRE-SCENARIO ACTIVITIES

1 If applicable, conduct pre-scenario activities in accordance with TQ-JA-150-08, SIMULATOR EXAMINATION BRIEFING.

   a. Direct the crew to perform their briefs prior to entering the simulator.

   b. Provide the Team a marked-up copy of DOS 6600-01, Diesel Generator Surveillance Tests.

2 Simulator Setup (the following steps can be done in any logical order)

   a. Initialize simulator in an IC with Reactor power ~60%.

   b. Verify core flow at 57-58 Mlbm/hr.

   c. Adjust control rods to establish ~535 MWe.

   d. Cut in/out Cond Demins as needed, to maintain DP within limits.

   e. Advance the chart recorders.

3 Verify the following simulator conditions:

   a. Verify 2B1 Recirc MG Set lube oil pump running.

   b. Verify 'B' FWRV in Master Auto with 'A FWRV in MAN and closed.

   c. Verify 2A, 2B & 2C Cond/Boost pumps running with 2D pump off.

   d. Verify 2D Cond/Boost pump in STBY.

   e. Verify 2B Service Water pump running.

   f. Verify TR 86 LTC in MANUAL.

   g. Start the 2/3 EDG as follows:

      1) At the instructor station, set the 2/3 EDG droop to 55. (irf t03 true)

      2) At the instructor station, acknowledge the local 2/3 EDG annunciator panel. (irf t23 acknowledge)

      3) Reset the 2/3 EDG Trouble alarm on the 902-8 panel.

      4) Place the 2/3 EDG control switch to START.

      5) Using the 2/3 EDG GOVERNOR control switch, adjust the frequency to ~60.2 Hz.

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

4 Run the initial setup CAEP file: ILT-N-2.cae

NOTE: Variables with more than one array dimension will not load into the EVENT program from a CAEP file. Therefore it is necessary to load logic statements directly into the EVENT program.

   a. Open the EVENT program and perform the following:

      1) Double click line 7 to select Event 7. ("The Command box should be blank)

      2) In the Event Action box, enter: hdvdrain(1,2) .gt. 0.05

      3) Click "Accept New Event". Verify "hdvdrain(1,2) .gt. 0.05" was added to Line 7.

      4) Double click line 10 to select Event 10. ("irf fwhdrc1b false" should already be in the Command box)

      5) In the Event Action box, enter: (hdlinst(1,2) .lt. 14.0) .and. et_array(9)

      6) Click "Accept New Event". Verify "(hdlinst(1,2) .lt. 14.0) .and. et_array(9)" was added to Line 10.

5 Place the following equipment out of service:

a. None

6 Complete the Simulator Setup Checklist.

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

- √ Critical Tasks
- ■ Required Actions
- ❑ Optional Actions

Event One – Shutdown U2 EDG Following Surveillance Testing		
Trigger	Position	Actions or Behavior
1		**SIMULATOR OPERATOR / ROLE PLAY:** If requested to set gains to 1, (wait 3 min) activate **trigger 1**, then report: "gains set to 1". (This trigger can be toggled OFF, then back ON to adjust the gains more than once).
2 **3**		**SIMULATOR OPERATOR / ROLE PLAY:** EO to set 2/3 EDG droop to 5: Wait 1 min, activate **trigger 2** which sets the droop to 5 and forces up alarm 902-8 A-4, 2/3 Diesel Gen Trouble. Verify **trigger 3** activates automatically when alarm 902-8 A-4 comes in. This returns the alarm to normal after 10 seconds. Then report "The 2/3 EDG droop is set to 5".
		ROLE PLAY: EO to perform steps in DOS 6600-01: Wait an appropriate time, then report the required action completed.
	CRS	❑ Directs the BOP to continue DOS 6600-01, Diesel Generator Surveillance Tests.
	ATC	❑ Assists as directed and monitors the panels.
		ROLE PLAY: If asked, report: "chemistry samples have been completed per DOS 6600-01 step I.15.A".
	BOP	Loads 2/3 EDG to Bus 23-1 per DOS 6600-01, Diesel Generator Surveillance Tests. ■ Inserts key AND turns the synchroscope ON between the 2/3 D/G and the Bus 23-1. ■ Adjusts the 2/3 D/G voltage (using VOLTAGE REG c/s) AND speed (using GOVERNOR c/s) until the 2/3 D/G output is synchronized with the 4 kV system. ■ Closes the 2/3 D/G output breaker to the 4 kV Bus 23-1. ❑ Turns off synchroscope AND remove key. ■ Using the GOVERNOR control switch, raises the load on the 2/3 D/G to 2340 to 2600 kW over a period of approximately 30 to 90 seconds. ■ Using the VOLTAGE REG control switch, adjusts D/G excitation to -300 to +300 KVARS (real load may have to be re-adjusted to maintain the kW band listed in the previous step). ❑ Records D/G load AND time.

Event One – Shutdown U2 EDG Following Surveillance Testing		
Trigger	Position	Actions or Behavior
	BOP	After the 2/3 D/G has run fully loaded for at least 5 minutes, shuts down 2/3 EDG per DOS 6600-01, Diesel Generator Surveillance Tests. ❑ Records shutdown information. ❑ Reduces the 2/3 D/G load to less than 100 kW using the GOVERNOR control switch. ■ Opens the circuit breaker from the 2/3 D/G 2 to 4 kV Bus 23-1 and records time. ■ Directs the EO at the 2/3 D/G governor to set the droop setting to 5 and reset the local annunciator. ❑ Resets annunciator 902-8 A-4, 2/3 DIESEL GEN TROUBLE. ■ Adjusts 2/3 D/G speed to 60 Hz with the GOVERNOR control switch. ■ Adjusts 2/3 D/G voltage to 4160 volts with the VOLTAGE REG control switch. ■ Moves the 2/3 D/G control switch to the STOP position momentarily, then moves the switch to the AUTO position and records time.
		FLOOR INSTRUCTOR ROLE PLAY: When the NSO moves the D/G control switch to the AUTO position, notify him that as the U3 BOP, you have been directed to complete the surveillance. When the 2/3 D/G stops, acknowledge, announce and reset expected alarms: ❖ 902-7 H-8, 2/3 Diesel Gen Clg Wtr PP Trip/Lockout. ❖ 902-8 A-4, 2/3 Diesel Gen Trouble.
Event 1 Completion Criteria: • **2/3 EDG shutdown, (Or in the cooldown period)** **AND/OR,** • **OR, at the direction of the Lead Examiner.**		

Event Two – Drywell Equipment Drain Sump Alarm Failure		
Trigger	Position	Actions or Behavior
		NOTE: This event should be started while the BOP Operator is still performing the actions of the previous event at the 902-8 panel, thus allowing the ATC Operator to perform these actions.
		NOTE: This event simulates failure of the alarm circuit; actual sump level is below the alarm setpoint. Therefore the sump pumps will not automatically start when the AO 2-2001-5 AND AO 2-2001-6, DW EQUIP DRN ISOL VLV(s), are opened. The sump pumping is intended to result in about a 3 gpm leak rate calculation.
4		**SIMULATOR OPERATOR / ROLE PLAY:** At the discretion of the Lead Examiner, activate **trigger 4**, which forces up alarm 902-4 B-17, Drywell Equip Sump Lvl Hi.
		ROLE PLAY: EO to check Drywell CAM: Wait 2 min, and then report that "the Drywell CAM reading is unchanged".
		FLOOR INSTRUCTOR ROLE PLAY: As U3 CRS, inform the U2 CRS that "I will perform the leakage rate calculation". Cue the Team that it has been 2 hours since the Drywell Equipment Sump was last pumped.
	ATC	Announces alarm: ❑ 902-4 B-17, Drywell Equip Sump Lvl Hi.
	CRS	■ Directs pumping the Drywell Equipment Drain Sump per DOP 2000-24, Drywell Sump Operation.
	ATC	Pumps the Drywell Equipment Drain Sump per DOP 2000-24, Drywell Sump Operation: ❑ Verifies ONE of the following conditions exists: o The Drywell CAM indicates normal activity with no unexplained changes. o Obtains an acceptable drywell air sample. o Verifies reactor water level, drywell pressure, and main steam line radiation monitors are within normal limits with NO unexplained changes. ❑ Verifies open AO 2-2001-3, DW EQUIP SUMP DISCH VLV. ■ Opens AO 2-2001-5 AND AO 2-2001-6, DW EQUIP DRN ISOL VLV(s). ■ Manually starts 2A OR 2B EQUIP DRN PP.

Event Two – Drywell Equipment Drain Sump Alarm Failure		
Trigger	Position	Actions or Behavior
	ATC	WHEN pumping is complete OR level has reach the desired point, THEN: ❑ Verify EQUIP DRN PP stops. ❑ Close AO 2-2001-5 AND AO 2-2001-6, DW EQUIP DRN ISOL VLV(s). ❑ Places the 2A OR 2B EQUIP DRN PP control switch in NORMAL-AFTER-STOP. ❑ Reset the annunciators associated with the Drywell Equipment and Drywell Floor drain valves.
	BOP	❑ Assists as directed.

Event 2 Completion Criteria:

- **Drywell Equipment Sump pumped and leak rate determined to be unchanged.**

AND/OR,

- **OR, at the direction of the Lead Examiner.**

Event Three – Drywell to Torus Differential Pressure Controller Failure.		
Trigger	Position	Crew Actions or Behavior
		NOTE: This event may be started while the previous event is on-going, due to the time for the failure to build in. 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.
5		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **trigger 5**, 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: EO to check PCV 2-8599-556: Wait until Drywell to Torus D/P is <1.0 psid, then report that "2-8599-556 is closed"
	BOP	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 until Drywell to Torus D/P is <1.0 psid, 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
	BOP	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.
	ATC	Monitors panels and assists as directed.
		ROLE PLAY: As Plant Support called to assist, respond: "I will send a team to investigate". EO 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)
		NOTE: The following Tech Spec applies only if Drywell to Torus DP drops below 1.0 psid.
	CRS	■ Determines following Technical Specifications apply: • TS 3.6.2.5: Restore differential pressure to within limit within 24 hours.
		NOTE: If Drywell to Torus DP does NOT drop below 1.0 psid and the CRS does NOT make the Tech Spec call, the Examiner will ask follow up question(s) after the scenario, asking the CRS what Tech Spec would be required to be entered IF the Drywell to Torus DP had dropped below 1.0 psid.

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 – Loss of a Feedwater Heater		
Trigger	Position	Crew Actions or Behavior
6		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **trigger 6,** which causes 2B1 HTR normal drain to unlatch.
7-11 **23-24**		**SIMULATOR OPERATOR:** Verify the following automatic triggers activate as expected: **Trigger 7:** Activates when 2B1 HTR Emergency Drain opens. Holds 2B1 HTR Emergency Drain at 15% open. Forces up alarm 902-6 E-04, 2B1 Heater Emerg Drain Vlv Open **Trigger 8:** Activates when 902-6 E-01, 2B1 Heater Lvl Hi, alarms. Holds 2B1 HTR Emerg Drain at 3.0% open. **Trigger 9:** Activates when 2B1 Heater Extraction control switch is placed to PTS or OPEN. Holds 2B1 HTR Emerg Drain at 12% open. **Trigger 10:** Activates when 2B1 Heater Level is below 14.0 inches and trigger 9 is active. Removes hold on 2B1 HTR Emerg Drain. **Trigger 11:** Activates when trigger 10 is active. Returns alarm 902-6 E-04, 2B1 Heater Emerg Drain Vlv Open, to NORMAL. **Trigger 23:** Activates when Trigger 8 is active and 2B1 Htr Extr Vlv CLOSE light is ON. After 30 sec, Holds 2B1 HTR Emerg Drain at 8.0% open. **Trigger 24:** Activates when alarm 902-6 E-01, 2B1 Heater Lvl Hi, clears. Holds 2B1 HTR Emerg Drain at 0.0% open.
		ROLE PLAY: EO to check 2B1 level controllers: wait 2 min, then report the following for each component: ❖ SO 2-3502A, 2B1 FW HTR LCV 2-3502A SO VLV: report “the SO 2-3502A is tripped due to its latch mechanically broken”. ❖ LIC 2-3541-17A, B1 DRAIN TO A1 FLASH TANK, setpoint: report “the LIC 2-3541-17A setpoint is 12 inches”. ❖ LIC 2-3541-10A, B1 SPILL TO COND, setpoint: report “the LIC 2-3541-10A setpoint is 14 inches”. ❖ LIC 2-3541-10A, B1 SPILL TO COND, demand: report “the LIC 2-3541-10A demand is 10 psig” If asked: “I see no obvious malfunction or instrument air leakage”. If asked: “All heater level controller MODE switches are in AUTOMATIC”. If asked for local heater level indication, report the value displayed on Instructor station drawing 902-6-03

Event Four – Loss of a Feedwater Heater		
Trigger	Position	Crew Actions or Behavior
	ATC	❑ Announces alarms: o 902-6 D-7, 2B1 Heater Normal Drain Vlv Closed. o 902-6 E-4, 2B1 Heater Emerg Drain Vlv 33% Open. ❑ Sends an operator to check 2B1 Heater level controllers.
	ATC	❑ Announces alarm 902-6 E-1, 2B1 Heater Lvl Hi. ❑ Verifies automatic actions: o MO 2-3101A, 2B1 FW HTR EXTR STM MOV, closes. o FCV 2-3102A, 2B1 FW HTR EXTR STM BYP FCV, opens.
	CRS	■ Due to 2B1 Heater trip, enters DOA 3500-02, Loss of Feedwater Heaters.
	ATC	Performs DOA 3500-02, Loss of Feedwater Heaters, immediate actions: ❑ Monitors feedwater temperature and heater levels. ■ Places 2B1 Heater extraction valve control switch in pull to stop (PTS). **OR** ■ Re-opens 2B1 Heater extraction valve when the 2B1 heater Hi level alarm resets.
	BOP	❑ Assists as directed.

Event 4 Completion Criteria:

- **2B1 Heater level controlling on its emergency drain valve,**

AND / OR,

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

Event Five – Service Water Pump Trip		
Trigger	Position	Crew Actions or Behavior
12		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **trigger 12,** which trips the 2B Service Water Pump.
		ROLE PLAY: EO at Service Water Pump just started (wait 2 min.): Report: "The Service Water Pump is operating normally and 2B Service Water Pump shows no sign of damage". EO at 2B Service Water Pump at Bus 24 (wait 2 min.): Report: "2B Service Water Pump Breaker has overcurrent targets up". EMD Acknowledges need to go to Bus 24 and troubleshoot overcurrent flag at 2B Service Water Pump breaker.
13		**SIMULATOR OPERATOR:** After a standby Service Water Pump is started, activate **trigger 13**, which returns the Remote for stopping the DFP to normal.
	BOP	❑ Announces 2B Service Water Pump trip. ❑ Refers to DAN 923-1 C-3, U2 OR U3 SERV WATER PP TRIP. ■ Starts an available Service Water Pump. Refers to DOA 6500-10, 4Kv Circuit Breaker Trip and: ❑ Directs an EO to the Cribhouse to check the Service Water Pump just started and inspect 2B Service Water Pump. ❑ Direct an EO to check the breaker of 2B Service Water Pump. ■ Places 2B Service Water Pump control switch in Pull to Lock. ❑ Notifies Ops Shift Supervisor. ❑ Requests EMD to troubleshoot.
	CRS	❑ Notifies Shift Manager and EMD. ❑ Enters DOA 3900-01, Loss of Cooling by Service Water System. ❑ Enters DOA 6500-10, 4Kv Circuit Breaker Trip.
	ATC	❑ Assists as directed.

Event 5 Completion Criteria:

- **An available Service Water pump is started,**

AND / OR,

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

Event Six – Recirc MG Set Motor High Temperature / MG Set Trip		
Trigger	Position	Crew Actions or Behavior
14 **15**		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **trigger 14**, which causes 2A Recirc MG Set motor stator temperature to rise. Verify **Trigger 15** automatically activates when 2A Recirc MG Set motor stator temperature reaches 315 deg. F. This causes 2A Recirc MG Set motor to trip on overcurrent. Before the Team takes any actions to perform an emergency load drop, **activate Trigger 15**.
		ROLE PLAY: As the EO sent to the Recirc MG set to inspect for problems (wait 3 min) then report: "Everything looks normal at the Recirc MG Sets".
	ATC	Announces and performs actions for the following DANs: ❖ 902-4 B-9, 2A/B RECIRC M-G MTR/GEN TEMP HI. ❖ 902-4 E-4, 2A RECIRC M-G TEMP HI. ❑ Checks recorder TR 2-262-19A points 1, 2, 3, 7, and 9. ❑ Verifies Recirc MG Set Vent Fan operating properly. ❑ Verifies MG Set current normal.
	CRS	❑ May direct an emergency load drop per DGP 03-01, Power Changes. ■ Due to rapidly rising Recirc MG Set temperature, directs shutting down 2A Recirc MG Set per DOP 0202-04, Unit 2(3) Reactor Recirculation System Shutdown. ■ √ Enters DOA 0202-01, Recirculation (Recirc) Pump Trip One or Both Pumps.
	ATC	Performs following per DOP 0202-04, Unit 2(3) Reactor Recirculation System Shutdown: ■ Takes 2A M-G SET DRIVE MOTOR to STOP. Performs following per DOA 0202-01, Recirculation (Recirc) Pump Trip One or Both Pumps: ❑ Closes tripped recirc pump discharge valve MO 2-0202-5A. ❑ After 5 minutes, opens recirc pump discharge valve previously closed. ■ √ Inserts CRAM Rods per DGP 03-04 to reduce Rx power to 25 to 30%. ■ √ Reduces running Recirc Pp speed to < 35%. ❑ Monitors MSL & off gas rad monitors for increased activity. ❑ Notify QNE to monitor core parameters. ❑ Notify Chemistry to take samples per TS and ODCM if power change was ≥ 20% thermal in one hour.

Event Six – Recirc MG Set Motor High Temperature / MG Set Trip		
Trigger	Position	Crew Actions or Behavior
	CRS	Refers to: ■ TS 3.4.1 Condition B: Declare the recirculation loop with lower flow to be "not in operation." within 2 hours. ■ TS 3.4.1 Condition C: Satisfy the requirements of the LCO (For one Recirc pump running) within 24 hours.
	CRS	❑ May enter DGP 03-03, Single Recirculation Loop Operation.
	BOP	❑ Assists as directed.

Event 6 Completion Criteria:

- **Appropriate Tech Specs referenced AND**
- **DOA 0202-01, Recirculation (Recirc) Pump Trip One or Both Pumps, completed,**

AND / OR

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

Event Seven – Trip of Second Recirc Pump / Reactor Scram		
Trigger	Position	Crew Actions or Behavior
16		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **Trigger 16**, which simulates a loss of 2B Recirc MG Set lube oil system resulting in a trip of 2B Recirc MG Set. If the reactor is not scrammed after the 2B Recirc MG Set trip, after a few minutes core oscillations will begin which will eventually scram the reactor.
		ROLE PLAY: As the EO sent to check: wait 1 min, then report "I see nothing abnormal".
	ATC	Announces alarms: ❖ 902-4 B-8, 2B RECIRC M-G LUBE OIL PRESS LO. ❖ 902-4 C-5, 2B RECIRC M-G SCOOP TUBE PWR FAILURE. ❖ 902-4 G-6, U-2 B1/B2 AC OIL PP AUTO START. ❑ Verifies 2B2 AC Oil pump auto started. ❑ Verifies 2B M-G Set scoop tube lockout.
	ATC	❑ Announces trip of 2B2 AC Oil pump and trip of 2A Recirc M-G Set.
	CRS	■ (Re-)Enters DOA 0202-01, Recirculation (Recirc) Pump Trip One or Both Pumps. ■ √ Enters DGP 02-03, Reactor Scram, and directs a manual scram.
	ATC	√ Performs DGP 02-03, Reactor Scram, actions as directed: ■ Depresses BOTH Scram buttons. ■ Places RX MODE SW in SHUTDOWN. ❑ Inserts SRMs and IRMs. ❑ Controls reactor water level +25 to +35 inches or as directed by the Unit Supervisor.
	BOP	Performs DGP 02-03, Reactor Scram, actions as directed: ❑ Silences annunciators at Panel 902-8, until the NSO reports reactor level and pressure trends. ❑ Silences Panels 902-54 and 902-65 annunciator alarms. ❑ Verifies turbine tripped. ❑ Verifies generator tripped. ❑ Verifies aux power transfers.
	CRS	Enters DEOP 0100, RPV Control, and directs: ❑ Verifying Isolations. ❑ Controlling RPV water level between 8 in. and 48 in. using feedwater system. ❑ Stabilizing RPV pressure below 1060 psig using main turbine BPVs.

Event Seven – Trip of Second Recirc Pump / Reactor Scram		
Trigger	Position	Crew Actions or Behavior
	BOP	❑ During verification of isolations, finds RWCU still operating and attempts to isolate the RWCU system. ❑ Reports to CRS that the MO 2-1201-1 and MO 2-1201-2 valves will not close.
Event 7 Completion Criteria: • **Reactor scram performed,** **AND/OR,** • **At the direction of the Lead Examiner.**		

Events Eight – Unisolable RWCU System Leak / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
17		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **Trigger 17** which causes a leak from the RWCU system in the pump room.
		ROLE PLAY: As a dispatched EO **OR as an EO on rounds**, (wait 2 min. after the leak starts) then report over the radio: "There is a large amount of water running from the RWCU pump room. The water is flowing down the stairs to the Reactor Building 1st floor. The floor drains appear to be plugged up". EO to check LPCI/CS corner rooms: wait until the corner room sump alarms are up, and then report "water is accumulating on the floor in both corner rooms". At the discretion of the Lead Evaluator, report as the EO that both corner room water levels have reached the DEOP 8 in. lines on the wall.
	BOP	Announces alarms due to the RWCU leak: 0 902-4 C-19, LPCI/CS EAST SUMP LEVEL HI. 0 902-4 D-19, LPCI/CS WEST SUMP LEVEL HI. 0 923-4 A-3, U2 E RBFD SUMP LVL HI HI. 0 923-4 B-2, U2 W RBFD SUMP LVL HI HI. ■ Dispatches EO(s) to check areas for leaks. ❑ Announces that the RWCU system has indication of flow.
	CRS	■ Enters DEOP 0300-01 Secondary Containment Control, when informed a LPCI/CS Corner room water level is above 0 in.
	BOP	■ Directs equipment operator to report if the corner room levels reach the DEOP lines on the wall.
	CRS	√ When notified of 2 or more areas above Max Safe (water level), enters DEOP 0400-02, **Emergency Depressurization**, and directs: ❑ Verifying all rods in to at least position 04. ❑ Drywell Pressure < 2.0 psig. ❑ Verifying SP/L >6 feet. ■ Opening all ADS valves. ❑ Verifying all ADS valves are open.
	BOP	√ Executes DEOP 0400-02, **Emergency Depressurization**, as directed: ❑ Verifies SP/L >6 feet. ■ Opens all ADS valves. ❑ Verifies all ADS are open.

Events Eight – Unisolable RWCU System Leak / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
Events 8 / Scenario Completion Criteria: • **Emergency Depressurization in progress,** **AND/OR,** • **At the direction of the Lead Examiner.**		

Critical Tasks	
(SC-1.2)	When an unplanned Recirc Pump shutdown or trip occurs, ***INSERT*** control rods to reduce FCL and/or ***RUNBACK*** the running Recirc Pump speed to establish the unit within acceptable operational limits. With the reactor critical and a loss of both recirculation pumps occurs, ***SCRAM*** the reactor. With a primary system discharging into the secondary containment and area water level exceeds maximum safe operating levels in more than one area, ***INITIATE*** emergency depressurization.

REFERENCES

PROCEDURE	TITLE
DAN 902-4 B-8	2B RECIRC M-G LUBE OIL PRESS LO
DAN 902-4 B-9	2A/B RECIRC M-G MTR/GEN TEMP HI
DAN 902-4 B-15	DW TO TORUS DP HI/LO
DAN 902-4 B-17	DRYWELL EQUIP SUMP LVL HI
DAN 902-4 C-5	2B RECIRC M-G SCOOP TUBE PWR FAILURE
DAN 902-4 C(D)-19	LPCI/CS EAST (WEST) SUMP LEVEL HI
DAN 902-4 E-4	2A RECIRC M-G TEMP HI.
DAN 902-4 G-6	U-2 B1/B2 AC OIL PP AUTO START
DAN 902-6 D-7	HEATER NORMAL DRAIN VLV CLOSED
DAN 902-6 E-1	2B1 HEATER LVL HI
DAN 902-6 E-4	2B1 HEATER EMERG DRAIN VLV 33% OPEN
DAN 923-1 C-3	U2 OR U3 SERV WATER PP TRIP
DAN 923-4 A-3(B-2)	U2 E(W) RBFD SUMP LVL HI HI.
DEOP 0100	RPV CONTROL
DEOP 0300-01	SECONDARY CONTAINMENT CONTROL
DEOP 0400-02	EMERGENCY DEPRESSURIZATION
DGP 02-03	REACTOR SCRAM
DOA 0202-01	RECIRCULATION (RECIRC) PUMP TRIP ONE OR BOTH PUMPS
DOA 3500-02	LOSS OF FEEDWATER HEATERS
DOA 3900-01	LOSS OF COOLING BY SERVICE WATER SYSTEM
DOA 6500-10	4KV CIRCUIT BREAKER TRIP
DOP 0202-04	UNIT 2(3) REACTOR RECIRCULATION SYSTEM SHUTDOWN
DOP 1600-05	PRIMARY CONTAINMENT INERTING AND ATMOSPHERE CONTROL
DOP 2000-24	DRYWELL SUMP OPERATION
DOS 6600-01	DIESEL GENERATOR SURVEILLANCE TESTS
TRM 3.6.c	DRYWELL-TO-SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE
TS 3.4.1	RECIRCULATION LOOPS OPERATING
TS 3.6.2.5	DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE

Simulator Scenario Review Checklist (cont'd)

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

CAEP Files

```
# ILT-N-2.cae
# For ILT Class 09-1 NRC Exam
# Written by DRDR9
# Rev 00
# Date 10/09


# INITIAL CONDITIONS

# Sets APRM Master Gain pot to 1.0
irf niagain 1.0

# Prevents the 2/3 DFP from starting.
irf w14 true
imf ser1792 off

# Prevents RWCU System from isolating
irf cirwcujp in
ior rtdcl1 off|2
ior rtdcl2 off|2

# Prevents nuisance alarm 902-8, F-6,Gen Volt Regulator Minor Trouble.
imf ser1557 off|2


# EVENT TRIGGERS

# Event Trigger 1 sets gain for all 6 APRMs.
trgset 1 "0"|2
trg 1 "irf niagainf true"|2

# Event Trigger 2 Sets 2/3 EDG droop to 5 and forces up alarm 902-8 A-4, U2/3 Diesel Gen Trouble.
trgset 2 "0"|4
irf t03 (2) false|4
imf ser1441 (2) on|4

# Event Trigger 3 clears alarm 902-8 A-4.
trgset 3 "sezpoint(1441)"|4
trg 3 "imf ser1441 (0 10) normal"|6

# Event Trigger 4 Forces up alarm 902-4 B-17, Drywell Equip Sump Lvl Hi.
# Sets mass in DWEDS to simulate a 3 gpm leak rate over 2 hrs.
trgset 4 "0"|6
trg 4 "set pcmdwes = 4200.0"|6
imf ser0512 (4) on|6

# Event Trigger 5 fails drywell to torus DP controller demand downscale.
trgset 5 "0"|8
ior pcvdmd14 (5) 0.0|8

# Event Trigger 6 Unlatches 2B1 HTR Normal Drain.
trgset 6 "0"|8
irf fw3502au (6) unlatch|8

# Event Trigger 7 Activates when 2B1 HTR Emerg Drain opens.
# Holds 2B1 HTR Emerg Drain at 17% open.
# Forces up alarm 902-6 E-04, 2B1 Heater Emerg Drain Vlv Open.
trgset 7 "hdvdrain(1,2) .gt. 0.05"|8
```

```
irf fwhdro1b (7) 17.0|8
irf fwhdrc1b (7) true|10
imf ser1243 (7) on|10

# Event Trigger 8 Activates when 902-6 E-01, 2B1 Heater Lvl Hi, alarms.
# Holds 2B1 HTR Emerg Drain at 3.0% open.
trgset 8 "sezpoint(1231)"|10
trg 8 "irf fwhdro1b 3.0"|10

# Event Trigger 23 Activates when Trigger 8 is active and 2B1 Htr Extr Vlv CLOSE light is ON.
# After 30 sec, Holds 2B1 HTR Emerg Drain at 8.0% open.
trgset 23 "et_array(8) .and. hdl3101c(1)"|24
trg 23 "irf fwhdro1b (0 30) 8.0"|24

# Event Trigger 24 Activates when alarm 902-6 E-01, 2B1 Heater Lvl Hi, clears.
# and 2B1 Htr Extr Vlv OPEN light is OFF.
# Holds 2B1 HTR Emerg Drain at 0.0% open.
trgset 24 "(.not. sezpoint(1231)) .and. (.not. hdl3101o(1))"|28
trg 24 "irf fwhdro1b 0.0"|26

# Event Trigger 9 Activates when 2B1 Heater Extraction control switch is placed to PTS or OPEN.
# Holds 2B1 HTR Emerg Drain at 12% open.
trgset 9 "hdd3101s_drw(1) .or. hdd3101o_drw(1)"|12
trg 9 "irf fwhdro1b 12.0"|12

# Event Trigger 10 Activates when 2B1 Heater Level is below 14.0 inches and trigger 9 is active.
# Removes hold on 2B1 HTR Emerg Drain.
trgset 10 "(hdlinst(1,2) .lt. 14.0) .and. et_array(9)"|12
trg 10 "irf fwhdrc1b false"|12

# Event Trigger 11 Activates when trigger 10 is active.
# Returns alarm 902-6 E-04, 2B1 Heater Emerg Drain Vlv Open, to NORMAL.
trgset 11 "et_array(10)"|14
trg 11 "imf ser1243 normal"|14

# Event Trigger 12 inserts a trip of the 2B service water pump. (takes several seconds to occur)
trgset 12 "0"|14
imf q22 (12)|14

# Event Trigger 13 Returns the Remote for stopping the 2/3 DFP back to normal.
trgset 13 "0"|16
irf w14 (13) false"|16
imf ser1792 (13 2) normal|16

# Event Trigger 14 Inserts 2A Recirc MG Set Motor High Temperature.
trgset 14 "0"|16
imf rrmgmahi (14)|18

# Event Trigger 15 Activates when 2A Recirc MG Set Motor Temperature >315 deg. F.
# Trips 2A Recirc MG Set Motor on overcurrent.
trgset 15 "rrtmstat(1) .gt. 315.0"|18
imf rrmgmaoc (15)|18

# Event Trigger 16 Trips 2B1 Recirc MG Set lube oil pump.
# After 2 min, trips 2B2 Recirc MG Set lube oil pump.
# After 5 min, starts core oscillations.
trgset 16 "0"|18
ior rrdb1stp (16) trip|20
ior rrdb2stp (16 2:00) trip|20
imf rxmlgosc (16 5:00) 25.0 8:00 5.0|20
```

```
imf a55 (16 5:02)|20

# Event Trigger 17 Starts a RWCU leak from the Main Pump suction.
# Opens the RWCU PCV bypass to maintain flow if the PCV is closed.
# Overrides RWCU DRN FLOW CONTLR RMC 2-1290-14 pot to 0.0
# After 3 min, drives up alarm 902-4 D-19, LPCI/CS West Sump Level Hi.
# After 5 min, drives up alarm 902-4 C-19, LPCI/CS East Sump Level Hi.
trgset 17 "0"|22
imf u34 (17) 10.0 1:00|22
irf u71 (17) 3.0 1:00|22
ior rtwmn14 (17) 0.0|22
imf ser0557 (17 3:00) on|24
imf ser0555 (17 5:00) on|24

# END
```

Unit 2 Risk: GREEN

Unit 2 is in Mode 1 at 535 MWe

Leading Thermal Limit: MAPRAT@0.781

Action limit: 0.980

Equipment Unavailable: None

Protected Equipment: None

Unit 3 Risk: GREEN

Unit 3 is in Mode 1 at 913 MWe

Leading Thermal Limit: MAPRAT @ 0.819

Action Limit: 0.980

Equipment Unavailable: None

Protected Equipment: None

Current Action Statements

2/3 EDG	LCO Started:	2 hrs ago	LCO Expires:	in 7 days

TS 3.8.1

Cause: Surveillance DOS 6600-01.

Unit 1 Plant Status

Today	U1 Diesel Oil Storage Tank Transfer House has grating removed. Currently roped off with pump installed to pump to U1 Oil Separator Pit as required. Outside operator monitor and pump as necessary.
Today	Chem Cleaning ventilation status: HV-1A/EF-1A are secured due to HV-1A inlet and outlet dampers being shut with fan on, IR# 913157, WO 1239746. HV-1B/EF-1B are secured due to HV-1B throwing its belts. WO 1156150. HVAC -1 ON. HV-2 running.

Switchyard Status

Today	138 KV Bus 1 Feed To TR 22 Combi Units has low oil in the 'C' phase, ComEd WO #276162
Today	HVO: Exercise CAUTION while in the 345 kV Yard due to excavation being performed in the area. Marv Evans reports holes being dug near manual switch disconnects 345kV Blue Bus. Plywood will be installed over the holes if access is needed, but be aware there are holes under the plywood. SSC called from the 345Kv yard reporting that the cable trough covers are removed to prep for upcoming work. Be careful.

Unit 2 Plant Status

Today	Unit 2 Activities
	**** Shift 1 Activities ****
	□
	□
	**** Shift 2 Activities ****
	□ Load was reduced last shift per BPO request. Expected to hold this load until tomorrow.
	□ DOS 6600-01 for 2/3 EDG loaded run to Bus 33-1 complete. Continue with surveillance and perform loaded run on Bus 23-1 and then secure the 2/3 EDG.
	□ Data Sheet 1A has been completed by another Operator and is being reviewed by the U3 Unit Supervisor.
	**** Shift 3 Activities ****
	□
	□
Today	**** Unit 2 Procedures In-Progress **** Do Not Delete ****
	□ DOS 6600-01, DIESEL GENERATOR SURVEILLANCE TEST.

Dresden Generating Station

ILT-N-3

REMOVE FWRV FROM SERVICE

CONDENSATE/BOOSTER PUMP TRIP WITH FAILURE OF STBY TO AUTO START

SECONDARY CONTAINMENT DOORS FOUND OPEN

IRM FAILS UPSCALE WITH HALF SCRAM

LOSS OF EHC / MANUAL REACTOR SCRAM

LOSS OF HIGH PRESSURE FEED / RECIRC LOOP LEAK / EMERGENCY DEPRESSURIZATION

Rev. 00

10/09

Developed By: _____ _____
Exam Author Date

Approved By: _____ _____
Facility Representative Date

Scenario Outline

Station: Dresden Generating Station **Scenario No.:** ILT-N-3 **Class ID:** 2010-301

Evaluators	Operators	/ crew position
		/ ATC
		/ BOP
		/ CRS

Initial Conditions: 2% Power
Startup On Hold For REMA Re-evaluation By ONE.

Turnover: Remove 'B' FWRV From Service After Assuming Shift.

Event No.	Malf. No.	Event Type*		Event Description
1	NONE	N	ATC	FW - Remove 'B' FWRV From Service.
2	H21	C	ATC	FW - Cond/Cond Bstr Pump Trip with Failure of Standby to Auto Start.
3	NONE	T	CRS	CONTAINMENT - Secondary Containment Doors Found Open.[T]
4	NII12POT	I	ATC	NI - IRM Channel Fails Upscale with Half Scram. [T]
5	J33	M	TEAM	Loss of EHC System / Team Takes a Manual Scram.
6	F41 RLMFAFC RLMFBFC RLMLFFC	M	TEAM	Recirc System Leak and Loss of All Feedwater Reg Valves / Team Emergency Depressurizes Due to Lowering RPV Level.

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

Scenario Objective

Evaluate the Team's ability to operate the plant with a loss of high pressure feed requiring an emergency depressurization.

Scenario Summary

1. Unit is at ~2%.
2. The following equipment is OOS:
   a. None
3. LCOs:
   a. None

Scenario Sequence

- The Team removes 'B' FWRV from service.
- 2A Condensate/Booster Pump trips with failure of the STBY pump to auto start. Also the first pump the Team attempts to start will trip. The other non-running pump will start.
- A report comes from the field that Secondary Containment is breached by doors found open. The crew directs the doors be closed. The Team references Tech Specs.
- IRM channel 12 then fails upscale and a half-scram occurs on the RPS "A" channel. The SRO addresses the technical specification requirements for the failure. Then the NSO bypasses the failed IRM channel and resets the half scram.
- A leak occurs in the EHC hydraulics system which eventually results in loss of the EHC hydraulic system. The Team will perform a manual scram before RPV pressure control is lost.
- Shortly after the manual scram, a problem in the FWLC system causes all the feedwater regulating valves to fail closed. After the Team addresses RPV level control, a recirculation loop develops a leak causing drywell pressure to slowly increase and RPV level to begin dropping. When HPCI starts, it spuriously isolates, resulting in a total loss of high pressure feed. The team performs the RPV Control and Primary Containment Control DEOPs. When RPV level drops to TAF, the team Emergency Depressurizes and restores RPV level with low pressure injection systems.

Event One – Remove 'B' FWRV from Service

- The Team removes 'B' FWRV from service.

Malfunctions required: 0

- (None)

Success Path:

- Performs DOP 0600-01, Feedwater Regulating Valve (FWRV) Operation, to remove 'B' FWRV from service.

Event Two – Condensate/Booster Pump Trip with Failure of STBY to Auto Start

- 2A Condensate/Booster Pump trips with failure of the STBY pump to auto start. Also the first pump the Team attempts to start will trip.

Malfunctions required: 1

- (Condensate/Booster pump trip with failure of STBY to auto start)

Success Path:

- Starts a Condensate/Booster pump.

Event Three – Secondary Containment Doors Found Open

- A report is received that Secondary Containment Doors are open.

Malfunctions required: 0

- (None)

Success Path:

- Directs the Secondary Containment Doors closed.
- Determines Technical Specifications requirements.

Event Four – IRM Channel Fails Upscale

- The crew recognizes and responds to an IRM failing upscale resulting in a half scram.

Malfunctions required: 1

- (IRM Fails Upscale)

Success Path:

- Bypasses the IRM and resets the half scram.
- Determines Technical Specifications requirements.

Event Five – Loss of EHC / Manual Reactor Scram

- A leak occurs in the EHC hydraulics system.

Malfunctions required: 1

- (EHC hydraulic leak)

Success Path:

- The Team performs a manual scram per DGP 02-03, Reactor Scram, before RPV pressure control is lost.

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

- A loss of high pressure feed and a recirculation loop leak causes Drywell pressure to increase and RPV level to drop below TAF.

Malfunctions required: 2

- (Loss of high pressure feed)
- (Recirc loop leak)

Success Path:

- Spray the Drywell.
- Emergency Depressurize to restore RPV level with low pressure systems.

PRE-SCENARIO ACTIVITIES

1 If applicable, conduct pre-scenario activities in accordance with TQ-JA-150-08, SIMULATOR EXAMINATION BRIEFING.

   a. Direct the crew to perform their briefs prior to entering the simulator.

   b. Provide the Team a marked-up copy of DGP 01-01, Unit Startup.

   c. Provide the Team a copy of DOP 0600-06, Feedwater Regulating Valve (FWRV) Operation.

2 Simulator Setup (the following steps can be done in any logical order)

   a. Initialize simulator in an IC with Reactor power ~2%.

   b. Cut in/out Cond Demins as needed, to maintain DP within limits.

   c. Ensure running Condensate pump amps within limits.

   d. Advance the chart recorders.

3 Verify the following simulator conditions:

   a. Verify both FWRVs in Master Auto.

   b. Verify 2B CRD pump running with 2A OFF.

   c. Verify 2A & 2C Cond/Boost pumps running with 2B & 2D pumps off.

   d. Verify 2D Cond/Boost pump in STBY.

   e. Verify 3 cond demin beds cut in.

   f. Verify the Cond Boost Min Flow open 90-95%.

   g. Verify the Turbine is reset.

   h. Verify TR 86 LTC in MANUAL.

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

4 Run the initial setup CAEP file: ILT-N-3.cae

5 Place the following equipment out of service:

   a. None

6 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 – Remove 'B' FWRV from Service		
Trigger	Position	Crew Actions or Behavior
1		**SIMULATOR OPERATOR / ROLE PLAY:** If requested to set gains to 1, (wait 3 min) activate **trigger 1**, then report: "gains set to 1". (This trigger can be toggled OFF, then back ON to adjust the gains more than once).
	CRS	❑ Directs ATC to remove 'B' FWRV from service per DOP 0600-06, Feedwater Regulating Valve (FWRV) Operation.
	ATC	Removes 'B' FWRV from service per DOP 0600-06, Feedwater Regulating Valve (FWRV) Operation. ❑ Verifies total Feedwater flow is ≤8.3 Mlbm/hr. ❑ Verifies reactor level stable. (LFRV is controlling level) ■ Places 'B' FWRV REG VLV CONTROL STATION in MAN. ❑ Verify 'A' FWRV operating in MASTER AUTO. ❑ Slowly reduces 'B' FWRV DEMAND to close 'B' FWRV while verifying 'A' FWRV automatically adjusts. (Both valves are closed at start of evolution) ■ Closes isolation valve MO 2-3206B, 2B FW REG ISOL. ❑ Places 'B' FWRV in test at the OIS
2 **3**		**SIMULATOR OPERATOR / ROLE PLAY:** When the operator goes to the OIS station, which is not modeled in the simulator, then: o When the operator indicates he is placing the 'B' FWRV in test, activate **trigger 2**, which forces up alarm 902-6 H-3, FW Control System Panel Trouble. Cue the operator that 'B' FWRV is in test. o When the operator indicates he is acknowledging the OIS alarm, activate **trigger 3**, which returns alarm 902-H-3 to normal. Cue the operator that the OIS alarm is acknowledged.
	BOP	❑ Assist ATC as directed.

Event 1 Completion Criteria:

- **2B FWRV removed from service,**

AND/OR,

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

Event Two – Condensate/Booster Pump Trip with Failure of STBY to Auto Start		
Trigger	Position	Crew Actions or Behavior
		NOTE: The first Cond/Boost pump the ATC attempts to start will also trip. The other non-running Cond/Boost pump will start and remain running.
4 **14** **15**		**SIMULATOR OPERATOR / ROLE PLAY:** At the discretion of the Lead Examiner, activate **trigger 4.** This will cause a trip of 2A Cond/Boost pump. Verify **trigger 14** automatically activates when 2B Cond/Boost PP breaker closes and if 2D Cond/Boost PP trip malfunction is not true. This trips 2B Cond/Boost PP. Verify **trigger 15** automatically activates when 2D Cond/Boost PP breaker closes and if 2B Cond/Boost PP trip malfunction is not true. This trips 2D Cond/Boost PP.
		ROLE PLAY: EO to check operation of started Cond/Boost pump: wait 2 min, the report "the 2B (Or 2D) Cond/Boost pump is operating normally". EO to check the breaker for tripped pump: wait 2 min, and then report "the breaker has an overcurrent target up". If another Cond/Boost pump trips, report: the breaker is open, but no flags are up".
	ATC	■ Announces alarms • 902-6 F-5, CONDENSATE BOOSTER PP TRIP. • 902-6 G-4, CONDENSATE PP DISCH PRESS LO. • 902-5 H-7, RFP SUCTION PRESS LO ■ Determines STBY pump (2D) did not start. ❑ May place STBY PP SELECTOR switch to OFF. ■ Attempts to start either 2B or 2D Condensate Booster pump. ■ Determines Condensate Booster pump started tripped. ■ Starts other non-tripped pump. ❑ .Determines it started and is operating properly.
		ROLE PLAY: As the EO, if asked, report: "2B (or 2D) Condensate Booster pump is operating normally".
	CRS	■ Enters DOA 0600-01, TRANSIENT LEVEL CONTROL. ■ Enters DOA 6500-10, 4KV CIRCUIT BREAKER TRIP. ■ Directs starting an available Condensate Booster pump.

Event Two – Condensate/Booster Pump Trip with Failure of STBY to Auto Start		
Trigger	Position	Crew Actions or Behavior
	ATC	Refers to DOA 6500-10, 4Kv CIRCUIT BREAKER TRIP and: ❑ Directs an EO to check the Condensate Booster pump just started and inspect tripped Condensate Booster pumps. ❑ Direct an EO to check the breakers of tripped Condensate Booster pumps. ■ Places 2A Condensate Booster pump control switch in Pull to Lock. ❑ Notifies Ops Shift Supervisor. ❑ Requests EMD to troubleshoot.
	BOP	❑ Monitors panels and assists as directed.

Event 2 Completion Criteria:

- **An available Condensate Booster pump started,**

AND/OR

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

Event Three – Secondary Containment Doors Open		
Trigger	Position	Crew Actions or Behavior
		ROLE PLAY: At the discretion of the Lead Evaluator, call the control room as the U2 EO and report, "Both the inner and outer U2 Reactor Building Truck Interlock doors are blocked open with an air hose running through them". EO 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".
	TEAM	■ Receives report that both the inner and outer U2 Reactor Building Truck Interlock doors are blocked open. ■ Directs EO to close at least one of the doors.
	CRS	■ References Technical Specifications and determines: ❖ TS 3.6.4.1.A: Determines must restore Secondary Containment within 4 hours.

Event 3 Completion Criteria:

- **Secondary Containment Doors closed and Tech Specs referenced,**

AND/OR,

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

Event Four – IRM Fails Upscale with Half Scram		
Trigger	Position	Crew Actions or Behavior
5		**SIMULATOR OPERATOR / ROLE PLAY:** At the discretion of the Lead Examiner, activate **trigger 5**, which fails IRM channel 12 upscale.
	ATC	Perform the following actions per DAN 902-5 C-10, CHANNEL A IRM HI HI/INOP: ❑ If not in the RUN Mode, verifies the following occurred: o Channel A half scram o No rods Scrammed. o Rod Block. ❑ Verifies IRM 12 readings against other IRMs on 902-5 panel. ❑ Verifies IRM range switch in correct position ■ Bypasses IRM 12 after T. S. compliance verified by CRS. ■ Resets RPS channel A per DOP 0500-07, Insertion/Reset of Manual Half Scram, as follows: o Verifies half scram no longer required • Turns the Scram Reset switch in each direction and verifies all eight white group solenoid lights are lit. o Verifies alarm 902-5 A-10, Channel A Manual Trip, resets.
	BOP	Performs the following actions per DAN 902-5 C-10: ❑ Verifies IRM 12 readings against other IRMs on 902-36 panel. ❑ Verifies IRM 12 function switch in operate.
	CRS	■ Directs IRM 12 bypassed and the half scram reset per DOP 0500-07, Insertion/Reset of Manual Half Scram. ❑ Notifies the Shift Manager and IMD.
		ROLE PLAY: At the discretion of the Lead Examiner, as the QNE, phone the control room and report "While analyzing the rod pattern I determined that control rods G-08 and J-08 do not comply with the analyzed rod sequence". If asked, report: " I will work on rod move sheets for control rods G-08 and J-08".
	CRS	■ References plant technical documents and determines: • TS 3.1.6 Condition A.1: Move associated control rod(s) to correct position within 8 hours; **OR**, • TS 3.1.6 Condition A.2: Declare associated control rod(s) inoperable within 8 hours.

Event Four – IRM Fails Upscale with Half Scram		
Trigger	Position	Crew Actions or Behavior
Event 4 Completion Criteria: • **IRM 12 bypassed,** • **Half scram reset, AND** • **Tech Spec determination complete.** **AND / OR** • **At the direction of the Lead Examiner.**		

Event Five – Loss of EHC / Manual Reactor Scram		
Trigger	Position	Applicant's Actions or Behavior
		NOTE: The next Event begins when the reactor is scrammed.
6		**SIMULATOR OPERATOR:** At the direction of the Lead Examiner, activate **trigger 6** to simulate EHC Hydraulic Oil leak. **ROLE PLAY:** EO sent to check EHC hydraulic system, wait 3 min. then report, "The EHC hydraulic oil tank level is at the bottom of the sight glass and dropping rapidly." EO directed to fill EHC reservoir: report "I will contact the store room to have EHC oil sent to the reservoir".
	BOP	❑ Announces alarm 902-7 B-6, EHC RESERVOIR LVL HI/LO. ❑ Determines from SER that the alarm is due to low EHC level. ❑ May direct EO to fill the EHC reservoir. ❑ May access the DEHC "Monitor/Hydraulics" display to track EHC level.
	CRS	■ Determines EHC system loss is imminent. ❑ May direct scram preparations per DGP 02-03, Reactor Scram.
	ATC	❑ Performs scram preparations per DGP 02-03, Reactor Scram, as directed: o Conditions are already met.
	CRS	■ Before EHC hydraulics is lost, directs Team to scram the reactor per DGP 02-03, Reactor Scram.
	ATC	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. ■ Determines all rods are inserted. ❑ Maintains RPV level as directed by CRS. ❑ Inserts SRMs and IRMs.
	CRS	Enters DEOP 100, RPV Control, ❑ Directs actions of DEOP 100. ❑ Directs actions of DGP 02-03. ❑ Verification of all isolations, ECCS and EDG starts. ❑ Holding RPV/L +8 to +48 inches. ❑ Maintaining RPV/P <1060 psig using the Isolation Condenser.

Event Five – Loss of EHC / Manual Reactor Scram		
Trigger	Position	Applicant's Actions or Behavior
	BOP	❑ If directed, maintains RPV/P <1060 psig using the Iso Cond to control RPV/P. (may use Hardcard) ❑ Performs Reactor Scram actions per his Hardcard.

<u>Event 5 Completion Criteria</u>:

- **Team has performed a reactor scram,**

AND/OR

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

Event Six – Loss Of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
		SIMULATOR OPERATOR:
7		Verify **trigger 7**, automatically activates when the Mode Switch is placed to S/D. After 1 min, this causes all feedwater regulating valves to fail closed.
		SIMULATOR OPERATOR:
8		After the loss of DEHC and at the discretion of the Lead Evaluator, activate **trigger 8** cause a recirc loop leak.
		SIMULATOR OPERATOR:
9		When HPCI starts, verify **trigger 9** automatically activates, which causes a spurious HPCI isolation.
		SIMULATOR OPERATOR / ROLE PLAY:
10		EO sent to lineup CRD crosstie: wait 4 min, activate **trigger 10,** then report: "the CRD crosstie is lined up".
		SIMULATOR OPERATOR / ROLE PLAY:
11		EO sent to lineup makeup to SBLC Boron tank: wait 4 min, activate **trigger 11,** and report: "makeup lined up to SBLC Boron tank".
12		EO sent to lineup makeup to SBLC Test tank: wait 4 min, activate **trigger 12,** and report: "makeup lined up to SBLC Test tank".
		ROLE PLAY:
		EO sent to check EDG operation: wait 3 min, then report: "Both EDGs are operating normally".
		EO sent to cut out Cond Demin beds: wait 3 min, cutout Demin beds as needed (using instructor station), then report: "Cond Demin beds cutout".
		BOP checks OIS: Inform BOP that "the OIS display lost power".
		ROLE PLAY:
		Acknowledge other requests; delay as necessary.
	ATC	■ Determines/announces all feedwater regulating valves are failed closed.
	CRS	❑ Directs use of HPCI if needed to maintain RPV level.
	TEAM	■ Determines/announces Drywell pressure rapidly rising. ■ Determines/announces RPV level is dropping.
	CRS	❑ Directs starting HPCI to maintain Level.
	BOP	❑ Starts HPCI as directed. ■ Determines/announces HPCI isolated.

Event Six – Loss Of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
	CRS	Determines insufficient high pressure feed is available, then performs/directs: ■ √ Inhibiting ADS before –59 inches. ❑ Initiating the Isolation Condenser ❑ Lining up high pressure Alternate Injection systems. ❑ Verifying at least two low pressure injection systems available. ■ Waiting until RPV level drops to TAF. ■ Verifying any low pressure system lined up with a pump running.
	BOP	■ √ Inhibits ADS as directed.
	CRS	Enters DEOP 0200-01, Primary Containment Control, when PC/P reaches 2 psig and performs/directs: ❑ Monitoring of PC/P. ❑ Initiation of torus sprays before PC/P of 9 psig. ■ **When PC/P is above 9 psig or before DW/T reaches 281°F:** • Verification of DSIL. • Tripping of recirc pumps. • Tripping of DW coolers. • √ **Initiation of DW sprays.** ❑ Monitoring of DW/T. (D/W sprays may be initiated for temp control) ■ Monitoring of SP/T and initiation of torus cooling. ❑ Monitors SP/L. ❑ Verifies initiation of drywell and torus H_2/O_2 monitors.
	BOP	Performs DEOP 0200-01, Primary Containment Control, actions as directed: ■ √ Monitors PC/P and **initiates** torus sprays and **drywell sprays** per Hard Card LPCI/CCSW OPERATION, as directed. ❑ Monitors DW/T. ■ Monitors SP/T and initiates torus cooling per Hard Card LPCI/CCSW OPERATION as directed. ❑ Monitors SP/L. ❑ Verifies initiation of drywell and torus H_2/O_2 monitors.
		NOTE: Above a RPV pressure of 500 psig, TAF is –170 inches on the Fuel Zone indicators. Below 500 psig, TAF is –143 inches.

Event Six – Loss Of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
	CRS	Before RPV level reaches –164 inches, 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.
	BOP	Performs DEOP 0400-02, Emergency Depressurization, as directed: ❑ Initiates Iso Condenser to maximum flow per Hard Card, ISOLATION CONDENSER. ❑ Verifies SP/L >6 feet. ■ **√ Opens all ADS valves.** ■ Verifies all relief valves are open.
	CRS	**√ Directs ATC/BOP to control RPV level above TAF** using any of the preferred injection systems listed below: ❑ Condensate ❑ Core Spray ❑ LPCI
	ATC / BOP	**√ Restores RPV level to that directed by the CRS (above TAF)** using the systems specified by the CRS.

Event 6 / Scenario Completion Criteria:

- **Sprays the Drywell**
- **Performs an Emergency Depressurization.**
- **Restores RPV level above TAF.**

AND / OR,

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

Critical Tasks	
	Inhibits ADS before Automatic Blowdown conditions are met.
(RPV-1.1)	With Reactor pressure greater than shutoff head of the low pressure system(s) and when RPV water level reaches TAF, ***INITIATE*** emergency depressurization, before level reaches Minimum Zero-Injection RPV Water Level.
(RPV-1.2)	Action is taken to restore RPV water level above TAF, by ***OPERATING*** available low pressure system(s), when RPV pressure decreases below the shutoff head of the low pressure system(s).
(RPV-5.1)	When drywell pressure exceeds the suppression chamber spray initiation pressure or before containment pressure exceeds the Pressure Suppression Pressure, ***INITIATE*** drywell/containment sprays, while in the safe region of the drywell spray initiation limit or above the containment spray initiation pressure.

REFERENCES

PROCEDURE	TITLE
DAN 902-5 C-10	CHANNEL A IRM HI HI/INOP
DAN 902-5 H-7	RFP SUCTION PRESS LO
DAN 902-6 F-5	CONDENSATE BOOSTER PP TRIP
DAN 902-6 G-4	CONDENSATE PP DISCH PRESS LO
DAN 902-7 B-6	EHC RESERVOIR LVL HI/LO
DEOP 0100	RPV CONTROL
DEOP 0200-01	PRIMARY CONTAINMENT CONTROL
DEOP 0400-02	EMERGENCY DEPRESSURIZATION
DGP 01-01	UNIT STARTUP
DGP 02-03	REACTOR SCRAM
DOA 0600-01	TRANSIENT LEVEL CONTROL
DOA 6500-10	4KV CIRCUIT BREAKER TRIP
DOP 0500-07	INSERTION/RESET OF MANUAL HALF SCRAM
DOP 0600-06	FEEDWATER REGULATING VALVE (FWRV) OPERATION
TS 3.1.6	REACTIVITY CONTROL
TS 3.3.1.1	REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION
TS 3.6.4.1	SECONDARY CONTAINMENT
TRM 3.3.a	CONTROL ROD BLOCK INSTRUMENTATION

Simulator Scenario Review Checklist (cont'd)

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

CAEP Files

```
# ILT-N-3.cae
# For ILT Class 09-1 NRC Exam
# Written by DRDR9
# Rev 00
# Date 10/09


# INITIAL CONDITIONS

# Sets APRM Master Gain pot to 1.0
irf niagain 1.0

# Prevents 2D Cond/Boost PP from Auto starting by:
# Overriding OFF the PUMP 2D position of the STBY SELECT switch,
# and overiding ON the 2D Cond/Boost PP STANDBY light.
ior fwdselcb2 off
ior fwdselcb4 off
ior fwlsbycb4 on

# Removes alarm 902-3 A-2, MSL Rad Mon Hi alarm. (Should not be up)
imf ser0024 off|2
imf ser0058 off|2
imf ser0060 off|2
imf ser0062 off|2

# Removes alarm 902-3 B-2, MSL Rad Mon Dwnscl alarm. (Should not be up)
imf ser0007 off|4
imf ser0034 off|4
imf ser0035 off|4
imf ser0064 off|4


# EVENT TRIGGERS

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

# Event Trigger 2 Forces up alarm 902-6 H-3, FW Control System Panel Trouble.
trgset 2 "0"|6
imf ser1274 (2) on|6

# Event Trigger 3 Forces up alarm 902-6 H-3, FW Control System Panel Trouble.
trgset 3 "0"|8
trg 3 "imf ser1274 (2) normal"|8

# Event Trigger 4 Trips 2A Cond/Boost PP.
# Overrides FW PP Suct Hdr Press meter to 135 psig.
# Forces up alarm 902-5 H-7, RFP Suction Press Lo.
trgset 4 "0"|8
imf h21 (4)|8
ior fwpsucta (4) 135.0|10
imf ser1031 (4 2) on|10

# Event Trigger 5 IRM 12 channel fails upscale over a two minute ramp.
trgset 5 "0"|10
imf nii12pot (5) 125.0|10
```

```
# Event Trigger 6 simulates EHC Hydraulic Oil leak.
trgset 6 "0"|12
imf daisehc_level (6) 0.0 4:00 14.0|12
irf ehcrfv1o (6 4:00) 0.0 4:00|12
imf ser0662 (6) on|12

# Event Trigger 7 Activates when Mode Switch is placed to S/D.
# After 1:00 min, fails ALL FW Reg valves closed.
trgset 7 "rpdmode4_drw"|14
imf rlmfafc (7 1:00)|14
imf rlmfbfc (7 1:00)|14
imf rlmlffc (7 1:00)|14

# Event Trigger 8 Inserts a small leak in A Recirc suction line.
trgset 8 "0"|16
imf f41 (8) 0.8|16

# Event Trigger 9 Activates when HPCI speed >2000 rpm.
# Causes a spurious HPCI isolation.
trgset 9 "hpsturb .gt. 2000.0"|16
imf at37 (9) 0.0|16
imf at43 (9) 0.0|18

# Event Trigger 10 opens U3/U2 CRD cross-tie valve
trgset 10 "0"|18
irf rdxtieu3 (10) true|18

# Event Trigger 11 lines up makeup to SBLC Main Boron tank.
trgset 11 "0"|20
irf scmumntk (11) true|20

# Event Trigger 12 lines up SBLC pumps to test tank and makeup to test tank
trgset 12 "0"|20
irf scoptttk (12) true|20

# Event Trigger 14 Activates when 2B Cond/Boost PP breaker closes and
# if 2D Cond/Boost PP trip malfunction is not true.
# Trips 2B Cond/Boost PP.
trgset 14 "fwsacbcb(2) .and. (.not. fwm433f(4))"|22
imf h22 (14)|22

# Event Trigger 15 Activates when 2D Cond/Boost PP breaker closes and
# if 2B Cond/Boost PP trip malfunction is not true.
# Trips 2B Cond/Boost PP.
trgset 15 "fwsacbcb(4) .and. (.not. fwm433f(2))"|22
imf h24 (15)|22

# Event Trigger 16 Activates when 2B Cond/Boost PP breaker closes and
# if 2D Cond/Boost PP trip malfunction is true.
# Deletes override on FW PP Suct Hdr Press meter.
trgset 16 "fwsacbcb(4) .and. fwm433f(2)"|24
trg 16 "dor fwpsucta"|24

# Event Trigger 17 Activates when 2D Cond/Boost PP breaker closes and
# if 2B Cond/Boost PP trip malfunction is true.
# Deletes override on FW PP Suct Hdr Press meter.
trgset 17 "fwsacbcb(2) .and. fwm433f(4)"|24
trg 17 "dor fwpsucta"|24

# Event Trigger 18 Activates when either trigger 16 or 17 is active.
```

```
# Returns alarm 902-5 H-7, RFP Suction Press Lo, to NORMAL.
trgset 18 "et_array(16) .or. et_array(17)"|26
trg 18 "imf ser1031 (0 2) normal"|26

# END
```

Unit 2 Risk: GREEN	Unit 3 Risk: GREEN
Unit 2 is in Mode 2 at ~2% power	Unit 3 is in Mode 1 at 913 MWe
Leading Thermal Limit: NA	Leading Thermal Limit: MAPRAT @ 0.819
Action limit: NA	Action Limit: 0.980
Equipment Unavailable: None	Equipment Unavailable: None
Protected Equipment: None	Protected Equipment: None

Current Action Statements

None	LCO Started:	LCO Expires:
TS		
Cause:		

Unit 1 Plant Status

Today	U1 Diesel Oil Storage Tank Transfer House has grating removed. Currently roped off with pump installed to pump to U1 Oil Separator Pit as required. Outside operator monitor and pump as necessary.
Today	Chem Cleaning ventilation status: HV-1A/EF-1A are secured due to HV-1A inlet and outlet dampers being shut with fan on, IR# 913157, WO 1239746. HV-1B/EF-1B are secured due to HV-1B throwing its belts. WO 1156150. HVAC -1 ON. HV-2 running.

Switchyard Status

Today	TSO notified of oil leaks on 345 Kv BT 2-3 CB (IR 810135) ComEd WO 6396128
Today	138 KV Bus 1 Feed To TR 22 Combi Units has low oil in the 'C' phase, ComEd WO #276162
Today	HVO: Exercise CAUTION while in the 345 kV Yard due to excavation being performed in the area. Marv Evans reports holes being dug near manual switch disconnects 345kV Blue Bus. Plywood will be installed over the holes if access is needed, but be aware there are holes under the plywood. SSC called from the 345Kv yard reporting that the cable trough covers are removed to prep for upcoming work. Be careful.

Unit 2 Plant Status

Today	Unit 2 Activities **** Shift 1 Activities **** **** Shift 2 Activities **** Immediately after assuming the shift, remove 2B FWRV from service for maintenance per DOP 0600-06, step G.11. (2A FWRV was placed in service at the end of last shift) Continue Unit Startup when QNE completes REMA Re-evaluation. **** Shift 3 Activities ****
Today	**** Unit 2 Procedures In-Progress **** Do Not Delete **** DGP 01-01, Unit Startup