

Dresden Generating Station

ILT-N-1

LOWER REACTOR POWER USING RECIRCULATION FLOW

REMOVE 345KV L0302 POWERTRON 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: <u>Dresden Generating Station</u>	Scenario No.: <u>ILT-N-1</u>	Class ID: <u>2010-301</u>	
Evaluators <hr/> <hr/> <hr/>	Operators	/ crew position / ATC / BOP / CRS	
Initial Conditions: <u>91% power.</u> <hr/> <hr/>			
Turnover: <u>Lower power with Recirc flow.</u> <u>Switching orders received to remove 345KV L0302 from service.</u> <hr/>			
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		<p><u>Floor Instructor / Simulator Operator / Role Play:</u></p> <p>If the team announces that they will adjust gains, inform them an extra NSO will perform the adjustment. Then:</p> <ul style="list-style-type: none"> ❖ Tell the team you are time compressing. ❖ Direct the simulator operator to activate trigger 1 and verify gains within limits. ❖ Inform the team the gains are adjusted. <p>(Note: trigger 1 can be toggled OFF, then back ON as many times as necessary to adjust gains)</p>
2		<p><u>Simulator Operator / Role Play:</u></p> <p>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”.</p>
	CRS	<input type="checkbox"/> Directs NSO to reduce load to 775 MWe using recirculation flow.
	ATC	<p>Performs the following actions per DGP 03-01, Power Changes, and DOP 0202-03, Reactor Recirculation Flow Control System Operation, as directed:</p> <ul style="list-style-type: none"> ■ Uses MASTER RECIRC FLOW CONTRL, 2(3)-262-22, potentiometer to reduce flow AND control reactor power. <input type="checkbox"/> Notifies CRS when at 775 MWe.
	BOP	<input type="checkbox"/> 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
		<p><u>Role Play:</u> At the discretion of the Lead Examiner, call as the TSO and direct “remove 345KV L0302 Powerton from service per the switching orders”.</p>
		<p><u>Role Play:</u> EO in 345KV Switchyard: Check the 345KV Instructor Station drawing for equipment status and then report its status to the control room.</p>
3		<p><u>Simulator Operator:</u> 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 is hung”.</p>
	BOP	<p>Acknowledges the TSO directions and performs the following per the switching orders and DOP 6400-13, Electrical Yard Switching, step G.3:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Checks 345KV ring bus normal. <input type="checkbox"/> 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. <input type="checkbox"/> Reports to TSO and CRS that switching is complete.
	ATC	<ul style="list-style-type: none"> <input type="checkbox"/> Monitors the panels.
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> 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		<p><u>SIMULATOR OPERATOR:</u></p> <p>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.</p> <p><u>ROLE PLAY:</u></p> <p>EO to investigate 3C IAC trip: (Wait 2 min)</p> <p>Report “the 3C IAC tripped on low lube oil pressure. There is nothing else abnormal at the compressor”.</p> <p>EO to check 3C IAC breaker: (Wait 2 min)</p> <p>Report “the 3C IAC breaker is closed and looks normal”.</p> <p>Note: The compressor will NOT be restored to operation.</p>
5		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>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”.</p>
		<p><u>ROLE PLAY:</u></p> <p>EO to verify proper operation of 2B IAC: (Wait 2 min)</p> <p>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”.</p>
	BOP	<p>Announces alarm 923-1 B-5, U2 OR U3 INST AIR COMP TRIP:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Reports 3C IAC tripped <input type="checkbox"/> Directs an EO to investigate the cause of the 3C Instrument Air Compressor trip. <input type="checkbox"/> May send an EO to check 3C IAC breaker.
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> May enter DOA 4700-01, Instrument Air System Failure. <input type="checkbox"/> Directs BOP to perform DOP 6700-20, 480 Volt Breaker Trip.
	BOP	<p>Performs DOA 4700-01, Instrument Air System Failure, as directed:</p> <ul style="list-style-type: none"> ■ Starts the 2B IAC. <input type="checkbox"/> Directs an EO to verify proper operation of 2B IAC. ■ Directs an EO to line up 2B IAC to the IA header. <input type="checkbox"/> 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		<p><u>SIMULATOR OPERATOR:</u></p> <p>At the direction of the Lead Examiner, activate trigger 6, RPIS failure for control rod F-05.</p>
		<p><u>ROLE PLAY:</u></p> <p>Respond as Support Groups notified.</p>
	ATC	<p>Reports and responds to DANs 902-5 A-3 ROD DRIFT, and B-3 ROD WORTH MIN BLOCK.</p> <ul style="list-style-type: none"> ■ Views Full Core Display and identifies CRD with Rod Drift light. ■ Selects Control Rod F-05 and reports no indication on Four Rod Display for Control Rod F-05.
	ATC	<p>Recognizes loss of control rod F-05 position indication on Full Core Display, Four Rod Display, RWM, and/or Process Computer.</p>
	CRS	<p>Enters DOA 0300-06, RPIS Failure, and directs its actions.</p>
	ATC	<p>Performs subsequent actions of DOA 0300-06, RPIS FAILURE:</p> <ul style="list-style-type: none"> ■ Stops any power change or control rod motion in progress. □ May insert Rod F-05 to 00 prior to entering DOA 0300-06. □ 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	<p>References appropriate plant licensing documents and determines:</p> <ul style="list-style-type: none"> ■ TS 3.1.3, condition C, required actions: <ul style="list-style-type: none"> ❖ 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.
		<p><u>ROLE PLAY</u></p> <p>As QNE acknowledge reports. If concurrence is requested for any action, report “I concur with (insert requested action here)”</p>
	BOP	<ul style="list-style-type: none"> □ Monitors panel, provides assistance as directed.

Event Four – Control Rod RPIS Failure

Trigger	Position	Crew Actions or Behavior
	TEAM	<ul style="list-style-type: none"> <input type="checkbox"/> May enter DOA 0300-12, Mispositioned Control Rod. <input type="checkbox"/> Notifies the Shift Manager, QNE, Work Week Manager, Fin team, IMD, OR EMD.
		<p><u>ROLE PLAY:</u></p> <p>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).</p>
	ATC	<ul style="list-style-type: none"> <input type="checkbox"/> 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		<p><u>SIMULATOR OPERATOR:</u> At the direction of the Lead Examiner, activate trigger 7, which drifts the Isolation Condenser Initiation setpoint.</p>
		<p><u>ROLE PLAY:</u> Respond as Support Groups notified.</p>
	BOP	<p>Reports and responds to DANs:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 902-3 B-4, ISOL CONDR VLVS OFF NORM. <input type="checkbox"/> 902-3 C-4, ISOL CONDR TEMP HI. <input type="checkbox"/> 902-4 A-15, ISOL CONDR CH A/B INITIATION. <input checked="" type="checkbox"/> Determines Isolation Condenser in operation due to MO 2-1301-3 valve open.
	TEAM	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Determines Isolation Condenser initiation spurious due to RPV pressure in normal band.
	CRS	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Directs removing the Isolation Condenser from service.
	BOP	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Places MO 2-1301-3 in PTL. <input type="checkbox"/> When MO 2-1301-3 indicates closed, reports that the Isolation Condenser is removed from service.
	ATC	<ul style="list-style-type: none"> <input type="checkbox"/> Monitors reactor water level, pressure, and power.
	TEAM	<ul style="list-style-type: none"> <input type="checkbox"/> May enter DGA 07, Unpredicted Reactivity Addition.
	CRS	<p>References appropriate plant licensing documents and determines:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> TS 3.3.5.2, condition A. required actions: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE immediately, AND, <input checked="" type="checkbox"/> A.2 Restore IC System to OPERABLE status within 14 days. <input type="checkbox"/> TS 3.5.3, condition A. required actions: (May wait for IMD investigation) <ul style="list-style-type: none"> <input checked="" type="checkbox"/> A.1 Declare IC System inoperable within 1 hour; AND, <input checked="" type="checkbox"/> A.2 Place channel(s) in trip within 24 hours.
	TEAM	<ul style="list-style-type: none"> <input type="checkbox"/> Notifies Security to limit access to area under Isolation Condenser vent. <input type="checkbox"/> Notifies Radiation Protection to survey under the Isolation Condenser vent.

Event Five – Isolation Condenser Inadvertent Initiation

Trigger	Position	Crew Actions or Behavior
<p style="text-align: center;"><u>Event 5 Completion Criteria:</u></p> <ul style="list-style-type: none">• Isolation Condenser removed from operation,• Technical Specifications have been referenced, <p>AND/OR,</p> <ul style="list-style-type: none">• At the direction of the Lead Examiner.		

Event Six – FWLC Controller Setpoint Drifts High

Trigger	Position	Crew Actions or Behavior
8		<p><u>Simulator Operator:</u> At the discretion of the Lead Examiner, activate trigger 8, which causes the FWLC setpoint to drift high.</p>
		<p><u>Role Play:</u> Support Personnel: respond you will assist as directed.</p>
	TEAM	<input type="checkbox"/> Determines RPV level is increasing.
	CRS	<input type="checkbox"/> Enters DOA 0600-01, Transient Level Control. <input checked="" type="checkbox"/> Directs ATC to control RPV level manually.
	ATC	<input checked="" type="checkbox"/> Places FWLC in MAN and manually controls RPV level.
	BOP	<input type="checkbox"/> Assists as directed.
	TEAM	<input type="checkbox"/> May enter DGA 07, Unpredicted Reactivity Addition.
	CRS	<input type="checkbox"/> 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		<p><u>Simulator Operator:</u> At the direction of the Lead Examiner, activate trigger 9 to initiate a large Instrument Air leak.</p> <p><u>Role Play:</u> 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 in service</p>
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> Announces alarm 923-1 F-4, U2 INST AIR PRESS LOW. <input type="checkbox"/> May start the standby IAC. <input type="checkbox"/> Verifies U2 SA to IA Auto Crosstie Valve opens at 85 psig
	CRS	<ul style="list-style-type: none"> ■ 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. <input type="checkbox"/> Announces entry into DOA 0600-01, Transient Level Control, and directs concurrent performance with DOA 4700-01, IA System Failure.
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> Directs EO(s) to check air compressors and air dryers for proper operation <input type="checkbox"/> Directs in-plant personnel to inspect U2 IA system for proper lineup and leaks. <input type="checkbox"/> May direct EO to cross-connect U2 to U3 IA Systems per DOP 4700-03, U2/3 IA Cross-Connect Operation. <input type="checkbox"/> May direct EO to cross-connect U2 to U3 SA Systems
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> May direct scram preparations per DGP 02-03, Reactor Scram.
	ATC	<ul style="list-style-type: none"> <input type="checkbox"/> Performs scram preparations per DGP 02-03, Reactor Scram, as directed: <ul style="list-style-type: none"> ○ Reduces power with Recirc flow to 56 Mlbm/hr core flow ○ Starts the turbine motor suction pump AND turning gear oil pump. ○ Trips H2 addition.
	CRS	<p>When IA pressure drops to 55 psig, directs team to:</p> <ul style="list-style-type: none"> ■ 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: <ul style="list-style-type: none"> ■ 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, <ul style="list-style-type: none"> □ 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	<ul style="list-style-type: none"> ■ 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.

Event 7 Completion Criteria:

- **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		<p><u>SIMULATOR OPERATOR:</u> 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.</p>
	TEAM	<ul style="list-style-type: none"> ■ Recognizes and announces that Drywell pressure is rising rapidly.
	CRS	<p>Enters DEOP 0200-01, Primary Containment Control, when Drywell pressure reaches 2 psig and performs/directs:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Verifying of Torus water level <27.5 ft. <input type="checkbox"/> Initiation of Torus sprays. <input type="checkbox"/> Monitoring of Drywell temperature (Drywell sprays may be initiated for temperature control) <input type="checkbox"/> Monitoring Torus Temperature. <input type="checkbox"/> Monitors Torus level.
		<p><u>Role Play:</u> EO to check operation of the EDGs after auto start: Wait 3 minutes and then report “the EDGs are operating normally”.</p>
	CRS	<p>Per DEOP 0200-01, Primary Containment Control, when Drywell pressure reaches 9 psig directs:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Verifying Recirc Pumps and Drywell Coolers tripped. <input type="checkbox"/> 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	<p>Performs DEOP 0200-1, Primary Containment Control, actions as directed:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Monitors Drywell temperature and pressure and attempts to initiate torus sprays and drywell sprays pre Hard Card LPCI/CCSW OPERATION, as directed.
11		<p><u>SIMULATOR OPERATOR:</u> 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.</p>
	ATC / BOP	<ul style="list-style-type: none"> ■ √ Initiates Drywell Sprays. <input type="checkbox"/> Notices and reports the loss of ECCS equipment powered from Bus 23-1. <input type="checkbox"/> 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.

Event Eight –Steam Leak Inside The Drywell / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
	US	<input type="checkbox"/> Directs Operators to investigate the loss of Bus 23-1. Directs entry into DGA-12 for Partial Loss of AC Power.
	BOP	<input type="checkbox"/> 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: <ul style="list-style-type: none"> <input type="checkbox"/> Takes actions per DGA 12 for any faulted buses. <input type="checkbox"/> Recognizes the loss of Bus 28. <input type="checkbox"/> Dispatches EO to Bus 23-1 to investigate the loss of Bus 23-1. <input type="checkbox"/> May enter DOA 6500-01, 4kV Breaker Trip.
		<p><u>ROLE PLAY:</u></p> <p>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”.</p> <p>EO to Bus 28: Wait 2 min. then report “Bus 28 has an overcurrent flag up and will not reset”</p>
		<p><u>ROLE PLAY:</u></p> <p>If contacted as EMD Foreman: Respond, “I will report to Bus 23-1”.</p> <p>Note: EMD personnel will not report back.</p> <p>DO NOT REPORT BACK ON ATTEMPTS TO OPEN DW SPRAY VALVE TILL after Torus bottom pressure is > 20 #.</p>
	ATC / BOP	<input type="checkbox"/> May dispatch an Operator to attempt to manually open “A” LOOP of drywell spray.
		<p><u>Role Play:</u></p> <p>EO to open “A” LOOP of drywell spray: Wait 2 min, then report “The handwheel for MO 2-1501-28A will not engage”.</p>
12		<p><u>SIMULATOR OPERATOR:</u></p> <p>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.</p>

Event Eight –Steam Leak Inside The Drywell / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
	CRS	<ul style="list-style-type: none"> ■ Recognizes that Emergency Depressurization per DEOP 0400-02 is necessary due to one of the below: <ul style="list-style-type: none"> ○ Drywell temperature cannot be maintained below 281°F. ○ Exceeding the PSP. √ Enters DEOP 400-02, Emergency Depressurization, and directs: <ul style="list-style-type: none"> ■ 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	<ul style="list-style-type: none"> √ Performs DEOP 400-02, Emergency Depressurization, as directed. <ul style="list-style-type: none"> □ 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 icspdf (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 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.

Today

Switching orders 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.

After the load drop, perform 345 KV switching.

**** Shift 3 Activities ****

Today

**** Unit 2 Procedures In-Progress **** Do Not Delete ****

DGP 03-01, Power Changes.

Dresden Generating Station

ILT-N-2

MASTER RECIRC FLOW CONTROLLER FAILS DOWNSCALE

CRD SUCTION FILTER PLUGGING / SWAP CRD PUMPS

EMERGENCY DIESEL GENERATOR INOPERABLE

B MED RANGE LEVEL INSTRUMENT FAILS LOW WITH A PARTIAL HALF SCRAM

MAIN SEAL OIL PUMP TRIP / FAILURE OF EMERGENCY SEAL OIL PUMP TO AUTO START

RBCCW PUMP TRIP

LOSS OF RBCCW DUE TO LEAK / MANUAL SCRAM

ELECTRICAL ATWS / ARI UNSUCCESSFUL

Rev. 00

10/09

Developed By:

Exam Author

Date

Approved By:

Facility Representative

Date

Scenario Outline

Station: <u>Dresden Generating Station</u>		Scenario No.: <u>ILT-N-2</u>		Class ID: <u>2010-301</u>	
Evaluators		Operators		/ crew position	
_____		_____		/ ATC	
_____		_____		/ BOP	
_____		_____		/ CRS	
Initial Conditions: <u>Full Power.</u>					

Turnover:					

Event No.	Malfunction No.	Event Type*		Event Description	
1	RRMASDND	I	ATC	RECIRC - Master Recirc Flow Controller Fails Downscale.	
2	RDFILTB	C	ATC	CRD - 2B Pump Suction Filter Plugging, Must Swap.	
3	SER1589 SER0710 T18	C	BOP	EDG - Diesel Generator Inop Due to Cooling Water Pump Failure. ^T	
4	B15 NVM100BP	I	ATC	NBI - B Med Range Level Inst Fails Low with Partial Half Scram. ^T	
5	K50	C	BOP	H2 SEAL OIL – Main Seal Oil Pump Trip / Failure Of Emergency Seal Oil Pump To Auto Start.	
6	Q01	C	BOP	RBCCW - Pump Trip.	
7	SER1784 WRPPDSH1 SER1735 SER0369 SER0322 RRMPMAHI RRMPMBHI	M	TEAM	Loss of RBCCW System / Team Takes a Manual Scram.	
8	B12 SER1026 SER1060 AW4	M	TEAM	ATWS - Electrical, ARI Unsuccessful / Team Takes Actions To Insert Rods.	

* (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 electrical ATWS.

Scenario Summary

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

Scenario Sequence

- The Master Recirc Flow Controller fails downscale. The NSO will lockout both recirc scoop tubes.
- 2B CRD pump suction filter becomes clogged. The NSO will swap CRD pumps, placing 2A CRD pump in service. (2B will eventually trip if no action is taken)
- The Unit 2 Emergency Diesel Generator (EDG) cooling water pump breaker fails rendering the EDG Inoperable.
- Medium Range B RPV level instrument fails low. A partial half scram results requiring the Team to insert a manual half scram on the B RPS channel. The SRO will reference Tech Specs for failed level instrument and partial half scram.
- The Main Hydrogen Seal Oil pump trips with a failure of the Emergency Hydrogen Seal Oil pump to start. The team starts the Emergency Hydrogen Seal Oil pump and verifies the generator load does not exceed the capacity limit curves for possibly reduced generator hydrogen pressure.
- A RBCCW pump trips. The Team will start the standby pump.
- A large leak develops in the RBCCW system. The Team will scram the reactor and trip the recirculation pumps to prevent damage to them.
- An electrical ATWS occurs when the reactor is scrammed. ARI is unsuccessful. The Team inserts control rods by pulling scram fuses, venting the scram air header, and / or driving control rods.

Event One – Master Recirc Flow Controller Failure

- Master Recirc Flow Controller fails downscale.

Malfunctions required: 1

- (Master Recirc Flow Controller fails down)

Success Path:

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

Event Two – CRD Suction Filter Plugging / Swap CRD Pumps

- 2B CRD pump suction filter clogs causing the Team to swap CRD pumps, placing 2A CRD pump in service. If the operators do not swap CRD pumps in a timely manner, 2B CRD pump eventually trips.

Malfunctions required: 1

- (CRD pump suction filter Plugging)

Success Path:

- Swap CRD pumps.

Event Three – Emergency Diesel Generator Inoperable

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

Malfunctions required: 1

- (U2 EDG cooling water pump breaker trip)

Success Path:

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

Event Four – B Med Range Level Instrument Fails Low with a Partial Half Scram

- B Medium Range Level Instrument fails low and a partial half scram occurs.

Malfunctions required: 2

- (Failure of Medium Range B level Instrument)
- (Partial Half Scram on the B channel)

Success Path:

- Manually inserts a B RPS channel half scram.
- References the Tech Specs for an inoperable level instrument and the partial half scram.

Event Five – Main Seal Oil Pump Trip / Failure of Emergency Seal Oil Pump to Auto Start

- The Main Hydrogen Seal Oil pump trips with a failure of the Emergency Hydrogen Seal Oil pump to start.

Malfunctions required: 1

- (Main Seal Oil Pump Trip / Failure Of Emergency Seal Oil Pump To Auto Start)

Success Path:

- The team starts the Emergency Hydrogen Seal Oil pump.

Event Six – RBCCW Pump Trip

- A RBCCW pump trips.

Malfunctions required: 1

- (RBCCW pump trip)

Success Path:

- The team starts the standby RBCCW pump.

Event Seven – Loss of RBCCW / Manual Scram

- A leak develops in the RBCCW system.

Malfunctions required: 1

- (RBCCW system leak)

Success Path:

- The team performs DOA 3700-01, Loss of Reactor Building Closed Cooling Water (RBCCW) System.
- Performs a manual scram.

Event Eight – Electrical ATWS / ARI Unsuccessful

- An electrical ATWS occurs when the reactor is scrammed. ARI is unsuccessful.

Malfunctions required: 1

- (Electrical ATWS)

Success Path:

- The Team inserts control rods by pulling scram fuses, venting the scram air header, and / or driving control rods.

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.

- 2 Simulator Setup (the following steps can be done in any logical order)
 - a. Initialize simulator in a full power IC.
 - 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 Master Recirc Controller demand at $\geq 95\%$.
 - b. Verify 2B CRD pump is running with 2A CRD pump off.
 - c. Verify 2A and 2/3 RBCCW pumps are running with 2B OFF.
 - d. 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-2.cae

NOTE: Some analog overrides do not load correctly from a CAEP file. (See SWR #8652) Therefore it is necessary to setup override WRPPDSH1 manually.

- a. Open the ACTION Program and perform the following:
 - 1) Select tab OVERRIDE AO
 - 2) Locate override WRPPDSH1 and open it.
 - 3) Set Ramp Start Value 65.0
 - 4) Set Ramp time to 5:00
 - 5) Set Delay Time to 10:00
 - 6) Set Analog Value to 10.0
 - 7) Set Event Trigger to 12
 - 8) Click Insert.
-
- 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 – Master Recirc Flow Controller Fails Downscale

Trigger	Position	Crew Actions or Behavior
1		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>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).</p>
2		<p><u>Simulator Operator:</u></p> <p>When the BOP is NOT near the 902-4 panel and at the discretion of the Lead Examiner, activate trigger 2, which will cause Master Recirc Flow Controller to fail downscale.</p>
	ATC	<ul style="list-style-type: none"> ■ Determines and announces Recirculation Flow transient occurring by observing any of the following: <ul style="list-style-type: none"> ○ Decrease in Recirc Loop Flow as indicated on FR 2-260-7. ○ Decrease in Rx Power indicated on WI 2-6040-59. ○ Decrease in Core Flow and DP on DPR/FR 2-263-110. ○ Decrease in Total Stm Flow on UR 2-640-27. ○ Decrease in Rx Pressure on P/FR 2-640-28. ○ Decrease in Total Feedwater Flow on UR 2-640-26. ○ Decrease in Power Level on RR 2-750-10A/D, & RR 2-750-10B/C.
	CRS	<ul style="list-style-type: none"> ■ Enters DOA 0202-03, Reactor Recirc System Flow Control Failure. □ May enter DGA 07, Unpredicted Reactivity Addition.
	ATC	<p>Performs the following actions per DOA 0202-03, Reactor Recirc System Flow Control Failure:</p> <ul style="list-style-type: none"> ■ Places 2A & B M-G Set Scoop Tube Power Lockout Reset Switches in the Lockout position. □ Verifies Core thermal power <2957 MWt. □ Verifies Recirc Pump NOT operating in the instability region of the MG Set voltage regulator AND uncontrolled pump flow AND speed oscillations are NOT occurring. □ Verifies NOT operating in the unstable region of the Power / Flow Map.

Event One – Master Recirc Flow Controller Fails Downscale

Trigger	Position	Crew Actions or Behavior
	ATC	<p>Completes actions of Recirc M-G Lockout in DOP 0202-12, Recirculation Pump Motor Generator Set Scoop Tube Operation.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Verifies alarm is received on annunciator 902-4 C-1(5), 2A(B) RECIRC M-G SCOOP TUBE PWR FAILURE. <input checked="" type="checkbox"/> Places BOTH recirc pump speed control transfer stations in manual (MAN) at panel 902-4: <ul style="list-style-type: none"> • 2A(B) RECIRC PP SPEED CONTRL, 2-262-25A(B) <input type="checkbox"/> Verify MASTER RECIRC FLOW CONTRL, 2-262-22, is in manual (MAN). <input checked="" type="checkbox"/> At the recirc pump speed control transfer station with the locked out scoop tube, rotate the potentiometer counterclockwise to set speed demand to minimum (30%): <ul style="list-style-type: none"> • 2A(B) RECIRC PP SPEED CONTRL, 2-262-25A(B) <input type="checkbox"/> At panel 902-4, place an Equipment Status Tag on 2A(B) M-G SET SCOOP TUBE POWER LOCKOUT RESET switch stating the reason the recirc MG set scoop tube is locked out.
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> Assist ATC as directed.
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> Verifies actions of DOA 0202-03 and DOP 0202-12 are carried out. <input type="checkbox"/> May reference DOA 0500-01, Inadvertent Entry into the Unstable Region of the Power to Flow Map.

Event 1 Completion Criteria:

- 2A & 2B Recirc Scoop Tubes locked out,
AND/OR,
- At the discretion of the Lead Examiner.

Event Two – CRD Suction Filter Plugging / Swap CRD Pumps

Trigger	Position	Crew Actions or Behavior
3		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>At the discretion of the Lead Examiner, activate trigger 3. This will cause a simulated Plugging of 2B CRD pump suction filter, and finally trip the pump on low suction pressure if the crew has not swapped the pump yet. Note: It may take several minutes before an alarm occurs.</p> <p>As the EO, if asked, wait 2 min. and then report: “The 2B CRD pump suction pressure is 14 Hg and getting worse”.</p> <p>NSO may follow DOP 0300-01 and have the EO check 2A CRD pump ready to start... Wait 1 min, then report: “2A CRD pump is ready to start”.</p>
	ATC	<ul style="list-style-type: none"> ■ Announces alarm 902-5 D-2, 2B ROD DRIVE PP SUCT LO, and degrading CRD system parameters. <p>Carries out actions of DOP 0300-01, Control Rod Drive System Start Up And Operation:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Directs EO vent 2A CRD pump casing. <input type="checkbox"/> Directs EO vent 2A CRD pump suction filter. <input type="checkbox"/> Directs EO to verify 2A CRD pump oil levels. <input type="checkbox"/> Directs EO to verify 2A CRD pump suction and discharge valves open. ■ Starts 2A CRD pump. ■ Secures 2B CRD pump. <input type="checkbox"/> Verifies normal CRD system pressures and flow.
		<p><u>ROLE PLAY:</u></p> <p>As the EO, if asked, report: “2A CRD pump is operating normally”.</p>
	CRS	<ul style="list-style-type: none"> ■ Directs swapping CRD pumps per DOP 0300-01, Control Rod Drive System Start Up and Operation, due to degrading operation of 2B CRD pump.
	BOP	Monitors panels and assists as directed.
		<p><u>NOTE:</u></p> <p>If the Team wait until the 2B CRD pump trips, the following actions apply:</p>
	ATC	<ul style="list-style-type: none"> <input type="checkbox"/> Announces 2B CRD pump trip. ■ Per immediate action of DOA 0300-01, Control Rod Drive System Failure, starts the standby CRD pump.
	CRS	<ul style="list-style-type: none"> ■ Enters DOA 0300-01, Control Rod Drive System Failure, due to failure of 2B CRD pump. ■ Enters DOA 6500-10, 4KV Circuit Breaker Trip, due to trip of 2B CRD pump. <input type="checkbox"/> May reference TRM 3.3.h Reactor Vessel Water Level Instrumentation System (RVWLIS) Backfill System due to short loss of RVWLIS supply.

Event Two – CRD Suction Filter Plugging / Swap CRD Pumps

Trigger	Position	Crew Actions or Behavior
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Event 2 Completion Criteria:

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

Event Three – Emergency Diesel Generator Inoperable

Trigger	Position	Crew Actions or Behavior
4		<p><u>Simulator Operator:</u></p> <p>At the discretion of the Lead Examiner, activate trigger 4, which simulates Unit 2 EDG cooling water pump breaker control power transformer failure.</p>
5		<p><u>Simulator Operator / Role Play:</u></p> <p>EO to U2 EDG to check Trouble alarm: wait 3 min, activate trigger 5, which clears the U2 EDG Trouble alarm. Then report “I acknowledged the local alarm on panel DG2A Tile C-3 which is ‘Diesel Clg Wtr Pump Failure Or Locked Out’. It will not reset”.</p>
		<p><u>Role Play:</u></p> <p>EO in U2 EDG room to check cooling water pump control switch: report, “the cooling water pump control switch is in its normal position and all control switch indicating lights are OFF”.</p> <p>EO to verify fuse 2-3903-F1 in EDG 2 Aux Control Panel: wait 2 min, the report that “fuse 2-3903-F1 is NOT blown”.</p> <p>EO to check the U2 EDG cooling water pump breaker: Wait 2 min, then report “the U2 EDG cooling water pump breaker is closed, but there is an acrid smell coming from the cubicle”.</p> <p>Support personnel: Acknowledge requests.</p>
	BOP	<ul style="list-style-type: none"> ■ Announces alarms: <ul style="list-style-type: none"> ❖ 902-8 A-7, U2 Diesel Gen Trouble. ❖ 902-7 G-8, U2 Diesel Gen Clg Wtr PP Trip/Lkout ■ Sends an operator to check the U2 EDG Trouble alarm. □ Directs operator to verify fuse 2-3903-F1 in EDG 2 Aux Control Panel. ■ Sends an operator to check the U2 EDG cooling water pump breaker. ■ Performs DOA 6600-01, Diesel Generator Failure, as directed: <ul style="list-style-type: none"> ❖ Places the U2 EDG output breaker to the Pull-To-Lock position. (Optional / required only if EDG is running) ❖ Places the U2 EDG control switch to STOP. □ Informs the Unit Supervisor of the field reports.
	ATC	<ul style="list-style-type: none"> □ Monitors panels, provide assistance as directed.
	CRS	<ul style="list-style-type: none"> ■ Enters DOA 6600-01, Diesel Generator Failure, and directs actions. ■ Declares the U2 EDG inoperable.
	TEAM	<ul style="list-style-type: none"> □ May enter DOP 6700-20, 480V Circuit Breaker Trip.

Event Three – Emergency Diesel Generator Inoperable

Trigger	Position	Crew Actions or Behavior
	CRS	<ul style="list-style-type: none">■ Determines following Technical Specifications apply:<ul style="list-style-type: none">• TS 3.7.2, Diesel Generator Cooling Water (DGCW) System, Condition A. Declare associated DG inoperable immediately.• TS 3.8.1, AC Sources—Operating, Condition B.
	CRS	<ul style="list-style-type: none">□ Directs performance of DOS 0040-08, Unit 2 Operating Power Sources and Distribution.□ Directs Engineering to determine the EDG is not inoperable due to common cause failure OR directs performing operability surveillance for the 2/3 EDG.

Event 3 Completion Criteria:

- U2 EDG declared inoperable; and,
 - Technical Specification determination completed,
- AND/OR,**
- At the discretion of the Lead Examiner.

Event Four – B Med Range Level Instrument Fails Low with a Partial Half Scram

Trigger	Position	Crew Actions or Behavior
6		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>At the discretion of the Lead Examiner, activate trigger 6, which fails B medium range downscale and inserts B RPS partial half scram.</p>
7		<p>Verify trigger 7 automatically activates when CH B RPS scram pushbutton is depressed. This inserts an electrical ATWS</p>
	ATC	<p><input type="checkbox"/> Notices and reports the B Medium Range level instrument trending down.</p> <p>Announces:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The partial half scram condition on the B RPS channel. <input type="checkbox"/> Scram Solenoid Group lights B2 and B3 did NOT extinguish. <input type="checkbox"/> Refers to DOA 0500-02, Partial ½ or Full Scram Actuation. (May insert the manual half scram as an immediate action of DOA 0500-02 then refer to the procedure). <input type="checkbox"/> Depresses RPS Channel B Manual Scram pushbutton.
		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>As the EO sent to the ATS Panel (wait 2 min AND the 902-4 G-20 alarm is up), then report: “The ‘B’ medium range level instrument MTU LIS 2-263-140B is reading full downscale and its gross failure light is lit.”</p> <p>As the EO sent to the MCC 28-1 circuit 15 and/or 125vdc Bus 2A-1 Dist Panel, circuit 27 (wait 3 min), then report: “The breaker is NOT tripped and looks normal.”</p> <p>IF asked: “The Yarway LI-2(3)-263-59A on the 2202-5 rack is indicating 30 inches and steady.”</p>
	ATC / BOP	<p>Refers to DAN 902-4 G-20:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Dispatches an operator to inspect the Div 1 ATS panel 2202-73A <input type="checkbox"/> Notifies the Unit Supervisor of inspection results.
	CRS	<p>Announces entry into DOA 0500-02, Partial ½ or Full Scram Actuation and performs/directs:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Directs NSO to insert manual scram on RPS Channel A. <input type="checkbox"/> May refer to DOP 0010-10, Unit 2(3) Technical Specification Instrumentation Operability Manual.
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> References Technical Specifications and determines: <ul style="list-style-type: none"> • TS 3.3.1.1 Action A1 or A2 and C1 apply. Most limiting is Restore RPS trip capability within 1 hour. • TS 3.3.3.1 Action A1. Restore required channel to OPERABLE status within 30 days. • TS 3.3.6.1 Condition A1. Place channel in trip within 12 hours. • TS 3.3.6.2 Condition A1. Place channel in trip within 12 hours.

Event Four – B Med Range Level Instrument Fails Low with a Partial Half Scram

Trigger

Position

Crew Actions or Behavior

Event 4 Completion Criteria:

- Half Scram inserted, and
 - Appropriate Tech Specs referenced,
- AND/OR**
- At the direction of the Lead Examiner.

Event Five – Main Seal Oil Pump Trip / Failure Of Emergency Seal Oil Pump To Auto Start

Trigger	Position	Crew Actions or Behavior
		Note: The Emergency Hydrogen Seal Oil (ESOP) pump control switch TRIP position is overridden to TRIP so the ESOP will NOT start automatically.
8		Simulator Operator: At the direction of the Lead Evaluator, insert trigger 8 to trip the Main Hydrogen Seal Oil Pump (MSOP).
10		Simulator Operator / Role Play: EO directed to investigate local panel trouble alarm, wait 1 min., activate trigger 10 , and then report that “The local alarm is Differential seal oil pressure low. If the ESOP is running, add to the report “and it reset”. EO to report local Generator H ₂ pressure: Wait 1 min, and then report “the local Generator H ₂ pressure indicates (use value from Instructor Station drawing EG3) psig.”
		Role Play: EO sent to check the MSOP breaker: Wait 3 min. then report, “The MSOP breaker is tripped in the tripped free position”. If directed to check the MSOP, report, “I can’t find anything wrong with the MSOP.” EO to align Seal Oil and H ₂ valves: Wait 2 min, then report “the (Insert nomenclature of requested valves) are (insert position requested)”. Note: The simulator does not model the Seal Oil and H ₂ valves.
	BOP	Announces: <input type="checkbox"/> 902-7 A-11, H ₂ Seal Oil Sys Oil Pp/Vac Pp Trip, alarm. <input type="checkbox"/> MSOP tripped. <input type="checkbox"/> Generator machine gas pressure dropping.
	BOP	<input type="checkbox"/> Determines ESOP did NOT automatically start as expected. <input checked="" type="checkbox"/> Starts the ESOP.
	TEAM	<input type="checkbox"/> Makes PA announcement warning of H ₂ and /or oil vapor around the main generator.
	CRS	<input type="checkbox"/> Directs starting ESOP. <input type="checkbox"/> Enters DOP 6700-20, 480V Circuit Breaker Trip.
	BOP	<input type="checkbox"/> Announces 902-7 E-11, H ₂ Seal Oil & Alterrex Pnl Trouble, alarm <input type="checkbox"/> Dispatches EO to investigate local panel trouble alarm.
	BOP	Performs DOP 6700-20, 480V Circuit Breaker Trip, as directed: <input type="checkbox"/> Dispatches EO to MCC 28-2 to investigate the MSOP trip. <input type="checkbox"/> Places MSOP in PTL.

Event Five – Main Seal Oil Pump Trip / Failure Of Emergency Seal Oil Pump To Auto Start

Trigger	Position	Crew Actions or Behavior
	BOP	Performs DAN 902-7 A-11, H ₂ Seal Oil Sys Oil Pp/Vac Pp Trip, additional actions: <ul style="list-style-type: none"> <input type="checkbox"/> Directs EO to close: <ul style="list-style-type: none"> ○ H-09, U2 H2 SEAL OIL VACUUM TK INLET SPRYA SV. ○ H-13, U2 MAIN SEAL OIL PMP DISCH STOP CHC VLV. <input type="checkbox"/> Stops the Seal Oil Vacuum Pump. <input type="checkbox"/> Monitors 250 VDC electrical system (DOP 6900-01). <input type="checkbox"/> Periodically monitors seal oil bearing pressure, hydrogen purity, and hydrogen differential pressure. <input type="checkbox"/> Enters DOP 5320-11, Filling and Venting the Generator with Hydrogen to Raise Purity and/or Pressure during Normal Operation, if necessary. <input type="checkbox"/> Directs an Operator to check for hydrogen at Generator shaft seal in Alterrex housing.
	ATC	Assists as directed.

Event 5 Completion Criteria:

- **ESOP started,**
- AND/OR,**
- **At the discretion of the Floor Instructor**

Event Six – RBCCW Pump Trip

Trigger	Position	Crew Actions or Behavior
11		<p><u>Simulator Operator:</u> At the discretion of the Lead Examiner, activate trigger 11, which trips 2A RBCCW pump.</p>
		<p><u>Role Play:</u> EO to check 2B RBCCW pump operation: Wait 2 min, then report “2B RBCCW pump is operating normally”. EO to check 2A RBCCW pump breaker: Wait 2 min, then report “2A RBCCW pump breaker has an overcurrent target up”. EO to check 2A RBCCW pump: Wait 2 min, then report “2A RBCCW pump motor is very hot to the touch”.</p>
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> Acknowledges and announces alarm(s): <ul style="list-style-type: none"> o 923-1 C-1, U2 or U3 RBCCW Pump Trip o 923-1 D-1, U2 or U3 RBCCW Press Lo (may not come up) <input checked="" type="checkbox"/> Starts 2B RBCCW pump. <input type="checkbox"/> Sends an operator to check RBCCW system status. <input type="checkbox"/> Performs DOA 6500-10, 4KV Circuit Breaker Trip, actions as directed.
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> May enter DOA 3700-01, Loss of Reactor Building Closed Cooling Water (RBCCW) System. <input checked="" type="checkbox"/> Directs BOP to start 2B RBCCW pump. <input type="checkbox"/> Enters DOA 6500-10, 4KV Circuit Breaker Trip.
	ATC	<ul style="list-style-type: none"> <input type="checkbox"/> Assists as directed.
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> Contacts support personnel for assistance.

Event 6 Completion Criteria:

- Standby RBCCW pump started,
- AND/OR,
- At the direction of the Lead Examiner.

Event Seven –Loss of RBCCW / Reactor Scram

Trigger	Position	Crew Actions or Behavior
<p>12</p> <p>13</p> <p>14</p> <p>22-25</p>		<p><u>SIMULATOR OPERATOR:</u></p> <p>At the discretion of the Lead Examiner, activate trigger 12, which simulates a leak in the Reactor Building from the RBCCW system.</p> <p>As the EO sent to defeat the RBV high Drywell pressure and RPV water level interlocks (wait 5 min) activate trigger 13 and then report: “the RBV high Drywell pressure and RPV water level interlocks are defeated”.</p> <p>Verify trigger 14 automatically activates when East RBFDS mass is >7950.0 (variable wamrfsa2). This holds the East RBFDS mass above the High High level.</p> <p>Verify triggers 22 thru 25 automatically activate when all RBCCW pumps are OFF. This returns overrides to normal.</p>
		<p><u>ROLE PLAY:</u></p> <p>As the EO sent to check RBCCW head tank level: (wait 2 min) then report: “RBCCW head tank level is out of the sight glass low. The head tank makeup valve is open”.</p> <p>As the EO to check RBCCW head tank drain sightglass: (wait 1 min) then report “there is no flow through the RBCCW head tank drain sightglass”.</p> <p>As the EO sent to check RBCCW system: (wait 2 min) then report: “There is a very large leak coming from the RBCCW HX area. The floor is flooded with water”.</p> <p>If asked as the EO about isolating the leak, report: The leak cannot be isolated”.</p> <p>As the EO sent to check the RBFDS (wait 2 min) then report: “the East Reactor Building Floor Drain sump is overflowing onto the Torus basement floor”.</p> <p>If called as the Radwaste Control Room Operator and asked about the inputs into the Radwaste sumps, report: “the Floor Drain input has increased significantly”.</p> <p>As the EO sent to check RBCCW leak after the pumps are stopped: (wait 1 min) then report: “the flow rate from the RBCCW leak has slowed down significantly”.</p>
	<p>BOP</p>	<ul style="list-style-type: none"> ■ Announces alarm 923-1 F-1, U2 RBCCW Head Tank Lvl Hi/Lo <ul style="list-style-type: none"> • Refers to DAN and performs actions. • Monitors operation of the RBCCW system. • Dispatches EO to check U2 RBCCW Head tank level. • Announces entry into DOA 3700-01, Loss of Cooling by Reactor Building Closed Cooling Water (RBCCW) System, is required.
	<p>CRS</p>	<ul style="list-style-type: none"> ■ Enters DOA 3700-01, Loss of Cooling by Reactor Building Closed Cooling Water (RBCCW) System, and directs actions.
	<p>BOP</p>	<ul style="list-style-type: none"> ■ Performs DOA 3700-01, Loss of Cooling by Reactor Building Closed Cooling Water (RBCCW) System, actions as directed. ■ Announces alarm 923-4 A-3, U2 E. Rbfd Sump Lvl Hi-Hi <ul style="list-style-type: none"> • Dispatches operators to check sumps • Announces entry to DEOP 300-01, Secondary Containment Control, is required.

Event Seven –Loss of RBCCW / Reactor Scram

Trigger	Position	Crew Actions or Behavior
	CRS	<ul style="list-style-type: none"> ■ Enters DEOP 0300-01, Secondary Containment Control. □ May enter DOA 0040-02, Localized Flooding in Plant, and direct actions.
	BOP	<ul style="list-style-type: none"> □ Performs DOA 0040-02, Localized Flooding in Plant, actions as directed.
	CRS	<ul style="list-style-type: none"> □ May direct scram preparatory actions per DGP 02-03, Reactor Scram.
	ATC / BOP	<ul style="list-style-type: none"> □ Performs scram preparatory actions per DGP 02-03, Reactor Scram, as directed. <ul style="list-style-type: none"> ○ Inserts control rods to reduce FCL to <93%. ○ Start the motor suction pump and turning gear oil pump. ○ Trip hydrogen addition.
	CRS	<p>Determines RBCCW System loss CANNOT be prevented and performs / directs:</p> <ul style="list-style-type: none"> ■ Manual scram per DGP 02-03, Reactor Scram. □ Tripping RBCCW pumps.
	BOP	<ul style="list-style-type: none"> □ Trips RBCCW pumps.

Event 7 Completion Criteria:

- Reactor scram ordered,
- AND/OR,
- At the direction of the Lead Examiner.

Event Eight – Electrical ATWS / ARI Unsuccessful

Trigger	Position	Crew Actions or Behavior
15 16		<p><u>Simulator Operator / Role Play:</u></p> <p>Operator to pull scram fuses: wait 4 min, then activate trigger 15. This sequentially pulls the scram fuses.</p> <p>Operator to vent the scram air header: wait 5 min, the activate trigger 16. This vents the scram air header.</p>
17		<p><u>Simulator Operator / Role Play:</u></p> <p>Operator to install GP 1 -59 in. and Off Gas Hi Hi Rad jumpers: wait 3 min, activate trigger 17, and then report “the GP 1 -59 in. and Off Gas Hi Hi Rad jumpers are installed”.</p>
	ATC	<p>Performs the following actions per DGP 02-03, Reactor Scram, as directed:</p> <ul style="list-style-type: none"> ■ Presses scram pushbuttons ■ Places mode switch in shutdown ■ Check rods inserted / Determines control rods did not insert. □ Initiates ARI / Determines ARI did not insert control rods. ■ Announces ATWS condition and RX power is >6%. □ May resets scoop tubes so Recirc Pumps run back / trips recirc pumps □ Initiates SBLC. Announces failure to inject. □ Maintains RPV/L between +8 and +48 inches or as directed by Unit Supervisor.
	BOP	<ul style="list-style-type: none"> □ Performs DGP 02-03, Reactor Scram, as directed.
	CRS	<ul style="list-style-type: none"> □ Enters DEOP 100, RPV Control, and directs actions. <p>Due to report of ATWS condition, exits DEOP 100 AND enters DEOP 0400-05, Failure to Scram, and directs/performs:</p> <ul style="list-style-type: none"> □ Placing ADS to inhibit. (Not expected to be a Critical Task for this scenario) □ Placing Core Spray pumps in PTL. ■ √ Inserting control rods using Alternate Rod Insertion. <ul style="list-style-type: none"> ❖ Directs driving control rods. ❖ Directs pulling scram fuses. ❖ Directs venting scram air header. □ Verifying required auto actions. □ Installing of the jumpers for the MSIV low level isolations and the Off Gas high Rad isolations. ■ √ If RX power >6%, terminating and preventing all injection except boron and CRD until RPV level ≤35 inches. ■ √ Holding RPV level between –164 inches and the level lowered to. ■ Stabilizing RPV pressure below 1060 psig.

Event Eight – Electrical ATWS / ARI Unsuccessful

Trigger	Position	Crew Actions or Behavior
	CRS	<ul style="list-style-type: none"> ❑ Based on report that SBLC failed, directs DEOP 0500-01, Alternate Boron Injection, performed.
	ATC	<ul style="list-style-type: none"> ■ √ Terminates and prevents all injection except boron and CRD at the 902-5 panel in automatic as follows: <ul style="list-style-type: none"> ❖ Using the RX LOW FLOW CONTROL STATION, 2(3)-640-20, lowers FWLC SETPOINT to –40 inches.
	BOP	<ul style="list-style-type: none"> ■ √ Terminates and prevents all injection except boron and CRD at the 902-3 panel as follows: <ul style="list-style-type: none"> ❖ Place HPCI Aux Oil Pump AND HPCI 14 valve in PTL. ❖ Verify HPCI flow controller in AUTO AND reduce setpoint to 2000 gpm. ❖ PLACES LPCI 22 valves in Pull-to-Close.
	ATC	<ul style="list-style-type: none"> ■ √ Drives control rods per DEOP 500-05, Alternate Insertion Of Control Rods, as follows: (RPV-6.1) <ul style="list-style-type: none"> ❖ Bypasses the RWM. ❖ Maximizes CRD drive water pressure. ❖ Inserts Control Rods by either using the ROD MOVEMENT CONTROL switch or the EMERG ROD IN position of the ROD OUT NOTCH OVERRIDE switch.
	CRS	<ul style="list-style-type: none"> ❑ Based on report that all control rods are inserted, exits DEOP 0400-05 and enters DEOP 0100. <ul style="list-style-type: none"> ❖ Directs securing SBLC.
	ATC	<ul style="list-style-type: none"> ❑ Performs as directed: <ul style="list-style-type: none"> ❖ Secures SBLC.
	ATC / BOP	<ul style="list-style-type: none"> ■ Performs as directed: <ul style="list-style-type: none"> ❖ Re-establishes injection using available injection systems to MAINTAIN RPV water level above -164" (in band directed by Unit Supervisor).

Event 8 / Scenario Completion Criteria:

- Control rods inserted,
- AND / OR,
- At the discretion of the Lead Examiner.

Critical Tasks	
(RPV-6.1)	With a reactor scram required and the reactor not shutdown, TAKE ACTION TO REDUCE POWER by injecting boron and/or inserting control rods, to prevent exceeding the primary containment design limits.
(RPV-6.2)	With a reactor scram required, reactor not shutdown, and conditions for ADS blowdown are met, INHIBIT ADS to prevent an uncontrolled RPV depressurization, to prevent causing a significant power excursion. (Conditions may not occur to cause this to be critical for this scenario)
(RPV-6.3)	During an ATWS with conditions met to perform power/level control TERMINATE AND PREVENT INJECTION, with exception of boron and CRD, into the RPV until conditions are met to re-establish injection.
(RPV-6.4)	When conditions are met to re-establish injection use available injection systems to MAINTAIN RPV water level above -164".

REFERENCES

PROCEDURE	TITLE
DAN 902-4 C-1(5)	2A(B) RECIRC M-G SCOOP TUBE PWR FAILURE
DAN 902-4 G-20	ANALOGTRIP SYS DIV 1 2202-73A TRBL
DAN 902-5 D-2	2B ROD DRIVE PP SUCT LO
DAN 902-7 A-11	H ₂ SEAL OIL SYS OIL PP/VAC PP TRIP
DAN 902-7 E-11	H ₂ SEAL OIL & ALTERREX PNL TROUBLE
DAN 902-7 G-8	U2 DIESEL GEN CLG WTR PP TRIP/LKOUT
DAN 902-8 A-7	U2 DIESEL GEN TROUBLE
DAN 923-1 C-1	U2 OR U3 RBCCW PUMP TRIP
DAN 923-1 D-1	U2 OR U3 RBCCW PRESS LO
DAN 923-1 F-1	U2 RBCCW HEAD TANK LVL HI/LO
DAN 923-4 A-3	U2 E. Rbfd SUMP LVL HI-HI
DEOP 0100	RPV CONTROL
DEOP 300-01	SECONDARY CONTAINMENT CONTROL
DEOP 0400-05	FAILURE TO SCRAM
DEOP 0500-05	ALTERNATE INSERTION OF CONTROL RODS
DGA 07	UNPREDICTED REACTIVITY ADDITION
DGP 02-03	REACTOR SCRAM
DGP 03-01	POWER CHANGES
DOA 0040-02	LOCALIZED FLOODING IN PLANT
DOA 0202-03	REACTOR RECIRC SYSTEM FLOW CONTROL FAILURE
DOA 0300-01	CONTROL ROD DRIVE SYSTEM FAILURE
DOA 0500-02	PARTIAL ½ OR FULL SCRAM ACTUATION
DOA 3700-01	LOSS OF COOLING BY REACTOR BUILDING CLOSED COOLING WATER (RBCCW) SYSTEM
DOA 6500-10	4KV CIRCUIT BREAKER TRIP
DOA 6600-01	DIESEL GENERATOR FAILURE
DOP 0202-12	RECIRCULATION PUMP MOTOR GENERATOR SET SCOOP TUBE OPERATION
DOP 6700-20	480V CIRCUIT BREAKER TRIP
DOS 0040-08	UNIT 2 OPERATING POWER SOURCES AND DISTRIBUTION
TS 3.3.1.1	REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION
TS 3.3.3.1	POST ACCIDENT MONITORING (PAM) INSTRUMENTATION
TS 3.3.6.1	PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION
TS 3.3.6.2	SECONDARY CONTAINMENT ISOLATION INSTRUMENTATION
TS 3.7.2	DIESEL GENERATOR COOLING WATER (DGCW) SYSTEM
TS 3.8.1	AC SOURCES—OPERATING, CONDITION

Simulator Scenario Review Checklist (cont'd)

ILT-N-2 Quantitative Attributes	
9	Total malfunctions (5 to 8)
1	Malfunctions after EOP entry (1 to 2)
6	Abnormal events (2 to 4)
2	Major transients (1 to 2)
1	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

Inserts CH B RPS partial half scram.
imf b15

Disables CH A RPS Manual Scram pushbutton;
in case wrong pushbutton depressed in partial 1/2 scram event.
imf b20

Overrides Panel 2202-70A(B) Trouble alarm points OFF so pulling ARI fuses does not cause alarm.
Pulls ARI fuses.
Imf ser1026 off
imf ser1060 off
irf aw4 pulled|2

Inserts failure of Emergency Hydrogen Seal Oil pump to auto start.
imf t53|2

Inserts trip of 2A SBLC pump.
imf scmpoca|2

Sets 2B SBLC Relief valve setpoint to 100.0 psig
imf scrfvbd 100.0|2

EVENT TRIGGERS

Event Trigger 1 sets gain for all 6 APRMs.
trgset 1 "0"|4
trg 1 "irf niagainf true"|4

Event Trigger 2 Causes master recirc flow controller to fail downscale.
trgset 2 "0"|4
imf rrmasdnd (2) 0.3 4:00 0.95|4

Event Trigger 3 Ramps the CRD suction filter closed over 8 min. to cause the low suct pres alarm.
After 8 min, isolates the 2B CRD pump suction filter to simulate a clogged filter causing a trip of the 2B

CRD pump
trgset 3 "0"|6
trg 3 "ramp rdvstrnr(2) 0.25 .01 8:00"|6
irf rdfltb (3 8:00) false|6

Event trigger 4 Simulates U2 EDG cooling water pump breaker control power transformer failure:
Forces up alarm 902-8 A-7, U2 Diesel Gen Trouble.
Forces up alarm 902-7 G-8, U2 Diesel Gen Clg Wtr PP Trip/lkout.
Inserts U2 Diesel Gen Clg Wtr PP Trip malfunction.
Trgset 4 "0"|6

imf ser1589 (4) on|8
imf ser0710 (4) on|8
imf t18 (4)|8

Event trigger 5 Clears alarm 902-8 A-7, U2 Diesel Gen Trouble.
Trgset 5 "0"|10
trg 5 "imf ser1589 normal"|10

Event Trigger 6 fails B medium range downscale.
trgset 6 "0"|10
imf nvm100bp (6) -120.0 4:00|10

Event Trigger 7 Activates when CH B RPS scram pushbutton depressed.
Inserts an electrical ATWS.
trgset 7 "rpl301b"|12
imf b12 (7)|12

Event Trigger 8 Trips the Main Hydrogen Seal Oil Pump.
trgset 8 "0"|12
imf k50 (8)|12

Event Trigger 10 Acknowledges the Alterrex panel trouble alarm.
trgset 10 "0"|14
irf t81 (10) true|14

Event Trigger 11 Trips 2A RBCCW pump.
Trgset 11 "0"|16
imf q01 (11)|16

Trigger 12 Simulates a RBCCW leak in the Rx Bldg.
Ramps E. RBFDS mass to fill it.
Overrides alarm 923-1 E-2 RBCCW Head Tank Lvl Lo.
After 10 min, ramps RBCCW Disch pressure meter to 10 psig over 5 min.
After 11 min, overrides alarm 923-1 D-1.
After 12 min, overrides 902-4 G-3 ON.
After 12:15 min, overrides 902-4 G-7 ON.
Trgset 12 "0"|16
trg 12 "ramp wamrfsa2 5000.0 8000.0 3:00"|16
imf ser1784 (12) on|18
imf ser1735 (12 11:00) on|18
imf ser0369 (12 12:00) on|18
imf ser0322 (12 12:15) on|18

Trigger 13 Jumpers the RBV Group II Isolation signal.
Trgset 13 "0"|20
irf cirbvnt (13) lifted|20

Event Trigger 14 Activates when E. RBFDS mass is >7950.0, which holds E. RBFDS mass above Hi Hi level.
Trgset 14 "wamrfsa2 .gt. 7950.0"|20
trg 14 "ramp wamrfsa2 7950.0 8000.0 10:00"|20

Event trigger 15 Simulates pulling RPS scram fuses.
Trgset 15 "0"|22
irf rpfusea1 (15 0) pulled|22
irf rpfusea2 (15 20) pulled|22
irf rpfusea3 (15 40) pulled|22
irf rpfusea4 (15 60) pulled|24
irf rpfuseb1 (15 80) pulled|24
irf rpfuseb2 (15 100) pulled|24
irf rpfuseb3 (15 120) pulled|24

irf rpfuseb4 (15 140) pulled|26

Event trigger 16 Simulates venting scram air header.
trgset 16 "0"|26
irf rdscrair (16) open|26

Event Trigger 17 installs MSL Group 1 RPV level byp and Offgas High Rad byp jumpers.
trgset 17 "0"|26
irf ci59jp (17) in|28
irf ogogjp (17) in|28

Triggers 22-25 Activate when no RBCCW pumps are running.

Event Trigger 22 Deletes RBCCW pressure meter override.
Trgset 22 ".not. (wrsp(1) .or. wrsp(2) .or. wrsp(3))"|34
trg 22 "dor wrppdsh1"|30

Event Trigger 23 Returns alarm 923-1 D-1 override to normal.
Trgset 23 ".not. (wrsp(1) .or. wrsp(2) .or. wrsp(3))"|36
trg 23 "imf ser1735 normal"|30

Event Trigger 24 Returns alarm 902-4 G-3 override to normal.
Trgset 24 ".not. (wrsp(1) .or. wrsp(2) .or. wrsp(3))"|38
trg 24 "imf ser0369 normal"|32

Event Trigger 25 Returns alarm 902-4 G-7 override to normal.
Trgset 25 ".not. (wrsp(1) .or. wrsp(2) .or. wrsp(3))"|40
trg 25 "imf ser0322 normal"|32

END

Unit 2 Risk: GREEN

Unit 2 is in Mode 1 at 912 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 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 ****

**** Shift 3 Activities ****

Today

**** Unit 2 Procedures In-Progress **** Do Not Delete ****

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: <u>Dresden Generating Station</u>	Scenario No.: <u>ILT-N-3</u>	Class ID: <u>2010-301</u>
Evaluators	Operators	/ crew position
_____	_____	/ ATC
_____	_____	/ BOP
_____	_____	/ CRS
Initial Conditions:	<u>2% Power</u>	
	<u>Startup On Hold For REMA Re-evaluation By QNE.</u>	
Turnover:	<u>Remove 'B' FWRV From Service After Assuming Shift.</u>	

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		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>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).</p>
	CRS	<p><input type="checkbox"/> Directs ATC to remove ‘B’ FWRV from service per DOP 0600-06, Feedwater Regulating Valve (FWRV) Operation.</p>
	ATC	<p>Removes ‘B’ FWRV from service per DOP 0600-06, Feedwater Regulating Valve (FWRV) Operation.</p> <p><input type="checkbox"/> Verifies total Feedwater flow is ≤ 8.3 Mlbm/hr.</p> <p><input type="checkbox"/> Verifies reactor level stable. (LFRV is controlling level)</p> <p><input checked="" type="checkbox"/> Places ‘B’ FWRV REG VLV CONTROL STATION in MAN.</p> <p><input type="checkbox"/> Verify ‘A’ FWRV operating in MASTER AUTO.</p> <p><input type="checkbox"/> Slowly reduces ‘B’ FWRV DEMAND to close ‘B’ FWRV while verifying ‘A’ FWRV automatically adjusts. (Both valves are closed at start of evolution)</p> <p><input checked="" type="checkbox"/> Closes isolation valve MO 2-3206B, 2B FW REG ISOL.</p> <p><input type="checkbox"/> Places ‘B’ FWRV in test at the OIS</p>
2		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>When the operator goes to the OIS station, which is not modeled in the simulator, then:</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> 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.</p>
3		
	BOP	<p><input type="checkbox"/> Assist ATC as directed.</p>

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.
2		<u>SIMULATOR OPERATOR / ROLE PLAY:</u> At the discretion of the Lead Examiner, activate trigger 2 . This will cause a trip of 2A Cond/Boost pump.
14		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.
15		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.
		<u>ROLE PLAY:</u> 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”.
	ATC	<ul style="list-style-type: none"> ■ Announces alarms <ul style="list-style-type: none"> • 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. <input type="checkbox"/> 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. <input type="checkbox"/> .Determines it started and is operating properly.
		<u>ROLE PLAY:</u> As the EO, if asked, report: “2B (or 2D) Condensate Booster pump is operating normally”.
	CRS	<ul style="list-style-type: none"> ■ Enters DOA 0600-01, Transient Level Control. ■ Directs starting an available Condensate Booster pump.
	BOP	<input type="checkbox"/> 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
		<p><u>Role Play:</u></p> <p>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”.</p> <p>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”.</p>
	TEAM	<ul style="list-style-type: none"> ■ 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	<ul style="list-style-type: none"> ■ References Technical Specifications and determines: <ul style="list-style-type: none"> ❖ 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
3		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>At the discretion of the Lead Examiner, activate trigger 3, which fails IRM channel 12 upscale.</p>
	ATC	<p>Perform the following actions per DAN 902-5 C-10, CHANNEL A IRM HI HI/INOP:</p> <ul style="list-style-type: none"> <input type="checkbox"/> If not in the RUN Mode, verifies the following occurred: <ul style="list-style-type: none"> ○ Channel A half scram ○ No rods Scrammed. ○ Rod Block. <input type="checkbox"/> Verifies IRM 12 readings against other IRMs on 902-5 panel. <input type="checkbox"/> 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: <ul style="list-style-type: none"> ○ Verifies half scram no longer required ● Turns the Scram Reset switch in each direction and verifies all eight white group solenoid lights are lit. ○ Verifies alarm 902-5 A-10, Channel A Manual Trip, resets.
	BOP	<p>Performs the following actions per DAN 902-5 C-10:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Verifies IRM 12 readings against other IRMs on 902-36 panel. <input type="checkbox"/> Verifies IRM 12 function switch in operate. <input type="checkbox"/> Verifies power supplies operating properly.
	CRS	<ul style="list-style-type: none"> ■ Directs IRM 12 bypassed and the half scram reset per DOP 0500-07, Insertion/Reset of Manual Half Scram. <input type="checkbox"/> Notifies the Shift Manager and IMD.
		<p><u>ROLE PLAY:</u></p> <p>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”.</p>
	CRS	<ul style="list-style-type: none"> ■ References plant technical documents and determines: <ul style="list-style-type: none"> ● 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.
4		<p>Simulator Operator: At the direction of the Lead Examiner, activate trigger 4 to simulate EHC Hydraulic Oil leak.</p> <p>Role Play: EO sent to check EHC hydraulic system, wait 3 min. then report, "The EHC hydraulic oil tank level is dropping rapidly." EO directed to fill EHC reservoir: report "I will contact the store room to have EHC oil sent to the reservoir".</p>
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> Announces alarm 902-7 B-6, EHC RESERVOIR LVL HI/LO. <input type="checkbox"/> Determines from SER that the alarm is due to low EHC level. <input type="checkbox"/> May direct EO to fill the EHC reservoir. <input type="checkbox"/> May access the DEHC "Monitor/Hydraulics" display to track EHC level.
	CRS	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Determines EHC system loss is imminent. <input type="checkbox"/> May direct scram preparations per DGP 02-03, Reactor Scram.
	ATC	<ul style="list-style-type: none"> <input type="checkbox"/> Performs scram preparations per DGP 02-03, Reactor Scram, as directed: <ul style="list-style-type: none"> o Conditions are already met.
	CRS	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Before EHC hydraulics is lost, directs Team to scram the reactor per DGP 02-03, Reactor Scram.
	ATC	<p>Performs the following actions per DGP 02-03, Reactor Scram, and DEOP 100, RPV Control, as directed:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Places Mode Switch to Shutdown and depresses the Scram pushbuttons. <input checked="" type="checkbox"/> Determines all rods are inserted. <input type="checkbox"/> Maintains RPV level as directed by CRS. <input type="checkbox"/> Inserts SRMs and IRMs.
	CRS	<p>Enters DEOP 100, RPV Control,</p> <ul style="list-style-type: none"> <input type="checkbox"/> Directs actions of DEOP 100. <input type="checkbox"/> Directs actions of DGP 02-03. <input type="checkbox"/> Verification of all isolations, ECCS and EDG starts. <input type="checkbox"/> Holding RPV/L +8 to +48 inches. <input type="checkbox"/> Maintaining RPV/P <1060 psig using the Isolation Condenser.
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> If directed, maintains RPV/P <1060 psig using the Iso Cond to control RPV/P. (may use Hardcard) <input type="checkbox"/> Performs Reactor Scram actions per his Hardcard.

Event Five – Loss of EHC / Manual Reactor Scram

Trigger

Position

Applicant's Actions or Behavior

Event 5 Completion Criteria:

- 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
5		<p><u>SIMULATOR OPERATOR:</u> Verify trigger 5, automatically activates when the Mode Switch is placed to S/D. After 1 min, this causes all feedwater regulating valves to fail closed.</p>
6		<p><u>SIMULATOR OPERATOR:</u> After the loss of DEHC and at the discretion of the Lead Evaluator, activate trigger 6 cause a recirc loop leak.</p>
7		<p><u>SIMULATOR OPERATOR:</u> When HPCI starts, verify trigger 7 automatically activates, which causes a spurious HPCI isolation.</p>
8		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u> EO sent to lineup CRD crosstie: wait 4 min, activate trigger 8, then report: “the CRD crosstie is lined up”.</p>
9		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u> EO sent to lineup makeup to SBLC Boron tank: wait 4 min, activate trigger 9, and report: “makeup lined up to SBLC Boron tank”.</p>
10		<p>EO sent to lineup makeup to SBLC Test tank: wait 4 min, activate trigger 10, and report: “makeup lined up to SBLC Test tank”.</p> <p><u>ROLE PLAY:</u> EO sent to check EDG operation: wait 3 min, then report: “Both EDGs are operating normally”.</p> <p>EO sent to cut out Cond Demin beds: wait 3 min, cutout Demin beds as needed (using instructor station), then report: “Cond Demin beds cutout”.</p> <p>BOP checks OIS: Inform BOP that “the OIS display lost power”.</p> <p><u>ROLE PLAY:</u> Acknowledge other requests; delay as necessary.</p>
	ATC	<ul style="list-style-type: none"> ■ Determines/announces all feedwater regulating valves are failed closed.
	CRS	<ul style="list-style-type: none"> □ Directs use of HPCI if needed to maintain RPV level.
	TEAM	<ul style="list-style-type: none"> ■ Determines/announces Drywell pressure rapidly rising. ■ Determines/announces RPV level is dropping.
	CRS	<ul style="list-style-type: none"> □ Directs starting HPCI to maintain Level.
	BOP	<ul style="list-style-type: none"> □ 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: <ul style="list-style-type: none"> ■ √ 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	<ul style="list-style-type: none"> ■ √ Inhibits ADS as directed.
	CRS	Enters DEOP 0200-01, Primary Containment Control, when PC/P reaches 2 psig and performs/directs: <ul style="list-style-type: none"> □ 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: <ul style="list-style-type: none"> • 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 H₂/O₂ monitors.
	BOP	Performs DEOP 0200-01, Primary Containment Control, actions as directed: <ul style="list-style-type: none"> ■ √ 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 H₂/O₂ monitors.
		<p>NOTE: Above a RPV pressure of 500 psig, TAF is –170 inches on the Fuel Zone indicators. Below 500 psig, TAF is –143 inches.</p>

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: <ul style="list-style-type: none"> <input type="checkbox"/> Initiation of Iso Condenser to maximum flow. <input type="checkbox"/> 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: <ul style="list-style-type: none"> <input type="checkbox"/> Initiates Iso Condenser to maximum flow per Hard Card, ISOLATION CONDENSER. <input type="checkbox"/> Verifies SP/L >6 feet. <ul style="list-style-type: none"> ■ √ 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: <ul style="list-style-type: none"> <input type="checkbox"/> Condensate <input type="checkbox"/> Core Spray <input type="checkbox"/> 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 overriding 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 Dwncsl 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 rlmiffc (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 "fwsacbc(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 "fwsacbc(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 "fwsacbc(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 "fwsacbc(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 2 is in Mode 2 at ~2% power
Leading Thermal Limit: NA
Action limit: NA
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 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