

Dresden Generating Station

2017-301 ILT-N-1

Place IC in Standby Lineup

Raise power with rods to open bypass valves

CRD Pump trip (Overcurrent)

EDG CWP failure – EDG INOP

IRM Fails upscale with partial 1/2 scram

Swap SAC due to oil leak

2nd CRD pump trip with accumulator trouble alarm

Hydraulic ATWS – ARI unsuccessful

EXAM MATERIAL

Rev. 00

05/17

Developed By: _____
Exam Author Date

Approved By: _____
Facility Representative Date

Station: <u>Dresden Generating Station</u>	Scenario No.: <u>2017-301 ILT-N-1</u>	Class ID: <u>2017-301</u>
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Evaluators <hr/> <hr/> <hr/>	Operators / crew position <hr/> / ATC <hr/> / BOP <hr/> / CRS
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Initial Conditions: Unit 2 is in Mode 2. DGP 01-01 is in progress.

Turnover: Place Isolation Condenser in a Standby Lineup in preparation for RPV pressure reaching 150 psig. When the Isolation Condenser has been placed in a Standby Lineup continue startup per DGP 01-01. Raise reactor power by control rod withdrawal until 2 Main Turbine Bypass Valves are fully opened.

Critical Tasks: RPV-5.1 – With a reactor scram required and the reactor not shutdown, take action per DEOP 400-5, Failure to Scram, to reduce power by inserting control rods.

RPV-5.12 – When executing DEOP 400-5, Failure to Scram, reactor pressure is controlled as necessary to prevent an uncontrolled positive reactivity excursion of > 5% power.

Event No.	Malfunction No.	Event Type*	Event Description
1	NONE	N BOP	IC – Place Isolation Condenser in a Standby Lineup
2	NONE	R ATC	REACTIVITY – Raise reactor power by withdrawing control rods.
3	RDPPATRP	C ATC	CRD – CRD Pump trip (Overcurrent)
4	T18	C/T BOP	AUX POWER – EDG INOP due to EDGCW pump failure
5	NII17POT B15	I/T ATC	NI – IRM fails upscale with partial ½ scram
6	N01	C BOP	SERVICE AIR – Swap SAC due to oil leak
7	RDPPBTRP	M TEAM	CRD – CRD pump trip and accumulator trouble alarm (Manual Scram)
8	RDHLVFPA RDHLVFPB RDHLDEGA RDHLDEGB RDFHYLK	M TEAM	Hydraulic ATWS/ARI unsuccessful – Scram Resets

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

Scenario Objective

Evaluate the Team's ability to operate the plant with a failure of control rods to fully insert upon receipt of a scram signal.

Scenario Summary

1. Unit startup is in progress.
2. The following equipment is OOS:
 - a. None
3. LCOs:
 - a. None

Scenario Sequence

- The team will take the shift with DGP 01-01 Unit Startup, in progress. The team will place the Isolation Condenser in a standby lineup per DGP 01-01.
- Immediately following placing the Isolation Condenser in a standby lineup, the team will continue raising reactor power by withdrawing control rods until 2 main turbine bypass valves are fully opened.
- When the 2nd main turbine bypass valve is fully opened, the 2A CRD pump will trip on overcurrent. The ATC operator will take actions to start the 2B CRD pump and the team will execute DOA 0300-01, Control Rod Drive System Failure and DOA 6500-10, 4KV Circuit Breaker Trip.
- After the 2B CRD pump has been started and action of DOA 6500-10 and DOA 0300-01 are completed, the Unit 2 Emergency Diesel Generator Cooling Water Pump will experience a power failure due to a blown fuse. The team will declare the Unit 2 EDG inoperable and Tech Specs 3.8.1 and 3.7.2 are not met.
- After Tech Specs are addressed for the Unit 2 EDG failure, IRM #17 will fail upscale causing a ½ scram; a partial ½ half scram will occur. The team will perform DOA 0500-02, Partial Half or Full Scram Actuation, and insert the RPS Channel B ½ scram and determine that Tech Spec 3.3.1.1 is not met until the ½ scram is inserted.
- After Tech Specs are addressed for the Partial ½ scram, an oil leak will develop on the Unit 2 Service Air Compressor. The team will start the Unit 3 Service Air Compressor and secure the Unit 2 Service Air Compressor per DOA 4600-01, Service Air System Failure.
- Once the Service Air System has been restored, the 2B CRD pump will trip. After the team enters DOA 0300-01 and DOA 6500-10, CRD N-09 accumulator alarm will illuminate and the team will insert a manual scram IAW DOA 0300-01.
- The manual scram will fail to insert control rods fully. ARI will also fail to insert the control rods due to a hydraulic lock in the Scram Discharge Volume.
- The team will ultimately be successful in achieving reactor shutdown by driving control rods and performing repeated scram resets.

Event One – Place Isolation Condenser in a standby Lineup

- Preparation of the Isolation Condenser Lineup for RPV pressure > 150 psig.

Malfunctions required: 0

Success Path:

- 2-1301-3, 2-1301-17&20 valves are open
- 2-1301-1, 2-1301-2, and 2-1301-4 valves are closed.

Event Two – Raise Reactor Power to Establish 2 Main Turbine Bypass Valves Fully Opened.

- Reactor Power ascension.

Malfunctions required: 0

Success Path:

- Crew withdraws control rods per Control Rod Sequence package and REMA until 2 Main Turbine Bypass Valves are fully opened.

Event Three – Control Rod Drive (CRD) Pump Trip

- 2A CRD pump trips on overcurrent.

Malfunctions required: 1

- (2A CRD Pump Overcurrent)

Success Path:

- Starts 2B CRD Pump
- Addresses actions of DOA 6500-10, 4KV Circuit Breaker Trip

Event Four – EDG Cooling Water Pump Failure

- Fuse failure occurs resulting in loss of power to Unit 2 EDG Cooling Water Pump

Malfunctions required: 1

- (EDG Cooling Water Pump Fuse)

Success Path:

- Performs DOA 6600-01, Diesel Generator Failure
- Declares TS 3.8.1 Condition B and TS 3.7.2 Condition A not met.

Event Five – IRM Fails upscale with Partial Half Scram

- IRM #17 fails upscale with partial half scram.

Malfunctions required: 2

- (IRM #17 fails upscale)
- (Partial half scram)

Success Path:

- IRM #17 placed in bypass and RPS Channel B ½ scram is completed.

Event Six – Oil leak on U2 Service Air Compressor

- An oil leak is reported from the U2 EO and the team will swap the Service Air Compressors. The U2 Service Air will trip if the swap is not completed within 10 minutes.

Malfunctions required: 1

- (Service Air Compressor trip)

Success Path:

- U3 SAC is running
- U2 SAC is secured

Event Seven – 2nd CRD Pump trip with Accumulator Trouble alarm

- 2B CRD Pump trips.
- CRD N-09 accumulator alarm comes in.

Malfunctions required: 2

- (2B CRD Pump trip)
- (CRD N-09 accumulator alarm)

Success Path:

- Manual Reactor Scram.

Event Eight – Hydraulic ATWS/ARI Unsuccessful

- A Hydraulic ATWS occurs when the reactor is scrammed. ARI is unsuccessful

Malfunctions required: 1

- (Hydraulic ATWS)

Success Path:

- Team inserts control rods by manually driving control rods and performing repeated scrams.

PRE-SCENARIO ACTIVITIES

Evolution	Malfunctions / CAEP	Instructor Information
Simulator Setup		<ul style="list-style-type: none"> • Initialize the simulator in IC <u>163</u> (password 2017ilt) • Run <u>Pump Sumps.cae</u> • Run caep file: <u>16-1 ILT-N-1.cae</u> • Provide crew with a marked up copy of DGP 01-01 (to step 37) • Provide crew with appropriate REMA and control rod move sheets • Verify 2A CRD pump is operating • Verify 2A and 2B IAC are running • Verify placard for 3C IAC indicates lined up to Unit 2 • Verify U2 SAC is running • Verify U3 SAC in PTL • Verify the U2 to U3 SA crosstie open • Verify RB Vent lineup on Units 2 & 3 • Remove PPC Alarm E207 from scan • Verify RWM sequence is correct (2.I.0 0E9C) • Ensure HPCI Turbine is reset • Range IRMs UP as high as possible • Reset all annunciators • Complete Simulator Setup Checklist

Event One – Place Isolation Condenser in Standby Lineup

Trigger	Position	Crew Actions or Behavior
	CRS	<input type="checkbox"/> Directs BOP to place IC in standby lineup per DGP 01-01, Unit Startup
	BOP	<ul style="list-style-type: none">■ Places Isolation Condenser in Standby Lineup per DOP 1300-01, Standby Operation of the Isolation Condenser System■ Verifies or manipulates the following valves:<ul style="list-style-type: none"><input type="checkbox"/> MO 2(3)-1301-1, RX OUTLET ISOL, open.<input type="checkbox"/> MO 2(3)-1301-2, RX OUTLET ISOL, open.<input type="checkbox"/> MO 2(3)-1301-3, RX INLET ISOL, closed.<input type="checkbox"/> AO 2(3)-1301-17 <u>AND</u> AO 2(3)-1301-20, VENT VLVs, open.<input type="checkbox"/> MO 2(3)-1301-4, RX INLET ISOL, open.■ Informs US IC is in a standby lineup
	US	<input type="checkbox"/> Directs the team to continue startup per DGP 01-01

Event One is complete when:

- IC is in a standby lineup
- AND/OR --

At the discretion of the lead evaluator

Event Two – Withdraw Control Rods to Open Bypass Valves

Trigger	Position	Crew Actions or Behavior
<p align="center">NOTE: If Reactivity SRO is requested, inform the crew: No reactivity SRO is available</p>		
	CRS	<input type="checkbox"/> Directs NSO to continue startup per DPG 01-01 and REMA to establish 2 bypass valves open. <input type="checkbox"/> Performs brief
	ATC	Withdraws control rods per control rod move sheets to establish 2 bypass valves open. <input type="checkbox"/> Verifies RWM in service <input type="checkbox"/> May request QNE/reactivity SRO. <input type="checkbox"/> Withdraws control rods IAW DGP 03-04, Control Rod Movements <input type="checkbox"/> Performs coupling check for all control rods moved to position 48 <input type="checkbox"/> Monitors reactor response <input type="checkbox"/> Informs US when 2 bypass valves are open
	BOP	<input type="checkbox"/> Acts as verifier for control rod moves <input type="checkbox"/> Monitors Reactor Pressure and Bypass valve position

Event Two is complete when:

- 2 Bypass Valves are open
- AND/OR --

At the discretion of the lead evaluator

Event Three – CRD Pump Trip

Trigger	Position	Crew Actions or Behavior
30 1		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>If requested, insert TRIGGER 30, to set gains.</p> <p>At the discretion of the Lead Examiner, activate TRIGGER 1. This will trip the 2A CRD pump on overcurrent.</p> <p>If contacted to check the breaker on Bus 23 (wait 3 minutes) and respond, The breaker for the 2A CRD pump is open with an overcurrent target up.</p> <p>If contacted to 2A CRD pump locally (wait 3 minutes) and respond, The 2A CRD pump is at rest and the motor is hot to the touch.</p> <p>If contacted to verify proper operation of the 2B CRD pump (wait 3 minutes after the pump has been started) and respond, The 2B CRD pump is operating normally.</p> <p>Acknowledge communications to organizations outside the MCR. No response is intended.</p>
	ATC	<p>■ Announces alarms 902-5 B-2, ROD DRIVE PP TRIP</p> <p>Takes actions per DAN 902-5 B-2 and/or DOA 0300-01, Control Rod Drive System Failure:</p> <ul style="list-style-type: none"> ❑ Takes manual control of FIC 2-340-1 CRD FLOW CONTRL (if valve has gone open). ❑ Starts 2B CRD pump. ❑ Verifies CRD parameters return to previous values ❑ (May take FIC 2-340-1 CRD FLOW CONTRL to open/automatic, if closed previously). <p>■ Place the control switch for 2A CRD pump in PTL IAW DOA 6500-10, 4kV Circuit Breaker Trip</p>
	CRS	<p>■ Directs entry into DOA 0300-01 and DOA 6500-10</p> <ul style="list-style-type: none"> ❑ Establishes contingency actions if 2nd CRD pump fails ❑ Contacts outside organizations for assistance ❑ May reference TRM 3.3.h, Reactor Vessel Water Level Instrumentation System (RVWLIS) Backfill System, due to short loss of RVWLIS supply.
	BOP	Monitors panels and assists as directed.

Event Three is complete when:

- 2B CRD pump has been started and the actions of DOA 0300-01 and DOA 6500-10 are complete,
-- AND/OR --
At the discretion of the lead evaluator

Event Four – EDG Cooling Water Pump Failure

Trigger	Position	Crew Actions or Behavior
3		<p><u>SIMULATOR OPERATOR:</u> At the direction of the Lead Examiner, activate TRIGGER 3 to fail the U2 EDG Cooling Water Pump</p> <p><u>ROLE PLAY:</u> If dispatched in investigate the U2 EDG (wait 3 minutes) and report: I see nothing abnormal with the U2 EDG, but alarm DG2 C-3, DIESEL CLG WTR PUMP FAILURE OR LOCKED OUT is in. If dispatched to MCC 29-2 to check status of EDG CWP breaker, (wait 3 minutes) and report: The breaker for the U2 EDG CWP is closed. If dispatched in investigate 2-3903-F1 (Fuse in the U2 EDG control cabinet) wait 3 minutes and report: Fuse 2-3903-F1 is blown. I will contact the Field Supervisor to obtain a replacement. (It is not intended to replace this fuse. If further requests for fuse replacement are made delay by searching for a like for like fuse) Respond as outside organizations as appropriate</p>
	BOP	<ul style="list-style-type: none"> ■ Announces alarm 902-7 G-8, U2 Diesel Gen Clg Wtr Pp Trip Lkout. ■ Dispatches EO to U2 EDG to investigate. ■ Enters and performs actions of DOA 6600-01, Diesel Generator Failure <ul style="list-style-type: none"> ○ Places U2 EDG control switch to STOP ○ Places the U2 EDG to Bus 24-1 Breaker control switch to PTL
	CRS	<ul style="list-style-type: none"> ■ Announces entry into DOA 6600-01 and directs team actions. ■ Reviews Tech Specs and determines TS 3.8.1 Condition B.1, B 3.1 or B 3.2 and B.4 and 3.7.2 Condition A.1 are not met. □ May direct placing the U2 EDG control switch in STOP
		<p><u>FLOOR INSTRUCTOR NOTE:</u> If Appendix X is directed to be performed, intervene and inform the US another NSO will perform Appendix X</p>

Event Four is complete when:

- Tech Spec call is completed,
-- AND/OR --
At the discretion of the lead evaluator

Event Five – IRM Fails upscale with Partial Half Scram

Trigger	Position	Crew Actions or Behavior
5		<u>SIMULATOR OPERATOR:</u> At the direction of the Lead Examiner, activate TRIGGER 5 to fail IRM #17 upscale.
29		Verify TRIGGER 29 automatically activates when the B Manual Scram Pushbutton is depressed to remove the partial ½ scram malfunction.
	ATC	<ul style="list-style-type: none"> ■ Announces alarm 902-5 C-15, Channel B IRM HI HI/INOP. □ Reports IRM #17 failed upscale. ■ Announces the RPS Channel B Partial ½ Scram.
	CRS	<ul style="list-style-type: none"> □ Acknowledges IRM #17 failed upscale and Partial ½ scram. ■ Directs entry into DOA 0500-02, Partial ½ Scram or Full Scram Actuation
	BOP	<ul style="list-style-type: none"> □ Investigates IRM #17 on panel 902-36. □ Reports IRM #17 is reading upscale on panel 902-36
	CRS	<ul style="list-style-type: none"> ■ Refers to Tech Spec 3.3.1.1 and determines that 3 IRMs are required per channel and that the LCO is met. <ul style="list-style-type: none"> ○ Directs IRM #17 to be bypassed. ■ Refers to Tech Spec 3.3.1.1 and determines that RPS Channel B is INOP and that Condition A is not met and that the RPS Channel B must be placed in Trip within 12 hours. And condition C1 may apply. <ul style="list-style-type: none"> ○ Directs B ½ scram to be put in manually. □ May Refer to TRM 3.3.a Control Rod Block Instrumentation.
	ATC	<ul style="list-style-type: none"> ■ Inserts B ½ scram manually by depressing the B Manual Scram Button.

Event Five is complete when:

- RPS Channel B ½ Scram inserted
- Tech Spec call is completed,
- AND/OR --

At the discretion of the lead evaluator

Event Six – Service Air Compressor Oil Leak / Swap Service Air Compressors

Trigger	Position	Crew Actions or Behavior
7		<p><u>SIMULATOR OPERATOR:</u></p> <p>At the discretion of the Lead Examiner, activate call as EO on rounds, and report: There is an oil leak coming from the U2 Service Air Compressor (SAC). The oil is contained.</p> <p>After the report is made regarding oil leak, Insert TRIGGER 7 which trips the U2 SAC after 10 minutes</p> <p>If required, as directed by the Lead Evaluator, call the unit as the U2 EO and Recommend removing the U2 SAC from service without delay.</p> <p><u>ROLE PLAY:</u></p> <p>If dispatched to the U3 SAC (wait 2 minutes) and report: U3 SAC is ready to start.</p> <p>If requested after U3 SAC is running, report: U3 SAC is operating normally.</p> <p>If U2 SA Trips</p> <p>If dispatched to Bus 26 to check status of U2 SAC breaker, (wait 3 minutes) and report: The breaker for the U2 SAC is open with overcurrent trip indicated.</p> <p>Respond as outside organizations as appropriate</p>
	BOP	<p>Informs US of degrading SAC</p> <ul style="list-style-type: none"> <input type="checkbox"/> Directs EO to check U3 SAC is ready to be started ■ Starts U3 SAC per DOP 4600-01, Unit 3 Service Air System Operation ■ Secures U2 SAC per DOP 4600-04, Unit 2 Service Air Compressor Startup, Operation, Shutdown <p>If the U2 SAC trips before securing, performs the following:</p> <ul style="list-style-type: none"> ■ Starts U3 SAC per DOA 4600-01, Service Air System Failure ■ Performs DOP 6700-20 480V Circuit Breaker Trip to place the U2 SAC breaker in PTL.
	CRS	<ul style="list-style-type: none"> ■ Directs BOP to perform the following: <ul style="list-style-type: none"> <input type="checkbox"/> Start U3 SAC IAW DOP 4600-01 <input type="checkbox"/> Secure U2 SAC IAW DOP 4600-04 ■ If the U2 SAC trips before securing, enters the following: <ul style="list-style-type: none"> <input type="checkbox"/> DOA 4600-01 <input type="checkbox"/> DOP 6700-20

Event Six is complete when:

- U3 SAC is started and U2 SAC is secured,
-- AND/OR --

At the discretion of the floor instructor

Event Seven – Trip of 2nd CRD pump

Trigger	Position	Crew Actions or Behavior
9		<p><u>SIMULATOR OPERATOR:</u></p> <p>At the direction of the Lead Examiner, activate TRIGGER 9 to trip the 2B CRD pump</p> <p>After the trip of the 2B CRD accumulator trouble light for CRD N-09 will illuminate.</p> <p>If contacted to check the breaker on Bus 24 (wait 3 minutes) and respond, The breaker for the 2B CRD pump is open with no targets up. There is an acrid odor coming from the breaker. No signs of fire.</p>
	ATC	<ul style="list-style-type: none"> ■ Announces alarms 902-5 B-2, ROD DRIVE PP TRIP; 902-5 G-2, ACCUMULATOR LVL HI/PRESS LO ■ Dispatches EO to 2B CRD pump to investigate. ■ Monitors full core display for accumulator trouble lights ■ When N-09 accumulator alarm illuminates, inserts a manual scram IAW DOA 0300-01
	CRS	<ul style="list-style-type: none"> ■ Announces entry into DOA 0300-01, Control rod drive system failure, and DOA 6500-10, 4KV Breaker Trip ■ Directs team actions. ■ Sets contingency for accumulator trouble alarm ■ Directs insertion of manual scram after accumulator trouble alarm illuminates.

Event Seven is complete when:

- Manual scram has been attempted,
-- AND/OR --
At the discretion of the lead evaluator

Event Eight – Hydraulic ATWS / ARI Unsuccessful

Trigger	Position	Crew Actions or Behavior
11 13 15 17 19 21		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u></p> <p>When requested: Wait several minutes and as directed by the Floor Instructor, activate the appropriate trigger and report completed.</p> <p>TRIGGER 11 inserts automatically to insert Full Hydraulic Lock 30 seconds after the Mode Switch is placed in S/D</p> <p>TRIGGER 13: Closes the CRD Charging Water Valve.</p> <p>TRIGGER 15: bypasses MSL GP 1 RPV/L and Offgas High Rad.</p> <p>TRIGGER 17: pulls ARI fuses.</p> <p>TRIGGER 19: installs scram jumpers</p> <p>TRIGGER 21: Crossties CRD with Unit 3</p> <p>When directed by Lead Evaluator/Floor Instructor: Run clrhdydk.cae to clear the hydraulic lock.</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. <input type="checkbox"/> Initiates ARI / Determines ARI did not insert control rods. ■ Announces ATWS condition and RX power is < 6% <input type="checkbox"/> Runs Recirc pumps back to minimum. <input type="checkbox"/> √ 8 Lowers FWLC setpoint to -40 inches.
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> Performs DGP 02-03 as directed.
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> Enters DEOP 100, RPV Control (as directed by DGP 02-03), 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"> <input type="checkbox"/> Placing ADS to inhibit. (Not expected to be a Critical Task for this scenario) <input type="checkbox"/> Placing Core Spray pumps in PTL. <input type="checkbox"/> Verifying required auto actions. <input type="checkbox"/> May direct initiation of SBLC <input type="checkbox"/> Installing of the jumpers for the MSIV low level isolations and the Off Gas high Rad isolations. <p>Continues DEOP 0400-05, Failure to Scram, and directs/performs:</p> <ul style="list-style-type: none"> ■ √ Inserting control rods using Alternate Rod Insertion. (RPV-5.1) <ul style="list-style-type: none"> <input type="checkbox"/> Directs CRD crosstie with Unit 3 <input type="checkbox"/> Directs driving control rods. <input type="checkbox"/> Directs repeated scram/resets defeating RPS logic. <input type="checkbox"/> Based on report that SBLC failed, directs DEOP 0500-01, Alternate Boron Injection, performed. (If SBLC start was attempted)

Event Eight – Hydraulic ATWS / ARI Unsuccessful

Trigger	Position	Crew Actions or Behavior
	ATC	<ul style="list-style-type: none"> ■ √ Inserts control rods per DEOP 500-05, Alternate Insertion Of Control Rods, as follows: (RPV-5.1) <ul style="list-style-type: none"> ○ Drives rods by: <ul style="list-style-type: none"> ○ Bypassing the RWM. ○ Uses either the ROD MOVEMENT CONTROL switch or the EMERG ROD IN position of the ROD OUT NOTCH OVERRIDE switch. ○ Performs repeated scram/resets defeating RPS logic: <ul style="list-style-type: none"> ○ Directs ARI fuses pulled if RPV level is lowered below – 59 in. ○ Directs scram jumpers installed. ○ Places SDV Hi Water Bypass in the BYPASS position. ○ Closes the SDV vent and drain valves. ○ Resets the scram. ○ Opens SDV Vent and Drain valves. ○ Manually scrams the reactor when the SDV is drained. ○ Repeats as necessary.
	CRS	<ul style="list-style-type: none"> □ Based on report that all control rods are inserted, exits DEOP 0400-05 and enters DEOP 0100.
	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 TAF (in band directed by Unit Supervisor).

Event Eight / Scenario Completion Criteria:

- Control rods inserted,

-- AND/OR --

At the discretion of the Lead Examiner.

SUPPORTING PROCEDURES

Procedure Numbers	Title
DAN 902(3)-5 B-2	Rod Drive Pp Trip
DAN 902(3)-5 C-15	Channel B IRM HI HI/INOP
DAN 902-7 G-8	U2 Diesel Gen Clg Wtr Pp Trip Lkout
DEOP 100	RPV Control
DEOP 400-5	Failure To Scram
DEOP 500-5	Alternate Insertion Of Control Rods
DGP 01-01	Unit Startup
DGP 02-03	Reactor Scram
DGP 03-04	Control Rod Movements
DOA 0300-01	Control Rod Drive System Failure
DOA 0500-02	Partial ½ Scram or Full Scram Actuation
DOA 4600-01	Service Air System Failure
DOA 6500-10	4kV Circuit Breaker Trip
DOA 6600-01	Diesel Generator Failure
DOP 1300-01	Standby Operation Of The Isolation Condenser System
DOP 4600-01	Unit 3 Service Air System Operation
DOP 4600-04	Unit 2 Service Air Compressor Startup, Operation, Shutdown
TRM 3.3.h	Reactor Vessel Water Level Instrumentation System
TS 3.3.1.1	Reactor Protection System Instrumentation
TS 3.7.2	Diesel Generator Cooling Water (DGCW) System
TS 3.8.1	AC Sources – Operating

Critical Tasks	
RPV-5.1	With a reactor scram required and the reactor not shutdown, take action per DEOP 400-5, Failure to Scram, to reduce power by inserting control rods.
RPV-5.12	When executing DEOP 400-5, Failure to Scram, reactor pressure is controlled as necessary to prevent an uncontrolled positive reactivity excursion of > 5% power.

CAEP Files:

16-1 ILT-N-1.cae
For ILT Class 16-1 NRC Exam
Written by DSS
Rev 00
Date 4/17

INITIAL CONDITIONS

Sets APRM Master Gain pot to 1.0
imf niagain 1.0

Sets scram discharge volume hydraulic blockage and degradation to 94%.

imf rdhlvfp 94.0
imf rdhlvfpb 94.0
imf rdhldega 94.0
imf rdhldegb 94.0

Inserts partial 1/2 scram on RPS Channel B
imf b15

Overrides CST High Level Alarms off
imf ser1204 off
imf ser1200 off

EVENT TRIGGERS

Event Trigger 1 trips the 2A CRD Pump
trgset 2 "0"|2
imf rdppatrp (1)|2

Event Trigger 3 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 3 "0"|2
imf ser1589 (3) on|2
imf ser0710 (3) on|4
imf t18 (3)|4

Event Trigger 5 fails IRM #17 upscale

trgset 5 "0"|4
imf nii17pot (5) 125.0 30.0|4

Event Trigger 7 trips the U2 SAC 10 minutes after trigger is activated

trgset 7 "0"|6
imf n01 (7 10:00)|6

Event Trigger 9 trips the 2B CRD Pump and drives up N-09 accumulator alarm

trgset 9 "0"|6
imf rdppbtrp (9)|6
ior rdlacuma124 (9 10) on|8
imf ser1009 (9 10) on|8

Event Trigger 11 inserts the Full Hydraulic Lock malfunction 30 seconds after MODE switch in S/D to prevent rods from moving on their own

trgset 11 "rpdmode4"|8
imf rdfhylk (11 30)|8

Event Trigger 13 Closes the CRD Charging Water Valve

trgset 13 "0"|8

irf rd25pos (13) 0.0|10

Event Trigger 15 Installs jumpers to bypass RPV low level MSIV and Off Gas Hi Rad Isolations

trgset 15 "0"|10

irf ci59jp (15) in|10

irf ogogjp (15) in|10

Event Trigger 17 Pulls ARI fuses.

trgset 17 "0"|12

irf aw4 (17) pulled|12

Event Trigger 19 Installs RPS Jumpers.

trgset 19 "0"|12

irf rpjumpas (19) on|12

Event Trigger 21 crossties CRD with Unit 3

trgset 21 "0"|14

irf rdxtieu3 (21) true|14

Event Trigger 29 activates when the B RPS channel pushbutton is depressed and removes malfunction B13

trgset 29 "rpd301b"|14

trg 29 "dmf b13"|14

Event Trigger 30 sets gain for all 6 APRMs.

trgset 30 "0"|16

trg 30 "irf niagainf true"|16

END

Dresden Generating Station

2017-301 ILT-N-2

Pump DWED Sump

Control Rod Drift

IC – Spurious Initiation

RB Vent Rad monitor failure w/ failure of SBT to Auto Start

Stator Water Cooling pump trip

Emergency Load Reduction

Recirc Leak

Aux Power fails to transfer – ED on RPV level

EXAM MATERIAL

Rev. 00

05/17

Developed By: _____
Exam Author Date

Approved By: _____
Facility Representative Date

Facility: <u>Dresden Generating Station</u>	Scenario No.: <u>2017-301 ILT-N-2</u>	Op-Test No.: <u>2017-301</u>
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Examiners <hr/> <hr/> <hr/>	Operators / crew position <hr/> / ATC <hr/> / BOP <hr/> / CRS
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Initial Conditions: Unit 2 is at 62% Rx Power. No equipment is OOS, and no LCO required actions.
Unit 3 is at full power. No equipment is out of service, no evolutions in progress, no LCO required actions.

Turnover: Unit 2: Pump DWEDS IAW DOP 2000-180 at request of Engineering
Maintain load per TSO direction.

Critical Tasks:

RPV-1.1 – If the RPV level trend is not reversible with an RPV injection source lined up with a pump running, initiate emergency depressurization between an RPV water level between the Top-of-Active Fuel and the Minimum Steam Cooling RPV Water Level or within 1 minute after TAF is reached, whichever is later.

RPV-1.2 – When high and low pressure systems are available for RPV injection, do not stop or divert injection from the RPV until level is restored to above the Top-of-Active Fuel (TAF).

RPV-1.3 – Upon RPV level restoration following a loss of vessel inventory, all available injection systems are controlled in such a fashion that RPV overfill does not result in compromise of the HPCI system due to steam line flooding (+55 inches).

RPV-1.5 – Per DEOP 100, RPV Control, with the automatic ADS timer initiated, inhibit ADS before an automatic actuation occurs.

RPV-2.1 – When conditions are met per DEOP 400-2, Emergency Depressurization, the minimum number of available SRV's required for emergency depressurization (MNSRED) are opened.

PC-1.1 – While executing DEOP 200-1, Primary Containment Control, when drywell pressure exceeds 9 psig and only if operating within the safe region of the drywell spray initiation limit (DSIL), initiate drywell sprays.

Event No.	Malf. No.	Event Type*	Event Description
1	NONE	N ATC	CONTAINMENT – Pump DWED Sump
2	RODH06DO	C ATC	CRD – Control Rod H-06 Drift Out
3	ICSPDFT	C/T BOP	IC – Spurious Initiation
4	RADRBVAH VRD5741C VRD741C3 VRD742C3 VGLAUA06	C/T BOP	CONTAINMENT – RB Vent Rad monitor failure w/ failure of SBGT to AutoStart
5	T47 T50	C BOP	SWC – Stator Water Cooling Pump Trip/Failure of Standby Pump to Start
6	NONE	R ATC	REACTIVITY – Emergency Load Reduction
7	F43 L72 AT46	M ALL	RECIRC – Recirc System Leak (Manual Scram); AUX PWR – Auxiliary Power Fails to Transfer / Emergency Depressurization due to Low RPV Level

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

Scenario Objective

Evaluate the Team's ability to operate the plant with an Emergency Depressurization on RPV low level.

Scenario Summary

1. Unit is at 62% power.
2. The following equipment is OOS:
 - a. None.
3. LCOs:
 - a. None

Scenario Sequence

- The team will take the shift and pump the Drywell Equipment Drain sumps.
- After the sumps are pumped, a control rod will drift out. This will result in the team executing DOA 0300-05 and DOA 0300-01.
- Following the control rod drift, a spurious initiation of the IC will occur. This will result in the IC being declared inoperable. The IC may still be considered available.
- The RB Vent rad monitor will fail upscale and SBGT will fail to start. This will result in both trains of SBGT being declared inoperable.
- The running stator water cooling pump will trip and the standby will fail to start. This will result in a runback. DOA 7400-01 will direct the team to execute an emergency load reduction.
- Following the load reduction a leak develops from the recirc system. This will result in RPS scram setpoints being challenged. The team will execute a manual reactor scram.
- Following the scram, Aux power will fail to transfer to offsite power, resulting in a loss of the feed system. HPCI is degraded. With insufficient HP injection sources available to overcome the leak rate, an ED will be performed on low RPV level. The team will recover RPV level with LP ECCS systems.

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

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

Event One – Pump DWEDS

- Pumps Drywell Equipment Drain Sump.

Malfunctions required: 0

Success Path:

- DWEDs is pumped

Event Two – CRD FCV Controller Fails High Causing a Rod to Drift Out.

- CRD FCV failure causes Control Rod H-06 to drift out.

Malfunctions required: 1

- (Rod H-6 drift out)

Success Path:

- Crew inserts control rod H-06 to position 00. CRD H-06 has been removed from service on RWM.

Event Three – Isolation Condenser Inadvertent Initiation

- The Isolation Condenser Initiation setpoint drifts causing initiation..

Malfunctions required: 1

- (Iso Cond Initiation setpoint)

Success Path:

- Isolation condenser removed from operation.
- Declares TS 3.5.3 Condition A.1 and A.2 not met

Event Four – Rx Bldg Vent Rad Fails Upscale With Failure of SBGT To Auto Start

- Fuse failure occurs resulting in loss of power to Unit 2 EDG Cooling Water Pump

Malfunctions required: 3

- (RX Bldg Vent Rad monitor)
- (2/3A SBGT C/S)
- (2/3B SBGT C/S)

Success Path:

- Performs DOA 7500-01, Standby Gas Treatment Fan Trip
- Declares TS 3.3.6.2 Condition A.1; 3.3.7.1 Condition A and TS 3.6.4.3 Condition A & D not met.

Event Five – Stator Water Cooling Pump Trips

- 2A and 2B stator cooling water pumps trip.

Malfunctions required: 2

- (2A Stator Cooling Pump)
- (2B Stator Cooling Pump)

Success Path:

- Load Reduction in progress to close bypass valves

Event Six – Load Reduction

- Emergency load reduction due to loss of Stator water cooling.

Malfunctions required: 0

Success Path:

- Bypass valves closed or Reactor power is 45%

Event Seven – Loss Of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization

- Recirc loop leak
- HPCI isolation.
- Failure of Aux power to transfer.

Malfunctions required: 3

- (Recirc Leak)
- (Group IV isolation)
- (TR-22 trip)

Success Path:

- Emergency Depressurization, RPV level restored above TAF.

PRE-SCENARIO ACTIVITIES

Evolution	Malfunctions / CAEP	Instructor Information
Simulator Setup		<ul style="list-style-type: none"> • Initialize the simulator in IC 169 • Run caep file: <u>Pump Sumps.cae</u> • Run caep file: <u>16-1 ILT-N-2.cae</u> • Provide the crew with a copy of DOP 2000-180 and Appendix with sump data • Provide Pre-Job Brief sheet to crew • Verify 2A Stator Water Cooling pump running and 2B in standby • Verify 2D Condensate pump selected for standby • Verify 2C Feed pump on Bus 22 selected for standby • Verify Condensate Demin DP within limits • Run Floordrainmass SimView file and change DWEDS mass to 4000 • Cycle power to DWEDS recorder • Remove PPC Alarm E208 from scan • Verify RB Vent lineup on Units 2 & 3 • Verify CRAM rod move sheet • Verify CRD system parameters are normal • Verify Control Rod Sequence <u>2.S.0.0.909D</u> is loaded in RWM

Event One – Pump DWEDS

Trigger	Position	Crew Actions or Behavior
	CRS	<input type="checkbox"/> Directs NSO to pump DWEDS per DOP 2000-180, Drywell Sump Operation with the Unit On-Line
	ATC	<p>Pumps Drywell Equipment Drain Sump:</p> <ul style="list-style-type: none"><input type="checkbox"/> Verifies AO 2-2001-3 open<input type="checkbox"/> Open AO-2-2001-5 and 6<input type="checkbox"/> Verify recorder 2(3)-2040-2, D/W EQUIPMENT DRAIN SUMP FLOW:<ul style="list-style-type: none">○ Indicates “RCD” on digital display.○ Integrator value resets to approximately zero.<input type="checkbox"/> Start 2A or 2B EQUIP DRN PP.<input type="checkbox"/> Secures pump<input type="checkbox"/> Shut AO-2-2001-5 and 6

Event One is Complete When:

- DWEDS is pumped
- AND/OR --

At the discretion of the lead evaluator

Event Two – CRD FCV Controller Fails High Causing a Rod to Drift Out

Trigger	Position	Crew Actions or Behavior
1		<p><u>Simulator Operator:</u> At the discretion of the Lead examiner, activate TRIGGER 1, which causes:</p> <ul style="list-style-type: none"> Control Rod H-06 to drift out. <p><u>Role Play:</u> EO to check H-06 accumulator: Wait 2 min, then report “At the HCU for H-06, I see nothing abnormal.” WEC/EO to hydraulically isolate and electrically disarm H-06: acknowledge the request. It is not intended to complete the request. QNE to evaluate core limits: Acknowledge the request. Wait 2 min. and report, “core parameters are within limits”.</p>
16		<p><u>Simulator Operator:</u> Verify TRIGGER 16 activates when H-06 is selected and Emergency In signal is given. This deletes the Drift Out malfunction</p>
	ATC	<ul style="list-style-type: none"> Announces 902-5 A-3, Rod Drift, alarm. Notifies and announces that Control Rod H-06 is drifting out. Performs actions of DOA 0300-05, Inoperable Or Failed Control Rod Drives as directed. <p><u>Immediate:</u></p> <ul style="list-style-type: none"> Bypasses the Rod Worth Minimizer. Inserts the CRD to 00 using Emergency Rod In.
	CRS	<ul style="list-style-type: none"> Enters DOA 0300-05, Inoperable or Failed Control Rod Drives, and directs actions. May refer to Tech. Spec 3.3.2.1 Condition C. (Not required with RX power >10%) May enter DGA 07, Unpredicted Reactivity Addition.
	ATC	<ul style="list-style-type: none"> Announces that procedure directs entering DOA 0300-12, Mispositioned Control Rod. Discontinues ALL non-emergency control rod motion and notifies CRS and QNE to evaluate core parameters.
	CRS	<ul style="list-style-type: none"> May reference TS 3.1.3, Condition C, and determine the following actions may be required: <ul style="list-style-type: none"> C.1 Fully insert inoperable control rod within 3 hours. (DOA 0300-05, Inoperable or Failed Control Rod Drives, directs inserting the rod) C.2 Disarm the associated CRD within 4 hours. Directs disarming rod H-06 within 4 hours.
	CRS	<ul style="list-style-type: none"> Enters DOA 0300-12, Mispositioned Control Rod. Directs taking rod H-06 OOS on the RWM.
	ATC	<ul style="list-style-type: none"> Takes rod H-06 OOS on the RWM.

Event Two – CRD FCV Controller Fails High Causing a Rod to Drift Out

Trigger	Position	Crew Actions or Behavior
	BOP	<input type="checkbox"/> Monitor panels and assists as directed. <input type="checkbox"/> Provides peer check for taking rod H-06 OOS on RWM

Event Two Completion Criteria:

- Control Rod H-06 Has Been Inserted To Position 00, AND
- CRD H-06 has been removed from service on RWM, AND
- Tech Specs Have Been Addressed,
-- AND/OR --

At the direction of the Lead Examiner

Event Three – Isolation Condenser Inadvertent Initiation

Trigger	Position	Crew Actions or Behavior
3		<p><u>SIMULATOR OPERATOR:</u> At the discretion of the Lead Examiner, activate TRIGGER 3, which drifts the isolation Condenser Initiation setpoint.</p> <p><u>ROLE PLAY:</u> Respond as Outside Organizations contacted for help.</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. ■ Determines Isolation Condenser in operation due to MO 2-1301-3 valve open.
	TEAM	<ul style="list-style-type: none"> ■ Determines Isolation Condenser initiation spurious due to RPV pressure in normal band.
	US	<ul style="list-style-type: none"> ■ Directs removing the Isolation Condenser from service.
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> Takes action per DAN 902-4 A-15, ISOL CONDR CH A/B INITIATION. <input type="checkbox"/> May utilize Hard Card for Securing Iso Condenser ■ 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, Unexpected Reactivity Change.
	US	<p>References appropriate plant licensing documents and determines:</p> <ul style="list-style-type: none"> ■ TS 3.5.3, condition A. required actions: <ul style="list-style-type: none"> ❖ A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE immediately, AND, ❖ A.2 Restore IC System to OPERABLE status within 14 days. <input type="checkbox"/> TS 3.3.5.2, condition A. required actions: (May wait for IMD investigation) <ul style="list-style-type: none"> ❖ A.1 Declare IC System inoperable within 1 hour; AND, ❖ 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 Three is complete when:

- Isolation condenser removed from operation,
- Technical specifications have been referenced,
- AND/OR --

At the discretion of the lead examiner

Event Four – Rx Bldg Vent Rad Fails Upscale With Failure of SBGT To Auto Start

Trigger	Position	Crew Actions or Behavior
5		<p><u>Simulator Operator:</u> At the discretion of the Floor Instructor / Lead Evaluator, activate TRIGGER 5. This fails 2A RX Bldg Vent Rad monitor upscale.</p> <p>Note: BOTH SBGT system trains fail to automatically start.</p> <p><u>Role Play:</u> Operator/maintenance sent to in-plant panel 2223-28A for 2/3A SBGT system: Wait 4 min, then report that: “smoke came from the panel when I opened it, but there is no fire. It smells like burnt electrical insulation”. If directed to check fuses in panel 2223-28A, wait 2 min. and report: “fuse FU2 is blown”.</p> <p><u>Role Play:</u> EO to check RX Bldg to Atmosphere D/P on the Refuel floor: wait 2 min, the report “the RX Bldg to Atmosphere D/P is (Insert the value from Instructor Station drawing 923-5-03 OR variable VRP4)”. Acknowledge requests as plant support groups.</p>
	BOP	<p>Announces alarms indicating 2A RX Bldg Vent Rad high and a Secondary Containment Isolation have occurred:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 902-3 F-14, Rx BLDG Vent Ch A Rad Hi Hi. <input type="checkbox"/> 923-5 A-1(4), U2(3) Rx BLDG Vent/Exh Fan Trip. <input type="checkbox"/> 923-5 C-1, Rx Bldg DP Lo. <input type="checkbox"/> Checks back panels and determines that 2A RX Bldg Vent Rad monitor has failed high (all other monitors are indicating normal levels). <p>Verifies expected automatic actions have occurred. Discovers and announces the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Both SBGT system trains failed to automatically start.
	CRS	<ul style="list-style-type: none"> <input type="checkbox"/> Acknowledges reports of failed 2A RX Bldg Vent Rad monitor and the Secondary Containment Isolation. <input type="checkbox"/> Acknowledges report of SBGT system failure ■ Enters DOA 7500-01, Standby Gas Treatment System Fan Trip.
	BOP	<p>Performs the following to complete the Secondary Containment Isolation:</p> <ul style="list-style-type: none"> ■ Places 2/3B SBGT train control switch to START (Per DOA 7500-01, Standby Gas Treatment Fan Trip) <input type="checkbox"/> May place 2/3A SBGT Train control switch to OFF.

Event Four – Rx Bldg Vent Rad Fails Upscale With Failure of SBGT To Auto Start

Trigger	Position	Crew Actions or Behavior
	CRS	Refers to Technical Specifications and determines: <ul style="list-style-type: none">■ Technical Specification 3.3.6.2 Table 3.3.6.2-1 Function 3: Place channel in trip within 24 hrs. (Condition met)□ Technical Specification 3.6.4.1.A: Restore secondary containment to OPERABLE status within 4 hrs. (If D/P drops to below -0.25 inches)■ Technical Specification 3.6.4.3.D: Restore one SGT subsystem to Operable status within 1 hour.■ Technical Specification 3.3.7.1.A.2: Restore CREV System Instrument Channel to OPERABLE within 6 hrs.

Event Four Completion Criteria:

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

At the discretion of the Floor Instructor/Lead Evaluator.

Event Five – Stator Water Cooling Pump Trips

Trigger	Position	Crew Actions or Behavior	
7		<u>SIMULATOR OPERATOR / ROLE PLAY:</u> At the discretion of the Lead Examiner, activate TRIGGER 7 , which causes 2A stator cooling water pump to trip on overload and 2B to fails to auto start.	
	BOP	Announces the following alarms: <input type="checkbox"/> DAN 902-7 B-10, Stator Clg PP Trip <input type="checkbox"/> DAN 902-7 C-10, Stator Clg Panel Trouble <input type="checkbox"/> DAN 902-7 E-11, H2 Seal Oil & Alterrex Pnl Trouble <input type="checkbox"/> DAN 902-7 C-3, Turb Stator Coolant Runback <input type="checkbox"/> DAN 902-7 A-5, Turbine Control Major Trouble Performs appropriate actions per DOA 7400-01, Failure of the Stator Coolant System: <input checked="" type="checkbox"/> Starts 2B Stator Cooling Water Pump (Immediate Action) <input type="checkbox"/> Announces 2B Stator Cooling Water pump failed to start <input type="checkbox"/> Sends EO to check breaker and 2A Stator Cooling Water Pump for cause of trip. <input type="checkbox"/> Performs DOP 6700-20, 480V Circuit Breaker Trip. <input type="checkbox"/> Places 2A Stator Cooling Water Pump control switch in PTL.	
9		<u>SIMULATOR OPERATOR / ROLE PLAY:</u> As the EO sent to acknowledge the stator cooling water trouble and/or the H2 Seal Oil & Alterrex Pnl Trouble alarm (wait 2 min), activate TRIGGER 9 and report: "I have acknowledged stator cooling water trouble and/or the H2 Seal Oil & Alterrex Pnl Trouble alarm. The alarms are cleared and were ...". (Use table below to determine report)	
		902-7 alarm received	Local alarm to report
		902-7 C-10, Stator Clg Panel Trouble	Inlet Flow Low, & Inlet Pressure Low
		902-7 E-11, H2 Seal Oil & Alterrex Pnl Trouble	Rectifier Coolant Flow Low.
		902-7 C-3, Turb Stator Coolant Runback	Turbine Runback
		<u>ROLE PLAY:</u> As the EO sent to check cause of 2A Stator Cooling Water Pump trip (wait 2 min), then report: "2A Stator Cooling Water Pump tripped on overload". As the EO sent to check cause of 2B Stator Cooling Water Pump trip (wait 2 min), then report: "2B Stator Cooling Water Pump breaker is open with no indication for the cause of the trip". As the EO sent to check Conductivity (wait 2 min), the report: "Stator cooling water conductivity is .08µmhos".	
		CRS	<input checked="" type="checkbox"/> Enters and directs performance of DOA 7400-01, Failure of the Stator Coolant System. <input type="checkbox"/> Enters and directs performance of DOP 6700-20, 480V Circuit Breaker Trip. <input type="checkbox"/> Notifies Work Week Manager, IMD and/or EMD <input type="checkbox"/> Directs load reduction per DGP 03-04 and DOA 7400-01
ATC	<input type="checkbox"/> Performs Load Reduction per DGP 03-01, DGP 03-04 and DOA 7400-01		
<u>Event 5 Completion Criteria:</u> <ul style="list-style-type: none">• Load Reduction in progress (Next event) , -- AND/OR -- At the discretion of the Lead Examiner.			

Event Six –Load Reduction

Trigger	Position	Crew Actions or Behavior
		<p><u>SIMULATOR OPERATOR / ROLE PLAY:</u> Respond as support organizations as necessary</p> <p><u>ROLE PLAY:</u> If the crew does not perform the load reduction due to <8½ bypass valves being open, direct them as the Shift Manager to lower power to close the bypass valves.</p>
	ATC	<p>■ Performs the following:</p> <ul style="list-style-type: none"> • Lowers Recirc flow to no less than 56Mlbm/hr • Inserts CRAM rods per DGP 03-04 as necessary to lower reactor power to no less than 33% to reclose bypass valves
	US	<ul style="list-style-type: none"> ❑ Directs load reduction ❑ Directs NSO to maintain < 8½ bypass valves open ❑ May enter DOA 0500-03, 38.5% REACTOR SCRAM BYPASS ❑ May direct continued power reduction to close bypass valves ❑ Sets contingency to insert manual scram if >8½ bypass valves are open ❑ May direct WEC to pull fuses to defeat 38.5% Scram bypass ❑ May reference T.S. 3.3.1.1
	BOP	<ul style="list-style-type: none"> ❑ Monitors BOP parameters ❑ Directs FS/EO to remove service units from service ❑ Provides peer check for rod moves

Event 6 Completion Criteria:

- 2 Bypass valves closed
- OR --
- Reactor power is 45%
- AND/OR --

At the discretion of the Floor Instructor/Lead Evaluator.

Event Seven – Loss Of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
11 18 20 22		<p><u>SIMULATOR OPERATOR:</u> At the discretion of the Lead Evaluator, activate TRIGGER 11 which cause a Recirc loop leak.</p> <p>Verify TRIGGER 18 automatically activates when the Mode Switch is placed to S/D. This causes a failure of aux power to fast transfer</p> <p>Verify TRIGGER 20 automatically activates when the Mode Switch is placed to S/D. This causes a Group IV isolation.</p> <p>Verify TRIGGER 22 automatically activates when Drywell pressure is >4.0 psig. This increases the size of the leak.</p> <p><u>ROLE PLAY:</u> EO sent to check EDG operation: wait 3 min, then report: "Both EDGs are operating normally". EO sent to cut out Cond Demin beds: wait 3 min, cutout Demin beds as needed (using instructor station), then report: "Cond Demin beds cutout".</p> <p><u>ROLE PLAY:</u> Acknowledge other requests; delay as necessary.</p>
	ATC	<ul style="list-style-type: none"> ■ Recognizes DW pressure going up
	CRS	<ul style="list-style-type: none"> ■ Assigns DW pressure as a critical parameter and directs insertion of manual scram at or before DW pressure reaching 1.5 psig □ May direct entry into DOA 0040-01 □ Directs BOP to establish max torus cooling
	BOP	<ul style="list-style-type: none"> ■ Validates DW pressure increase and investigates cause □ Establishes max Torus cooling per the hardcard (DOA 0040-01 action)
	ATC	<ul style="list-style-type: none"> ■ Inserts a manual scram when DW pressure reaches contingency threshold ■ Takes actions per DGP 02-03
	BOP	<ul style="list-style-type: none"> ■ Announces failure of aux power to transfer ■ Execute DGA-12 as directed.
	CRS	<ul style="list-style-type: none"> □ Enters DEOP 100 on RPV level less than +8"
	TEAM	<ul style="list-style-type: none"> ■ Determines/announces Drywell pressure rising more rapidly. ■ 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.
	CRS	<p>Determines insufficient high pressure feed is available, then performs/directs:</p> <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.

Event Seven – Loss Of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
	BOP	<ul style="list-style-type: none"> ■ √ Inhibits ADS as directed.
	CRS	<p>Enters DEOP 0200-01, Primary Containment Control, when PC/P reaches 2 psig and performs/directs:</p> <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: <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	<p>Performs DEOP 0200-01, Primary Containment Control, actions as directed:</p> <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><u>NOTE:</u></p> <p>Above a RPV pressure of 500 psig, TAF is -170 inches on the Fuel Zone indicators. Below 500 psig, TAF is -143 inches.</p>
	CRS	<p>Before RPV level reaches -191 inches (-209 inches corrected), enters DEOP 0400-02, Emergency Depressurization, and directs:</p> <ul style="list-style-type: none"> □ Initiation of Iso Condenser to maximum flow. □ Verification that SP/L >6 feet. □ √ Opening all ADS valves. □ Verification all relief valves are open.
	BOP	<p>Performs DEOP 0400-02, Emergency Depressurization, as directed:</p> <ul style="list-style-type: none"> □ Initiates Iso Condenser to maximum flow per Hard Card, ISOLATION CONDENSER. □ Verifies SP/L >6 feet. <ul style="list-style-type: none"> ■ √ Opens all ADS valves. ■ Verifies all relief valves are open.
	CRS	<p>√ Directs maximizing injection flow with minimum ECCS Pump lineups prescribed by the transient mitigation guidelines (OP-DR-103-102-1002) to the reactor when pressure drops below 350 psig until level is restored to > TAF</p>

Event Seven – Loss Of High Pressure Feed / Recirc Loop Leak / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
	ATC / BOP	√ Maximizes injection flow with minimum ECCS Pump lineups prescribed by the transient mitigation guidelines (OP-DR-103-102-1002) to the reactor when pressure drops below 350 psig to restore level to above TAF.

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

SUPPORTING PROCEDURES

Procedure Numbers	Title
DAN 902-3 B-4	ISOL CONDR VLVS OFF NORM
DAN 902-3 C-4	ISOL CONDR TEMP HI
DAN 902-3 F-14	RX BLDG VENT CH A RAD HI-HI
DAN 902-4 A-15	ISOL CONDR CH A/B INITIATION
DAN 902-5 A-3	ROD DRIFT
DAN 902-7 A-5	TRUBINE CONTROL MAJOR TROUBLE
DAN 902-7 B-10	STATOR CLG PP TRIP
DAN 902-7 C-10	STATOR CLG PANEL TROUBLE
DAN 902-7 C-3	TRUB STATOR COOLANT RUNBACK
DAN 902-7 E-11	H2 SEAL OIL & ALTERREX PNL TROUBLE
DAN 923-5 A-1(4)	UNIT 2(3) RX BLEDDG VENT/EXH FAN TRIP
DAN 923-5 C-1	RX BLDG DP LO
DEOP 100	RPV CONTROL
DEOP 200-1	PRIMARY CONTAINMENT CONTROL
DEOP 400-2	EMERGENCY DEPRESSURIZATION
DGA-07	UNEXPECTED REACTIVITY CHANGE
DGA-12	LOSS OF OFFSITE POWER
DGP 02-03	REACTOR SCRAM
DGP 03-01	POWER CHANGES
DGP 03-04	CONTROL ROD MOVEMENTS
DO 6700-20	480V CIRCUIT BREAKER TRIP
DOA 0040-01	SLOW LEAK
DOA 0300-05	INOPERABLE OR FAILED CONTROL ROD DRIVES
DOA 0300-12	MISPOSITIONED CONTROL ROD

Procedure Numbers	Title
DOA 7400-01	FAILURE OF THE STATOR COOLANT SYTEM
DOA 7500-01	STANDBY GAS TREATMENT SYSTEM FAN TRIP
DOP 2000-180	DRYWELL SUMP OPERATION WITH THE UNIT ON-LINE
OP-DR-103-102-1002	STRATETIES FOR SUCCESSFUL TRANSIENT MITIGATION
TS 3.1.3	CONTROL ROD OPERABILITY
TS 3.3.2.1	CONTROL ROD BLOCK INSTRUMENTATION
TS 3.3.5.2	ISOLATION CONDENSER (IC) SYSTEM INSTRUMENTATION
TS 3.3.6.2	SECONDARY CONTAINMENT ISOLATION INSTRUMENTATION
TS 3.3.7.1	CONTROL ROOM EMERGENCY VENTILATION (CREV) SYSTEM INSTRUMENTATION
TS 3.5.3	IC SYSTEM
TS 3.6.4.1	SECONDARY CONTAINMENT
TS 3.6.4.2	SECONDARY CONTAINMENT ISOLATION VALVES (SCIVs)
TS 3.6.4.3	STANDBY GAS TREATMENT SYSTEM (SBGT)

Critical Tasks	
RPV-1.1	If the RPV level trend is not reversible with an RPV injection source lined up with a pump running, initiate emergency depressurization between an RPV water level between the Top-of-Active Fuel and the Minimum Steam Cooling RPV Water Level or within 1 minute after TAF is reached, whichever is later.
RPV-1.2	When high and low pressure systems are available for RPV injection, do not stop or divert injection from the RPV until level is restored to above the Top-of-Active Fuel (TAF).
RPV-1.5	Per DEOP 100, RPV Control, with the automatic ADS timer initiated, inhibit ADS before an automatic actuation occurs.
RPV-2.1	When conditions are met per DEOP 400-2, Emergency Depressurization, the minimum number of available SRV's required for emergency depressurization (MNSRED) are opened.
PC-1.1	While executing DEOP 200-1, Primary Containment Control, when drywell pressure exceeds 9 psig and only if operating within the safe region of the drywell spray initiation limit (DSIL), initiate drywell sprays.

CAEP Files:

16-1 ILT-N-2.cae
CAEP for Scenario 16-1 ILT-N-2
Written by DSS
05/17

INITIAL CONDITIONS

Causes the 2B Stator Cooling Pump to trip as soon as the control switch is taken to run
imf t47

Overrides OFF the alarm that comes up due to the 2/3A SBGT control switch in OFF
imf ser1896 off

Fails 2/3A SBGT by overriding its control switch
ior vgdstbya off
ior vgdprima off
ior vgdstrta off

Overrides OFF the alarm that comes up due to the 2/3B SBGT control switch in OFF
imf ser1910 off|2

Fails 2/3B SBGT STBY position of its control switch.
ior vgdstbyb off|2

EVENT TRIGGERS

Event Trigger 1 will cause Rod H-6 to drift out
trgset 1 "0"|2
imf rodh06do (1)|2

Event Trigger 3 Drifts the Iso Cond Initiation setpoint.
trgset 3 "0"|4
imf icspdft (3) 0.0|4

Event Trigger 5 fails RX Bldg Vent Rad monitor upscale.
trgset 5 "0"|4
imf radrbvah (5)|4
ior vglaua06 (5) true|6

Event Trigger 7 trips the 2A Stator Cooling pump
trgset 7 "0"|8
imf t50 (7)|8

#Event Trigger 9 acknowledges Stator Water Cooling panel and H2 Seal Oil Panel Trouble
trgset 9 "0"|14
irf t22 (9) ack|14

irf t81 (9) true|14

Event Trigger 11 inserts a small Recirc leak

trgset 11 "0"|8

imf f43 (11) 0.1 2:00|8

Event Trigger 16 will auto initiate to delete the drift out malfunction for Rod H-6 when Trigger 1 is active and the Emergency In is used on the RONOR switch

trgset 16 "rds303em .and. et_array(1)"|4

trg 16 "dmf rodh06do"|4

Event Trigger 18 will auto trip TR-22 when the MODE switch is taken to SHUTDOWN

trgset 18 "rpdmode4"|10

imf l72 (18)|10

Event Trigger 20 causes a Group IV isolation when the MODE switch is taken to SHUTDOWN

trgset 20 "rpdmode4"|10

imf at46 (20) 1038.5|10

Event Trigger 22 increases the size of the Recirc leak when Drywell pressure >4.0 psig

trgset 22 "ppc268 .gt. 4.0"|12

trg 22 "mmf f43 0.5 10:00 0.1"|12

End

Dresden Generating Station

2017-301 ILT-N-3

Swap Reactor Water Cleanup Pumps

100 MWE Tso Initiated Load Reduction

NBI / MR Level Inst. Fails With Partial Half Scram

Main Steam / ERV Spurious Opening

Swap CRD Pumps Due To Suction Filter Clogging

Containment / Controller, Drywell To Torus D/P Failure

FW / RFP, Secure Due To High Vibrations

**Emergency Depressurize On 2 Areas Above Max Safe Water Levels Due To
Unisolable RWCU Leak And Flooding LPCI Corner Rooms**

EXAM MATERIAL

Rev. 00

05/17

Developed By: _____
Exam Author Date

Approved By: _____
Facility Representative Date

Scenario Outline

Facility: <u>Dresden Generating Station</u>	Scenario No.: <u>2017-301 ILT-N-3</u>	Op-Test No.: <u>2017-301</u>
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Examiners <hr/> <hr/> <hr/>	Operators / crew position <hr/> / ATC <hr/> / BOP <hr/> / CRS
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Initial Conditions: Unit 2 is at Full Power. No equipment is OOS, and no LCO required actions.
Unit 3 is at full power. No equipment is out of service, no evolutions in progress, no LCO required actions.

Turnover: Swap RWCU recirc pumps to allow for maintenance on 2A pump.
Maintain load per TSO direction.

Critical Tasks: RPV-2.1 – When conditions are met per DEOP 400-2, Emergency Depressurization, the minimum number of available SRV's required for emergency depressurization (MNSRED) are opened.
RPV-2.3 – After DEOP 400-2, Emergency Depressurization, has been entered, an attempt has been made to open all ERV's, and less than the minimum number of available SRV's required for emergency depressurization (MNSRED) are open, alternate emergency depressurization methods are used until RPV pressure is less than the decay heat removal pressure (DHRP).
SC-1.1 – When executing DEOP 300-1, Secondary Containment Control, before any critical area(s) reach their respective maximum safe operating values with an unisolable primary system discharging into the respective area(s), manually scram the reactor.
SC-1.2 – When executing DEOP 300-1, Secondary Containment Control, when more than one critical area reaches their respective maximum safe operating values for the same parameter with an unisolable primary system discharging into the respective area(s), perform an emergency depressurization of the reactor.

Event No.	Malf. No.	Event Type*	Event Description
1	NONE	N BOP	RWCU – Swap RWCU pumps
2	NONE	R ATC	REACTIVITY – Lower power 100 MWe using Rods and Recirc.
3	B15 NVM100BP	I/T ATC	NBI – MR level instrument fails downscale with RPS failure to ½ scram
4	ADS3CBN ADS3CSD	C/T BOP	MAIN STEAM – ERV spurious opening
5	SCAFILOF	C ATC	CRD – Swap Pumps Due To Suction Filter Clogging
6	PCVDMD14	I BOP	CONTAINMENT – DW to Torus D/P controller failure.
7	SER1363	M ALL	FEEDWATER – System high vibes (Manual Scram).
8	CIRWCUJP U34 U71	M ALL	EMERGENCY DEPRESSURIZE – On 2 areas above max safe water levels due to unisolable RWC system leak and flooding LPCI corner rooms.

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

Scenario Objective

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

Scenario Summary

1. Unit is at Full Power ~100%.
2. The following equipment is OOS:
 - a. None
3. LCOs:
 - a. None

Scenario Sequence

- The team will Transfer RWCU Recirc pumps using DOP 1200-03 which was provided during the turnover to allow for maintenance on the 2A pump.
- The TSO will call to request a 100 MWe load drop for U2 due to grid instabilities. The team will use rods and Recirc to reduce power per DGP 03-01.
- 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 ERV 2E spuriously opens. The BOP must perform actions per DOA 0250-01, Relief Valve Failure, to close the ERV. Technical Specifications 3.4.3.A.1, 3.5.1.H.1 and 3.6.1.8 apply.
- Swap CRD Pumps Due To Suction Filter Clogging.
- Drywell to Torus differential pressure controller demand fails downscale. Pressure control is regained when the BOP directs an operator to open the drywell to torus differential pressure control valve bypass or vents the torus. Action will be delayed so the DP drops to <1.0 psid requiring Tech Spec LCO entry.
- High Feedwater vibrations will come in one at a time until action is taken to insert a Manual Scram and secure all Reactor feed pumps.
- A RWCU system leak which cannot be isolated occurs in the RWCU pump room. Failure of the Reactor Building floor drains results in the LPCI/CS Corner Rooms filling with water. Eventually level in both LPCI/CS Corner Rooms will fill to above Max Safe levels. The Team will perform an Emergency Depressurization.

Event One – RWCU Recirc pump swap

- Starts the 2B RWCU Recirc pump and secures 2A RWCU Recirc pump.

Malfunctions required: 0

- (None)

Success Path:

- The Team starts the 2B RWCU Recirc pump.
- The Team secures the 2A RWCU Recirc pump.

Event Two – Lower power 100 MWe using Rods and Recirc

- TSO calls to request 100 MWE load drop on Unit 2.

Malfunctions required: 0

- (None)

Success Path:

- Crew lowers power 100 MWe using the following:
 - Inserts Control Rods to reduce FCL to less than 93%.
 - Reduces Recirc Flow.

Event Three – 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 Four – ERV Spurious Opening

- ERV 2E spuriously opens.

Malfunctions required: 1

- (ERV 2E spuriously opens)

Success Path:

- Performs DOA 0250-01, Relief Valve Failure. Pulling the control power fuses is successful.

Event Five – Swap CRD Pumps Due To Suction Filter Clogging

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

- (Simulated Plugging of CRD pump suction filter and trip pump on pressure if not pumps swapped)

Success Path: 2A CRD Pump has been started and the immediate actions of DOA 300-01 are complete

Event Six – Drywell to Torus Differential Pressure Controller Failure

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

Malfunctions required: 1

- (Controller demand fails downscale)

Success Path:

- Restores Drywell to Torus DP using any of the following:
 - Cycle AO 2-1601-58.
 - Vent the Torus.
 - Open the Drywell to Torus DP control valve manual bypass valve.

Event Seven – Feedwater high vibration/Reactor Scram

- 2A, 2B, 2C, RFP Hi Vibration alarm is received.
- Feedwater Reg Station vibration Hi alarm is received.

Malfunctions required: 4

- (2A RFP Hi Vibration alarm)
- (2B RFP Hi Vibration alarm)
- (2C RFP Hi Vibration alarm)
- (Feedwater Reg Station Vibration Hi alarm)

Success Path:

- Feedwater system secured and Manual Reactor Scram.

Event Eight – Unisolable RWCU System Leak / Emergency Depressurization

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

Malfunctions required: 1

- (RWCU system leak)

Success Path:

- Performs an Emergency Depressurization.

PRE-SCENARIO ACTIVITIES

- 1 If applicable, conduct pre-scenario activities in accordance with TQ-AA-155-J040, SIMULATOR EXAMINATION BRIEFING.
 - a. Direct the crew to perform their briefs prior to entering the simulator.
 - b. Provide the Team a copy of DOP 1200-03, RWCU System Operation with the Reactor at Pressure.
- 2 Simulator Setup (the following steps can be done in any logical order)
 - a. Initialize simulator in an IC with Reactor power ~100%. (IC 168 used)
 - b. IC 168 uses control rod sequence **2.S.0.0 909D**
 - c. Cut in/out Cond Demins as needed, to maintain DP within limits.
 - d. Advance the chart recorders.
 - e. Run the CAEP file: **Pump_Sumps.cae**
 - f. Verify Cram Sheet is correct for RWM sequence and correctly marked
- 3 Verify the following simulator conditions:
 - a. Verify 2A FWRV in Master Auto.
 - b. Verify 2B FWRV in Master Auto.
 - c. Verify 2B CRD pump running with 2A OFF.
 - d. Verify TR 86 LTC in AUTO.
 - e. Verify U2 SAC running and the U3 SAC in PTL with the U2 to U3 SA crosstie valve open
 - f. Verify 2A and 2/3 RBCCW pumps are running and lined up to Unit 2
 - g. Verify 2B RBCCW pump is secured
 - h. Verify 2A RWCU pump running with 2B RWCU pump secured.
 - i. Verify U2 and U3 RB Ventilation lineup.

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
- Required Actions
- Optional Actions

Event One – RWCU Recirc pump swap		
Trigger	Position	Crew Actions or Behavior
		<p><u>Simulator Operator:</u></p> <p>When directed by the lead evaluator, call as the Shift Manager, and direct the team to swap RWCU recirc pumps to allow for maintenance on 2A pump.</p> <p>ROLE PLAY:</p> <p>If contacted as EO report:</p> <p>2B RWCU pump is operating normally</p> <p>2A RWCU pump is at rest.</p>
	CRS	<ul style="list-style-type: none"> ■ Directs BOP to swap RWCU recirc pumps per DOP 1200-03, RWCU system operation with the reactor at pressure
	BOP	<ul style="list-style-type: none"> ■ Swaps RWCU recirc pumps when directed <ul style="list-style-type: none"> ○ Slowly lower demand on RMC 2-1290-10, FLOW CONTLR, to reduce RWCU system flow to approximately 400 gpm. ○ Verify closed MO 2-1201-9B, B RWCU PP DISCH, for standby pump. ○ Start 2B RWCU RECIRC PP <u>AND</u> immediately open MO 2-1201-9B, 2B RWCU PP DISCH. ○ Verify RWCU system flow and pressure are steady. ○ Close MO 2-1201-9A, 2A RWCU PP DISCH ○ Stop 2A RWCU RECIRC PP. ○ Adjust demand on RMC 2-1290-10, FLOW CONTLR, to restore proper system flow. ○ Verify RWCU system flow <u>AND</u> pressure are steady.
<p style="text-align: center;"><u>Event 1 Completion Criteria:</u></p> <p>⇒ U2 RWCU RECIRC PUMP SWAP COMPLETED</p> <p>-- AND / OR --</p> <p>At the discretion of the Lead Examiner</p>		

Event Two – Lower Power 100 MWe		
Trigger	Position	Crew Actions or Behavior
		When directed by the lead evaluator, call as the TSO , and report: This is TSO, Mark Jenga. Due to unstable grid conditions execute emergency load following contingencies and immediately drop 100 MWe.
	CRS	Directs 100 MWe emergency power reduction per DGP 03-01, Power Changes. <ul style="list-style-type: none"> <input type="checkbox"/> May designate second verifier. <input type="checkbox"/> Directs ATC to insert rods.
	ATC	Performs the following actions per DGP 03-01, Power Changes, as directed <u>Reduces power as follows:</u> <ul style="list-style-type: none"> ■ Inserts control via CRAM rod insertion for 90 MWe of generator power <u>OR</u> 9% of APRM power. <ul style="list-style-type: none"> ■ Moves the Rod Movement Control switch to ROD IN. ■ Verifies ON light and proper Control Rod Timer operation. ■ Verifies rod settles to target position and proper response of nuclear instrumentation. <input type="checkbox"/> Reduces Reactor power by decreasing core flow to complete 100 MWe load drop.
	BOP	<ul style="list-style-type: none"> <input type="checkbox"/> Monitors BOP parameters <input type="checkbox"/> Directs FS/EO to remove service units from service <input type="checkbox"/> Provides peer check for rod moves
<p style="text-align: center;"><u>Event 2 Completion Criteria:</u></p> <p>⇒ Load dropped by 100 MWe</p> <p>-- AND / OR --</p> <p>At the discretion of the Lead Examiner.</p>		

Event Three – B Med Range Level Instrument Fails Low with a Partial 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 B medium range downscale. The B RPS partial half scram was inserted during initial setup.</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"> ■ The partial half scram condition on the B RPS channel. <input type="checkbox"/> Scram Solenoid Group lights B2 and B3 did NOT extinguish. ■ Refers to DOA 0500-02, Partial ½ or Full Scram Actuation. ■ Depresses RPS Channel B Manual Scram pushbutton. ■ Acknowledges appropriate annunciators.
		<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 requested to reset gross fail light then report back (after 1 minute): attempt was made and the gross fail light is still lit.</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"> ■ 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 B. <input type="checkbox"/> May refer to DOP 0010-10, Unit 2(3) Technical Specification Instrumentation Operability Manual. ■ References Technical Specifications and determines: <ul style="list-style-type: none"> • Refers to Tech Spec 3.3.1.1 and determines that RPS Channel B is INOP and that Condition A is not met and that the RPS Channel B must be placed in Trip within 12 hours. And condition C1 may apply. <ul style="list-style-type: none"> ○ Directs B ½ scram to be put in manually. • TS 3.3.3.1 Action A1. Restore required channel to OPERABLE status within 30 days. <ul style="list-style-type: none"> ○ May review TS 3.3.6.1 Condition A1. Place channel in trip within 12 hours. ○ May review TS 3.3.6.2 Condition A1. Place channel in trip within 12 hours.
<p align="center"><u>Event 3 Completion Criteria:</u></p> <p>⇒ Half Scram inserted -- AND --</p> <p>⇒ Appropriate Tech Specs referenced -- AND / OR --</p> <p>At the discretion of the Lead Examiner.</p>		

Event Four – ERV Spurious Opening

Trigger	Position	Crew Actions or Behavior
5 7		<p>Simulator Operator / Role Play:</p> <p>At the discretion of the Lead Examiner, activate TRIGGER 5, which causes “E” ERV to spuriously open due to an electrical failure.</p> <p>As the EO sent to pull control power fuses for the “E” ERV (wait 3 min) activate TRIGGER 7, which removes control power fuses for the “E” ERV, then call the control room on the phone and report: “I have pulled the “E” ERV fuses”.</p> <p>As the QNE called to evaluate core parameters (wait 2 min) then report: “core parameters are within limits”.</p>
	BOP	<p>Determines/announces that “E” ERV is open. Performs DOA 0250-01, Relief Valve Failure, immediate actions:</p> <ul style="list-style-type: none"> ■ Places the “E” ERV control switch to OFF.
	ATC	<ul style="list-style-type: none"> □ Verifies FWLCS has stabilized level.
	CRS	<ul style="list-style-type: none"> ■ Enters DOA 0250-01, Relief Valve Failure, and directs actions. □ May enter DOA 0040-01, SLOW LEAK
	BOP	<p>Determines that “E” ERV is still open and performs subsequent actions of DOA 0250-01:</p> <ul style="list-style-type: none"> ■ Cycles “E” ERV control switch to MAN and OFF twice. ■ Cycles the ADS INHIBIT switch from NORMAL to INHIBIT to NORMAL several times. ■ Directs “E” ERV control power fuses pulled. □ If torus temp is greater than circulating water inlet temperature, starts torus cooling as directed. (Steps listed later in this Event) □ If > 95° and DEOP 0200-01, Primary Containment Control, entry is required. □ Monitors Turbine Control / Bypass Valve Operation. □ May check hydrogen addition operation. □ May monitor torus temp per DOS 1600-20, Suppression Pool Temp Monitoring.
	CRS	<ul style="list-style-type: none"> □ May direct scram preparatory actions per DGP 02-03, Reactor Scram. □ May enter DEOP 0200-01, Primary Containment Control, for high Torus level. <p>If Torus temperature reaches 95°F, then enters DEOP 0200-1, Primary Containment Control, and performs/directs:</p> <ul style="list-style-type: none"> □ Monitoring of PC/P □ Initiation of torus cooling. (May already be started per DOA 0250-01) □ Monitoring of Torus level. □ Verifying initiation of drywell and torus H₂/O₂ monitors.
	ATC	<ul style="list-style-type: none"> □ Performs scram preparatory actions per DGP 02-03, Reactor Scram, (if directed).
	BOP	<ul style="list-style-type: none"> ■ Determines/announces that E ERV closed when fuses pulled. □ Resets the acoustic monitor.

Event Four – ERV Spurious Opening		
Trigger	Position	Crew Actions or Behavior
	BOP	<p>Initiates Torus cooling per “Hard Card”:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Places 316A/B and 318A/B keylock switches in MANUAL OVERRD. <input type="checkbox"/> Verifies the third circ water pump is secured prior to starting the first CCSW pump. <input type="checkbox"/> IF starting torus cooling during a LOCA, THEN verifies RWCU recirc pump is tripped PRIOR to starting the first CCSW pump. <input type="checkbox"/> Starts one CCSW pump in each loop and verifies 3A/B valves open. <input type="checkbox"/> Starts at least one LPCI pump in each loop. (Starts additional LPCI pumps as required.) <input type="checkbox"/> Adjusts CCSW flow controller to approximately 3500 gpm for one pump; > 5000 gpm two pumps. [Maintain LPCI/CCSW dP \geq 7 psid (1 LPCI Pump/loop) OR \geq 20 psid (two LPCI Pumps/loop)] <input type="checkbox"/> Momentarily places 11A/B valve control switches to close. (IF 11A/B remain open or re-opened due to LPCI logic, then close valves as soon as possible.) <input type="checkbox"/> IF required, obtains Unit Supervisor permission, THEN places 317 keylock switches to MANUAL OVERRD. <input type="checkbox"/> Opens 21A/B and 20A/B valves in desired loop. <input type="checkbox"/> Throttles open 38A/B valves until > 5000 gpm per LPCI pump is established (maintains LPCI pump discharge pressure > 125 psig). <input type="checkbox"/> Starts additional CCSW pumps if desired: <ul style="list-style-type: none"> ○ IF TR 86(32) LTC in MANUAL, THEN PRIOR to starting 3rd OR 4th CCSW PP, verifies voltage on applicable ECCS bus > 4000 volts, preferred target 4160V. ○ (Unit 2 Only) If 2/3 EDG is loaded, then refers to DOP 1500-02 prior to starting additional pumps. <input type="checkbox"/> Adjusts CCSW flow controller to > 5000 gpm for two CCSW pumps [Maintain LPCI/CCSW dP \geq 7 psid (1 LPCI Pump/loop) OR \geq 20 psid (two LPCI Pumps/loop)].
	CRS	<ul style="list-style-type: none"> ■ Declares “E” ERV inoperable. ■ Determines following Technical Specifications apply: <ul style="list-style-type: none"> • 3.4.3, Safety and Relief Valves, Condition A.1: Restore the relief valve to OPERABLE status within 14 days. • 3.5.1, ECCS Operating, Condition H.1: Restore the ADSV to OPERABLE status within 14 days. • 3.6.1.8, Suppression Chamber–to–Drywell Vacuum Breaker, SR 3.6.1.8.2: Perform a functional test of each required vacuum breaker within 12 hours. • May refer to 3.3.6.3, A.1 Relief Valve Instrumentation. <input type="checkbox"/> Directs performance of Suppression Chamber–to–Drywell Vacuum Breaker testing.
	TEAM	<ul style="list-style-type: none"> <input type="checkbox"/> May enter and perform DGA-07, Unpredicted Reactivity Addition
<p style="text-align: center;"><u>Event 4 Completion Criteria:</u></p> <p>⇒ The failed ERV is closed -- AND --</p> <p>⇒ Appropriate Tech Specs referenced -- AND / OR --</p> <p>At the discretion of the Lead Examiner.</p>		

Event Five – Swap CRD Pumps Due To Suction Filter Clogging		
Trigger	Position	Crew Actions or Behavior
9 10		<p>Floor Instructor / Simulator Operator / Role Play:</p> <p>At the discretion of the Lead Examiner, activate TRIGGER 9 to 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.</p> <p>Verify TRIGGER 10 automatically activates when the 2B CRD pump is secured to normalize alarm 902-5 D-2.</p> <p>NOTE: It may take several minutes before an alarm occurs.</p> <p>As the EO, if asked, wait 1 min. and then report: “The 2B CRD pump suction pressure is 14 in. Hg and getting worse”.</p> <p>As the EO, if asked, wait 1 min. and then report: “The 2B CRD pump suction filter DP is 20 psid 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 alarms 902-5 D-2, 2B ROD DRIVE PP SUCT LO AND 902-5 F-2, ACCUMULATOR CHARGING WTR PRESS LO, and degrading CRD system parameters. <p>Carries out actions of DOA 0300-01, Control Rod Drive System Failure:</p> <ul style="list-style-type: none"> ■ Starts 2A CRD pump. ■ Secures 2B CRD pump. □ Verifies normal CRD system pressures and flow.
		<p>ROLE PLAY:</p> <p>As the EO, if asked, report: “The 2A CRD pump is operating and everything appears normal”.</p>
	CRS	<ul style="list-style-type: none"> ■ Directs swapping CRD pumps per DOA 0300-01, Control Rod Drive System Failure, due to degrading operation of 2B CRD pump.
	BOP	Monitors panels and assists as directed.
		NOTE: If the Team waits until the 2B CRD pump trips, the following actions apply.
		<p>ROLE PLAY:</p> <p>As the EO, sent to Bus 24, report: “The 2B CRD pump is OPEN with no targets up”.</p> <p>As the EO, sent to 2B CRD pump, report: “I see nothing abnormal with the 2B CRD pump”</p>
	ATC	<ul style="list-style-type: none"> ■ If occurs, announces 2B CRD pump trip. ■ Performs actions of DAN 902-5 B-2 Rod Drive PP Trip, starts the standby CRD pump. □ Takes manual control of FIC 2-340-1 CRD FLOW CONTRL (if valve has gone open). □ Verifies CRD parameters return to previous values □ (May take FIC 2-340-1 CRD FLOW CONTRL to open/automatic, if closed previously).

Event Five – Swap CRD Pumps Due To Suction Filter Clogging

Trigger	Position	Crew Actions or Behavior
	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.□ May reference TRM 3.3.h Reactor Vessel Water Level Instrumentation System (RVWLIS) Backfill System due to short loss of RVWLIS supply.□ May direct changing CRD suction filters for 2B CRD pump

Event 5 Completion Criteria:

⇒ 2A CRD Pump has been started and the immediate actions of DOA 300-01 are complete,
-- AND / OR --

At the discretion of the Lead Examiner.

Event Six – Drywell to Torus Differential Pressure Controller Failure

Trigger	Position	Crew Actions or Behavior
11		<p><u>NOTE:</u> After activating the Trigger to start this Event, depending on how high the DW to Torus D/P is to start with, it may take several minutes for D/P to drop enough to receive the alarm at 1.05 psid. If desired, start this event during the previous event.</p> <p><u>SIMULATOR OPERATOR:</u> At the discretion of the Lead Examiner, activate TRIGGER 11, which causes drywell to torus differential pressure controller demand to fail downscale. (NOTE: The demand meter on the controller will appear to be operating normally, but the demand sent to the PCV is what is failed downscale)</p> <p><u>ROLE PLAY:</u> EO to check PCV 2-8599-556: Wait until Drywell to Torus D/P is <1.0 psid, then report that “2-8599-556 is closed” EO to check Pumpback air compressor operation (Wait 3 minutes) and report: The running pumpback air compressor is operating normally.</p>
	BOP	<p>Acknowledges and announces alarm 902-4 B-15, DW to Torus DP Hi/Lo, and performs the following:</p> <ul style="list-style-type: none"> ■ Diagnoses that the drywell to torus differential pressure controller appears to be operating normally. ■ Closes AO 2-1601-58, TORUS M/U VLV. ■ Control Drywell to Torus dP as directed.
	CRS	<p>To maintain Primary Containment pressures to those specified in DOP 1600-05, Primary Containment Inerting and Atmosphere Control, should direct performance of any of the following:</p> <ul style="list-style-type: none"> ■ Placing the drywell torus differential pressure controller to MAN and controlling Drywell to Torus differential pressure manually; ■ Directs controlling DW to Torus DP via the Drywell to Torus DP PCV bypass 2-8599-558. ■ AND / OR, venting to Reactor Building Ventilation per DOP 1600-05, Primary Containment Inerting and Atmosphere Control, to maintain the required differential pressure. ■ May notify Work Week Manager.
		<p><u>ROLE PLAY:</u> Chemistry for most recent Drywell sample results: Wait until Drywell to Torus D/P is <1.0 psid, then call and report “The most recent Drywell sample results are one hour old and are:</p> <ul style="list-style-type: none"> ❖ Beta Gamma 7.5×10^{-10} ❖ Iodine 5.5×10^{-10}

Event Six – Drywell to Torus Differential Pressure Controller Failure		
Trigger	Position	Crew Actions or Behavior
	BOP	<p>Performs any of the following as directed:</p> <ul style="list-style-type: none"> ■ Places the drywell to torus differential pressure controller to MAN and observes demand appears to follow. However, DP continues to drop. (Unsuccessful) ■ Directs an operator to open Drywell to Torus DP PCV bypass 2-8599-558 AND / OR ■ Vents the torus to Reactor Building Ventilation per DOP 1600-05, Primary Containment Inerting and Atmosphere Control: <ul style="list-style-type: none"> • Closes or verifies closed TORUS M-U VLV, AO 2-1601-58. • Verifies the DW PRESS CONTRL, PIC 2-8540-1 is in AUTO with the setpoint at approximately 1.1 psig. • At the DW/TORUS DP CONTRL, PIC 2-1602-14 reduces the auto setpoint to 0.0 psid OR places PIC 2-1602-14 in MAN with full closed demand. • Vents the torus as necessary to control drywell-to-torus DP between 1.05 to 1.3 psid (DOP 1600-01).
	ATC	Monitors panels and assists as directed.
13		<p><u>ROLE PLAY:</u> As Plant Support called to assist, respond: “I will send a team to investigate”. EO to open Drywell to Torus DP PCV bypass 2-8599-558: Wait until Drywell to Torus DP drops to <1.0 psid, (Stall as necessary) then Insert TRIGGER 13 to open 2-8599-558 10%.</p> <p><u>NOTE:</u> The following Tech Spec applies only if Drywell to Torus DP drops below 1.0 psid.</p>
	CRS	<p>□ Determines following Technical Specifications apply if drywell to Torus DP drops below 1.0 psid.:</p> <ul style="list-style-type: none"> • TS 3.6.2.5.A.1: Restore differential pressure to within limit within 24 hours.
<p style="text-align: center;"><u>Event 6 Completion Criteria:</u></p> <p>⇒ Drywell to Torus DP restored and TS addressed</p> <p style="text-align: center;">-- AND / OR --</p> <p>At the direction of the Lead Examiner</p>		

Event Seven – Feedwater system high vibrations (Manual Scram)		
Trigger	Position	Crew Actions or Behavior
CAEP		<p><u>SIMULATOR OPERATOR:</u></p> <p>At the discretion of the Lead Examiner, simulate a Feedwater System high vibration by performing the following:</p> <ul style="list-style-type: none"> ➤ RUN CAEP file 2017-301 ILT-N-3 SUPPLEMENTAL.cae, which causes Feedwater System parameters to oscillate by varying MO 3206A & B valve positions. <p>When the Team secures the RFPs, PAUSE AND EXIT CAEP 2017-301 ILT-N-3 SUPPLEMENTAL.cae which stops varying MO 3206A & B valve positions to stop the Feedwater System high vibration.</p> <p><u>ROLE PLAY:</u></p> <p>If RFPs are running:</p> <p>As the EO sent to Feedwater Regulating Valve station: (wait 2 min) then report: “Feedwater Regulating Valve pipes are swinging”.</p> <p>As the EO sent to Feedwater Pump room: (wait 2 min) then report: “Feedwater System pipes are swinging outside the RFP room”.</p> <p>If RFPs are secured:</p> <p>Report there is insulation on the floor and a large amount of dust in the air. There is no evidence of a leak.</p>
	ATC / BOP	<ul style="list-style-type: none"> ■ Announces following alarms and refers to DANS: <ul style="list-style-type: none"> • 902-6 E-12, FEEDWATER REG STATION VIBRATION HI. • 902-6 F-12, 2A RFP VIBRATION HI.
	CRS	<ul style="list-style-type: none"> ■ Enters DOA 3200-01, Feedwater System High Vibration, and directs actions.
	ATC / BOP	<ul style="list-style-type: none"> ■ Observes and announces Feedwater parameters are swinging. □ Dispatches EO to check Feedwater System.
	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"> ○ Reduces FCL to <93% by inserting control rods. ○ Reduce Recirc flow to 56 Mlbm/hr core flow. ○ Start the motor suction pump AND turning gear oil pump. ○ Trip hydrogen addition.
	CRS	<ul style="list-style-type: none"> ■ Directs manual scram per DGP 02-03, Reactor Scram. ■ Tripping RFPs when DOA 3200-01 requirements met.
	ATC / BOP	<ul style="list-style-type: none"> ■ Performs manual scram per DGP 02-03, Reactor Scram. ■ Trips RFPs when RPV time/level directions of DOA 3200-01 are met.

Event Seven – Feedwater system high vibrations (Manual Scram)		
Trigger	Position	Crew Actions or Behavior
	TEAM	<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"> ■ Depresses BOTH Scram buttons. ■ Places RX MODE SW in SHUTDOWN. ❑ Verifies Recirc pumps run back to minimum. ❑ Inserts SRMs and IRMs. ❑ Controls reactor water level +8 to +48 inches or as directed by the Unit Supervisor. ❑ Controls RPV/P <1060 psig using the Iso Cond and/or bypass valves ❑ Verifies turbine tripped. ❑ Verifies generator tripped. ❑ Verifies aux power transfers.
	CRS	<p>Enters DEOP 100, RPV Control,</p> <ul style="list-style-type: none"> ❑ Directs actions of DEOP 100. ❑ Directs actions of DGP 02-03. ❑ Maintaining RPV/P <1060 psig using the Isolation Condenser and/or bypass valves ❑ Maintaining RPV/L +8 to +48 using CRD, HPCI and/or closing MSIVs.
<p style="text-align: center;"><u>Event 7 Completion Criteria:</u></p> <p>⇒ Reactor scrambled, -- AND / OR -- At the direction of the Lead Examiner.</p>		

Events Eight – Unisolable RWCU System Leak / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior
15		<p><u>SIMULATOR OPERATOR:</u></p> <p>At the discretion of the Lead Examiner, activate TRIGGER 15 which causes a leak from the RWCU system in the pump room.</p> <p>NOTE: DO NOT SILENCE COMMON PANEL ALARMS AFTER LEAK IS INSERTED.</p> <p><u>ROLE PLAY:</u></p> <p>As a dispatched EO OR as an EO on rounds, (wait 2 min. after the leak starts) then report over the radio: "There is a large amount of steam and water running from the RWCU pump room. The water is flowing down the stairs to the Reactor Building 1st floor. The floor drains appear to be plugged up".</p> <p>As a dispatched EO OR as an EO on rounds, wait until the LPCI/CS corner room sump alarms are up, and then report "water is accumulating on the floor in both corner rooms".</p> <p>At the discretion of the Lead Evaluator, report as the EO that both corner room water levels have reached the DEOP 8 in. lines on the wall.</p>
17		<p>As the EO sent to install control power fuses for the "E" ERV (wait 2 min) activate TRIGGER 17, which installs control power fuses for the "E" ERV, then call the control room on the phone and report: "I have installed the "E" ERV fuses".</p>
	BOP	<p>Announces alarms due to the RWCU leak:</p> <ul style="list-style-type: none"> ○ 902-4 C-19, LPCI/CS EAST SUMP LEVEL HI. ○ 902-4 D-19, LPCI/CS WEST SUMP LEVEL HI. ○ 923-4 A-3, U2 E RBFD SUMP LVL HI HI. ○ 923-4 B-2, U2 W RBFD SUMP LVL HI HI. <ul style="list-style-type: none"> ■ Dispatches EO(s) to check areas for leaks. □ Announces that the RWCU system has indication of flow. ■ Determines PCIS GRP III Isolation Failed to Occur ■ Attempts to complete the isolation □ Closes MSIVs for inventory control (if directed)
	CRS	<ul style="list-style-type: none"> □ Enters DEOP 0300-01 Secondary Containment Control, when informed a LPCI/CS Corner room water level is above 0 in. □ May direct cooldown to lower RPV pressure in efforts to mitigate leakage rate □ May anticipate Blowdown IAW DEOP 100 □ May direct closing MSIVs for inventory control □ May direct operator briefed and standing by to re-install 2E ERV fuses.
	BOP	<ul style="list-style-type: none"> □ Directs equipment operator to report if the corner room levels reach the DEOP lines on the wall. □ Ensures all sump pumps are operating □ Attempts to restart RB Vent (if RB exhaust rad is below 4 mr/hr)
	CRS	<p>When notified of 2 or more areas above Max Safe (water level), enters DEOP 0400-02, Emergency Depressurization, and directs:</p> <ul style="list-style-type: none"> □ Verifying all rods in to at least position 04. □ Drywell Pressure < 2.0 psig. □ Verifying SP/L >6 feet. ■ √ Verifying all available ADS valves are open. (only 4 will open due to fuses removed from previous event) ■ √ Complete Emergency Depressurization actions by one of the following: <ul style="list-style-type: none"> ○ Direct ERV fuses to be re-installed to open all 5 ADS valves. ○ Execute alternate emergency depressurization methods (DEOP 0400-02 Fig O)

Events Eight – Unisolable RWCU System Leak / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
	BOP	Executes DEOP 0400-02, Emergency Depressurization , as directed: <ul style="list-style-type: none"> <input type="checkbox"/> Verifies SP/L >6 feet. ■ √ Opens all ADS valves. ■ √ Verifies all AVAILABLE ADS valves are open ■ √ Reports 4 ERVs are open
<p style="text-align: center;"><u>Events 8 / Scenario Completion Criteria:</u></p> <p>⇒ Emergency Depressurization in progress, -- AND / OR -- At the direction of the Lead Examiner.</p>		

PROCEDURE	TITLE
DAN 902-3 C-12	HPCI STM LINE FLOW HI
DAN 902-4 B-15	DW TO TORUS DP HI/LO
DAN 902-4 C(D)-19	LPCI/CS EAST (WEST) SUMP LEVEL HI
DAN 902-5 D-2	2B ROD DRIVE PP SUCT LO
DAN 902-5 F-2	ACCUMULATOR CHARGING WTR PRESS LO
DAN 902-6 H-3	FW CONTROL SYSTEM PANEL TROUBLE
DAN 923-1 C-3	SW Pump Trip
DAN 923-1 G-4	2/3 DIESEL FIRE PP RUNNING
DAN 923-1 F-4	U2 INST AIR PRESS LOW
DAN 923-4 A-3(B-2)	U2 E(W) RBFD SUMP LVL HI HI.
DEOP 0100	RPV CONTROL
DEOP 0300-01	SECONDARY CONTAINMENT CONTROL
DEOP 0400-02	EMERGENCY DEPRESSURIZATION
DGP 02-03	REACTOR SCRAM
DOA 0300-01	CONTROL ROD DRIVE SYSTEM FAILURE
DOA 0600-01	TRANSIENT LEVEL CONTROL
DOA 3800-01	LOSS OF TURBINE BUILDING CLOSED COOLING WATER
DOA 4700-01	INSTRUMENT AIR SYSTEM FAILURE
DOA 6500-10	4KV CIRCUIT BREAKER TRIP
DOP 0300-01	CONTROL ROD DRIVE SYSTEM START UP AND OPERATION
DOP 0600-06	FEEDWATER REGULATING VALVE (FWRV) OPERATION
DOP 1600-05	PRIMARY CONTAINMENT INERTING AND ATMOSPHERE CONTROL
DOP 4700-03	U2/3 IA CROSS-CONNECT OPERATION
TRM 3.3.h	REACTOR VESSEL WATER LEVEL INSTRUMENTATION SYSTEM (RVWLIS) BACKFILL SYSTEM
TRM 3.6.c	DRYWELL-TO-SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE
TS 3.3.6.1	PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION
TS 3.5.1	ECCS - OPERATING
TS 3.6.2.5	DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE
DOP 1200-02	RWCU SYSTEM OPERATION WITH THE REACTOR AT PRESSURE
DGP 03-01	POWER CHANGES
DGP 03-04	CONTROL ROD MOVEMENTS
DOP 0400-01	REACTOR MANUAL CONTROL SYSTEM
DAN 902-4 G-20	ANALOG TRIP SYS DIV 1 2202-73A TROUBLE ANALOG TRIP SYS DIV 1 2203-73A TROUBLE
DOA 0500-02	PARTIAL ½ OR FULL SCRAM ACTUATION
TS 3.3.1.1	REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION

PROCEDURE	TITLE
TS 3.3.6.1	PRIMARY CONTAINMENT ISOLATION SYSTEM INSTRUMENTATION
TS 3.3.6.2	SECONDARY CONTAINMENT ISOLATION SYSTEM INSTRUMENTATION
TS 3.4.3	SAFETY AND RELIEF VALVES
TS 3.5.1	ECCS OPERATING
TS 3.6.1.8	SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS
TS 3.3.6.3	RELIEF VALVE INSTRUMENTATION
DOP 0010-10	UNIT 2(3) TECHNICAL SPECIFICATION INSTRUMENTATION OPERABILITY MANUA
DOA 0250-01	RELIEF VALVE FAILURE
DEOP 200-1	PRIMARY CONTAINMENT CONTROL
DOS 1600-20	SUPPRESSION POOL TEMP MONITORING
DGP 02-03	REACTOR SCRAM
DGA-07	UNEXPECTED REACTIVITY CHANGE
DOA 6500-10	4KV CIRCUIT BREAKER TRIP
DAN 902-4 B-15	DW TO TORUS DP HI/LO
DOP 1600-05	PRIMARY CONTAINMENT INERTING AND ATMOSPHERE CONTROL
TS 3.6.2.5	DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE
TRM 3.6.c	DRYWELL TO SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE
DAN 902-6 E-12	FEEDWATER REG STATION VIBRATION HI
DAN 902-6 F-12	2A RFP VIBRATION HI
DOA 3200-01	FEEDWATER SYSTEM HIGH VIBRATION
DEOP 100	RPV CONTROL
DEOP 0300-1	SECONDARY CONTAINMENT CONTROL
DEOP 400-2	EMERGENCY DEPERESSURIZATION
DAN 902-4 C-19	LPCI/CS EAST SUMP LEVEL HI
DAN 902-4 d-19	LPCI/CS WEST SUMP LEVEL HI
DAN 923-4 A-3	U2 E RBFD SUMP LVL HI HI
DAN 923-4 B-2	U2 W RBFD SUMP LVL HI HI

Critical Tasks	
RPV-2.1	When conditions are met per DEOP 400-2, Emergency Depressurization, the minimum number of available SRV's required for emergency depressurization (MNSRED) are opened.
SC-1.2	When executing DEOP 300-1, Secondary Containment Control, when more than one critical area reaches their respective maximum safe operating values for the same parameter with an unisolable primary system discharging into the respective area(s), perform an emergency depressurization of the reactor.
RPV-2.3	After DEOP 400-2, Emergency Depressurization, has been entered, an attempt has been made to open all ERV's, and less than the minimum number of available SRV's required for emergency depressurization (MNSRED) are open, alternate emergency depressurization methods are used until RPV pressure is less than the decay heat removal pressure (DHRP).

ILT N-3.cae
ILT 16-1 NRC Exam Scernario 3
Written by DSS
06/17

Initial Conditions

Inserts a RPS Channel B partial half scram
imf b15

Sets E ERV binding malfunction to 25%
imf ads3ebn 25

Defeats RWCU isolations and overrides MO 2-1201-1 and 2 control switches to OFF
imf cirwcuap
imf cirwcubp
ior rtdcl1 off
ior rtdcl2 off|2

Opens the U2 to U3 Service Air Cross-tie valve
irf vpc 100|2

EVENT TRIGGERS

Event Trigger 3 fails B medium range level instrument downscale over 4 minutes
trgset 3 "0"|2
imf nvm100bp (3) -120.0 4:00|2

Event Trigger 5 causes the E ERV setpoint to drift to fail it open
trgset 5 "0"|4
imf ads3esd (5) 75.0|4

Event trigger 7 deletes E ERV binding malfunction so valve will close and removes fuses for E ERV
trgset 7 "0"|4
trg 7 "dmf ads3ebn"|4
irf adsrfe (7) pulled|6

Event trigger 9 drives up the 902-5 D-2 alarm and isolates 2B CRD tripping 2B CRD Pump on low suction pressure
trgset 9 "0"|6
imf ser0945 (9) on|6
irf rdfiltb (9 3:00) false|6

Event Trigger 10 normalizes the 902-5 D-2 Alarm after the 2B CRD is off
trgset 10 "hwrldpmpg(2)"|8
trg 10 "mmf ser0945 normal"|8

Event Trigger 11 fails drywell to torus DP controller demand downscale.
trgset 11 "0"|8
irf p33 (11) false|8
irf p37 (11) true|10
ior pcvdmd14 (11) 0.0|10

Event Trigger 13 opens 2-8599-558 10%
trgset 13 "0"|10
irf pp3 (13) 10|10

Event Trigger 15 Starts a RWCU leak from the Main Pump suction.
Opens the RWCU PCV bypass to maintain flow if the PCV is closed.
Overrides RWCU DRN FLOW CONTRL RMC 2-1290-14 pot to 0.0
After 3 min, drives up alarm 902-4 D-19, LPCI/CS West Sump Level Hi.

After 5 min, drives up alarm 902-4 C-19, LPCI/CS East Sump Level Hi.

```
trgset 15 "0"|12
imf u34 (15) 10.0 1:00|12
irf u71 (15) 3.0 1:00|12
ior rtwmn14 (15) 0.0|12
imf ser0557 (15 3:00) on|14
imf ser0555 (15 5:00) on|14
```

Event trigger 17 installs fuses for E ERV

```
trgset 17 "0"|14
trg 17 "irf adsrfe in"|14
ior add303ea (17) auto|16
```

Event Trigger 19 automatically activates when Trigger 17 is activated to make the E ERV open

```
trgset 19 "et_array(17)"|16
trg 19 "imf ads3esd 75.0"|16
```

End

ILT-N-3 SUPPLEMENTAL.cae

Revised by DSS

05/17

The following drives up the following vibration alarms:

```
# 2A RFP after 40 seconds
# FRWV Station after 60 seconds
# 2B RFP after 65 seconds
# 2C RFP after 75 seconds
```

```
imf ser1363 on|40
imf ser1361 on|60
imf ser1397 on|65
imf ser1399 on|75
```

The following cycles MO 3206A & B valve positions to simulate FW Sys Hi Vibes.

```
set fwv3206a(1) = 0.4
set fwv3206a(2) = 0.4
set fwv3206a(1) = 0.6|3
set fwv3206a(2) = 0.6|3
```

```
set fwv3206a(1) = 0.4|6
set fwv3206a(2) = 0.4|6
set fwv3206a(1) = 0.6|9
set fwv3206a(2) = 0.6|9
```

```
set fwv3206a(1) = 0.4|12
set fwv3206a(2) = 0.4|12
set fwv3206a(1) = 0.6|15
set fwv3206a(2) = 0.6|15
```

```
set fwv3206a(1) = 0.4|18
set fwv3206a(2) = 0.4|18
set fwv3206a(1) = 0.6|21
set fwv3206a(2) = 0.6|21
```

```
set fwv3206a(1) = 0.4|24
```

set fwv3206a(2) = 0.4|24
 set fwv3206a(1) = 0.6|27
 set fwv3206a(2) = 0.6|27

 set fwv3206a(1) = 0.4|30
 set fwv3206a(2) = 0.4|30
 set fwv3206a(1) = 0.6|33
 set fwv3206a(2) = 0.6|33

 set fwv3206a(1) = 0.4|36
 set fwv3206a(2) = 0.4|36
 set fwv3206a(1) = 0.6|39
 set fwv3206a(2) = 0.6|39

 set fwv3206a(1) = 0.4|42
 set fwv3206a(2) = 0.4|42
 set fwv3206a(1) = 0.6|45
 set fwv3206a(2) = 0.6|45

 set fwv3206a(1) = 0.4|48
 set fwv3206a(2) = 0.4|48
 set fwv3206a(1) = 0.6|51
 set fwv3206a(2) = 0.6|51

 set fwv3206a(1) = 0.4|54
 set fwv3206a(2) = 0.4|54
 set fwv3206a(1) = 0.6|57
 set fwv3206a(2) = 0.6|57

 set fwv3206a(1) = 0.4|60
 set fwv3206a(2) = 0.4|60
 set fwv3206a(1) = 0.65|63
 set fwv3206a(2) = 0.65|63

 set fwv3206a(1) = 0.25|66
 set fwv3206a(2) = 0.25|66
 set fwv3206a(1) = 0.65|69
 set fwv3206a(2) = 0.65|69

 set fwv3206a(1) = 0.25|72
 set fwv3206a(2) = 0.25|72
 set fwv3206a(1) = 0.65|75
 set fwv3206a(2) = 0.65|75

 set fwv3206a(1) = 0.25|78
 set fwv3206a(2) = 0.25|78
 set fwv3206a(1) = 0.65|81
 set fwv3206a(2) = 0.65|81

 set fwv3206a(1) = 0.25|84
 set fwv3206a(2) = 0.25|84
 set fwv3206a(1) = 0.65|87
 set fwv3206a(2) = 0.65|87

 set fwv3206a(1) = 0.25|90
 set fwv3206a(2) = 0.25|90
 set fwv3206a(1) = 0.65|93
 set fwv3206a(2) = 0.65|93

 set fwv3206a(1) = 0.25|96
 set fwv3206a(2) = 0.25|96

set fwv3206a(1) = 0.65|99
set fwv3206a(2) = 0.65|99

set fwv3206a(1) = 0.25|102
set fwv3206a(2) = 0.25|102
set fwv3206a(1) = 0.65|105
set fwv3206a(2) = 0.65|105

set fwv3206a(1) = 0.25|108
set fwv3206a(2) = 0.25|108
set fwv3206a(1) = 0.65|111
set fwv3206a(2) = 0.65|111

set fwv3206a(1) = 0.25|114
set fwv3206a(2) = 0.25|114
set fwv3206a(1) = 0.65|117
set fwv3206a(2) = 0.65|117

set fwv3206a(1) = 0.25|120
set fwv3206a(2) = 0.25|120
set fwv3206a(1) = 0.7|123
set fwv3206a(2) = 0.7|123

set fwv3206a(1) = 0.3|126
set fwv3206a(2) = 0.3|126
set fwv3206a(1) = 0.7|129
set fwv3206a(2) = 0.7|129

set fwv3206a(1) = 0.3|132
set fwv3206a(2) = 0.3|132
set fwv3206a(1) = 0.7|135
set fwv3206a(2) = 0.7|135

set fwv3206a(1) = 0.3|138
set fwv3206a(2) = 0.3|138
set fwv3206a(1) = 0.7|141
set fwv3206a(2) = 0.7|141

set fwv3206a(1) = 0.3|144
set fwv3206a(2) = 0.3|144
set fwv3206a(1) = 0.7|147
set fwv3206a(2) = 0.7|147

set fwv3206a(1) = 0.3|150
set fwv3206a(2) = 0.3|150
set fwv3206a(1) = 0.7|153
set fwv3206a(2) = 0.7|153

set fwv3206a(1) = 0.3|156
set fwv3206a(2) = 0.3|156
set fwv3206a(1) = 0.7|159
set fwv3206a(2) = 0.7|159

set fwv3206a(1) = 0.3|162
set fwv3206a(2) = 0.3|162
set fwv3206a(1) = 0.7|165
set fwv3206a(2) = 0.7|165

set fwv3206a(1) = 0.3|168
set fwv3206a(2) = 0.3|168
set fwv3206a(1) = 0.7|171

set fwv3206a(2) = 0.7|171

set fwv3206a(1) = 0.25|174
set fwv3206a(2) = 0.25|174
set fwv3206a(1) = 0.75|177
set fwv3206a(2) = 0.75|177

set fwv3206a(1) = 0.25|180
set fwv3206a(2) = 0.25|180
set fwv3206a(1) = 0.75|183
set fwv3206a(2) = 0.75|183

set fwv3206a(1) = 0.25|186
set fwv3206a(2) = 0.25|186
set fwv3206a(1) = 0.75|189
set fwv3206a(2) = 0.75|189

set fwv3206a(1) = 0.25|192
set fwv3206a(2) = 0.25|192
set fwv3206a(1) = 0.75|195
set fwv3206a(2) = 0.75|195

set fwv3206a(1) = 0.25|198
set fwv3206a(2) = 0.25|198
set fwv3206a(1) = 0.75|201
set fwv3206a(2) = 0.75|201

set fwv3206a(1) = 0.25|204
set fwv3206a(2) = 0.25|204
set fwv3206a(1) = 0.75|207
set fwv3206a(2) = 0.75|207

set fwv3206a(1) = 0.25|210
set fwv3206a(2) = 0.25|210
set fwv3206a(1) = 0.75|213
set fwv3206a(2) = 0.75|213

set fwv3206a(1) = 0.25|216
set fwv3206a(2) = 0.25|216
set fwv3206a(1) = 0.75|219
set fwv3206a(2) = 0.75|219

END