Dresden Generating Station

ILT-N-1

FWRV LOCKUP

HPCI SPURIOUS INITIATION

2/3 CRIBHOUSE INTAKE CLOGGING

LOSS OF ALL SERVICE WATER / MANUAL SCRAM

HYDRAULIC ATWS / ARI UNSUCCESSFUL / TEAM MANUALLY DRIVES CONTROL RODS

Rev. 00

11/18

Developed By: _____ _____

Exam Author Date

Approved By: _____ _____

Facility Representative Date

Scenario Outline

Station: Dresden Generating Station **Scenario No.:** ILT-N-1 **Class ID:** 18-1 (2019-301)

Evaluators	Operators	/ crew position
		/ ATC
		/ BOP
		/ CRS

Initial Conditions: Unit 2 is at 85% power.

Turnover: Maintain load per TSO direction.

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-5.5 – Once DEOP 400-5, Failure to Scram power/level control leg, is entered with reactor power is > 6% - AND- RPV level is greater than -35 inches, terminate and prevent injection (with exception of boron and CRD) into the RPV.

Event No.	Malf. No.	Event Type*		Event Description
1	FRV2ALU	C	ATC	FW – 2A FWRV Lockup
2	HPSPDFT	C/T	BOP	HPCI – Spurious Initiation
3	HP6	C	BOP	CONDENSER - Cribhouse, Intake Clogging
4	Q31	M	ALL	MANUAL SCRAM - Loss Of All Service Water
5	RDHLVFPA RDHLDEGA	M	ALL	ATWS – Hydraulic, ARI Unsuccessful / Team Inserts Rods By Manually Drive Rods / SBLC fails to inject / Power Oscillations

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

Scenario Objective

Evaluate the Team's ability to operate the plant with a hydraulic ATWS.

Scenario Summary

1. Unit 2 is at ~85% power.
2. Unit 3 is in Cold Shutdown.
3. The following equipment is OOS:
   a. 3A Service Water Pump
4. LCOs:
   a. None

Scenario Sequence

- After the shift turnover, the 2A FWRV will lockup and automatically switch to manual control. The Team will troubleshoot the issue and come to the conclusion the valve can be reset and placed back into automatic control.
- HPCI will spuriously initiate and the Team will take action to secure and isolate HPCI.
- Debris begins entering the 2/3 Cribhouse intake. Failure of the traveling screens for Circulating water pump 2A causes its bay level to drop. The 2A Circulating Water pump will begin cavitating. The Team starts 2B Circulating Water pump and shuts down 2A.
- An unisolable Cribhouse Service Water leak down stream of the Service Water strainers occurs. The Team will perform a manual scram due to the loss of cooling to vital plant equipment.
- A hydraulic ATWS occurs when the Reactor scrams. The SBLC system fails to inject when started. Power Oscillations will occur if the team does not direct alternate boron injection. The Team inserts control rods by manually driving them in and performing repeated scrams.

Event One – 2A FWRV Lockup

- The 2A FWRV locks-up due to an air leak on the valve. IMD will report the fitting has been fixed and the Team can place the valve back into manual control.

Malfunctions required: 1

- (FWRV Lockup)

Success Path:

- Perform DAN 902-6 E-10, 2A FEEDWATER REG VLV LOCKUP.

Event Two – HPCI Spurious Initiation

- A malfunction in the HPCI control system causes HPCI to inadvertently initiate. The team takes the actions to secure the system and mitigate the consequences of any injection that might have occurred.

Malfunctions required: 1

- (HPCI Auto Initiation)

Success Path:

- Take control of HPCI in response to an inadvertent initiation.
- References Tech Specs.

Event Three – 2/3 Cribhouse Intake Clogging

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

Malfunctions required: 1

- (2/3 Cribhouse Intake Clogging)

Success Path:

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

Event Four – Loss of Service Water / Manual Scram

- Inserts an unisolable Cribhouse Service Water leak down stream of the strainers.

Malfunctions required: 1

- (Service Water Leak)

Success Path:

- Performs a manual scram per DOA 3900-01, Loss of Cooling by Service Water System, and DGP 02-03, Reactor Scram.

Event Five – Hydraulic ATWS / ARI Unsuccessful

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

Malfunctions required: 3

- (Hydraulic ATWS)
- (SBLC Failure to inject)
- (Core oscillations)

Success Path:

- The Team inserts control rods by manually driving control rods and performing repeated scrams.
- The Team directs Alternate boron injection.

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.

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

   a. Initialize simulator in an ~85% power IC. (IC 210 used for validation, sequence 2S.0.3 CF1E)

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

   c. Ensure running Condensate pump amps within limits.

   d. Advance the chart recorders.

3 Verify the following simulator conditions:

   a. Verify Core Flow ≤98.0 Mlbm/hr core flow.

   b. 2A and 2C Circ Water pumps running with 2B OFF.

   c. Verify 2B and 3B Service Water pumps running.

4 Run **Pump_Sumps.cae**

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

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

6 Place the following equipment out of service:

   a. Place 3A Service Water pump control switch in PTL.

   b. Place a Danger Card on 3A Service Water pump control switch.

7 Ensure this setup is peer checked.

8 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 – 2A FWRV Lockup

Trigger	Position	Crew Actions or Behavior
1 **2**		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, initiate the first event by activating **TRIGGER 1**, which locks up 2A FWRV. Coordinate with the Role Play below and activate **TRIGGER 2**, which acknowledges the FWLCS trouble alarm. **NOTE:** For the OIS role play, ONLY show the operator the OIS sheet; do NOT let the operator take them. The operator can make notes. If BOP operator investigates the 902-18 panel, show them the attached OIS sheet (Attachment 1). **ROLE PLAY:** EO sent to 2A FWRV: wait 5 min, and then report, "there is a significant air leak coming from an air fitting on the 2A FWRV". If asked if the leak could be isolated, respond "if the fitting were to be tightened, it might stop the leak. I would need IMD to validate."
16		IMD to investigate 2A FWRV: Respond, "A technician will be sent to investigate ASAP". **Simulator Operator:** 5 minutes after being contacted as IMD, activate **TRIGGER 16**, which deletes 2A FWRV malfunction and give the following report: "There was a loose fitting on the air line going to the 2A FWRV and it has been tightened and is not leaking anymore. If asked if FWLC can be restored to automatic operation: "You should be able to place the 2A FWRV back into automatic control." If the crew delays restoring FWLC automatic operation, as the Shift Manager direct the CRS to restore FWLC to automatic operation. Other plant personnel: Respond you will assist as needed.
	ATC	Announces 902-6 H-3, FW Control System Panel Trouble and 902-6 E-10, 2A Feedwater Reg Valve Lockup. ❑ Send EO to investigate 2A FWRV. Performs DAN 902-6 E-10 actions. If directed, performs DOA 0600-01, Transient Level Control. This may include but is not limited to any of the following actions: ❑ Verify 2A FWRV is operating in MAN control. ❑ Establish RWCU blowdown.
	CRS	❑ May enter DOA 0600-01, Transient Level Control; and directs actions. ■ Following report from IMD, directs the 2A FWRV be placed in automatic control.
	ATC	■ When directed, resets the 2A FWRV by depressing the RESET button on the 902-5 panel and places the valve back into automatic control.

Event 1 Completion Criteria:

- **2A FWRV is in automatic control,**

  -- AND/OR --

At the discretion of the Floor Instructor/Lead Evaluator.

Event Two– HPCI Spurious Initiation		
Trigger	Position	Crew Actions or Behavior
3 **4** **5**		**SIMULATOR OPERATOR:** At the discretion of the lead evaluator, activate **TRIGGER 3**. • Causes an auto initiation of HPCI, • After 10 sec, pulls HPCI control power fuse from 2A-1 to simulate blown fuse. • After 10 sec, trips HPCI 8 valve breaker. • After 30 sec, pulls HPCI control power fuse from 2B-1 to simulate blown fuse. Verify **TRIGGER 4** automatically activates when the HPCI 8 vlv breaker is tripped (variable hpr701f goes true). This sets the HPCI 8 vlv at 5% open. Verify **TRIGGER 5** activates when the 2nd fuse blows (variable hpr706f goes true). This removes the auto initiation signal. **ROLE PLAY:** (Assign someone on the floor to handout the alarm sheet) Approximately 60 seconds after the HPCI initiation inform the team that the XL-3 is alarming and hand a team member the XL-3 alarm sheet (Attachment 2) provided with this scenario. If dispatched to check the 125 VDC feeds to the HPCI Logic at the 125 VDC Distribution Panels, wait a few minutes, and then report that both of the 125 VDC supply breakers are closed. • 2A-1 ckt 21 • 2B-1 ckt 14 After 3 minutes, call on the phone as the EO sent to the AEER. Report that there is a smell of smoke in the room. There is a small amount of smoke coming from the 902-39 cabinet. You have carefully opened the cabinet, and you can see some damaged components. THERE IS NO FIRE. If dispatched to the HPCI Room, wait 3 minutes, and then report that there appears to nothing wrong in the HPCI Room. If dispatched to the Reactor Building 250VDC busses, wait 3 minutes and then report that there is nothing abnormal at the RB 250VDC busses. If dispatched to check Drywell CAM readings, wait 3 minutes, and then report that there is no change in drywell CAM trend. After 5 minutes, as the IM Foreman, inform the team that initial investigation of the problem has revealed extensive damage to many of the HPCI initiation logic relays. You cannot tell him at this time which ones are damaged. You estimate at least 2 days to repair the damage. If asked for input regarding HPCI availability, inform the team that you are not sure if HPCI can be manually initiated, but that it definitely will not initiate automatically.

Event Two– HPCI Spurious Initiation

Trigger	Position	Crew Actions or Behavior
	BOP	○ Announces annunciators: ○ 902-3 G-12, HPCI Cont Pwr Failure ○ 902-3 D-12, HPCI PP FLOW LO ○ 902-3 B-9, HPCI MOTOR OVERLOAD ○ 902-3 A-12, HPCI COND STG TK LVL LO LO Recognizes initiation of HPCI: ○ 2-2301-3, 14, 35, 36 Valves – OPEN ○ AUX OIL PP, EMERG OIL PP and GSLO DRN PP AUTO TRIP lights illuminated ❑ Determines initiation is spurious. ■ Stops HPCI from injecting by any of the following: ○ Isolates the HPCI System by placing the 4 and 14 valves in PTL ○ Reduces the HPCI Flow Controller to minimum ❑ Secures HPCI operation and isolates flow path from CSTs to the Torus by closing the 2-2301-14 if not already closed.
	ATC	❑ May dispatch an EO to check the 125 VDC feeds to HPCI Logic at Bus 2A-1 and 2B-1 ❑ Refers to DAN XL-3 81-12 ❑ Performs DGA-07, Unexpected Reactivity Change, if HPCI injects into the RPV, causing reactor power to increase ❑ May dispatch an EO to the AEER to investigate the problem. ❑ May dispatch an operator to the HPCI Room to investigate the problem.
	CRS	■ Directs securing HPCI injection ■ Declares HPCI Inoperable ■ References Tech Spec 3.5.1 Condition G. ⇒ Required actions: ○ Verify by administrative means IC System is OPERABLE ○ Restore HPCI System to Operable status within 14 days. ❑ May reference Tech Spec 3.3.5.1 table 3.3.5.1 and determine that additional information is needed from maintenance personnel to determine Tech Spec applicability. ❑ May direct entry into DGA-07, Unexpected Reactivity Change (if HPCI injected into RPV)

Event 2 Completion Criteria:

- **HPCI system declared inoperable,**
- **Tech Specs have been determined**

-- AND/OR --

At the discretion of the Lead Examiner.

Event Three – 2/3 Cribhouse Intake Clogging

Trigger	Position	Crew Actions or Behavior
6 **7**		**Simulator Operator:** At the discretion of the Lead Evaluator, activate **TRIGGER 6**. This inserts 2/3 Intake clogging and traveling screen shear pin failure for Bay 1. (2A Circ Water PP) When 2A Circ Water pump is manually tripped, verify **TRIGGER 7** automatically activates. This stops the intake clogging.
	BOP	❑ Announces alarm 902-7 B-15, Screen Wash Control Panel Trouble.
	CRS	■ Enters DOA 4400-06, 2/3 Cribhouse Screen Plugging, and directs actions. ❑ May enter DOA 4400-01, Circulating Water System Failure.
	BOP	■ Performs DOA 4400-06, 2/3 Cribhouse Screen Plugging, and DOA 4400-01, Circulating Water System Failure, actions as directed and monitors Condenser Vacuum.
		Role Play: EO to cribhouse: Wait 2 min. then report: • "There is a lot of debris passing through the 2/3 Cribhouse intake bar racks and accumulating on the traveling screens". • "The traveling screens are all operating in fast speed and are keeping up with the debris except the 2A Circ Water pump bay screens. The 2A Circ Water pump bay screen motors are running, but the screens are not moving". • The level in the 2A Circ Water pump bay has dropped several feet and is continuing to drop. • All other Cribhouse bays are at normal level and steady. If asked, report "2B Circ Water pump is ready for start".
	BOP	❑ Announces that 2A Circ Water pump current is fluctuating and other Circ Water system parameters are affected also. (**Note:** This occurs ~8-10 min. after the Event starts, so the Team may have swapped pumps before this based on field reports) ■ Starts 2B Circ Water pump. ■ Secures 2A Circ Water pump.
		Role Play: EO at cribhouse about 2B Circ Water pump operation after it is started: wait 1 min. then report, "the 2B Circ Water pump is operating normally". EO at cribhouse about 2A Circ Water pump discharge valve status after the pump is secured: wait 1 min. then report, "the 2A Circ Water pump is at rest and the discharge valve is closed". EO at cribhouse: about 2 min. after 2A Circ Water pump is tripped, report, "the amount of debris entering the 2/3 intake is unchanged.

Event 4 Completion Criteria:

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

  -- AND/OR --

At the discretion of the Lead Examiner.

Event Four – Loss of Service Water / Manual Scram

Trigger	Position	Crew Actions or Behavior
8		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **TRIGGER 8**, which Inserts an unisolable Cribhouse Service Water leak downstream of the strainers. **FLOOR INSTRUCTOR CUE:** When the DFP starts, provide the Team the XL3 handout (Attachment 3) at the end of the scenario guide. **ROLE PLAY:** As EO sent to check the Service Water system: (wait 2 min) then report: "there is a very large leak in the Cribhouse from the Service Water system downstream of the strainers". If asked, "the leak cannot be isolated". EO to check 2/3 Service Water pump breaker: (wait 2 min) then report: "the 2/3 Service Water pump breaker is tripped and has an overcurrent target up"
	BOP	Announces following alarms: (Dependent on how long the TEAM waits to scram) ❑ 923-1 G-4. U2/3 DIESEL FIRE PP RUNNING. ❑ 923-1 D-3, U2/3 SERV WTR HDR PRESS LO. ❑ 902-3 G-2, AREA TEMP HI. ❑ 902-7 C-10, STATOR CLG PANEL TROUBLE. ❑ 902-7 E-11, H2 SEAL OIL AND ALTERREX PNL TROUBLE. ❑ 902-7 A-5, TURBINE CONTROL MAJOR TROUBLE. ❑ 902-7 C-3, TURB STATOR COOLANT RUNBACK. ❑ Dispatches EOs to check the Service Water system.
	CRS	❑ Enters DOA 3900-01, LOSS OF COOLING BY SERVICE WATER SYSTEM, and directs actions. ❑ May enter DOA 6500-10, 4KV CIRCUIT BREAKER TRIP.
	BOP	Performs DAN actions and DOA 3900-01, LOSS OF COOLING BY SERVICE WATER SYSTEM, actions as directed. ❑ Starts 2A and 2/3 Service Water Pump. (2/3 Service Water pump trips soon after starting)
	CRS	❑ May enter DOA 0040-02, Localized Flooding in Plant, and direct actions.
	BOP	❑ Performs DOA 0040-02, Localized Flooding in Plant, actions as directed.
	CRS	❑ May direct scram preparatory actions per DGP 02-03, Reactor Scram.
	ATC / BOP	❑ Performs scram preparatory actions per DGP 02-03, Reactor Scram, as directed. o Inserts control rods to reduce FCL to <93%. o Reduces power with Recirc flow to no lower than 56 Mlbm/hr core flow o Starts the motor suction pump and turning gear oil pump. o Trips hydrogen addition.
	CRS	■ Determines Service Water System loss CANNOT be prevented directs a manual scram.
	ATC / BOP	■ Performs Manual scram per DGP 02-03, Reactor Scram.

Event 4 Completion Criteria:

- **Reactor scram directed,**

  -- AND/OR --

  At the direction of the Lead Examiner.

Event Five – Hydraulic ATWS / ARI Unsuccessful		
Trigger	Position	Crew Actions or Behavior
9 **10** **11** **12**		**SIMULATOR OPERATOR / ROLE PLAY:** When requested: Wait 3 minutes and as directed by the Floor Instructor, activate the appropriate trigger and report completed. **TRIGGER 9:** Closes the CRD Charging Water Valve. **TRIGGER 10:** bypasses Offgas High Rad isolations. **TRIGGER 11:** pulls ARI fuses. **TRIGGER 12:** installs scram jumpers
13 **14** **15**		**SIMULATOR OPERATOR / ROLE PLAY:** **TRIGGER 13:** Activate **TRIGGER 13** after the team trips Recirc pumps to start core oscillations. **TRIGGER 14:** When alternate boron injection is directed, wait 3 minutes then activate **TRIGGER 14** to reduce core oscillations 0. **TRIGGER 15:** When core oscillation severity is <0.1, verify **TRIGGER 15** automatically activates. This resets the core oscillation constant.
ClrHydLk .cae		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, when the scram is reset, run caep file ClrHydLk.cae to clear the hydraulic lock and allow rods to insert when scrammed.
	ATC	Performs the following actions per DGP 02-03, Reactor Scram, as directed: ■ Presses scram pushbuttons ■ Places mode switch in shutdown ■ Check rods inserted / Determines control rods did not insert. ■ Initiates ARI / Determines ARI did not insert control rods. ■ Announces ATWS condition and RX power is >6%. ■ Places MSIV LO-LO LVL Bypass Keylocks in BYPASS. ■ Runs recirc pumps back to minimum. ■ Lowers FWLC setpoint to -40 inches. ■ Trips recirc pumps. ■ Initiates one train of SBLC. Announces failure to inject. ■ √ Maintains RPV/L between as directed. **(RPV-5.5)**
	BOP	■ Performs DGP 02-03, Reactor Scram, as directed.
	CRS	❑ Enters DEOP 100, RPV Control, and directs actions. Due to report of ATWS condition, exits DEOP 100 AND enters DEOP 0400-05, Failure to Scram, and directs/performs: ❑ Placing ADS to inhibit. (Not expected to be a Critical Task for this scenario) ❑ Placing Core Spray pumps in PTL. ❑ Verifying required auto actions. ❑ Placing MSIV LO-LO LVL Bypass Keylocks in BYPASS. ■ Installing of the jumpers for the Off Gas high Rad isolations. ■ √ With RX power >6%, terminating and preventing all injection except boron and CRD until RPV level ≤-35 inches. **(RPV-5.5)** ■ Holding RPV level between -162 inches and the level lowered to. ■ Stabilizing RPV pressure below 1060 psig. **(RPV-5.12)** (not expected to be critical in this scenario)

Event Five – Hydraulic ATWS / ARI Unsuccessful

Trigger	Position	Crew Actions or Behavior
		Continues DEOP 0400-05, Failure to Scram, and directs/performs: ■ √ Inserting control rods using Alternate Rod Insertion. **(RPV-5.1)** ❖ Directs driving control rods. ❖ Directs repeated scram/resets defeating RPS logic. ■ Based on report that SBLC failed, directs DEOP 0500-01, Alternate Boron Injection, performed. **(RPV-5.2)**
	BOP	■ √ With override conditions are met, Terminates and prevents all injection except boron and CRD at the 902-3 panel as follows: **(RPV-5.5)** ❖ Verify/place HPCI Aux Oil Pump AND HPCI 14 valve in PTL. ❖ Verify HPCI flow controller in AUTO AND reduce setpoint to 2000 gpm. ❖ PLACES 2-1501-22A/B valves in Pull-to-Close.
	ATC / BOP	■ √ Inserts control rods per DEOP 500-05, Alternate Insertion Of Control Rods, as follows: **(RPV-5.1)** ❖ Drives rods by: ⇒ Bypassing the RWM. ⇒ Maximizing CRD drive water pressure. o Start a second CRD pump o Open the CRD flow control valve (flow controller in manual) o Adjust drive water pressure using MO 2-302-8 ⇒ 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: ⇒ 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	■ Based on report that all control rods are inserted, exits DEOP 0400-05 and enters DEOP 0100.
	ATC / BOP	■ Performs as directed: ❖ √ Re-establishes injection using available injection systems to MAINTAIN RPV water level between -35" and -162" (in band directed by Unit Supervisor). **(RPV-5.5)**

Event 5 / Scenario Completion Criteria:

- **Control rods inserted,**
- **RPV level being controlled,**

-- AND/OR --

At the discretion of the Lead Examiner.

REFERENCES

PROCEDURE	TITLE
DAN 902-3 G-2	AREA TEMP HI
DAN 902-5 C-8	MAIN STM – TURBINE STM 10% MISMATCH
DAN 902-6 E-10	2A Feedwater Reg Vlv Lockup
DAN 902-7 B-15	SCREEN WASH CONTROL PANEL TROUBLE
DAN 923-1 D-3	U2/3 SERV WTR HDR PRESS LO
DAN 923-1 G-4	U2/3 DIESEL FIRE PP RUNNING
DEOP 0100	RPV CONTROL
DEOP 0400-05	FAILURE TO SCRAM
DEOP 0500-05	ALTERNATE INSERTION OF CONTROL RODS
DGA 07	UNPREDICTED REACTIVITY ADDITION
DGP 02-03	REACTOR SCRAM
DGP 03-01	POWER CHANGES
DOA 0040-02	LOCALIZED FLOODING IN PLANT
DOA 3900-01	LOSS OF COOLING BY SERVICE WATER SYSTEM
DOA 4400-01	CIRCULATING WATER SYSTEM FAILURE
DOA 4400-06	2/3 CRIBHOUSE SCREEN PLUGGING
DOA 6500-10	4KV CIRCUIT BREAKER TRIP
TS 3.3.5.1	EMERGENCY CORE COOLING SYSTEM (ECCS) INSTRUMENTATION
TS 3.5.1	ECCS-OPERATING

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

CAEP Files

```
# 18-1 ILT-N-1.cae
# For ILT Class 18-1 NRC Exam
# Written by DSS
# Rev 00
# Date 11/18

#### INITIAL CONDITIONS ####

# Sets APRM Master Gain pot to 1.0
irf niagain 1.0

# Inserts West SDV Hydraulic Lock
imf rdhlvfpa 96.0
imf rdhldega 96.0


# Changes a Core Oscillation Constant to expand the region oscillation occurs
set thklapf2 = 1.3 |1

# Inserts trip of 2A SBLC pump.
imf scpmpoca|2

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

# Inserts 2/3 Service Water pump overcurrent malfunction.
imf q23|2
imf q33|2

#### EVENT TRIGGERS ####

# Event Trigger 1 causes a lockup of the 2A FWRV.
trgset 1 "0"|2
imf rlmfala (1)|2

# Event Trigger 2 acknowledges the OIS alarm.
trgset 2 "0"|2
trg 2 "irf fwralrmf true"|2

# Event Trigger 3  Causes an auto initiation of HPCI,
# After 10 sec, pulls HPCI control power fuse from 2A-1 to simulate blown fuse.
# After 10 sec, trips HPCI 8 vlv breaker.
# After 30 sec, pulls HPCI control power fuse from 2B-1 to simulate blown fuse.
trgset 3 "0"|8
imf hpinit (3)|8
irf hp2a1f1 (3 10) pulled|8
irf hp8vbkr (3 10) tripped|10
irf hp2b1f1 (3 30) pulled|10

# Event Trigger 4 Activates when HPCI 8 vlv breaker trips.
# Sets HPCI 8 vlv position at 5% open to limit flow to the RPV.
trgset 4 "hpr701f"|10
trg 4 "set hpv8 = 0.05"|10
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# Event Trigger 5 Activates when the 2nd fuse blows.
# Removes the HPCI initiation signal.
trgset 5 "hpr706f"|12
trg 5 "dmf hpinit"|12

# Event Trigger 6 inserts the following malfunctions:
# Forces up alarm 902-7 B-15, SCREEN WASH CONTROL PANEL TROUBLE, on high screen DP.
# Shear pin failure of both Circ Water Bay 1 traveling screens.
# 2/3 Intake clogging.
trgset 6 "0"|6
imf ser0803 (6) on|6
imf cwmsc01f (6)|6
imf cwmsc07f (6)|6
imf cwmscdep (6 2:00) 15.0 2:00 100.0|6

# Event Trigger 7 Activates when 2A Circ Wtr PP is stopped.
# Deletes 2/3 Intake clogging.
trgset 7 "(.not. cwscwp(1))"|8
trg 7 "dmf cwmscdep"|8

# Event Trigger 8 inserts an unisolable Cribhouse Service Water leak.
trgset 8 "0"|8
imf q31 (8) 95.0 12:00 25.0|8

# Trigger 9 Closes the CRD Charging Water Valve
trgset 9 "0"|8
irf  rd25pos (9) 0.0|8

# Trigger 10 Installs lifts leads for the Off Gas Hi Rad Isolations
trgset 10 "0"|10
irf ogogjp (10) in|10

# Trigger 11 Pulls ARI fuses.
trgset 11 "0"|10
irf aw4 (11) pulled|10

# Trigger 12 Installs RPS Jumpers.
trgset 12 "0"|12
irf rpjumpas (12) on|12

# Event Trigger 13 starts core oscillations.
trgset 13 "0"|10
trg 13 "set thkwlacr = 150000000.0"|10
imf a55 (13)|10
imf rxmlgosc (13 20) 50.0 8:00 5.0|11

 # Trigger 14 Ramps Core Power oscillations to 0.0 over 2 min.
trgset 14 "0"|11
trg 14 "imf rxmlgosc 0.0 30"|11

# Trigger 15 Activates when core oscillation severity is <0.1.
# Changes Core Oscillation Constant back to original value.
trgset 15 " core osc .lt. 0.1"|11
trg 15 "set thkwlacr = 98000000.0"|12
```

```
# Trigger 16 deletes FWRV lockout
trgset 16 "0"|12
trg 16 "dmf rlmfala"|12

# Event Trigger 28 sets gain for all 6 APRMs.
trgset 28 "0"|12
trg 28 "irf niagainf true"|12

#### END ####
```

Unit 2 Risk: GREEN	Unit 3 Risk: GREEN
Unit 2 is in Mode 1 at 85% power,	Unit 3 is in Mode 4 Cold Shutdown
Leading Thermal Limit: MFLCPR @ 0.881	Leading Thermal Limit: MAPRAT
Action limit: 0.980	Action Limit:
Equipment Unavailable: 3A Service Water Pump	Equipment Unavailable: 3A Service Water Pump
Protected Equipment: None	Protected Equipment: None

Current Action Statements

None	LCO Started:	LCO Expires:

Cause:

Unit 2 Plant Status

Today	Unit 2 Activities
	**** Shift 1 Activities ****
	**** Shift 2 Activities ****
	2B Circulating Water Pump was secured last shift for Engineering to collect Turbine efficiency data. Plans are to restart it next shift.
	**** Shift 3 Activities ****
	3A Service Water Pump is out of service for bearing replacement. Expected to return to service in 12 hours.

Attachment 1

S **ALARM SUMMARY** Current 2 2

A	time-now	U2-DI091	YES	2A FRV REJECTED TO MANUAL
		2A FRV M/A STATION REJECTED FROM AUTO TO MANUAL		
B	time-now	U2-DI002	YES	642A FRV LOW CNTL AIR PRESS
		2A FRV CONTROL AIR <65 PSI, VALVE MOTION INHIBITED		
C				
D				
E				
F				
G				
H				
I				
J				
K				
L				
M				
N				
O				
P				

Esc Cancel

ALT-X GenFun Num5 DispSumm Alt-Num5 Alarm Summ Alt-H Help

Attachment 2

XL3 Alarm

****

DEVICE 81-12 IN ALARM AEER ABOVE 902-39

****

Attachment 3

XL-3 ALARMS

****

DEVICE 51-20 IN ALARM 2/3 FIRE PUMP RUNNING

****

Dresden Generating Station

ILT-N-2

SECURE SBO DIESEL FROM SURVEILLANCE RUN

RAISE POWER USING CONTROL RODS

CRD FCV FAILS HIGH CAUSING A ROD TO DRIFT IN

CORE SPRAY SYSTEM LOW PRESSURE

INSTRUMENT AIR COMPRESSOR TRIP

MASTER RECIRCULATION FLOW CONTROLLER FAILS UPSCALE

EARTHQUAKE CAUSES PLANT DAMAGE / TORUS LEAK / MANUAL SCRAM

SMALL STEAM LEAK / EMERGENCY DEPRESSURIZE DUE LOW TORUS LEVEL

Rev. 00

11/18

Developed By: _____ _____

Exam Author Date

Approved By: _____ _____

Facility Representative Date

Scenario Outline

Station: Dresden Generating Station **Scenario No.:** ILT-N-2 **Class ID:** 18-1 (2019-301)

Evaluators	Operators / crew position
	/ ATC
	/ BOP
	/ CRS

Initial Conditions: 70% Power, steady state, and equilibrium xenon
U2 SBO Diesel Generator running for surveillance

Turnover: Shutdown the U2 SBO Diesel Generator
Then, raise power using control rods.

Critical Tasks:

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. (This may not apply based on crew actions to depressurize the RPV)

PC-1.2 – After initiating drywell sprays per the primary containment pressure or temperature legs of DEOP 200-1, Primary Containment Control, terminate drywell sprays before drywell pressure drops to < 0 psig. (This may not apply based on scenario run time)

PC-4.3 – When executing DEOP 200-1, Primary Containment Control, when suppression pool water level cannot be held above 12 feet, trip HPCI.

PC-4.4 – When executing DEOP 200-1, Primary Containment Control, when suppression pool water level cannot be held above 11 feet, manually scram and then perform an emergency depressurization of the reactor.

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.

Event No.	Malf. No.	Event Type*		Event Description
1	NONE	N	BOP	AUX POWER – SBO Diesel, Secure from Surveillance Run
2	NONE	R	ATC	REACTIVITY – Raise Power Using Control Rods
3	RODF08DI	C/T	ATC	CRD FCV Fails High Causing Rods to Drift IN
4	RADRBVAH	C/T	BOP	CORE SPRAY - System Low Pressure
5	N33	C	BOP	INSTRUMENT AIR – Compressor, Trip Due to Overcurrent
6	ASDMRHGH	C	ATC	RECIRC – Master Recirculation Flow Controller Fails Upscale
7	CSBRKSEV	M	ALL	Manual Scram – Earthquake Causes Plant Damage/Torus Leak
8	F41	M	ALL	Small Steam Leak/Emergency Depressurize Due to Low Torus Level

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

Scenario Objective

Evaluate the Team's ability to operate the plant with a Torus leak that requires an Emergency Depressurization.

Scenario Summary

1. Unit is at ~70%.
2. The following equipment is OOS:
   a. None.
3. LCOs:
   a. None

Scenario Sequence

- After completing shift turnover, the BOP will shutdown the U2 SBO Diesel Generator per DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests.
- After completing DOS 6620-07, the Team will raise power using control rods per procedure DGP 03-01, Power Changes.
- After the change in power has been observed, a CRD FCV controller failure occurs causing control rod P-08 to drift in. The Team should take actions per DOA 0300-05, Inoperable or Failed Control Rod Drives. Technical Specifications 3.1.3, Condition C, applies.
- After the CRD FCV failure is addressed, a Core Spray System low pressure alarm is received and the CRS must review Tech Specs and declare the loop INOP.
- After the Core Spray System low pressure alarm is addressed, an IAC trips on overcurrent. The Team starts a standby IAC and directs it lined up to the Unit 2 air system.
- After the IAC trip is addressed, the Master Recirculation Flow Controller fails upscale. The CRS/ATC will enter DOA 0202-03, Reactor Recirculation System Flow Control Failure to address the failure.
- After the Master Recirc failure is addressed, an earthquake causes plant damage, including a torus leak, which will require the Team to implement DOA 0010-03, Earthquakes, and manually scram the reactor.
- After the scram, a small steam leak occurs. Emergency Depressurization will ultimately be required due to torus level.
- Completion criteria: When the RPV is depressurized and at the discretion of the Lead Examiner, Place the simulator in FREEZE.

Event One – Shutdown the U2 SBO Diesel Generator

- The BOP will shutdown the U2 SBO Diesel Generator.

Malfunctions required: 0

- (None)

Success Path:

- Performs DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests.

Event Two – Raise Power Using Control Rods

- The Team will raise power by withdrawing control rods.

Malfunctions required: 0

- (None)

Success Path:

- Performs DGP 03-01, Power Changes.
- Performs DGP 03-04, Control Rod Movements
- Performs DOP 0400-01, Reactor Manual Control System Operation

Event Three – CRD FCV Controller Fails High Causing a Rod to Drift In

- The CRD FCV fails open due to a failed low flow signal to the controller. The higher cooling water flow causes rod P-08 to drift in.

Malfunctions required: 1

- (Control Rod Drifts In)

Success Path:

- Takes manual control of the CRD Flow Controller.
- Performs DOA 300-05, Inoperable or Failed Control Rod Drives.
- Determines Technical Specifications requirements.

Event Four – Core Spray System Low Pressure

- 2B Core Spray System low-pressure alarm is received.

Malfunctions required: 1

- (2B Core Spray System low-pressure)

Success Path:

- CRS declares the 2B Core Spray System INOP and references Tech Specs.

Event Five – Instrument Air Compressor Trip

- An IAC trips and IA pressure slowly drops.

Malfunctions required: 1

- (IAC Trip)

Success Path:

- Performs DOA 4700-01, Instrument Air System Failure.
- Starts and lines up a standby IAC.

Event Six – Master Recirculation Flow Controller Fails Upscale

- The Master Recirculation Flow Controller fails upscale.

Malfunctions required: 1

- (Master Recirculation Flow Controller fails upscale)

Success Path:

- DOA 0202-03, Reactor Recirculation System Flow Control Failure.

Event Seven – Earthquake Causes Plant Damage / Torus Leak / Manual Scram

- An earthquake causes plant damage, including a torus leak.

Malfunctions required: 1

- (Earthquake Causing Torus Leak)

Success Path:

- Performs DGP 02-03, Reactor Scram.
- Performs DEOP 0100, RPV Control
- Performs DEOP 0200-01, Primary Containment Control.

Event Eight – Small Steam Leak / Emergency Depressurize Due Low Torus Level

- A small steam leak occurs. Emergency Depressurization will ultimately be required due to torus level

Malfunctions required: 1

- (Small Steam Leak)

Success Path:

- Performs DEOP 0200-01, Primary Containment Control.

PRE-SCENARIO ACTIVITIES

1 If applicable, conduct pre-scenario activities in accordance with TQ-AA-155-J040, SIMULATOR EXAMINATION BRIEFING.

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

b. Provide the Team a copy of DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests, marked-up ready to shutdown the U2 SBO Diesel Generator. (Step 45 next of Rev. 46)

c. Provide the Team a copy of DGP 03-01, Power Changes, marked-up for plant conditions below.

d. Provide the Team a copy of DGP 03-04, Control Rod Movements.

e. Provide the Team a copy of DOP 0400-01, Reactor Manual Control System Operation.

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

a. Initialize simulator in an IC with the following:

1) Reactor power ~63%. (ILT Training Load IC 211 used for validation, Seq. 2S.0.3, CF1E, ready to pull step 13)

2) Adjust Core flow to 58-60 Mlbm/hr. (MWe ~560)

3) Delete PPC alarm E208 from scan to prevent nuisance alarms.

4) Run CAEP file: **Pump_Sumps.cae**

3 Verify the following simulator conditions:

a. Verify 2A and 2B Instrument Air Compressors running.

b. Verify 3C IAC off.

c. Verify one Service Air Compressor supplying both Units.

d. Load the U2 SBO Diesel Generator to Bus 24 per DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests. (Step 45 next of Rev. 46)

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

4 Run the initial setup CAEP file: **18-1 ILT-N-2.cae**

5 Open but **DO NOT RUN YET** CAEP file: **Recirc_up.cae**

6 Place the following equipment out of service:

a. None

7 Ensure this setup is peer checked.

8 Complete the Simulator Setup Checklist.

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

√ Critical Tasks

■ Required Actions

❑ Optional Actions

Event One – Shutdown the U2 SBO Diesel Generator

Trigger	Position	Crew Actions or Behavior
28		**SIMULATOR OPERATOR / ROLE PLAY:** At any time during the scenario the Team requests gains set to 1, (wait 3 min) activate **TRIGGER 28**, then report: "gains set to 1". (This trigger can be toggled OFF, then back ON to adjust the gains more than once).
		ROLE PLAY: EO at SBO DG directed to perform local operations: wait 3 min, and then report "I completed the [fill in the requested operation]". TSO: Acknowledge reports from the Team.
	CRS	❑ Directs BOP to shutdown the U2 SBO Diesel Generator per DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests.

	BOP	Performs DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests, as directed:
		❑ Notifies TSO of Unit 2 SBO D/G shutdown.
		❑ Announces on the PA system that the U2 SBO Diesel Generator is being shutdown.
		• Removes U2 SBO D/G feed from Bus 24.
		  • Select BUS 24 FEED
		  • Select TRIP
		  • Verify green breaker open indication
		❑ Notifies TSO that Unit 2 SBO D/G is removed from the Grid.
		• Opens 4 kV bus SBO tie breaker BUS 61 TO BUS 24 TIE GCB.
		• Restores BUS 61 to normal feed (Bus 11).
		  • Select D/G GOVERNOR
		  • Select DECREASE
		  • Select D/G VOLTAGE REG
		  • Select LOWER
		  • Sets voltage slightly higher than 4229.
		  • Select BUS 61
		  • Select Normal Feed
		  • Select SYNC CLOSE
		• Reduces U2 SBO D/G load to between 250 and 500 kW.
		  • Select D/G GGOVERNER
		  • Select DECREASE
		• Removes U2 SBO D/G feed from BUS 61.
		  • Select DG BKR
		  • Select TRIP
		  • Verify green breaker open indication
		  • Record time breaker opened
		• Prepares U2 SBO D/G 2 for subsequent start.
		  • Select ISOCH DROOP
		  • Select ISOCH
		  • Verify GOVERNER IN ISOCHRONOUS is displayed

Event One – Shutdown the U2 SBO Diesel Generator

Trigger	Position	Crew Actions or Behavior

		• Shut down SBO D/G 2.
		  • Select NORMAL ENGINE START/STOP
		  • Select STOP
		  • Verify ENGINE IN COOLDOWN message is displayed

		CUE: When U2 SBO D/G is placed in Cooldown mode, inform the CRS that another NSO will complete the remainder of DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests.
	ATC	❑ Assists BOP as directed.

Event 1 Completion Criteria:

- **U2 SBO DG in Cooldown Mode,**

  -- AND/OR --

At the discretion of the Lead Examiner.

Event Two – Raise Power Using Control Rods

Trigger	Position	Crew Actions or Behavior
	CRS	Directs pulling control rods: ❑ Reviews REMA. ❑ Designates second verifier. ❑ Directs ATC to pulls rods.
	ATC	Performs the following actions per DOP 0400-01, Reactor Manual Control System Operation, and DGP 03-04, Control Rod Movements, as directed <u>Verifies the following prior to moving any control rod:</u> • Control rod selected on the select matrix is correct rod. • Second Verification requirements satisfied. • Rod Out Permit light is illuminated. <u>Withdraws rods as follows</u>: • Moves RONOR Switch to NOTCH OVERRIDE (use of RONOR is optional) and the Rod Movement Control switch to ROD OUT. • Verifies ON light and proper Control Rod Timer operation. • Releases switches before target position is reached. • Verifies rod settles to target position and proper response of nuclear instrumentation.
		<u>ROLE PLAY:</u> As the QNE when the team requests/performs an OD-20, Inform them that all core parameters are within limits.
	BOP	Performs second verification checks. <u>For first rod in a step:</u> ■ Verifies correct control rod pattern ■ Verifies correct step and array. ■ Verifies RWM rod blocks enabled <u>For all rods moved:</u> ■ Verifies correct control rod selected. ■ Verifies planned control rod motion is correct. ■ Verifies control rod at target position.

<u>Event 2 Completion Criteria:</u>

- **Sufficient power increase,**

  -- AND/OR --

At the discretion of the Lead Examiner.

Event Three – CRD FCV Controller Fails High Causing a Rod to Drift In		
Trigger	Position	Crew Actions or Behavior
		Note: The failure of CRD flow controller input low causes the FCV to open which increases drive water and cooling water pressure. This has been known to cause Control Rods to drift in.
1		**Simulator Operator:** At the discretion of the Lead examiner, activate **TRIGGER 1**, which causes: ○ CRD Flow Controller flow input to fail low. ○ Control Rod P-08 to drift in.
		Role Play: EO to check P-08 accumulator: Wait 2 min, then report "At the HCU for P-08, the line with the 112 valve is hotter than normal. WEC/EO to hydraulically isolate and/or electrically disarm P-08: 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".
16		**Simulator Operator:** When CRD flow has been returned to normal, activate **TRIGGER 16**, which deletes Control Rod P-08 drift in malfunction.
16		**Simulator Operator / Role Play:** EO to close CRD P-08's 2-0305-102, WITHDRAW VLV: Wait 2 min, then activate **TRIGGER 16** and report, "CRD P-08's 2-0305-102 is closed".
	ATC	❑ Announces 902-5 A-3, Rod Drift, alarm. ❑ Notices and announces that Control Rod P-08 is drifting in. ❑ May select Rod P-08 and receives alarm DAN 902-5 B-3, Rod Worth Min Block. Performs actions of DOA 0300-05, Inoperable Or Failed Control Rod Drives as directed. Immediate: ■ Bypasses the Rod Worth Minimizer. ■ Inserts the CRD to 00 using Emergency Rod In.
	CRS	■ 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 >20%) ❑ May enter DGA 07, Unpredicted Reactivity Addition.
	ATC	■ 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. ❑ Directs EO to close CRD P-08's 2-0305-102, WITHDRAW VLV, to prevent CRD discharge volume from filling.
	CRS	■ References TS 3.1.3, Condition C, and determines the following actions are required: • 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 P-08. ■ Enters DOA 0300-12, Mispositioned Control Rod.

Event Three – CRD FCV Controller Fails High Causing a Rod to Drift In

Trigger	Position	Crew Actions or Behavior
	CRS	❑ Directs taking rod P-08 OOS on the RWM.
	ATC	❑ Takes rod P-08 OOS on the RWM. o Select SECONDARY FUNCTIONS o Select the Rod to be taken OOS on the select matrix. o Select the Rod to be taken OOS on the RWM Screen. o Verify the Rod is enclosed in a blue box. o Select ROD OUT OF SERVICE and verify message "Rod XXX placed out of service".
		Note: The following actions for the CRD FCV controller failure may be performed concurrently with the drifting CRD actions.
	CRS	■ Due to reports of abnormal CRD system flows and pressures, enters DOA 0300-01, Control Rod Drive System Failure.
	ATC	■ Performs DOA 0300-01, Control Rod Drive System Failure: • Places FIC 2-340-1, CRD Flow Controller, in MANUAL. • Adjusts flow to between 40 and 60 gpm.

Event 3 Completion Criteria:

- **CRD Flow Controller in MAN with flow restored to normal, AND**
- **Control Rod P-08 Has Been Inserted To Position 00, Disarmed and removed from service on the RWM AND**
- **Tech Specs Have Been Addressed,**

-- AND/OR --

At the direction of the Lead Examiner.

Event Four – Core Spray System Low Pressure Alarm

Trigger	Position	Crew Actions or Behavior
2		**Simulator Operator:** At the discretion of the Lead Examiner, activate **TRIGGER 2**, which closes ECCS Keep Fill to 2B Core Spray loop and cracks open Core Spray 4B valve to bleed the pressure down. **Role Play:** EO to investigate ECCS Jockey pump, (wait 3 min.): Report, "the ECCS jockey pump is operating normally". EO to check 2B Core Spray system, wait 2 minutes: Report, "Water is spraying onto the 2B Core Spray motor from the flange of relief valve RV 2-1402-28B". If asked if the leak can be isolated: Report, "the leak cannot be isolated". If asked if the leak can be isolated by closing the pump suction valve: Report, "closing the pump suction valve will isolate the leak". If asked about the status of the sump, wait 1 minute: Report, "the sump pumps are keeping up with the leak". If asked local 2B Core Spray system pressure, wait 1 minute: Report, "Local 2B Core Spray system pressure is approximately (Use pressure from instructor station drawing CS2) psig. If sent to vent 2B Core Spray system: Report, "No water is coming out the vent." If calling radwaste to ask about RBEDT levels: Report, "The rate of input into the Unit 2 RBEDT has increased, the level is currently 60%." If asked the status of the leak, respond as follows: • If the 2B Core Spray pump suction valve is open, report, "the leak rate is unchanged". • If the 2B Core Spray pump suction valve is closed, report "the leak rate is slowing and is no longer spraying on the 2B Core Spray pump motor". If asked if water sprayed onto 2C & 2D LPCI pumps: Report, "the 2C & 2D LPCI pumps were not sprayed on, they are dry"
	BOP	Reports alarm to CRS. Carries out actions of DAN 902-3 D-7, 2A/B CORE SPRAY HDR PRESS LO: ❑ Verify FLOW TEST VLV MO 2-1402-4B is fully closed. ❑ Verify PP DISCH VLV MO 2-1402-24B is fully open. ❑ Check for relief valve RV 2-1402-28B 2B CORE SPRAY PMP DISCH HDR RV leaking to Reactor Building Equipment Drain Tank OR valves leaking into Torus. ❑ Notify Operations Shift Supervisor. ❑ Directs WEC to send Operators out to investigate. ❑ Directs an Equipment Attendant to inspect ECCS jockey pump for proper operation. ■ Places 2B Core Spray pump in PTL. ❑ May close 2B Core Spray pump discharge valve ■ Closes 2B Core Spray pump suction valve.
	ATC	❑ Assists BOP with carrying out actions of DAN as necessary.

Event Four – Core Spray System Low Pressure Alarm

Trigger	Position	Crew Actions or Behavior
	CRS	❑ Directs carrying out actions of the DAN. ■ References Tech Spec 3.5.1 Condition B1. ⇒ Required action, restore Low pressure ECCS injection/spray subsystem to OPERABLE status within 7 days. (Surveillance Requirement SR 3.5.1.1.) ■ Orders 2B Core Spray pump placed in PTL. ❑ May direct closing keepfill to 2B Core Spray system. (2-1402-37B) OR ❑ May direct closing keepfill to 2B Core Spray system. (2-1402-36B) ❑ May direct 2B Core Spray pump discharge valve ■ Directs closing 2B Core Spray suction valve. ❑ Notifies Shift manager ❑ Notifies maintenance groups.

Event 4 Completion Criteria:

- **2B Core Spray system declared inoperable,**

-- AND/OR --

At the direction of the Lead Examiner.

Event Five – Loss of Instrument Air

Trigger	Position	Crew Actions or Behavior
4 **6**		**Simulator Operator:** At the discretion of the evaluators, activate **TRIGGER 4**, which trips the 2B Instrument Air Compressor and inserts an IA leak to cause pressure to drop. Verify **TRIGGER 6** automatically activates when 3C IAC loads. (Amps > 90) This ramps 3C IA pressure up. Goes very slow otherwise.
		Role Play: EO to investigate 2B IAC trip: (Wait 4 min) Report "the 2B IAC tripped on low lube oil pressure. There is nothing else abnormal at the compressor". At Bus 27 breaker report "the breaker is closed and appears normal". **Note:** The compressor will NOT be restored to operation.
5		**Simulator Operator / Role Play:** Coordinate with the NSO to start and lineup 3C IAC. After 3C IAC is started and its air pressure is greater than U2 IA pressure, call the Control Room and report "the 3C IAC is ready to lineup to U2, do you want me to continue?" If directed to lineup 3C IAC to U2 IA: wait 1 min, then activate **TRIGGER 5** to lineup 3C IAC to U2. Also valves 2A IAC back in.
		Role Play: EO to verify 2-4701-500 opened: (wait 2 min) Verify annunciator 923-1 F-4 is in alarm, then report, "2-4701-500 is open".
7		**Simulator Operator / Role Play:** EO to reset Service Air to Instrument Air backup valve 2-4701-500. Wait 2 min, activate **TRIGGER 7** and then report "Service Air to Instrument Air backup valve 2-4701-500 is reset and closed".
		When/if asked report that the U2 and U1 Service Air Systems are not cross-tied.
	BOP	Announces alarm 923-1 B-5, U2 OR U3 INST AIR COMP TRIP: ❑ Reports 2B IAC tripped ❑ Directs an EO to investigate the cause of the 2B Instrument Air Compressor trip
	CRS	❑ Enters DOA 4700-01, Instrument Air System Failure: ❑ If required, enters DOA 4600-01, Service Air System Failure
	BOP	Performs DOA 4700-01, Instrument Air System Failure, as directed: ■ Starts 3C IAC and directs it lined up to U2 ❑ Directs an EO to investigate the cause of the 2B Instrument Air Compressor trip ❑ Verifies U2 Service Air to U2 Inst. Air cross-tie (2-4701-500) valve opens ❑ Reports 923-1, F-4, U2 INST PRESS LO ALARM.
	ATC	❑ If received, reports 902-6 H-10, FW REG VLVS BACKUP AIR ACTIVE.

Event Five – Loss of Instrument Air

Trigger	Position	Crew Actions or Behavior
	BOP	If received, announces 923-1, D-5 U2 SERV AIR PRESS LO and refers to DAN: ❑ Verifies Unit 2 to Unit 1 Service Air not cross-tied. ❑ Performs DOA 4600-1, Service Air System Failure, as directed. ❑ Announces loss of service air on the plant PA for people who may be using this as breathing air.

Event 5 Completion Criteria:

- **Unit 2 Instrument Air pressure has recovered or is recovering,**

  -- AND/OR --

At the discretion of the Floor Instructor / Lead Evaluator.

Event Six – Master Recirculation Flow Controller Fails Upscale

Trigger	Position	Applicant's Actions or Behavior
CAEP: Recirc_up.cae		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, run **CAEP: Recirc_up.cae,** which will cause Master Recirc Flow Controller to fail upscale. When both pumps are in speed hold, pause the CAEP.
		ROLE PLAY: QNE to check core parameters: Wait 5 min, and then report "all core parameters are within limits".
		NOTE: If there is a significant delay between the Recirc pumps being placed in SPEED HOLD, TS 3.4.1 condition B.1 may apply for RECIRC loop mismatch. @hours to declare the loop with lower flow to be "not in operation"
	ATC	■ Determines and announces Recirculation Flow transient occurring by observing any of the following: ○ Increase in Recirc Loop Flow as indicated on FR 2-260-7. ○ Increase in Rx Power indicated on WI 2-6040-59. ○ Increase in Core Flow and DP on DPR/FR 2-263-110. ○ Increase in Total Stm Flow on UR 2-640-27. ○ Increase in Rx Pressure on P/FR 2-640-28. ○ Increase in Total Feedwater Flow on UR 2-640-26. ○ Increase in Power Level on RR 2-750-10A/D, & RR 2-750-10B/C.
	CRS	■ Enters and directs actions of DOA 0202-03, Reactor Recirc System Flow Control Failure. ❑ Enters DGA-07, Unpredicted Reactivity Addition.
	ATC	Performs the following actions per DOA 0202-03, Reactor Recirc System Flow Control Failure: ■ Momentarily places 2A & 2B ASD SPEED HOLD switches 2-202-60-302A & B to HOLD at Panel 902-4. ❑ Verifies Core thermal power <2957 MWt. ❑ Verifies NOT operating in the unstable region of the Power / Flow Map.
	ATC	Completes actions of DOP 0202-16, Reactor Recirculation System Manual Hold and Local Manual Operation. (None required)
	BOP	Performs the following actions per DOA 0202-03, Reactor Recirc System Flow Control Failure: ■ Contact a QNE (Qualified Nuclear Engineer). ❑ Assists NSO as directed.

Event 6 Completion Criteria:

- **Both Recirc pumps in Speed Hold;**

  -- AND/OR --

At the direction of the Lead Examiner.

Event Seven – Earthquake Causes Plant Damage / Torus Leak / Manual Scram		
Trigger	Position	Applicant's Actions or Behavior
8		**Role Play:** At the discretion of the Lead Examiner, call the Control Room, as Security and report there has been a confirmed earthquake felt throughout the plant. **SIMULATOR OPERATOR:** After the above report, activate **TRIGGER 8**, which starts an ECCS suction line break in the torus basement. **Note:** It takes about 20 minutes for torus level to reach 11 feet. *At the discretion of the lead examiner, use the cues in this event to jump ahead in time to expedite level drop if desired.*
	BOP	■ Reports the following alarms: • 923 A-3 (B-2), U2 E(W) RBFD SUMP LVL HI-HI • 902-4 C-23, Torus Narrow Range Wtr Lvl Lo ■ Checks the torus narrow range level indicator. Reports level dropping. ❑ Directs EO to perform DOS 1600-02, Torus Level Verification Using Local Sight Glass. ■ Directs EO to investigate leakage to torus basement. ■ Verifies proper operation of the RBFD Sump pumps. (Will require resetting the Group 2 isolation at both the 902-5 panel and the 923-4 panel for the sump pumps to operate if a Group 2 Isolation occurs).
		ROLE PLAY: As the EO sent to verify Torus level locally using sight glass (wait 4 min), then report: "Local Torus level is … (use value from variable ppc232, unless it is <20", then report it is below the sightglass)". As the EO sent to investigate leakage (wait 2 min) or if not sent, then as the EO on his round, report: "there is a large rupture from a pipe attached between the Torus shell and the Torus suction ring header near the East LPCI Corner room. The Torus basement floor is covered with water". There is no valve on the line". As the EO sent to report LPCI corner status (wait 2 min), then report: "there is no water in either LPCI corner room". As Maintenance sent to determine if the leak could be stopped (wait 3 min), then report: "Maintenance cannot stop the leak". As the EO sent to check the seismic monitor, report: "the seismic monitor has been activated (red light lit)". If contacted as any outside agencies, regarding the earthquake, confirm there has been an earthquake in the area but there is no more information at this time.
	CRS	❑ May enter DOA 0040-02, Localized Flooding in Plant. ❑ May reference DOA 0010-03, Earthquakes.
	BOP	Performs the following actions per DOA 0040-02, Localized Flooding in Plant, as directed: ■ Makes PA announcement. ■ Directs EO to investigate leakage to torus basement. ❑ Notifies Radiation Protection and Security as time permits.

Event Seven – Earthquake Causes Plant Damage / Torus Leak / Manual Scram		
Trigger	Position	Applicant's Actions or Behavior
		CUE (if desired for time compression): When torus level is < 14.5 feet and/or at the discretion of the lead examiner, cue the crew that we are taking a time jump and that both torus wide range level meters indicate 12.5 feet and are dropping at about 6 inches every 5 minutes.
	CRS	■ √ When suppression pool water level cannot be held above 12 feet, directs tripping HPCI and preventing HPCI from starting. **(PC-4.3)** ■ When suppression pool water level cannot be held above 12 feet, directs a Scram and enters DEOP 100
	BOP	■ √ Trips HPCI and prevents it from starting. **(PC-4.3)** • Place HPCI Aux Oil Pump in PTL. • Place HPCI 14 Valve in PTL. OR • Place HPCI flow controller in MANUAL AND reduce output to zero (0).
	CRS	Enters and directs performance of DEOP 0200-01, Primary Containment Control: ❑ May attempt to add water to the Torus per DOP 1600-02. ❑ May direct scram preparatory actions per DGP 02-03, Reactor Scram. ❑ May conservatively direct the Team to perform a manual reactor scram while determining if leak can be isolated.
	ATC / BOP	❑ Performs scram preparatory actions per DGP 02-03, Reactor Scram, as directed. o IF FCL > 93%, THEN reduce FCL to < 93% by inserting CRAM rods per DGP 03-04 OR in sequence rods per DGP 03-04. o Start the motor suction pump AND turning gear oil pump. o Trip hydrogen addition. ■ Performs manual scram per DGP 02-03, Reactor Scram, as directed. • Depresses BOTH Scram buttons. • Places RX MODE SW in SHUTDOWN. o Manually runs Recirc pumps back to minimum. o Inserts SRMs and IRMs. o Controls reactor water level +8 to +48 inches or as directed by the Unit Supervisor. o Verifies turbine tripped. o Verifies generator tripped. o Verifies aux power transfers.
	BOP	Performs the following actions per DEOP 200-01, Primary Containment Control, as directed: ❑ May attempt to add water to the torus by opening the HPCI 14 valve. ❑ Monitors/Reports DEOP 0200-01 entry parameters.
	CRS	❑ May anticipate blowdown and directs: o Initiating the Isolation Condenser. o Opening the Turbine Bypass valves.
	BOP	If directed, anticipates blowdown: ❑ Initiates Isolation Condenser to full flow. ❑ Opens the Turbine Bypass valves.

Event Seven – Earthquake Causes Plant Damage / Torus Leak / Manual Scram		
Trigger	Position	Applicant's Actions or Behavior
	CRS	Enters DEOP 0300-01, Secondary Containment Control, and directs: ❑ If Reactor Building Ventilation isolates when unit is scrammed, directs restarting Reactor Building Ventilation.
	BOP	Performs DEOP 0300-01, Secondary Control, as directed: ❒ Time permitting, restarts Reactor Building Ventilation (if it isolates when the reactor is scrammed).

Event 7 Completion Criteria:

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

  -- AND/OR --

  At the discretion of the Lead Examiner.

Event Eight – Small Steam Leak / Emergency Depressurize Due Low Torus Level		
Trigger	Position	Crew Actions or Behavior
9		**SIMULATOR OPERATOR:** After the Team has stabilized the plant (RPV Level ≥ 10") or at the discretion of the Lead Evaluator, activate **TRIGGER 9**, which causes a small steam leak. **ROLE PLAY:** EO sent to check EDG operation: wait 3 min, then report: "Both EDGs are operating normally". **ROLE PLAY:** Acknowledge other requests; delay as necessary.
	TEAM	■ Determines/announces Drywell pressure rapidly rising.
	CRS	Re-enters DEOP 0200-01, Primary Containment Control, when PC/P reaches 2 psig and performs/directs: ❑ Monitoring of PC/P. ❑ Initiation of torus sprays before PC/P of 9 psig. ■ When PC/P is above 9 psig or before DW/T reaches 281°F: • Verification of DSIL. • Tripping of recirc pumps. • Tripping of DW coolers. • √ Initiation of DW sprays. **(PC-1.1)** ■ √ Directs terminating drywell sprays before drywell pressure drops to < 0 psig. **(PC-1.2)** (This may not apply based on scenario run time)
	BOP	■ √ Initiates Torus sprays and Drywell sprays as directed. **(PC-1.1)** • Place 316A/B AND 318A/B keylock switches in MANUAL (MANUAL OVERRD). • Start one CCSW Pump in each loop AND verify 2(3)A/B valves open. (IF only one CCSW loop available, THEN start second CCSW Pump in same loop.) • Start at least one LPCI pump in each loop. (Start additional LPCI pumps as required.) • Open the 18A/B & 19A/B valve in desired loop. (Torus Sprays) • Open the 27A/B & 28A/B valve in desired loop. (Drywell Sprays) • Adjust CCSW flow controller to approximately 3500 gpm for one pump; > 5000 gpm two pumps. [Maintain LPCI/CCSW dP ≥ 7 psid (1 LPCI Pump/loop) OR ≥ 20 psid (two LPCI Pumps/loop)] • Momentarily place 11A/B valve control switches to close. ■ √ Secures torus sprays and Drywell sprays before 0.0 psig. **(PC-1.2)** (This may not apply based on scenario run time) ■ Re-enters DEOP 0200-01, Primary Containment Control, when torus bulk temperature reaches 95°F and performs/directs: • ⌛ Initiation of Torus Cooling. (May already be running) ■ ⌛ Initiates Torus Cooling per the Hardcard. (May already be running)
		Note: Once the Team determines the Torus leak cannot be stopped, they may anticipate blowdown by using the Isolation Condenser and the Turbine Bypass valves.

Event Eight – Small Steam Leak / Emergency Depressurize Due Low Torus Level		
Trigger	Position	Crew Actions or Behavior
	CRS	❑ May anticipate blowdown and directs: o Initiating the Isolation Condenser. o Opening the Turbine Bypass valves.
	BOP	If directed, anticipates blowdown: ❑ Initiates Isolation Condenser to full flow. ❑ Opens the Turbine Bypass valves.
		CUE (if desired for time compression): 10 minutes after the initial time compression cue was given and/or at the discretion of the lead examiner, cue the crew that both the Torus wide range level meters indicate 11.5 feet and are dropping at a rate of about 1 foot per 10 minutes.
	CRS	√ When suppression pool water level cannot be held above 11 feet, manually scrams and then performs an emergency depressurization. Enters DEOP 0400-02, Emergency Depressurization, and directs: **(PC-4.4)** Enters DGP 02-03, Reactor Scram, and directs a manual scram. (May be already done) Enters DEOP 0400-02, Emergency Depressurization, and directs: o Initiation of Isolation Condenser to maximum flow. ■ Verification that SP/L >6 feet. ■ √ Opening all ADS valves. **(RPV-2.1)** ■ Verification relief valves are open.
	BOP	√ Performs DGP 02-03, Reactor Scram. (May be already done, see actions earlier in previous Event) **(PC-4.4)** √ Performs DEOP 0400-02, Emergency Depressurization, actions as directed: **(PC-4.4)** ■ Initiates Isolation Condenser to maximum flow o Verifies that SP/L >6 feet. ■ √ Opens ADS valves. **(RPV-2.1)**

Event 8 / Scenario Completion Criteria:

- **Sprays the Drywell; AND,**
- **Containment Parameters Controlled; AND,**
- **RPV Level being controlled; AND,**
- **RPV depressurization in progress,**

-- AND/OR --

At the direction of the Lead Examiner.

REFERENCES

PROCEDURE	TITLE
DAN 902-3 D-7	2A/B CORE SPRAY HDR PRESS LO
DAN 902-4 C-23	TORUS NARROW RANGE WTR LVL LO
DAN 902-5 A-3	ROD DRIFT
DAN 902-5 B-3	ROD WORTH MIN BLOCK
DAN 923 A-3 (B-2)	U2 E(W) RBFD SUMP LVL HI-HI
DEOP 0100	RPV CONTROL
DEOP 0200-01	PRIMARY CONTAINMENT CONTROL
DEOP 0300-01	SECONDARY CONTAINMENT CONTROL
DEOP 0400-02	EMERGENCY DEPRESSURIZATION
DGA-07	UNPREDICTED REACTIVITY ADDITION
DGP 03-01	POWER CHANGES
DGP 02-03	REACTOR SCRAM
DGP 03-04	CONTROL ROD MOVEMENTS
DOA 0010-03	EARTHQUAKES
DOA 0040-02	LOCALIZED FLOODING IN PLANT
DOA 0202-03	REACTOR RECIRC SYSTEM FLOW CONTROL FAILURE
DOA 0250-01	RELIEF VALVE FAILURE
DOA 0300-01	CONTROL ROD DRIVE SYSTEM FAILURE
DOA 0300-05	INOPERABLE OR FAILED CONTROL ROD DRIVES
DOA 0300-12	MISPOSITIONED CONTROL ROD
DOA 4700-01	INSTRUMENT AIR SYSTEM FAILURE
DOP 0202-16	REACTOR RECIRCULATION SYSTEM MANUAL HOLD AND LOCAL MANUAL OPERATION
DOP 0400-01	REACTOR MANUAL CONTROL SYSTEM OPERATION
DOP 6700-20	480V CIRCUIT BREAKER TRIP
DOS 1600-02	TORUS LEVEL VERIFICATION USING LOCAL SIGHT GLASS
DOS 6620-07	SBO 2(3) DIESEL GENERATOR SURVEILLANCE TESTS
TS 3.1.3	CONTROL ROD OPERABILITY
TS 3.3.2.1	CONTROL ROD BLOCK INSTRUMENTATION
TS 3.3.6.3	RELIEF VALVE 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

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

CAEP Files

```
# 18-1 ILT-N-2.cae
# For ILT Class 18-1 NRC Exam
# Written by DSS
# Rev 00
# Date 11/18

#### INITIAL CONDITIONS ####

# Sets APRM Master Gain pot to 1.0
irf niagain 1.0

# Closes 2A IAC to U2 valve to simulate 2A IAC is failing to load.
irf vp1 0.0

# Closes 3C IAC to U2 valve and sets 3C IA pressures to S/D values.
irf vp6 0.0
set iap2 = 20.0
set iapcompr(5) = 20.0


#### EVENT TRIGGERS ####

# Event Trigger 1 Fails CRD Flow Controller input low.
# After 20 sec, drifts CRD P-08 in.
trgset 1 "0"|2
imf rdfcflo (1)|2
imf rodp08di (1 20)|2

# Event Trigger 16 deletes CRD P-08 drift in.
trgset 16 "0"|2
trg 16 "dmf rodp08di"|2

# Event Trigger 2 causes 2A/B Core System Low Pressure Alarm (902-3 D-7)
# Cracks open 4B VLV and isolates Keep Fill to 2B Loop
trgset 2 "0"|4
trg 2 "set csv4b = 0.002"|4
irf csbfilof (2) closed|4

# Event Trigger 3 Deletes E ERV binding malfunction so valve will close and removes fuses for the E ERV.
Trgset 3 "0"|4
trg 3 "dmf ads3ebn"|4
irf adsrfe (3) pulled|4

# Event Trigger 4 Trips 2B IAC and starts an IA leak to cause IA pressure to slowly drop.
trgset 4 "0"|6
imf n22 (4)|6
imf np2 (4) 10.0 5:00 5.0|6
irf vp2 (4) 0.0 60|6

# Event Trigger 5 Valves in 3C IAC to U2. Deletes IA leak.
# Valves 2A IAC back in
trgset 5 "0"|8
trg 5 "dmf np2"|8
irf vp6 (5) 100.0 60.0|8
irf vp1 (5) 100.0 60.0|8
```

```
# Event Trigger 6 Activates when 3C IAC loads. (> 100amps)
# Ramps 3C IA pressure up. Goes very slow otherwise.
trgset 6 "iaicompr(5) .gt. 90.0"|10
trg 6 "ramp iap2 20.0 110.0 2:00"|10

# Event Trigger 7 Resets Service Air to Instrument Air Backup valve.
trgset 7 "0"|10
irf ia1 (7) reset|10

# Event Trigger 8 Inserts an ECCS suction line break.
trgset 8 "0"|12
trg 8 "ramp wamwlps 200.0 201.0 1:00:00"|12
imf csbrksev (8) 100.0|12
imf csppbbrk (8 4:00) 100.0|12

# Event Trigger 9 Starts a small steam leak in the DW.
trgset 9 "0"|14
imf i21 (9) 0.4|14

# Event Trigger 28 sets gain for all 6 APRMs.
trgset 28 "0"|14
trg 28 "irf niagainf true"|14

#### END ####

#Recirc_up.cae
#Simulates pushing the raise high button.
#Gets around the modeling issue with the PDC in ASD.
#Written by JMN
#Date 03/19

set rrdraisehi = true|2
set rrdraisehi = false|3
set rrdraisehi = true|4
set rrdraisehi = false|5
set rrdraisehi = true|6
set rrdraisehi = false|7
set rrdraisehi = true|8
set rrdraisehi = false|9
set rrdraisehi = true|10
set rrdraisehi = false|11
set rrdraisehi = true|12
set rrdraisehi = false|13
set rrdraisehi = true|14
set rrdraisehi = false|15
set rrdraisehi = true|16
set rrdraisehi = false|17
set rrdraisehi = true|18
set rrdraisehi = false|19
set rrdraisehi = true|20
set rrdraisehi = false|21
set rrdraisehi = true|22
set rrdraisehi = false|23
set rrdraisehi = true|24
set rrdraisehi = false|25
set rrdraisehi = true|26
```

```
set rrdraisehi = false|27
set rrdraisehi = true|28
set rrdraisehi = false|29
set rrdraisehi = true|30
set rrdraisehi = false|31
set rrdraisehi = true|32
set rrdraisehi = false|33
set rrdraisehi = true|34
set rrdraisehi = false|35
cae caep\master_recirc_runup.cae|36

#### END ####
```

Unit 2 Risk: GREEN	Unit 3 Risk: GREEN
Unit 2 is 640 MWe	Unit 3 is in Mode 1 at Full Power
Leading Thermal Limit: MAPRAT @ 0.818	Leading Thermal Limit: MAPRAT @ 0.819
Action limit: 0.980	Action Limit: 0.980
Equipment Unavailable: None	Equipment Unavailable: None
Protected Equipment: None	Protected Equipment: None

Current Action Statements

None	LCO Started:	LCO Expires:
TS		
Cause:		

Unit 2 Plant Status

Today	Unit 2 Activities
	**** Shift 1 Activities ****
	**** Shift 2 Activities ****
	Immediately after assuming the shift, shutdown the U2 SBO Diesel Generator per DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests.
	Then raise power 50 MWE by pulling step 13 of the control rod sequence using the SMRMS provided by the QNE. The QNE is on site and just completed review of the REMA and has determined the REMA is acceptable to use for this power increase.
	**** Shift 3 Activities ****
Today	**** Unit 2 Procedures In-Progress **** Do Not Delete ****
	DGP 03-01, Power Changes
	DOS 6620-07, SBO 2(3) Diesel Generator Surveillance Tests

Dresden Generating Station

ILT-N-3

SWAP RFP DUE TO OIL LEAK

RAISE REACTOR POWER USING RECIRCULATION FLOW

APRM FLOW CONVERTER FAILURE

CRD FLOW CONTROL VALVE FAILS CLOSED

ISOLATION CONDENSER INADVERTENT ISOLATION

SMALL STEAM LEAK IN THE DRYWELL / MANUAL SCRAM

ELECTRICAL ATWS / ARI UNSUCCESSFUL

STEAM LEAK IN THE DRYWELL INCREASES / EMERGENCY DEPRESSURIZATION

Rev. 00

11/18

Developed By: _____ _____

Exam Author Date

Approved By: _____ _____

Facility Representative Date

Scenario Outline

Station: Dresden Generating Station **Scenario No.:** ILT-N-3 **Class ID:** 18-1 (2019-301)

Evaluators	Operators	/ crew position
		/ ATC
		/ BOP
		/ CRS

Initial Conditions: 70% power

Turnover: After shift turnover, raise power using Recirc flow.

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.

PC-1.3 – When executing DEOP 200-1, Primary Containment Control, if cannot stay inside the limits of the Pressure Suppression Pressure (PSP) limit, enter DEOP 400-2, Emergency Depressurization and blowdown the reactor.

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.

Event No.	Malf. No.	Event Type*		Event Description
1	NONE	C	ATC	FW – RFP, Swap Due to Oil Leak
2	NONE	R	ATC	RECIRC – Reactivity, Raise Power Using Recirculation Flow
3	WTNP	C / T	BOP	APRM – Flow Converter Failure
4	RDFCVFBL	C	ATC	CRD - FCV, Fails Closed
5	CIGP5AP ICGP5SP	I / T	BOP	ISO COND - System, Spurious Isolation (fails to isolate)
6	I21	M	ALL	MANUAL SCRAM - Steam Leak in the Drywell
7	B12 SER1026 SER1060 AW4	M	ALL	ATWS – Electrical, ARI Unsuccessful
8	I21 K23 K40	M	ALL	EMERGENCY DEPRESSURIZE – On Exceeding Pressure Suppression Pressure Due To Steam Leak inside the Drywell And Partial Loss of Ability to Spray the Drywell / Loss of Bus 23-1 and Bus 28

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

Scenario Objective

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

Scenario Summary

1. Unit is at 70% power.
2. The following equipment is OOS:
   a. None
3. LCOs:
   a. None

Scenario Sequence

- The Team receives a report from the field that 2B RFP has an oil leak. The Team starts 2C RFP and secures 2B RFP
- The Team raises reactor power using recirculation flow.
- An APRM Flow Converter fails.
- The CRD Flow Control Valve fails closed. This causes the controller demand to the CRD FCV to fail high, but all indications are the valve is closed. If the team does not recognize the failure quickly and restore CRD cooling flow, the ROD DRIVE TEMP HI alarm comes up. The Team directs in-plant operators to swap CRD flow control valves and restores CRD flow control to normal.
- The Isolation Condenser initiates due to setpoint drift. The Team will stop operation of the Isolation Condenser and reference Tech Specs.
- A small steam leak in the Drywell begins. The Team manually scrams the Reactor before the automatic Scram occurs.
- When the Reactor scrams, an electrical ATWS occurs. The Team successfully inserts control rods by pulling scram fuses or venting the scram air header.
- The steam leak worsens causing Drywell pressure to rise rapidly. When the Team attempts to spray the Drywell, Bus 23-1 trips resulting in a loss of one Division of Drywell Spray. Eventually Primary Containment pressure will exceed the PSP limit and require the Team to Emergency Depressurize.

Event One – Swap RFP Due to Oil Leak

- Report from the field of an oil leak on 2B RFP.

Malfunctions required: 1

- 2B RFP oil leak

Success Path:

- The Team starts 2C RFP and secures 2B RFP.

Event Two – Raises Reactor Power Using Recirculation Flow

- The Team raises reactor power using recirculation flow as directed by the QNE.

Malfunctions required: 0

None

Success Path:

- Raises reactor power using recirculation flow.

Event Three – APRM Flow Converter Failure

- The APRM Flow converter flow input fails high.

Malfunctions required: 1

- (Flow input to Channel A flow converter fails high)

Success Path:

- The team will insert a half scram on channel A and reference Tech Specs.

Event Four –CRD Flow Control Fails Closed

- The CRD Flow Control valve fails closed.

Malfunctions required: 1

- (CRD Flow Control Valve fails Closed)

Success Path:

- The Team directs in-plant operators to swap the CRD Flow Control valves.
- The Team references Technical Requirements.

Event Five – Isolation Condenser Inadvertent Isolation

- The Isolation Condenser isolates (incomplete) due to mechanical bumping.

Malfunctions required: 2

- (Isolation Condenser spurious isolation).
- (Failed Isolation Condenser Isolation)

Success Path:

- The Team will complete the isolation of the Isolation Condenser and reference Tech Specs.

Event Six – Small Steam Leak in the Drywell / Reactor Scram

A small MSL steam leak develops in the Drywell causing Drywell pressure to rise.

Malfunctions required: 1

- (Small Steam Leak in the Drywell)

Success Path:

- Performs a manual scram.

Event Seven – Electrical ATWS / ARI Unsuccessful

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

Malfunctions required: 1

- (Electrical ATWS)

Success Path:

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

Event Eight – Steam Leak Inside the Drywell / Emergency Depressurization

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

Malfunctions required: 2

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

Success Path:

- The Team performs an Emergency Depressurization.

PRE-SCENARIO ACTIVITIES

1 If applicable, conduct pre-scenario activities in accordance with TQ-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 DGP 03-01, Power Changes, marked up for load drop through inserting control rods to reduce FCL prior to reducing Recirc flow.
   c. Provide the Team a marked up copy of DOP 0202-03, Reactor Recirculation Flow Control System Operation.
   d. Provide a marked up CRSP for the load pickup.

2 Simulator Setup (the following steps can be done in any logical order)
   a. Initialize simulator in an IC which allows establishing the following: (IC 212 used for validation, Rod sequence 2S.0.3, CF1E)
      1) FCL @ ~90%.
      2) Core flow @ 58 to 65 Mlbm/hr.
   b. Cut in/out Cond Demins as needed, to maintain DP within limits.
   c. Ensure running Condensate pump amps within limits.
   d. Advance the chart recorders.

3 Verify the following simulator conditions:

   a. 2A and 2B RFPs running with 2C RFP in STBY on Bus 22.
   b. Verify Zinc Injection label in place for lined up to 2A RFP.
   c. 2B TBCCW pump running with 2A available.
   d. TR 86 Tap Changer in REMOTE / MANUAL.
   e. ALL APRM switches on 902-37 panel are in AVERAGE.
   f. Delete PPC alarm C025 from scan.
   g. Verify FWLC is in Automatic MEDIAN control.

4 Run **Pump_Sumps.cae**

NOTE: <u>DO NOT</u> run the initial setup CAEP file until the above setup is completed.

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

6 Place the following equipment out of service:

   a. None

7 Ensure this setup is peer checked.

8 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 - 2B RFP develops an oil leak, requiring it to be secured		
Trigger	Position	Actions or Behavior
28		**FLOOR INSTRUCTOR / SIMULATOR OPERATOR / ROLE PLAY:** If the team announces that they will adjust gains, inform them an extra NSO will perform the adjustment. Then: ❖ Tell the team you are time compressing. ❖ Direct the simulator operator to activate **TRIGGER 28** and verify gains within limits. ❖ Inform the team the gains are adjusted. (Note: **TRIGGER 28** can be toggled OFF, then back ON as necessary to adjust gains)
		Role Play: Call the control room as the U-2 EO and report, "While I was on rounds, I found 2B RFP has an oil leak on a line to the speed changer. It cannot be stopped". If asked "the oil is contained on the bed plate and I plugged the drain before the oil reached it". If asked to quantify the leak, "I can't tell". If asked, "The oil level is below the sight glass". If asked, "I recommend securing 2B RFP as soon as possible". If asked, "Zinc injection is lined up to 2A RFP". If asked, "2C RFP has been checked and is ready to start".
	ATC	■ Acknowledges report from the field and relays it to the CRS.
	CRS	❑ May enter DOA 0600-01, Transient Level Control. ■ Directs ATC to start 2C RFP and secure 2B RFP.
	ATC	Starts 2C RFP per DOA 0600-01, Transient Level Control, **OR** DOP 3200-03, Startup Of Second Or Third Reactor Feed Pump Or Shifting To Alternate Reactor Feed Pump. ❑ Places RFPs Standby Selector switch, STBY PP SELECT in OFF position. ❑ Closes MO 2-3201C, ❑ Opens 2C RFP RECIRC VLV PCV 2-3201C by placing control switch in OPEN. o Announces 902-6 G-9, RFP RECIRC VLV OPEN ❑ Verifies reactor water level is stable. ❑ Verifies sufficient system pressures. ❑ If previously closed, places MO 2-3201C, 2C PP DISCH VLV control switch to OPEN position. ■ Starts 2C RFP. ❑ Verifies reactor water level is stable. ■ Takes the 2C AUX OIL PP switch to TRIP. ■ Take the 2C AUX OIL PP switch to CLOSE and verifies amber AUTO TRIP light is lit. ❑ WHEN MO 2-3201C, 2C PP DISCH VLV, is fully open, THEN places 2C RFP RECIRC VLV PCV 2-3201C control switch in AUTO. (902-6 G-9, RFP RECIRC VLV OPEN will clear when valve is closed) ❑ Directs EO to perform checks on 2C RFP.

Event One - 2B RFP develops an oil leak, requiring it to be secured

Trigger	Position	Actions or Behavior
		Role Play: If asked following start, "2C RFP is operating normally".
	ATC	Secures 2B RFP per DOP 3200-05, Reactor Feed Pump Shutdown. ❑ Places RFPs standby selector switch, STBY PP SELECT, in OFF. ❑ Verifies the 2B AUX OIL PP control switch in AUTO. ❑ Opens 2B RFP recirculation valve, by placing 2B RFP RECIRC VLV PCV 2-3201B control switch in OPEN position. o Announces 902-6 G-9, RFP RECIRC VLV OPEN ❑ Verifies reactor water level is stable. ❑ Closes MO 2-3201B, 2B RFP DISCH VLV. ❑ Verifies reactor water level remains stable. ■ Stops 2B RFP. ❑ As the RFP slows down, verifies the associated auxiliary oil pump automatically starts. ❑ Close 2B RFP recirculation valve, by placing 2B RFP RECIRC VLV control switch in AUTO position. ❑ Direct an EO to verify the 2B RFP has come to rest. ❑ WHEN 2B RFP has come to rest, THEN may open MO 2- 3201B, 2B RFP DISCH VLV. ❑ Directs EO to perform remaining in plant steps for securing 2B RFP.
		Role Play: EO to verify 2B RFP is at rest: Wait 1 min and ensure 2B RFP RECIRC VLV PCV 2-3201B is closed, then report, "2B RFP is at rest". Acknowledge request to perform procedural steps for 2C and 2B RFPs. After a few minutes, report that the steps are completed.
	CRS	■ Directs 2B RFP Aux Oil PP secured to stop leak.
	ATC	■ Places 2B RFP Aux Oil PP in PTL.
		Role Play: If asked after 2B RFP Aux Oil PP is placed in PTL: Report, the oil leak on 2B RFP has stopped.

Event 1 Completion Criteria:

- **2C RFP started and 2B RFP secured**

-- AND/OR --

At the direction of the Lead Examiner.

Event Two – Raise Reactor Power using Recirculation Flow

Trigger	Position	Crew Actions or Behavior
		ROLE PLAY: Call the Control Room as the TSO and request: "Raise load by 75 MWe".
		SIMULATOR OPERATOR / ROLE PLAY: EO to cut in condensate demin beds: Use instructor station drawing FW4 to cut in condensate demin beds and acknowledge the local trouble alarm. Provide appropriate communications.
		NOTE: With 2 RFPs running the maximum allowable feed flow rate is 9.8 mlbm/hr.
	CRS	■ Directs ATC to raise load with Recirc flow by 75 MWe.
	ATC	Performs the following actions per DGP 03-01, Power Changes, and DOP 0202-03, Reactor Recirculation Flow Control System Operation, as directed: ■ RAISES Recirc Pump speed using Panel 902-5 Recirc Master Manual Control speed pushbuttons.
	BOP	Monitors Panels and provides peer check for changing Recirc flow.

Event 2 Completion Criteria:

- **Sufficient power increase.**

-- AND/OR --

At the discretion of the Lead Examiner.

Event Three – APRM Flow Converter Failure		
Trigger	Position	Crew Actions or Behavior
1 **26**		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **TRIGGER 1**, which causes a failure of Div I APRM flow converter. Verify **TRIGGER 26** actuates when the "A" manual scram push button is depressed.
		FLOOR INSTRUCTOR: If examinee cycles APRM meter function switch between FLOW and AVEARGE more than two times per APRM, provide cue that the meter is pegged high when in the FLOW position.
		ROLE PLAY: Respond as groups notified.
	ATC	Reports and responds to the following DANs" ■ 902-5 D-6, NEUTRON MON FLOW UNIT OFF NORMAL ■ 902-5 C-3, ROD OUT BLOCK ■ Monitors Reactor power, level and pressure.
	BOP	■ Checks for abnormal APRM indication on panel 902-37. • Place METER FUNCTION switch to FLOW position for each APRM meter AND verify indication < 110% • Observes APRMs 1, 2 and 3 indicate > 110% (pegged high) in the FLOW position. ■ Informs the Unit Supervisor APRMs 1, 2 and 3 indicate failed high in the FLOW position ❑ Informs Unit Supervisor of possible Tech Spec applicability from DAN references.
	CRS	References appropriate plant licensing documents and determines: TS 3.3.1.1 APRM instrumentation for Function 2.b in Table 3.3.1.1-1 is INOPERABLE. ■ TS 3.3.1.1, condition A required actions: ❖ A.1 Place Channel in trip within 12 hours. –OR – ❖ A.2 Place associated trip system in trip within 12 hours. ■ TS 3.3.1.1, Condition C required actions: ❖ C.1 Restore RPS trip capability within 1 hour. ■ TRM 3.3.a Function 1.a 3.3.1.1, Condition A.1 required actions: ❖ A.1 Restore inoperable channel to OPERABLE status within 7 days. ■ Directs inserting a Channel A Half Scram to comply with Tech Spec requirements.
	ATC	■ Inserts Channel A half scram per DOP 0500-07 INSERTION/RESET OF MANUAL HALF SCRAM as directed by Unit Supervisor.

Event Three – APRM Flow Converter Failure

Trigger	Position	Crew Actions or Behavior

Event 3 Completion Criteria:

- **Technical Specifications have been referenced,**
- **Half Scram inserted on Channel A,**

-- AND/OR --

At the direction of the Lead Examiner.

Event Four – CRD Flow Control Valve Fails Closed		
Trigger	Position	Crew Actions or Behavior
3		**Simulator Operator:** At the discretion of the Lead Examiner, activate **TRIGGER 3**, which causes the CRD Flow Control Valve to fail closed.
6		**Simulator Operator / Role Play:** After CRD FLOW CONTLR FIC 340-1 is in manual mode AND controller demand is set to minimum and at the discretion of the Lead Examiner, activate **TRIGGER 6**, which simulates swapping CRD FCVs by deleting the failed closed malfunction.
		Role Play: EO to check CRD FCV and/or take local manual control: wait 2 min, then report, "AO 2-0302-6B, 2B CRD FCV, is in-service, appears closed and its positioner is leaking air. I cannot control it locally".
		Role Play: (The following may be requested at any time during the Event) EO to check CRD FCV operation: See below for proper response. EO to check CRD system flow locally (FI 2-302-56); (wait 1 min) Report "CRD system flow indicates (same as control room meter)". EO to check drive water flow locally (FI 2-302-64): (wait 1 min) Report, "CRD drive water flow indicates (same as control room meter)". EO to check cooling water flow locally (FI 2-302-65): (wait 1 min) Report, "CRD cooling water flow indicates (same as control room meter)". EO to check CRD pumps locally: (wait 1 min) Report, "CRD Pumps appear to be operating normally". EO to check RVWLIS flow locally: (wait 1 min) Report, "RVWLIS Flow is 0.4 gallons/hour". Respond as groups notified.
	ATC	❑ From panel monitoring or alarm 902-5 F-3, ROD DRIVE HI TEMP, notices and announces loss of CRD system flow. ■ Diagnoses failure of the CRD Flow Control Valve.
	BOP	❑ May obtain CRD temperatures on the back panel.
	CRS	■ Directs entering and performing actions of DOA 0300-01, Control Rod Drive System Failure. ❑ Notifies Shift Manager and IMD of CRD Flow Controller failure.
	ATC	Performs DOA 0300-01, Control Rod Drive System Failure, actions as directed by the CRS: ❑ Attempts to manually control AO 2-0302-6B, 2B CRD FCV, by placing FIC 2-340-1, CRD FLOW CONTROLLER, in MANUAL and adjusting flow to between 40 and 60 gpm. ❑ IF the Master control station has failed, THEN manually adjust the CRD FCV by taking local manual control of the valve.
	ATC	Continues performing DOA 0300-01, Control Rod Drive System Failure, actions as directed by the CRS: ❑ Directs the EO to transfer the CRD FCVs per DOP 0300-03, Control Rod Drive System Flow Control Valve Transfer.

Event Four – CRD Flow Control Valve Fails Closed

Trigger	Position	Crew Actions or Behavior
		Role Play: EO performing DOP 0300-03, Control Rod Drive System Flow Control Valve Transfer: wait 2 min, then report to NSO that "I'm ready for you to perform step G.6 of DOP 0300-03".
	ATC	❑ At Panel 902-5, verifies CRD FLOW CONTLR FIC 340-1 is in manual mode AND controller demand is set to minimum. ❑ Informs EO step G.6 of DOP 0300-03 is completed.
		Role Play: EO performing DOP 0300-03, Control Rod Drive System Flow Control Valve Transfer: wait 2 min, then report to NSO that "I'm ready for you to perform step G.10 of DOP 0300-03".
	ATC	❑ Directs EO to slowly close 2-0301-41B, U2 CRD SYS B FCV OUTLET VLV.
		Role Play: EO to NSO: wait several min, and then report that "2-0301-41B, U2 CRD SYS B FCV OUTLET VLV is closed". If requested below: "the 2A CRD FCV is operating normally".
	ATC	❑ Raises CRD flow until normal system flow rate is achieved. ❑ Returns CRD Flow Control to AUTOMATIC.

Event 4 Completion Criteria:

- **Team has transferred CRD Flow Control valves and restored normal flow control,**

  -- AND/OR --

At the direction of the Lead Examiner.

Event Five – Isolation Condenser Inadvertent Isolation

Trigger	Position	Crew Actions or Behavior
7		**SIMULATOR OPERATOR:** At the direction of the Lead Examiner, activate **TRIGGER 7**, which inserts a spurious Isolation Condenser Isolation (Group 5 Isolation).
		ROLE PLAY: Respond as Support Groups notified. 2 minutes after the Isolation Condenser is isolated, call the control room as a GCA worker and report: "I was mopping on the 517' Floor of the reactor building near the 2202-28 rack and bumped the dPIS 2-1349-A, ISOLATION CONDENSER CONDENSATE LINE HIGH FLOW DIFFERENTIAL PRESSURE SWITCH. The instrument does not appear to be damaged." If contacted as IMD to investigate the dP switch, wait 3 minutes and report: "The dP switch does not appear to be damaged. We can assemble a work package to perform DIS 1300-02 to verify it is functioning correctly.
	BOP	Reports and responds to DANs: ■ 902-3 B-4, ISOL CONDR VLVS OFF NORM. ■ 902-3 H-2, ISOL CONDR LINE BREAK (GROUP 5 ISOL). ■ Determines Isolation Condenser failed to isolate due to MO 2-1301-1 and 4 valves open.
	TEAM	■ Determines Isolation Condenser isolation spurious due to report from the field.
	CRS	■ Directs isolating the Isolation Condenser.
	BOP	■ Places MO 2-1301-1 and 4 to close. ■ When MO 2-1301-1 and 4 indicate closed, reports that the Isolation Condenser is isolated.
	ATC	❑ Monitors reactor water level, pressure, and power.
	CRS	References appropriate plant licensing documents and determines: ■ TS 3.5.3, condition A. required actions: ❖ A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE immediately, AND, ❖ A.2 Restore IC System to OPERABLE status within 14 days. ■ TS 3.6.1.3, condition A. required actions: ❖ A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve within 4 hours. ❖ A.2 Verify the affected penetration flow path is isolated once per 31 days.

Event 5 Completion Criteria:

- **Isolation Condenser removed from operation,**
- **Technical Specifications have been referenced,**

-- AND/OR --

At the direction of the Lead Examiner.

Event Six - Small Steam Leak in Drywell / Manual Scram

Trigger	Position	Crew Actions or Behavior
8		**SIMULATOR OPERATOR:** At the discretion of the Lead examiner, activate **TRIGGER 8**, which causes a small Main Steam line leak to develop in the Drywell.
		Role Play: U-3 NSO to report Drywell pressure status: Report "U-3 Drywell pressure is 1.2 psig and steady".
	TEAM	■ Recognizes and announces that Drywell pressure is slowly rising.
	CRS	■ Enters and directs performance of DOA 0040-01, Slow Leak.
	ATC	Performs the following actions per DOA 0040-01, Slow Leak, as directed: ❑ Maintain Level with FWLCS (immediate action). ❑ Monitors leakage rate, reactor water level, and Drywell pressure. ■ Inserts manual reactor scram prior to 1.5 psig DW pressure
	BOP	Performs the following actions per DOA 0040-01 Slow Leak, as directed: ❑ Notifies Shift Supervisor and Rad Protection. ❑ Monitors for EP conditions. ❑ Directs search for leak. ❑ Shutdown H_2 Addition. ❑ Makes PA announcement. ❑ Verify Crib House inlet temperature is <95°F. ■ Initiates Torus cooling per "Hard Card". • Place 316A/B AND 318A/B keylock switches in MANUAL (MANUAL OVERRD). • Start one CCSW Pump in each loop AND verify 2(3)A/B valves open. (IF only one CCSW loop available, THEN start second CCSW Pump in same loop.) • Start at least one LPCI pump in each loop. (Start additional LPCI pumps as required.) • Open 21A/B AND 20A/B valves in desired loop. • Throttle open 38A/B valves until > 5000 gpm per LPCI pump is established (maintain LPCI pump discharge pressure > 125 psig OR > 100 psig if ADS is in INHIBIT). • Start additional CCSW Pumps • Adjust CCSW flow controller to > 5000 gpm for two CCSW Pumps [Maintain LPCI/CCSW dP ≥ 7 psid (1 LPCI Pump/loop) OR ≥ 20 psid (two LPCI Pumps/loop)]. • Momentarily place 11A/B valve control switches to close.

Event Six - Small Steam Leak in Drywell / Manual Scram

Trigger	Position	Crew Actions or Behavior
		Role Play: EO to check Drywell CAM: (wait 2 min.) Report, "The Drywell CAM had a step jump to 25K and is trending up". EO to search for leak Report, "I am on my way out to check for leaks". EO to check Cribhouse inlet temperature: (wait 5 min.) Report, "Cribhouse inlet temp is 70°F".
	CRS	❑ Sets Scram contingency of 1.5 psig DW pressure. ❑ May enter DGP 02-03, Reactor Scram, and direct taking scram preparatory actions. ■ Prior to reaching the Drywell Pressure scram setpoint, directs a manual reactor scram per DGP 02-03, Reactor Scram.
	ATC / BOP	Performs scram preparatory actions per DGP 02-03, Reactor Scram, as directed. ❑ ~~Reduces FCL to < 93% by inserting CRAM rods per DGP 03-04 OR in-sequence rods per DGP 03-04.~~ (Not required as Reactor Power < 93%) ❑ Reduces power with Recirc flow to no lower than 56 Mlbm/hr core flow. ❑ Starts MSP and TGOP. ❑ Trips H_2 addition.
	ATC	Performs the following actions per DGP 02-03, Reactor Scram, as directed: ■ Presses scram pushbuttons ■ Places mode switch in shutdown ■ Check rods inserted and determines an electrical ATWS. ❑ Initiates ARI / Determines ARI did not insert control rods. ❑ Announces the electrical ATWS.
	TEAM	Verifies the following as time allows: ❑ Group Isolations ❑ Automatic start of ECCS systems ❑ Automatic start of EDGs.
	CRS	■ Enters DEOP 100, RPV Control, due to high Drywell Pressure and/or low Reactor water level.

Event 6 Completion Criteria:

- **Reactor scrammed.**

-- AND/OR --

At the discretion of the Lead Examiner.

Event Seven – Electrical ATWS / ARI Unsuccessful		
Trigger	Position	Crew Actions or Behavior
9 **10**		**SIMULATOR OPERATOR / ROLE PLAY:** Operator to pull scram fuses: wait 4 min, then activate **TRIGGER 9**. This sequentially pulls the scram fuses. Operator to vent the scram air header: wait 5 min, the activate **TRIGGER 10**. This vents the scram air header.
11		**SIMULATOR OPERATOR / ROLE PLAY:** Operator to lift leads to bypass Off Gas Hi Hi Rad isolations: wait 3 min, activate **TRIGGER 11**, and then report "Off Gas Hi Hi Rad isolations have been bypassed". EO to CLOSE / OPEN the 2-0301-25, U2 CRD Sys Charging Wtr Hdr SV: wait 2 min, and then from Instructor Station drawing RD2, place the 25 vlv in the requested position. Report "the 2-0301-25, U2 CRD Sys Charging Wtr Hdr SV is (insert requested position)".
	ATC	Continues performing the following actions per DGP 02-03, Reactor Scram, as directed: ■ Places MSIV LO-LO LVL BYPASS KEYLOCKs in BYPASS. ■ Runs Recirc pumps back to minimum. ■ Using the RX LOW FLOW CONTROL STATION, 2(3)-640-20, lowers FWLC SETPOINT to -40 inches. ■ Trips Recirc pumps. ■ Initiates SBLC.
	BOP	❑ Performs DGP 02-03, Reactor Scram, as directed.
	CRS	❑ Due to report of ATWS condition, exits DEOP 100 AND enters DEOP 0400-05, Failure to Scram, and directs/performs: ❑ ATC Operator to perform ATWS Hardcard actions. ❑ Placing ADS to inhibit. **(RPV-5.4)** (Not expected to be a Critical Task for this scenario) ❑ Placing Core Spray pumps in PTL. ■ √ Inserting control rods using Alternate Rod Insertion. **(RPV-5.1)** ❖ Directs driving control rods. ❖ Directs pulling scram fuses. ❖ Directs venting scram air header. ❑ Verifying required auto actions. ❑ Directs Lifting leads for the Off Gas high Rad isolations to the WEC. ■ Stabilizing RPV pressure below 1060 psig. **(RPV-5.12)** (Not expected to be a critical task for this scenario)
	BOP	❑ Places ADS to inhibit. **(RPV-5.4)** (Not expected to be a Critical Task for this scenario) ❑ Places Core Spray pumps in PTL. ❑ May control HPCI to prevent injection.

Event Seven – Electrical ATWS / ARI Unsuccessful

Trigger	Position	Crew Actions or Behavior
	ATC	■ √ Inserts control rods per DEOP 500-05, Alternate Insertion Of Control Rods, as follows: (**RPV-5.1**) ❖ Pulling scram fuses. ❖ Venting scram air header. ❖ Drives rods by: ⇒ Bypassing the RWM. ⇒ Maximizing CRD drive water pressure. ⇒ Uses either the ROD MOVEMENT CONTROL switch or the EMERG ROD IN position of the ROD OUT NOTCH OVERRIDE switch.
	CRS	❑ Based on report that all control rods are inserted, exits DEOP 0400-05 and enters DEOP 0100. ❖ May direct securing SBLC.
	ATC	❑ Performs as directed: ❖ If directed, secures SBLC.
	ATC / BOP	■ Performs as directed: ❖ Re-establishes injection using available injection systems to MAINTAIN RPV water level above -162" (in band directed by Unit Supervisor).

Event 7 Completion Criteria:

- **Control rods inserted,**

  -- AND/OR --

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

Event Eight –Steam Leak Inside The Drywell Increases / Emergency Depressurization		
Trigger	Position	Applicant's Actions or Behavior
12		**SIMULATOR OPERATOR:** After the Team has inserted control rods, and at the discretion of the Lead Evaluator, activate **TRIGGER 12**, which increases the Main Steam line leak enough to require the Team to Emergency Depressurize due to exceeding PSP curve.
	TEAM	■ Recognizes and announces that Drywell pressure is rising rapidly.
	CRS	Enters DEOP 0200-01, Primary Containment Control, when Drywell pressure reaches 2 psig and / or Torus bulk temperature reaches 95 deg. F and performs/directs: ■ Verifying of Torus water level <27.5 ft. ■ Initiation of Torus sprays. ■ Monitoring of Drywell temperature (Drywell sprays may be initiated for temperature control) ■ Initiating Torus cooling per "Hard Card". (If not already complete) ■ Monitors Torus level.
		ROLE PLAY: EO to check operation of the EDGs after auto start: Wait 3 minutes and then report "the EDGs are operating normally".
	CRS	Per DEOP 0200-01, Primary Containment Control, when Drywell pressure reaches 9 psig directs: ■ Verifying Recirc Pumps and Drywell Coolers tripped. ■ Verifies the Drywell spray initiation curve prior to the operator manually opening any of the Drywell spray valves. Then directs the Operator to initiate Drywell Sprays. ■ Initiation of Drywell sprays.
	BOP	Performs DEOP 0200-01, Primary Containment Control, actions as directed: ❑ Monitors Drywell temperature and pressure and attempts to initiate torus sprays and drywell sprays pre Hard Card LPCI/CCSW OPERATION, as directed. ■ Initiates Torus cooling per "Hard Card". (If not already complete)
13		**SIMULATOR OPERATOR:** Verify **TRIGGER 13 automatically activates** when MO 1501-27A begins to open. This trips Bus 23-1 on overcurrent. As a result, Div. I of Drywell sprays cannot be initiated.
	ATC / BOP	■ Initiates Drywell Sprays. ❑ Notices and reports the loss of ECCS equipment powered from Bus 23-1. ❑ Reports the loss of Bus 23-1 and 28. ■ Reports Drywell Sprays will not initiate, "A" LOOP has no power and the 2-1501-27B valve will not open.
	CRS	❑ Directs Operators to investigate the loss of Bus 23-1. Directs entry into DGA-12 for Partial Loss of AC Power or DOA 6500-01, 4KV BUS FAILURE.

Event Eight –Steam Leak Inside The Drywell Increases / Emergency Depressurization		
Trigger	Position	Applicant's Actions or Behavior
	BOP	❑ Refers to DAN 902-8 F-5, 4KV Bus 23-1 Overcurrent. As directed, Performs DGA-12, Partial or Complete Loss of AC power or DOA 6500-01, 4KV BUS FAILURE: ❑ Takes actions per DGA 12 for any faulted buses. ❑ Recognizes the loss of Bus 28. ❑ Dispatches EO to Bus 23-1 to investigate the loss of Bus 23-1. ❑ May enter DOA 6500-01, 4kV Breaker Trip.
		NOTE: If team crossties Bus 28 and 29 and Bus 29 trips, allow the team to re-energize Bus 29 from Bus 24-1.
		ROLE PLAY: EO to Bus 23-1: Wait 2 min. then report "The feed breaker to Bus 23-1 from Bus 23 has an overcurrent flag up on it and will not reset". EO to Bus 28: Wait 2 min. then report "Bus 28 has an overcurrent flag up and will not reset" EO to Bus 29: Wait 2 min. then report "I see nothing abnormal at Bus 29".
		ROLE PLAY: If contacted as EMD Foreman: Respond, "I will report to Bus 23-1". **NOTE**: EMD personnel will not report back. DO NOT REPORT BACK ON ATTEMPTS TO OPEN DW SPRAY VALVE TILL after Torus bottom pressure is > 20 psig.
	ATC / BOP	❑ May dispatch an Operator to attempt to manually open "A" LOOP of drywell spray and/or the 2-1501-27B valve.
		ROLE PLAY: EO to open "A" LOOP of drywell spray: Wait 2 min, then report "The handwheel for MO 2-1501-28A will not engage". EO to open the 2-1501-27B valve: wait 2 min, the report "there is equipment in my way to get to the 2-1501-27B. It will take me a little while to get to the valve, I will let you know when I can get to the valve." (It is not intended for this valve to be opened during the scenario)

Event Eight –Steam Leak Inside The Drywell Increases / Emergency Depressurization

Trigger	Position	Applicant's Actions or Behavior
	CRS	■ Recognizes that Emergency Depressurization per DEOP 0400-02 is necessary due to one of the below: o Drywell temperature cannot be maintained below 281°F. o Exceeding the PSP. ❑ May anticipate blowdown per DGP 02-03. **√ Enters DEOP 400-02, Emergency Depressurization, and directs: (PC-1.3)** ■ If Drywell pressure >2 psig, prevention of injection from LPCI/CS pumps not needed for core cooling. ❑ Initiation of Iso Condenser to maximum flow. • Initiates Isolation Condenser makeup after Isolation Condenser initiation ❑ Verification of Torus level > 6ft. ■ √ Opening all ADS valves. ❑ Verifying all relief valves open. **(RPV-2.1)**
	BOP	**√ Performs DEOP 400-02, Emergency Depressurization, as directed. (PC-1.3)** ❑ If Drywell pressure is greater than +2 psig, prevents injection from LPCI/CS pumps not needed for Core cooling per Hard Card, LPCI INJ/CC CONTROL/SHUTDOWN. ❑ Initiates Iso Condenser to maximum flow per Hard Card, ISOLATION CONDENSER. • Initiate Isolation Condenser makeup after Isolation Condenser initiation ❑ Verifies Torus level >6 feet. ■ **√ Open all ADS valves. (RPV-2.1)** ❑ Verifies all relief valves open.

Event 8 / Scenario Completion Criteria:

- **Emergency depressurization in progress;**
- **RPV Level is being controlled;**

-- AND/OR --

At the discretion of the Lead Evaluator.

REFERENCES

PROCEDURE	TITLE
DAN 902-3 B-4	ISOL CONDR VLVS OFF NORM
DAN 902-3 H-2	ISOL CONDR LINE BREAK (GROUP 5 ISOL)
DAN 902-5 A-6	APRM HI
DAN 902-5 C-3	ROD OUT BLOCK
DAN 902-5 D-6	NEUTRON MON FLOW UNIT OFF NORMAL
DAN 902-5 F-3	ROD DRIVE HI TEMP
DAN 902-8 F-5	4KV BUS 23-1 OVERCURRENT
DEOP 0100	RPV CONTROL
DEOP 0200-01	PRIMARY CONTAINMENT CONTROL
DEOP 0400-02	EMERGENCY DEPRESSURIZATION
DEOP 0400-05	FAILURE TO SCRAM
DEOP 500-05	ALTERNATE INSERTION OF CONTROL RODS
DGA 07	UNPREDICTED REACTIVITY ADDITION
DGA 12	PARTIAL OR COMPLETE LOSS OF AC POWER
DGP 02-03	REACTOR SCRAM
DGP 03-01	POWER CHANGES
DOA 0040-01	SLOW LEAK
DOA 0300-01	CONTROL ROD DRIVE SYSTEM FAILURE
DOA 0300-12	MISPOSITIONED CONTROL ROD
DOA 0600-01	TRANSIENT LEVEL CONTROL
DOA 6500-01	4KV BREAKER TRIP
DOP 0202-03	REACTOR RECIRCULATION FLOW CONTROL SYSTEM OPERATION
DOP 0300-03	CONTROL ROD DRIVE SYSTEM FLOW CONTROL VALVE TRANSFER
DOP 3200-03	STARTUP OF SECOND OR THIRD REACTOR FEED PUMP OR SHIFTING TO ALTERNATE REACTOR FEED PUMP
DOP 3200-05	REACTOR FEED PUMP SHUTDOWN
DOP 4700-03	U2/3 IA CROSS-CONNECT OPERATION
DOP 6700-20	480 VOLT BREAKER TRIP
TS 3.3.5.2	ISOLATION CONDENSER (IC) SYSTEM INSTRUMENTATION
TS 3.5.3	IC SYSTEM
TRM 3.3.h	RVWLIS

Simulator Scenario Review Checklist

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

CAEP Files

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# 18-1 ILT-N-1.cae
# For ILT Class 18-1 NRC Exam
# Written by DSS
# Rev 00
# Date 11/18

#### INITIAL CONDITIONS ####

# Sets APRM Master Gain pot to 1.0
irf niagain 1.0

# Overrides Panel 2202-70A(B) Trouble alarm points OFF so pulling ARI fuses does not cause alarm.
# Pulls ARI fuses.
Imf ser1026 off
imf ser1060 off
irf aw4 pulled|4

# Inserts an electrical ATWS.i
mf b12

# Prevents 2-1501-27B, Div 2 DW spray valve, from opening
ior lpdvlvop18 off

# Prevents Flow Unit 2 Comparator light from turning on
imf ser0920 1

#Inserts an incomplete inboard Isolation Condenser Isolation
imf CIGP5AP

#### EVENT TRIGGERS ####

# Event Trigger 1 inserts a failure of the Div 1 APRM flow converter
trgset 1 "0"|2
imf nvmflwd1 (1) 21.4|2
ior nilblpcm2 (1) off|2

# Event Trigger 3 inserts a CRD flow control valve fail closed.
trgset 3 "0"|4
imf rdfcvfcl (3)|4

# Event Trigger 4 Holds one of the CRD's temperature higher so alarm 902-5 F-3 comes up sooner.
trgset 4 "0"|4
trg 4 "ramp rdtcrdm(3) 251.0 252.0 1:00:00"|4

# Event Trigger 5 Releases the CRD's temperature hold so alarm 902-5 F-3 clears.
trgset 5 "0"|4
trg 5 "ramp rdtcrdm(3) 251.1 251.0 1"|4

# Event Trigger 6 deletes the CRD flow control valve fail closed.
trgset 6 "0"|6
trg 6 "dmf rdfcvfcl"|6

# Event Trigger 7 simulates a spurious Isolation Condensor Isolation.
trgset 7 "0"|6
imf ICGP5SP (7) 0.0|6
```

```
# Event Trigger 8 Inserts a small DW MSL leak of 0.012%.
trgset 8 "0"|6
imf i21 (8) 0.012 10:00 0.002|6

# Event trigger 9 Simulates pulling RPS scram fuses.
Trgset 9 "0"|8
irf rpfusea1 (9) pulled|8
irf rpfusea2 (9 20) pulled|8
irf rpfusea3 (9 40) pulled|8
irf rpfusea4 (9 60) pulled|8
irf rpfuseb1 (9 1:20) pulled|10
irf rpfuseb2 (9 1:40) pulled|10
irf rpfuseb3 (9 2:00) pulled|10
irf rpfuseb4 (9 2:20) pulled|10

# Event trigger 10 Simulates venting scram air header.
trgset 10 "0"|12
irf rdscrair (10) open|12

# Event Trigger 11 lifts the leads for the Offgas High Rad isolations.
trgset 11 "0"|12
irf ogogjp (11) in|12

# Event Trigger 12 Increases DW MSL leak to 6%.
trgset 12 "0"|14
trg 12 "mmf i21 6.0 5:00 2.0"|16

# Event Trigger 13 activates when dw spray valve mo 1501-27a starts to open.
# trips bus 23-1 and bus 28 on overcurrent.
trgset 13 "lplvlvop(17)"|14
imf k23 (13)|14
imf k40 (13)|14

# Event triggers 14-17 automatically actuate to simulate APRM 1 indicating pegged high flow on 902-37.
trgset 14 "hwnidlmet1(6)"|16
ior nigbaprm1 (14) 125|16

trgset 15 "hwnidlmet1(7) .and. et_array(14)"|18
trg 15 "dor nigbaprm1"|18

trgset 16 "hwnidlmet1(6) .and. et_array(15)"|18
trg 16 "ior nigbaprm1 125"|18

trgset 17 "hwnidlmet1(7) .and. et_array(16)"|20
trg 17 "dor nigbaprm1"|20

# Event triggers 18-21 automatically actuate to simulate APRM 2 indicating pegged high flow on 902-37.
trgset 18 "hwnidlmet2(6)"|20
ior nigbaprm2 (18) 125|20

trgset 19 "hwnidlmet2(7) .and. et_array(18)"|22
trg 19 "dor nigbaprm2"|22

trgset 20 "hwnidlmet2(6) .and. et_array(19)"|22
trg 20 "ior nigbaprm2 125"|22

trgset 21 "hwnidlmet2(7) .and. et_array(20)"|24
```

```
trg 21 "dor nigbaprm2"|24

# Event triggers 22-25 automatically actuate to simulate APRM 3 indicating pegged high flow on 902-37.
trgset 22 "hwnidlmet3(6)"|24
ior nigbaprm3 (22) 125|24

trgset 23 "hwnidlmet3(7) .and. et_array(22)"|26
trg 23 "dor nigbaprm3"|26

trgset 24 "hwnidlmet3(6) .and. et_array(23)"|26
trg 24 "ior nigbaprm3 125|26

trgset 25 "hwnidlmet3(7) .and. et_array(24)"|28
trg 25 "dor nigbaprm3"|28

#Event trigger 26 actuates to simulate a Channel A half scram with the B12 failure to scram malfunction loaded.
trgset 26 "hwrpd301a"|28
ior rpl500a (26) off|28
ior rpl500c (26) off|30
ior rpl500e (26) off|30
ior rpl500g (26) off|30
imf ser1039 (26) 2|30
imf ser1040 (26) 2|32

# Event Trigger 28 sets gain for all 6 aprms.
trgset 28 "0"|32
trg 28 "irf niagainf true"|32

#### END ####
```

Unit 2 Risk: GREEN	Unit 3 Risk: GREEN
Unit 2 is in Mode 1 at 650 MWe,	Unit 3 is in Mode 1 at full power
Leading Thermal Limit: MFLCPR @ 0.881	Leading Thermal Limit: MAPRAT @ 0.819
Action limit: 0.980	Action Limit: 0.980
Equipment Unavailable: None	Equipment Unavailable: None
Protected Equipment: None	Protected Equipment: None

Current Action Statements

None	LCO Started:	LCO Expires:
TS		
Cause:		

Unit 2 Plant Status

Today	Unit 2 Activities
	**** Shift 1 Activities ****
	**** Shift 2 Activities ****
	The TSO is expected to request Load picked up early in the shift. The QNE recommends raising Core flow for the upcoming load pickup.
	**** Shift 3 Activities ****
Today	**** Unit 2 Procedures In-Progress **** Do Not Delete ****
	DGP 03-01, Power Changes.

Dresden Generating Station

ILT-N-4

RFP VENT FANS SWAP FOR MAINTENANCE

LOSS OF CONTROL ROD POSITION INDICATION

RBCCW PUMP TRIP

IRM FAILS UPSCALE CAUSING HALF SCRAM

CIRCULATING WATER PUMP TRIP DUE TO OVERCURRENT

FLOODING IN CONDENSATE PUMP ROOM / MANUAL SCRAM

HPCI STEAM LINE LEAK INTO THE HPCI ROOM / 2 AREAS ABOVE MAX SAFE RADIATION LEVELS / EMERGENCY DEPRESSURIZE

Rev. 00

11/18

Developed By: _____ _____
Exam Author Date

Approved By: _____ _____
Facility Representative Date

Scenario Outline

Station: Dresden Generating Station **Scenario No.:** ILT-N-4 **Class ID:** 18-1 (2019-301)

Evaluators	Operators	/ crew position
		/ ATC
		/ BOP
		/ CRS

Initial Conditions: Startup; Steady at ~ 5% Power

Turnover: Plant Inspections in progress. Resume pulling control rods next shift.
After shift turnover, swap RFP vent fans

Critical Tasks:
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), enter DEOP 0400-02, Emergency Depressurization.

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).

Event No.	Malf. No.	Event Type*		Event Description
1	NONE	N	BOP	HVAC – RFP Vent Fan, Swap For Maintenance
2	RDFAILF5	I / T	ATC	CRD - RPIS, Loss of Control Rod Position Indication
3	B38	C	BOP	RBCCW – Pump Trip
4	NII12POT	I	ATC	NI – IRM, Fails Upscale Causing Half Scram
5	NONE	T	CRS	RPS – EPA Breaker Inoperable
6	HP6 HP7	C	BOP	CIRC WATER - Pump, Trip Due To Overcurrent
7	HP3	M	ALL	MANUAL SCRAM - Flooding in Condensate Pump Room
8	HPRMBRKP	M	ALL	EMERGENCY DEPRESSURIZE – On 2 Areas Above Max Safe Radiation Levels Due To FEF and HPCI Steam Line Leak into the HPCI Room / Failed Closed ERV

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

Scenario Objective

Evaluate the Team's ability to operate the plant with a steam leak requiring Emergency Depressurization.

Scenario Summary

Initial Conditions:

1. Unit is at ~5% power.
2. The following equipment is OOS:
   a. None
3. LCOs:
   a. None

Scenario Sequence

- The Team swaps RFP Vent Fans for Maintenance.
- Control rod F-05 loses all RPIS indication. The Team will insert the control rod, reference Tech Specs and direct taking it OOS.
- A trip of a RBCCW pump occurs. The Team starts the standby RBCCW pump.
- IRM channel 12 then fails upscale and a half-scram occurs on the RPS "A" channel. The SRO addresses the technical specification requirements for the failure. Then the NSO bypasses the failed IRM channel and resets the half scram. After the IRM is bypassed, the QNE informs the team that two control rods are not in compliance with the analyzed rod pattern.
- The 2A Circulating water pump trips on overload. The Team starts the 2B Circulating water pump.
- An unisolable leak in the Condensate System causes flooding in the Condensate Pump Room. As a result, the Team performs a manual scram and shuts down the Condensate pumps.
- A Fuel Element Failure (FEF) and an unisolable HPCI steam line leak in the HPCI Room occur. When the HPCI Room temperature reaches Max Normal Level, (150 °F) the Team will enter DEOP 0300-01, Secondary Containment Control. The HPCI Room High Temperature isolation fails and the crew will attempt to close the HPCI steam line isolation valves MO 2301-4 & 5 manually. Failures in the control logic for the MO 2301-4 & 5 valves prevent closing the valves. The Team will Emergency Depressurize when 2 or more reactor building radiation levels exceed Max Safe Levels. The 3E ERV will fail to open and the team will be required to use Emergency Depressurization systems listed in DEOP 0400-02, Detail O.

Event One – Swap RFP Vent Fans

- When directed, swaps RFP Vent Fans.

Malfunctions required:

- (None)

Success Path:

- Swaps RFP Vent Fans.

Event Two – Control Rod RPIS Failure

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

Malfunctions required: 1

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

Success Path:

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

Event Three – Trip of RBCCW Pump

- 2A RBCCW Pump trips on overcurrent.

Malfunctions required: 1

- (RBCCW pump trip)

Success Path:

- The Team starts the standby RBCCW pump

Event Four – IRM Channel Fails Upscale, Two rods out of compliance with the analyzed rod pattern

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

Malfunctions required: 1

- (IRM Fails Upscale)

Success Path:

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

Event Five – Circulating Water Pump Trip

- The crew should recognize and respond to Circulating water pump 2A tripping on overload.

Malfunctions required: 1

- (Circulating Water Pump trip)

Success Path:

- Start 2B Circulating Water Pump.

Event Six – Flooding in Condensate Pump Room / Manual Scram

- An unisolable Condensate System leak occurs in the Condensate Pump Room.

Malfunctions required: 1

- (Flooding in Condensate Pump Room)

Success Path:

- Performs DOA 0040-02, Localized Flooding in Plant.
- Manually scrams the reactor.

Event Seven – FEF / Steam Leak in HPCI Room / Secondary Containment High Radiation / Emergency Depressurization

- A fuel element failure and an unisolable HPCI steam line leak in the HPCI Room occur
- Failed ERV

Malfunctions required: 2

- (Fuel Element Failure)
- (Unisolable HPCI steam line leak in the HPCI Room)
- (Mechanically bound ERV)

Success Path:

- Performs DEOP 0300-01, Secondary Containment Control.
- Performs DEOP 0400-02, Emergency Depressurization.
- Utilizes DEOP 0400-02 Detail O Emergency Depressurization Systems.

PRE-SCENARIO ACTIVITIES

1 If applicable, conduct pre-scenario activities in accordance with TQ-AA-155-J040, SIMULATOR EXAMINATION BRIEFING.

2 Provide the Team with marked up copies of the following:

   a. DOP 5750-06, Reactor Feed Pump Motor Ventilation System.

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

   a. Initialize simulator in an IC with Reactor power at ~5%. (IC 213 used for validation, sequence 2I.0.0 2A24)

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

   c. Ensure running Condensate pump amps within limits.

   d. Advance the chart recorders.

4 Verify the following simulator conditions:

   a. Verify MSL drains MO 2-220-1, 2, 3 & 4 open.

   b. Verify 2A RFP Vent Fan running.

   c. Verify 2A and 2C Circ Wtr pumps running with 2B available.

   d. Verify 2A and 2/3 (on Bus 24-1) RBCCW pumps running. (2B RBCCW pump available)

   e. Verify 2A & 2B IACs are operating with 3C IAC OFF.

   f. MSO cards removed from the panels.

5 Place the following equipment out of service:

   a. None

   NOTE: Perform the above setup prior to running the setup CAEP file.

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

7 Load but DO NOT RUN CAEP file: **ILT-N-4 Rad.cae**

8 Ensure this setup is peer checked.

9 Complete the Simulator Setup Checklist.

10 The Rad Malfunctions used in CAEP file ILT-N-4 Rad.cae do not reset when the IC is reset. Therefore, when the scenario is completed, EITHER:

   a. Run CAEP file: **ILT-N-4 Clear Rad.cae**; OR,

   b. Stop and Restart MST.

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

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

Event One – Swap Reactor Feed Pump Vent Fans

Trigger	Position	Crew Actions or Behavior
		ROLE PLAY: If the Team delays swapping fans, call as the Shift Manager and direct the Team to start 2B RFP Vent Fan and secure 2A RFP Vent Fan. EO stationed at RFP Vent Fans: If asked, report that "the RFP Vent Fans operated as expected".
		Note: Per DOP 5750-06, Reactor Feed Pump Motor Ventilation System, fan control switches should be held in CLOSE for 45 seconds to allow airflow to develop. If the Team does not successfully start 2B RFP Vent fan due to not holding the control switch long enough and to avoid RFP high stator temperature computer alarms, provide the following Role Play: **Role Play:** Cue as the Shift Manager to the CRS: "I recommend holding the 2B RFP Vent fan control switch to CLOSE for 45 sec."
	CRS	Directs starting 2B RFP Vent Fan and securing 2A RFP Vent Fan per DOP 5750-06, Reactor Feed Pump Motor Ventilation System.
	BOP	Performs DOP 5750-06, Reactor Feed Pump Motor Ventilation System, as follows. ■ Places the on-coming RFP VENT FAN control switch to START AND hold. ■ Places the off-going RFP VENT FAN control switch to TRIP. ❑ Releases the on-coming RFP VENT FAN control switch.
	ATC	❑ Monitors panel, provides assistance as directed.

Event 1 Completion Criteria:

- **RFP Vent Fans swapped,**

  -- AND/OR --

  At the direction of the Lead Examiner.

Event Two – Control Rod RPIS Failure		
Trigger	Position	Crew Actions or Behavior
1		**SIMULATOR OPERATOR:** At the direction of the Lead Examiner, activate **TRIGGER 1**, RPIS failure for control rod F-05.
		CUE: If Team checks Process Computer for Control Rod F-05 position, cue that "the Process Computer displays BAD for F-05 position.
		ROLE PLAY: Respond as Support Groups notified.
	ATC	Reports and responds to DANs 902-5 A-3 ROD DRIFT, and B-3 ROD WORTH MIN BLOCK. ■ Views Full Core Display and identifies CRD with Rod Drift light. ■ Selects Control Rod F-05 and reports no indication on Four Rod Display for Control Rod F-05.
	ATC	Recognizes loss of control rod F-05 position indication on Full Core Display, Four Rod Display, RWM, and/or Process Computer.
	CRS	Enters DOA 0300-06, RPIS Failure, and directs its actions.
	ATC	Performs subsequent actions of DOA 0300-06, RPIS FAILURE: ❑ May insert Rod F-05 to 00 prior to entering DOA 0300-06. ■ Disable RWM select blocks. • Select RWM MAIN MENU • Select disable RWM select blocks ■ Enters substitute position of 48 for F-05. • Select SECONDARY FUNCTIONS • Select the desired Rod • Select SUBSTITUTE POSITION • Select desired substitute Rod position, then select 'Apply' • Verify the Rod is selected on the select matrix AND the RWM Primary Display indicates the Rod has a substitute position entered ■ Inserts control rod F-05 one notch. ❑ Determines no control rod position indication at alternate position. ■ Bypasses the RWM (DOP 0400-02) ■ Drives rod F-05 to fully inserted position. Checks for a step reduction in drive water flow to indicate stall flow. ❑ Calls WEC to electrically or hydraulically isolate the control rod F-05 HCU.

Event Two – Control Rod RPIS Failure

Trigger	Position	Crew Actions or Behavior
	ATC	❑ May enter a substitute position and take OOS on the RWM per DOP 0400-02, Rod Worth Minimizer. o Select SECONDARY FUNCTIONS o Select the Rod to be taken OOS on the select matrix o Select the Rod to be taken OOS on the RWM Screen o Verify the Rod is enclosed in a blue box o Select ROD OUT OF SERVICE and verify message "Rod F-05 placed out of service" o Verify insert and withdraw blocks are applied o Verify the Rod is indicated in light blue
	CRS	References appropriate plant licensing documents and determines: ■ TS 3.1.3, condition C, required actions: ❖ C.1 Fully insert inoperable control rod within 3 hours. AND ❖ C.2. Disarm the associated CRD within 4 hours. ■ TS 3.3.2.1, condition C, Rod worth minimizer (RWM) inoperable during reactor startup, required actions: ❖ C.1. Suspend control rod movement except by scram immediately <u>OR</u> ❖ C.2.1.1 Verify ≥ 12 rods withdrawn immediately. <u>OR</u> ❖ C.2.1.2 Verify by administrative methods that startup with RWM inoperable has not been performed in the last 12 months immediately. <u>AND</u> ❖ C.2.2 Verify movement of control rods is in compliance with analyzed rod position sequence by a second licensed operator or other qualified member of the technical staff during control rod movement. ❑ Directs electrically or hydraulically isolating control rod F-05 HCU.
		<u>ROLE PLAY</u> As QNE acknowledge reports. If concurrence is requested for any action, report "I concur with (insert requested action here)"
	BOP	❑ Monitors panel, provides assistance as directed.
	TEAM	❑ May enter DOA 0300-12, Mispositioned Control Rod. ❑ Notifies the Shift Manager, QNE, Work Week Manager, FIN team, IMD, OR EMD.
		<u>ROLE PLAY:</u> When EO directed to disarm control rod F-05, report: "I'll disarm F-05 after I receive a pre-job brief" (it is not intended for this to be completed).
	ATC	❑ Records failed RPIS indication per DOS 0300-06, CRD Abnormality Record.

Event Two – Control Rod RPIS Failure

Trigger	Position	Crew Actions or Behavior

Event 2 Completion Criteria:

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

-- AND/OR --

At the direction of the Lead Examiner.

Event Three – RBCCW Pump trip

Trigger	Position	Crew Actions or Behavior
2		**Simulator Operator:** Shortly after the team has completed the previous Event, activate **TRIGGER 2**, which trips 2A RBCCW pump. EO to check 2A RBCCW pump breaker: Wait 2 min, then report, "the 2A RBCCW pump breaker is OPEN and an overcurrent target is up". EO to check 2A RBCCW pump: Wait 2 min, then report, "the 2A RBCCW pump motor is very hot". EO to check 2B RBCCW pump: Wait 2 min, then report, "the 2B RBCCW pump is operating normally".
	BOP	❑ Announces alarm 923-1 C-1, U2 Or U3 RBCCW PP Trip. Performs DOA 3700-01, Loss Of Cooling By Reactor Building Closed Cooling Water (RBCCW) System, and / or DAN 923-1 C-1, U2 Or U3 RBCCW PP Trip, as directed: ■ Starts 2B RBCCW pump. (Immediate action) ❑ Verifies RBCCW system operating normally. Performs DOA 6500-10, 4KV Circuit Breaker Trip, as directed: ❑ Directs EO to check status of 2A RBCCW pump breaker. ❑ Based on breaker report, places 2A RBCCW pump control switch in PTL.
	CRS	■ Enters DOA 3700-01, Loss Of Cooling By Reactor Building Closed Cooling Water (RBCCW) System. ❑ Enters DOA 6500-10, 4KV Circuit Breaker Trip.
	ATC	❑ Monitors panel, provides assistance as directed.

Event 3 Completion Criteria:

- **Standby RBCCW pump started**

-- OR --

At the discretion of the Floor Instructor/Evaluator

Event Four & Five – IRM Fails Upscale with Half Scram / EPA Breaker Inop		
Trigger	Position	Crew Actions or Behavior
3		**SIMULATOR OPERATOR / ROLE PLAY:** At the discretion of the Lead Examiner, activate **TRIGGER 3**, which fails IRM channel 12 upscale.
	ATC	Perform the following actions per DAN 902-5 C-10, CHANNEL A IRM HI HI/INOP: ❑ If not in the RUN Mode, verifies the following occurred: o Channel A half scram o No rods Scrammed. o Rod Block. ❑ Verifies IRM 12 readings against other IRMs on 902-5 panel. ❑ Verifies IRM range switch in correct position ■ Bypasses IRM 12 after T. S. compliance verified by CRS. ■ Resets RPS channel A per DOP 0500-07, Insertion/Reset of Manual Half Scram, as follows: o Verifies half scram no longer required • Turns the Scram Reset switch in each direction and verifies all eight white group solenoid lights are lit. o Verifies alarm 902-5 A-10, Channel A Manual Trip, resets.
	BOP	Performs the following actions per DAN 902-5 C-10: ❑ Verifies IRM 12 readings against other IRMs on 902-36 panel. ❑ Verifies IRM 12 function switch in operate.
	CRS	■ Directs IRM 12 bypassed and the half scram reset per DOP 0500-07, Insertion/Reset of Manual Half Scram. ❑ Notifies the Shift Manager and IMD.
		ROLE PLAY: At the discretion of the Lead Examiner, call as the Shift Manager and report: "Engineering has determined the following equipment inoperable: • 2-500-2B-1, 2B RPS MG SET 2B-1 EPA BKR • 2-500-2B-2, 2B RPS MG SET 2B-2 EPA BKR ALL other EPA breakers are operable".
	CRS	■ References plant technical documents and determines: • TS 3.3.8.2 (RPS Electric Power Monitoring) Condition A: Remove associated in-service power supply(s) from service within 72 hr. • TS 3.3.8.2 (RPS Electric Power Monitoring) Condition B: Remove associated in-service power supply(s) from service within 1 hr. ❑ May direct WEC to brief an operator to swap RPS Bus A to the alternate power supply per DOP 0500-03, RPS Power Supply Operation.

Event Four & Five – IRM Fails Upscale with Half Scram / EPA Breaker Inop

Trigger	Position	Crew Actions or Behavior

Event 4 & 5 Completion Criteria:

- **IRM 12 bypassed,**
- **Half scram reset,**
- **Tech Spec determination complete.**

-- AND/OR --

At the direction of the Lead Examiner.

Event Six – Circulating Water Pump 2A Trips on Overload.

Trigger	Position	Crew Actions or Behavior
4		**Simulator Operator:** At the discretion of the Lead Examiner, activate **TRIGGER 4**, which trips 2A Circulating Water pump.
	BOP	Performs the following actions per DAN 902-7 A-15, Circ Wtr PP Trip, DOA 4400-01, Circulating Water System Failure, and DOA 6500-10, 4KV Circuit Breaker Trip, as directed: ■ Starts 2B Circulating Water pump. (immediate action) ❑ Verifies condenser vacuum returning to normal. ❑ Verifies 2A Circulating Water pump discharge valve closes. ❑ Sends EO to check 2A Circulating Water pump breaker and operation of 2B Circulating Water pump. ■ Places 2A Circulating Water pump control switch in PTL. ❑ Verifies Circulating Water Flow reversal valves lined up normally. ❑ May send EO to check Cribhouse bar racks and traveling screens.
		Role Play: As the EO sent to 2A Circulating Water pump breaker (wait 3 min), then report: "2A Circulating Water pump breaker is open with an overcurrent target up". As the EO sent to 2A Circulating Water pump (wait 3 min), then report: "2A Circulating Water pump motor is hot to the touch". If asked, report "the 2A Circulating Water pump discharge valve is closed" As the EO sent to check 2B Circulating Water pump operation (wait 2 min), then report: "2B Circulating Water pump is operating normally". As the EO sent to check Cribhouse bar racks and traveling screens (wait 3 min), then report: "the Cribhouse bar racks and traveling screens are clear".
	CRS	■ Enters and directs performance of DOA 4400-01, Circulating Water System Failure, and DOA 6500-10, 4KV Circuit Breaker Trip. ❑ Notifies the Shift Manager and EMD.
	ATC	❑ Monitors panels and assists as directed.

Event 6 Completion Criteria:

- **2B Circulating Water pump started,**

  -- AND/OR --

  At the direction of the Lead Examiner.

Event Seven – Condensate Pump Room Flooding / Reactor Scram

Trigger	Position	Crew Actions or Behavior
5		**SIMULATOR OPERATOR:** At the discretion of the Lead Examiner, activate **TRIGGER 5**, which starts Condensate Pump Room flooding.
		ROLE PLAY: As the EO sent to investigate the Condensate Pump Room: wait 2 min, then report: "there is a large amount of water spraying from the Condensate Booster Pump common discharge header". If asked as the EO at the leak: "the leak cannot be isolated".
	BOP	❑ Announces alarms: ○ 902-4 D-20, Turb Bldg Flr Drn Sump Lvl Hi. ○ 902-4 C-20, Turb Bldg Equip Drn Sump Lvl Hi. ○ 902-6 H-2, Condenser Lvl Lo. ○ 902-6 H-4, Cond Emerg Make-up Vlv Open. ○ 902-6 G-11, Condensate Make-up Pp Auto Start. ○ 902-7 F-16, Cond Pp Rm Wtr Lvl Hi.
	CRS	■ Enters DOA 0040-02, Localized Flooding in Plant, and directs actions.
	BOP	Performs DOA 0040-02, Localized Flooding in Plant, actions as directed. ❑ Makes PA announcement. ❑ Sends operator(s) to investigate.
	CRS	Determines the Condensate System leak cannot be stopped and performs / directs: ■ Manual scram per DGP 02-03, Reactor Scram.
	ATC / BOP	Performs manual scram per DGP 02-03, Reactor Scram: ■ Places Mode Switch to Shutdown and depresses the Scram pushbuttons. ■ Determines all rods are inserted. ❑ Maintains RPV level as directed by CRS. ❑ Inserts SRMs and IRMs.
	BOP	Performs manual scram per DGP 02-03, Reactor Scram.
	CRS	■ Directs the RFP and Condensate pumps shutdown.
	ATC	■ Shuts down the RFP and Condensate Pumps.

Event 7 Completion Criteria:

- **Reactor scram actions in progress,**
- **Condensate Pumps shutdown,**

-- AND/OR --

At the direction of the Lead Examiner.

Event Eight – FEF / Steam Leak In HPCI Room / Secondary Containment High Radiation / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
6		**Simulator Operator:** When Condensate and Feed is secured, or at the discretion of the Floor Instructor / Lead Evaluator, activate **TRIGGER 6**. This causes: • A Fuel Element Failure. • A HPCI Room steam line break. When **TRIGGER 6** is activated, immediately RUN CAEP file **ILT-N-4 Rad.cae**. **Role Play:** EO sent to HPCI: wait 2 min, then report "the HPCI room is filled with steam. I left the area". Several minutes after above report, report as one of the EOs sent to the Rx Bldg "there is steam coming from the West LPCI Corner Room stairway; I am leaving the area". EO to Panel 902-39 in AEER: wait 3 min, call on the phone and report "there is an acrid odor coming from the 902-39 panel, but there is no indication of a fire"... **Role Play:** RP to take local RX Bldg radiation readings: Report "The highest reading is on the 1st floor near the west CRD accumulators. The reading is (provide the value from the W. CRD area as directed below)". For further reports provide EITHER: • The W. CRD ARM value; OR, • Once the W CRD area ARM is full upscale (100 mr/hr): 1000 mr/hr. **Note:** Use time compression if desired and report that radiation levels are >2500 mr/hr. **Floor Instructor / Lead Evaluator:** When directed by the Floor Instructor/Lead Evaluator once the W. CRD area ARM is full scale, provide the Communicator with field radiation levels. "W.CRD area radiation levels are 2600 mr/hr the Reactor Building has been evacuated" This will provide the crew a second area above Max Safe.
	BOP	❑ Announces alarm 902-3 G-2 for Area High Temperature. ❑ Checks back panel and determines HPCI Room temperatures are rising. Reports values to Unit Supervisor.
	CRS	When Rx Bldg Area High Temp alarm is received for the HPCI area, enters DEOP 0300-01, Secondary Containment Control. ■ Directs operator to isolate the HPCI system. ■ Determines steam leak cannot be isolated.
	BOP	❑ When directed, attempts to close HPCI MO 2301-4 & 5 to isolate the HPCI system. Reports the valves will not close. May send operator to check its breaker.
	CRS	Per DEOP 0300-01, before a Max Safe value is reached, and / or when RPV level drops below 8 inches, enters DEOP 0100, RPV Control. ■ Directs injecting with CRD and SBLC.

Event Eight – FEF / Steam Leak In HPCI Room / Secondary Containment High Radiation / Emergency Depressurization		
Trigger	Position	Crew Actions or Behavior
	BOP	❑ Announces alarm 902-3 A-1 for Rx Bldg Rad Hi. ❑ Obtains DEOP related ARM readings and reports values to Unit Supervisor.
	CRS	❑ Reenters DEOP 0300-01, Secondary Containment Control, due to Vent Rad above 4 mr/hr. ❑ Verifies Reactor Building Vent Isolation and SBGT start. ❑ Enters DGA-16, Coolant High Activity/Fuel Element Failure and directs: ■ ~~Within 40 minutes, isolate Main Control Room Ventilation AND start the air filtration unit per DOA 5750-04, Smoke, Noxious Fumes or Airborne Contaminants in the Control Room.~~ (Scenario completed prior to time critical action performance requirement). ❑ Reenters DEOP 0300-01, Secondary Containment Control, due to Rx Bldg Radiation above Max Normal. (HPCI Room >150 mr/hr)
	ATC / BOP	❑ Performs DGA 16, Coolant High Activity/Fuel Element Failure as directed: ■ Isolates Main Control Room Ventilation AND starts the air filtration unit per DOA 5750-04, Smoke, Noxious Fumes or Airborne Contaminants in the Control Room. ❑ Announces Drywell, Main Steam Line, SPING Radiation alarms.
	CRS	❑ May anticipate Emergency Depressurization by directing opening the Turbine Bypass valves and initiating the IC.
	ATC / BOP	❑ If directed, anticipates Emergency Depressurization by opening the Turbine Bypass valves and initiating the IC.
	CRS	√ When two Rx Bldg Radiation levels exceed Max Safe (>2500 mr/hr), enters DEOP 0400-02, Emergency Depressurization, **(SC-1.2)** and performs / directs: ❑ Preventing Core Spray and LPCI injection not needed for core cooling. (N/A if DW <2 psig) ❑ Initiating IC to maximum flow ❑ Verifying Torus level above 6' ■ ~~√~~ Opening all ADSVs **(RPV-2.1)** (not critical for this scenario) ■ With less than 5 ADSVs open, directs other Emergency Depressurization systems (DEOP 0400-02 Detail O) initiated: ○ √ Directs turbine bypass valves opened. **(RPV-2.3)**
	BOP	√ Performs DEOP 0400-02, Emergency Depressurization, **(SC-1.2)** as directed: ❑ Prevents Core Spray and LPCI injection not needed for core cooling (N/A if DW <2 psig) ❑ Initiates IC to maximum flow ❑ Verifies Torus level above 6' ■ ~~√~~ Opens all available ADSVs **(RPV-2.1)** (not critical for this scenario) ■ Reports 3E ERV failed to open ■ √ Initiates Emergency Depressurization systems as directed. **(RPV-2.3)**

Event Eight – FEF / Steam Leak In HPCI Room / Secondary Containment High Radiation / Emergency Depressurization

Trigger	Position	Crew Actions or Behavior

Event 8 / Scenario Completion Criteria:

- **Emergency Depressurization in Progress,**
- **RPV stabilized,**

-- AND/OR --

At the direction of the Lead Examiner.

REFERENCES

PROCEDURE	TITLE
DAN 902-3 A-1	Rx Bldg Rad Hi
DAN 902-3 F-14	Rx BLDG Vent Ch A Rad Hi Hi.
DAN 902-3 G-2	Area High Temperature
DAN 902-4 C-20	Turb Bldg Equip Drn Sump Lvl Hi
DAN 902-4 D-20	Turb Bldg Flr Drn Sump Lvl Hi
DAN 902-5 A-3	Rod Drift
DAN 902-5 C-10	CHANNEL A IRM HI HI/INOP
DAN 902-6 H-2	Condenser Lvl Lo
DAN 902-6 H-4	Cond Emerg Make-up Vlv Open
DAN 902-6 G-11	Condensate Make-up Pp Auto Start
DAN 902-7 A-15	Circ Wtr PP Trip
DAN 902-7 F-16	Cond Pp Rm Wtr Lvl Hi
DAN 923-1 C-1	U2 or U3 RBCCW PP Trip
DEOP 0100	RPV Control
DEOP 0200-01	Primary Containment Control
DEOP 0300-01	Secondary Containment Control
DEOP 0400-02	Emergency Depressurization
DGA 07	Unpredicted Reactivity Addition
DGA 16	Coolant High Activity/Fuel Element Failure
DGP 02-03	Reactor Scram
DOA 0040-02	Localized Flooding in Plant
DOA 0250-01	Relief Valve Failure
DOA 0300-06	RPIS Failure
DOA 0300-12	Mispositioned Control Rod
DOA 0600-01	Transient Level Control
DOA 3700-01	Loss Of Cooling By Reactor Building Closed Cooling Water (RBCCW) System
DOA 4400-01	Circulating Water System Failure
DOA 6500-10	4KV Circuit Breaker Trip
DOS 0300-06	CRD Abnormality Record
DOS 1600-20	Suppression Pool Temp Monitoring
DOP 0500-07	Insertion/Reset of Manual Half Scram
DOP 5750-06	Reactor Feed Pump Motor Ventilation System
TS 3.1.3	Control Rod Operability
TS 3.3.2.1	Control Rod Block Instrumentation
TS 3.3.7	Control Room Emergency Ventilation (CREV) System Instrumentation
TS 3.3.8.2	Reactor Protection System (RPS) Electric Power Monitoring
TS 3.4.3	Safety and Relief Valves

EXAM ILT-N-4 QUANTITATIVE ATTRIBUTES	
8	Total malfunctions (5-8)
1	Malfunctions after EOP entry (1-2)
3	Abnormal events (2-4)
2	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
1	EOP contingencies requiring substantive actions (0-2)
2	Critical tasks (2-3)

Computer Aided Exercise Programs

```
# 18-1 ILT-N-4.cae
# For ILT Class 18-1 NRC Exam
# Written by DSS
# Rev 00
# Date 11/18

#### INITIAL CONDITIONS ####

# Sets APRM Master Gain pot to 1.0
irf niagain 1.0

# Holds 2B RFP motor winding temperature on PPC @80 deg. F. (Below alarm point)
imf m295 80.0

# Binds HPCI 4 valve @ 90%.
# Overrides HPCI 5 valve control switch to prevent closing.
imf hp4vlbn 90.0|2
ior hpdcl5 1|2

# Lifts Leads to HPCI Isolation Relays.
irf hpgp4rly lifted|4

#### EVENT TRIGGERS ####

# Event Trigger 1 Fails all control rod F-05 RPIS indications.
trgset 1 "0"|4
imf rdfailf5 (1)|4
imf rpis_pos_cr043s (1) bad|4

# Event Trigger 2 Trips 2A RBCCW PP.
trgset 2 "0"|6
imf q01 (2)|6

# Event Trigger 3 IRM 12 channel fails upscale over a two minute ramp.
trgset 3 "0"|6
imf nii12pot (3) 125.0|6

# Event Trigger 4 Trips 2A Circ Water pump.
trgset 4 "0"|8
imf hp6 (4)|8

# Event Trigger 15 Drifts FWLC setpoint up over 5:00 min.
trgset 15 "0"|8
irf rllmls (15) 60 5:00|8

# Event Trigger 5 Floods the Condensate Pump Room.
trgset 5 "0"|10
imf hp3 (5) 20.0|10

# Event Trigger 6 Initiates a HPCI Room steam line break.
trgset 6 "0"|10
imf hprmbrkp (6) 100.0 15:00 5.0|10
imf radffd (6) 4.0 15:00 1.0|12
```

```
# Event Trigger 28 sets gain for all 6 APRMs.
trgset 28 "0"|12
trg 28 "irf niagainf true"|12

#### END ####


# ILT-N-4 Rad.cae
# For ILT Class 18-1 NRC Exam
# Written by DSS
# Rev 00
# Date 11/18


#### This CAEP ramps Rad level for a HPCI room unisolable leak with a FEF ####

# Starts a ramp of the HPCI CUBICAL ARM.
set RMARMFAILF(2) = true
ramp RMARMFAILD(2) 5.0 3000.0 8:00

# After 1 min, starts a ramp of the WEST LPCI PUMP AREA ARM.
set RMARMFAILF(3) = true|1:00
ramp RMARMFAILD(3) 2.0 1000.0 5:00|1:00

# After 2 min, starts a ramp of the WEST CRD MODULE AREA ARM.
set RMARMFAILF(5) = true|2:00
ramp RMARMFAILD(5) 0.2 100.0 2:00|2:00

# After 2 min, starts a ramp of the REACTOR BUILDING SOUTH ACCESS ARM.
set RMARMFAILF(7) = true|2:00
ramp RMARMFAILD(7) 1.0 100.0 2:00|2:00

#### END ####


# ILT-N-4 Clear Rad.cae
# For ILT Class 18-1 NRC Exam
# Written by DSS
# Rev 00
# Date 11/18

# This CAEP Clears the Rad level ramps.
# Reseting the IC does not clear them.
# Restarting MST will also clear them.

# Stops ramp of the HPCI CUBICAL ARM.
set RMARMFAILF(2) = false

# Stops ramp of the WEST LPCI PUMP AREA ARM.
set RMARMFAILF(3) = false

# Stops ramp of the WEST CRD MODULE AREA ARM.
set RMARMFAILF(5) = false

# Stops ramp of the REACTOR BUILDING SOUTH ACCESS ARM.
set RMARMFAILF(7) = false

#### END ####
```

Unit 2 Risk: GREEN	Unit 3 Risk: GREEN
Unit 2 is in Mode 2 with 1 Turb Bypass Open,	Unit 3 is in Mode 1 at Full Power
Leading Thermal Limit: MFLCPR @ 0.881	Leading Thermal Limit: MAPRAT @ 0.819
Action limit: 0.980	Action Limit: 0.980
Equipment Unavailable: None	Equipment Unavailable: None
Protected Equipment: None	Protected Equipment: None

Current Action Statements

None	LCO Started:	LCO Expires:
TS		
Cause:		

Unit 2 Plant Status

Today	Unit 2 Activities
	**** Shift 1 Activities ****
	**** Shift 2 Activities ****
	Unit startup in progress, steady at ~ 5% Power. Holding for plant inspections. Resume pulling Control Rods next shift.
	When directed by the Shift Manager, start 2B RFP Vent Fan and secure 2A RFP Vent Fan per DOP 5750-06, Reactor Feed Pump Motor Ventilation System.
	**** Shift 3 Activities ****
Today	**** Unit 2 Procedures In-Progress ****
	DGP 01-01, Unit Startup