Nine Mile Point 1	Scenario No. 1	Operating Test No. 1

Examiners:	Candidates:
	SRO SRO-1 SRO-3
	BOP RO-1 RO-2 RO-3
	CSO SRO-2 SRO-4 SRO-5

Objectives: Evaluate candidates ability to perform routine operating tasks, raise and/or lower reactor power and to respond to the following failures:

1. APRM #13 fails upscale,
2. Electrical Pressure Regulator oscillation
3. Mechanical Pressure Regulator failure
4. Recirculation Pump Seal leak
5. Fault on Power Bus 102
6. LOCA with degraded High and Low Pressure injection systems

Evaluate the candidates' ability to execute normal, abnormal and emergency procedures while ensuring compliance with Technical Specifications.

This scenario will be classified as an Alert

Initial Conditions:

1. IC 24, at 95% power

Turnover:

1. Plant is operating at 95% Reactor Power.
2. Raise power to 100% with Recirc Flow
3. Swap stabilizing valves from A and B to E and F
4. .#11 Feedwater Pump is out of service for seal repairs.

Event No.	Malf. No.	Type	Event Description
1		R	(CSO) Raise power to 100% with Recirc Flow
2		N	(BOP) Switching Stabilizing Valves – A and B to E and F. (N1-OP-5, Section F.4.1)
3	NM19C	I	(CSO/SRO) APRM # 13 fails upscale results in half scram and Tech Spec entry, bypass and RPS channel reset.

4	RR33 & 34 Overrides	C	(BOP/SRO) Recirc Pump #11 Seal Leak (75% lower, 25% upper over 10 min) requires pump removal from service. Pump suction valve fails to fully close, resulting in partial loop isolation.
5	TC06	C	(CSO/SRO) Electrical Pressure Regulator (EPR) Oscillating. Requires removing EPR from service and control shifted to backup MPR.
6	TC08	M	(CSO/BOP/SRO) Mechanical Pressure Regulator (MPR) fails, resulting in an automatic reactor scram.
7	ED07	C	(BOP) Fault on Power Board 4160 VAC Emergency Bus (PB 102). Diesel Generator 102 starts, but does not close in on the Bus. Requires manual shutdown of Diesel Generator, due to loss of diesel auxiliary. Downstream 600 VAC Emergency Power Board PB16B is re-energized from alternate power source
8	RR29 FW03B CS05D CS01B	C	(CSO/BOP/SRO) LOCA (15% over 8 minutes) with degraded RPV injection. (BOP/SRO) #12 Feedwater Pump trip, results in total loss of feedwater. Requires starting additional High Pressure Injection Sources (CRD Pumps and Liquid Poison Pumps) (BOP/SRO) Core Spray Pump 112 trips and Core Spray Pump 122 Suction Strainer clogs requires Firewater System Injection (CSO/SRO) Containment Pressure rise requires Containment Spray initiation.

NMP SIMULATOR SCENARIO

Scenario 1 **REV. 3** **No. of Pages: 36**

APRM FAILURE/RECIRC PUMP SEAL LEAK/EPR MPR FAILURE/LOCA WITH DEGRADED CORE SPRAY SYSTEMS

PREPARER	Hollingsworth	DATE 9/12/02
VALIDATED	Murthy, Frechette, Morgan	DATE
GEN SUPERVISOR OPS TRAINING		DATE 9/13/02
OPERATIONS MANAGER UNIT 1	NA Exam Security	DATE
CONFIGURATION CONTROL	NA Exam Security	DATE

SCENARIO SUMMARY

Length: 75 minutes

Crew assumes the shift with the plant at 95% power with #11 FWP out of service for repairs. The crew is directed to restore reactor power to <100% following performance of N1-ST-W1, Control Rod Exercising and Operability Test. Following the power reduction the crew is directed to swap CRD Stabilizing Valves from A and B to E and F. After this, #13 APRM will fail upscale, producing a half scram that may be reset. Crew will bypass the failed APRM, reset the half-scram and review Technical Specifications for the failed instrument.

After the Technical Specifications review, a seal leak develops on #11 Reactor Recirculation Pump. Crew will remove that pump from service, attempt to isolate it, and review Technical Specifications.

Reactor pressure will then begin to oscillate. Crew will recognize a failing EPR, place the MPR in control, move the EPR to its high stop, and review Technical Specifications for operation without a backup regulator. When the plant is stable, the MPR will fail, causing a reactor scram. Crew enters EOP-2 on low RPV water level.

After scram actions are complete, Powerboard 102 will develop a fault; EDG 102 will start, but its output breaker will not close. The Crew crossties PB 16B and PB 16A and restore loads. Shortly afterwards, #12 FWP will trip, leaving only CRD pumps and Liquid Poison pumps for high-pressure injection.

A medium break LOCA begins to develop inside Primary Containment. Crew enters EOP-4 on high drywell pressure. When Core Spray pumps start, one of the operable pumps will trip. Recognizing its inability to maintain level above TAF with high-pressure injection, the crew aligns alternate injection sources, and enters EOP-8 for blowdown.

Core Spray slowly begins to recover water level when suction strainer clogging occurs causing the running Core Spray Pump to trip. By this time, RPV pressure is low enough for firewater to inject. Crew will restore and maintain RPV water level above -109 inches.

Major Procedures: N1-EOP-2, 4, and 8

EAL Classification: Alert EAL 3.1.1

Termination Criteria: RPV depressurized with level recovered above –109 inches

I. SIMULATOR SET UP

A. IC Number: 24 [100% Reactor Power] (Reduce reactor power to 95% power prior to the crew assuming the shift.

B. Presets/Function Key Assignments

1. Malfunctions:

a. NM19C, APRM #13 Fails Upscale **(F3)**

b. RR33, Recirculation Pump Seal Leak (lower, 75% over 10 minutes) **(F4)**

c. RR34, Recirculation Pump Seal Leak (upper, 25% over 10 minutes) **(F4)**

d. TC06, Electrical Pressure Regulator (EPR) Oscillating **(F5)**

e. TC08, Mechanical Pressure Regulator (MPR) Fails **(F6)**

f. ED07, Fault On Power Board (PB 102) **(F7)**

g. FW03B, Feedwater Pump 12 Trip (TUA=5 minutes) **(F7)**

h. CS01B, Core Spray Pump 112 Trips **(Queued)**

i. CS05D, Core Spray Pump 122 Suction Strainer Clogged (100% over 30 seconds) **(F8)**

j. RR29, LOCA (15% over 8 minutes) **(F9)**

k. RR33, Recirculation Pump Seal Leak (lower, 10%, Ramp=1:30) **(ET01)**

l. RR34, Recirculation Pump Seal Leak (upper, 10%, Ramp=1:30) **(ET01)**

2. Remotes:

a. FP04, Fire Wtr to FW Blocking Vlvs, 100%, TD 5 minutes **Manual Insert, when directed in scenario**

3. Overrides:

a. 5S061-DI-00-007-15=INOP, TUA=1:30 (#11 RRP Suction) (ET01)

Causes control switch for #11 RRP to fail

b. 5DS235-LO-G-045-00=OFF, TUA=1:30 (#11 RRP Suction GREEN) (ET01)

Causes GREEN indicating light for valve position to extinguish

c. 5DS236-LO-R-045-00=OFF, TUA=1:30 (#11 RRP Suction RED) (ET01)

Causes RED indicating light for valve position to extinguish

4. Annunciators:

None

5. Event Triggers

   a. ZLRRV02C(1)=TRUE, RRP #11 Suct. Isol. Green Light On **ET01**

      Gives indication to operators that the breaker for the #11 RRP Suction MOV has tripped.

C. Equipment Out of Service

   1. FWP #11

D. Support Documentation

   1. Reactivity Maneuver Request Form, (Page 1, Attachment 1 to GAP-OPS-05) to support performance of power restoration following performance of N1-ST-W1.

E. Miscellaneous

   1. Hand red tag for FWP #11

II. **SHIFT TURNOVER INFORMATION**

SHIFT: ☐ N ☐ D DATE: _____

PART I: To be performed by the oncoming Operator before assuming the shift.

- Control Panel Walkdown (all panels) (SSS, SRO, STA, CSO, CRE)

PART II: To be reviewed by the oncoming Operator before assuming the shift.

- Shift Supervisor Log (SSS, SRO, STA)
- CSO Log (CSO)
- Lit Control Room Annunciators (SSS, SRO, STA, CSO, CRE)
- Shift Turnover Checklist (ALL)
- LCO Status (SSS, SRO, STA)
- Computer Alarm Summary (CSO)

Evolutions/General Information/Equipment Status:

- Reactor Power = 95%
- Loadline = 103%
- Raise reactor power to 100% following performance of N1-ST-W1, Control Rod Exercising and Operability Test by previous shift.
- FWP #11 Out of service for mechanical seal repairs. Day 2 of 15 day HPCI LCO, Technical Specification 3.1.8. Expected to be returned to service later this shift.
- All required log entries have been completed including Technical Specification references.

PART III: Remarks/Planned Evolutions:

- Restore power to 100%
- Swap Stabilizing Valves from A and B to E and F.
- Return FWP #11 to service (late in shift)

PART IV: To be reviewed/accomplished shortly after assuming the shift:

- Review new Clearances (SSS)
- Test Control Annunciators (CRE)
- Shift Crew Composition (SSS/SRO)

TITLE	NAME	TITLE	NAME
SSS		CRE	
SRO		E	
STA		E	
CSO		Other	

Scenario ID#: **Scenario 1**

INSTRUCTOR COMMENTS (Strengths, Areas for Improvement, Open Items etc.)

What Happened?	What we did?	Why? (Goals)	Other Options?

III. PERFORMANCE OBJECTIVES

A. Critical Tasks:

CT-1.0 Given a primary system leak into the containment, when torus pressure exceeds 13 psig or before drywell air temperature exceeds 300°F, the crew will initiate Containment Sprays, while in the safe region of the Containment Spray Initiation Limit and prior to exceeding the Pressure Suppression Pressure limit IAW N1-EOP-4.

CT-2.0 Given degraded RPV injection sources the crew will depressurize the RPV and inject with Preferred and Alternate Injection Systems to restore and maintain RPV water level above –109 inches IAW N1-EOP-2.

CT-3.0 Given a condition with Containment Sprays operating and a Drywell Pressure lowering, the Crew will secure Containment Sprays within 3 minutes of Drywell Pressure dropping below 3.5 psig in accordance with N1-EOP-4.

B. Performance Objectives:

PO-1.0 Transfer CRD Stabilizing Valves with the plant at power in accordance with N1-OP-5.

PO-2.0 Recognize and respond to a failed APRM in accordance with N1-ARP-F2 (F2-1-6) and N1-OP-38C with the plant at power.

PO-3.0 Identify limitations imposed by Technical Specifications due to a failed APRM instrument (TS 3.6.2.a and 3.6.2.g).

PO-4.0 Recognize and respond to a failure of automatic pressure control system (EPR) in accordance with N1-ARP-A2 (A2-4-4) and N1-OP-31.

PO-5.0 Identify limitations imposed by Technical Specifications as the result of operating without a backup pressure regulator.

PO-6.0 Diagnose and respond to failure of Reactor Recirculation Pump mechanical seals in accordance with N1-ARP-F2 (F2-1-1) and N1-OP-1.

PO-7.0 Identify limitations imposed by Technical Specifications for 4-Loop Operations (TS 3.1.7).

PO-8.0 Respond to an automatic reactor scram in accordance with N1-SOP-1.

PO-9.0 Recognize and respond to a loss of PB102 in accordance with N1-ARP-A4 (A4-1-6).

PO-10.0 Correctly identify Emergency Operating Procedure (EOP) entry conditions.

PO-11.0 Given an event requiring activation of the Emergency Plan, the SRO will correctly classify the event per the EAL Matrix.

Take the simulator out of freeze before the crew enters for the pre-shift walkdown and briefing. Allow no more than 5 minutes for panel walkdown.

CREW:

- Walks down panels
- Perform annunciator checks
- Conducts turnover brief
- Assumes the shift and continues power operations

SRO:

- Conducts reactivity brief for power restoration
  - Reviews Reactivity Maneuver Request Form
  - Provides direction to CSO/BOP regarding assignments
    - CSO adjusts recirculation flow
    - BOP monitors RRPs and feed system response
- Directs CSO to restore power to 100% using recirculation flow in accordance with N1-OP-43B
- Provides Reactivity Monitor for power manipulation

CSO:

- Acknowledges direction from SRO
- Obtains copy of N1-OP-43B and RMR form

- Reviews requirements of OP-43B, Section F.1
- Places computer point C875 on SPDS monitor or panel display "G" (on A Panel).
- Begins raising Master Recirculation Flow Controller while monitoring APRM and Total Recirculation Flow indications

- Reports to SRO when power restoration is complete.

BOP:

- Monitors individual RRP for response
  - Individual M/A-Speed Control stations trending uniformly
  - Individual RRP indications trending normally for speed increase
- Monitors feed water controls for proper response
  - FWP #13 FCV responding to power change
  - RPV Water Level remains within program band (65" - 75")

Power restoration complete.

Booth Operator:

Role Play: As Operator, when requested, report:

BV-44-175 is OPEN

BV-44-184 is OPEN

After Stabilizing Valve Transfer Switch selected to E and F and requested by Control Room, report:

BV-44-176 is CLOSED

BV-44-183 is CLOSED

When requested to confirm exhaust flow report:

EXHAUST FLOW 6.0 GPM

Booth Operator

When stabilizing valve operation is completed, insert malfunction:

NM19C=TRUE (F3)

APRM #13 Fails Upscale

Plant Response: Annunciator F2-1-6 (APRM 11-14), F1-1-1 (RPS CH 11 REACT NEUTRON MONITOR), F1-2-1 (RPS CH 11 REACTOR AUTO TRIP) and, F3-4-4 (ROD BLOCK) will be received

SRO:

- Direct BOP to swap CRD Stabilizing Valves from A-B to E-F per N1-OP-5, Section F.4.1

BOP:

- Acknowledges direction from SRO.
- Performs N1-OP-5, Section F.4.1, Switching Stabilizing Valves from A and B to E and F.
  - Directs NAO to perform valve lineups for transfer.
  - Places Stabilizing Solenoid Valves Transfer Switch to "E and F" position on Panel "F"
  - Directs NAO to confirm stabilizing exhaust line flow between 5.5 and 6.5 gpm.

CSO: PO-2

- Recognize/report RPS Channel 11 trip
- Reports APRM #13 Upscale

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator: Role Play: As WEC/Mgmt. acknowledge report from SRO. Advise that you will provide requested assistance. *The APRM will not be repaired during the scenario.* Technical Specification requirements from Tables 3.6.2.a and 3.6.2.g are satisfied with only one APRM failed.	SRO: PO-3 • Acknowledges report from CSO • Directs CSO/BOP to follow ARPs for failed APRM, Half-SCRAM and ROD BLOCK • Contacts WEC/Management and informs them of failed instrument. Requests assistance in correcting problem. • Reviews Technical Specifications for impact of failed instrument. – TS 3.6.2.a requires 2 operable trip systems and 3 operable channels per system to cause a SCRAM on High Flux – TS 3.6.2.g requires 2 operable trip systems and 3 operable channels per system to initiate a ROD BLOCK on High Flux • Determines that APRM #13 may be bypassed • Directs CSO to bypass APRM #13 and reset the half-SCRAM

BOP: PO-3

- Acknowledges direction from SRO
- Obtains ARP F2-1-6 and executes
  - Verifies alarm computer points B183 (ROD BLOCK) and D052 (UPSCALE HIHI FLUX)
  - Observes LPRM-APRM Auxiliaries Drawer (Panel "G") and determines that APRM #13 has an upscale condition
- Obtains/reviews ARP F1-1-1
  - Confirm RPS Channel 11 tripped
  - Confirms cause to be failed APRM
- Obtains/reviews ARP F1-2-1
  - Determines that failed APRM caused trip
- Obtains/reviews ARP F3-4-4
  - Confirms alarm by observing computer point C067 RWM ROD BLOCK
  - Determines caused by failed APRM
- Reports findings to CSO/SRO
- When directed to verify APRM #13 bypassed
  - Observes APRM #13 bypass light on Panel "G" (LPRM-APRM AUXILIARIES DRAWER)

Plant Response

When APRM #13 is bypassed F2-1-6, F3-4-4 and F1-1-1 should all clear.

The LPRM-APRM Auxiliaries drawer will indicate the HIHI condition until the APRM is bypassed then the BYPASS indicating light will also be illuminated.

Following the bypassing of APRM 13 and the reset of the half-scram, all annunciators will be clear.

CSO:

- Completes CSO actions for ARP F2-1-6
  - Determines that APRM #13 has UPSCALE/HI-HI condition
  - Monitors other APRM channels to determine that power is stable/unchanged
  - Verifies proper power to flow ratio on 5-Loop Operating Curve
- Bypasses APRM #13
  - Reviews N1-OP-38C
  - Places APRM BYPASS joystick on Panel "E" to "APRM 13" position
  - Verifies BYPASS light on panel, computer point indicates bypass, F2-1-6 clear and F3-4-4 clear
  - Directs BOP to verify APRM #13 indicates bypassed on Panel "G"
- After APRM bypassed RESET half-SCRAM
  - Verifies F1-1-1 clear
  - Depress SCRAM RESET pushbutton on "E"
  - Verifies F1-2-1 clear and resets annunciators
- Report APRM #13 bypassed and ARP actions completed to SRO

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
As directed by Lead Evaluator Or after actions for failed APRM are completed: Booth Operator Insert malfunctions: **RR33 @ 75% over 10 minutes (F4)** **RR34 @ 25% over 10 minutes (F4)** *#11 Reactor Recirculation Pump Upper/Lower Seal Leakage*	BOP: • Recognizes/reports annunciator F2-1-1 SRO: • Acknowledges report from BOP • Directs execution of ARP

Plant Response

HP Seal pressure will remain essentially unchanged at approximately system pressure. LP Seal pressure will gradually rise until it exceeds 625#. ARP F2-1-1 requires that a DER be initiated however, Drywell conditions will begin to deteriorate and increased in-leakage to the DWEDT will be indicated. This will confirm that gross seal failure has occurred.

Booth Operator

Role Play as WEC/Mgmt. when contacted regarding the seal leakage inform the SRO that you will provide what assistance is required.

If contacted to develop a DER for the leakage then advise the SRO that Plant Management has directed the pump be isolated.

BOP:

- Reviews/executes ARP F2-1-1
  - Confirms alarm computer point A072 RRP 11 SEAL LEAK DET FL
  - Monitors DWEDT and DWFDT level recorders
  - Monitors drywell pressure and temperature
  - Monitors and compares RRP Seal Pressure indications
  - Determines that HP Seal has failed based on rising pressure of LP Seal
  - Determines that LP Seal failure is occurring due to LP Seal pressure less than system pressure
- Reports findings to SRO

SRO:

- Acknowledge report from BOP
- Inform the WEC/Mgmt. of the leaking RRP seals
- Determine that the pump should be isolated
- Review Technical Specifications for impact of seal leakage and removal of pump from service

- Tech Spec 3.2.5 identifies RCS leakage be limited to <2 GPM/day increase for identified leakage. This will apply until the RRP is isolated.
- Tech Spec 3.1.7.e requires that power be maintained below 90.5% until the isolated loop has valve motor breakers locked open and RRP Motor circuit breaker removed

- Direct BOP to remove RRP #11 from service
  - Direct BOP that discharge and suction valves SHOULD NOT be reopened 2 - 3 seconds after closing.
- Provide HLA/Reactivity brief for crew
- Provide reactivity management oversight for removing the pump from service.

BOP:

- Acknowledge direction from SRO
- Obtain/review copy of N1-OP-1 for shutting down and isolating #11 RRP
- Remove #11 RRP from service
  - Verify #11 RRP M/A station balanced
  - Place #11 RRP M/A control selector switch to "MANUAL"
  - Reduce speed of pump (RRP Flow) to between 6 - 8 x 10^6 lbm/hr
  - Close #11 RRP discharge valve by holding switch in CLOSE position
    - Time valve stroke with wall clock, watch or stop watch. Closure time is 2 minutes.
  - Trip #11 RRP MG Set
- Isolate #11 RRP
  - Close #11 RRP Suction Valve by holding switch in CLOSE position
    - Time valve stroke with wall clock, watch or stop watch. Closure time is 2 minutes.
    - Recognize/report when suction valve indication is lost.

Booth Operator

When BOP begins closing #11 RRP Suction ensure that trigger ET01 has activated. This will insert overrides:

5S061=INOP, 5DS235=OFF, 5DS236=OFF

and malfunctions:

RR33=10%,, Ramp=1:30;

RR34=10%, Ramp=1:30

This will simulate the #11 RRP Suction MOV breaker tripping after valve 90% closed. Leak will reduce but not stop.

SRO:

- Acknowledge report from BOP
- Direct BOP to close Discharge Bypass for #11 RRP

BOP:

- Acknowledge direction from SRO
  - Close #11 RRP Discharge Bypass by placing switch to CLOSE and releasing
- Report actions to SRO

CSO:

- Monitor total recirculation flow and APRM power levels while #11 RRP being shutdown
- Monitor 4-Loop Power Operating Curve and verify allowable region
- Verify power less than 90.5% after #11 RRP is removed from service

Booth Operator

As WEC/Mgmt. acknowledge report from SRO. If requested to determine the problem with #11 RRP Suction Valve, report the breaker has tripped on overload and cannot be reset.

Plant Response

The seal leak will have reduced significantly. Seal pressures will not lower due to partially open Suction Valve.

SRO:

- Acknowledge report from BOP
- Contact WEC/Mgmt and advise of problem with #11 RRP Suction Valve.
  - Directs that troubleshooting be done due to pump seal leak.
- Direct that BOP monitor RRP #11 pressures and drywell leakage and report trends.

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
	• Verify CSO verifies power less than 90.5% and that operating point within limits on 4-Loop Power Operating Curve • Notify WEC/Mgmt. that #11 RRP has been shutdown but not isolated.
Booth Operator When actions to isolate #11 RRP have been completed or as directed by Lead Evaluator insert malfunction: **TC06=TRUE** **(F5)** *EPR Failure - Oscillates* *Plant Response* *This failure will cause RPV pressure to rise approximately 12 PSIG and power to rise 2-3%. Pressure will peak and level off when MPR is in control then begin to lower again. CSO will observe control valve position oscillations as well.*	CSO: • Recognize/Report Annunciator A2-4-4, TURBINE MECHANICAL PRESSURE REGULATOR IN CONTROL

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator As WEC/Mgmt. Acknowledge report of failed EPR. Advise SRO that you will provide requested assistance. (The EPR will not be repaired.) Note: This step may be performed by either operator or concurrently. The required controls are located on the desk section of Panel "E".	SRO: • Acknowledge report by CSO • Direct execution of ARP A2-4-4 • Direct actions of OP-31 for oscillating EPR taken when confirmed by CSO/BOP • Notify WEC/Mgmt. of failed EPR BOP: • Monitor suppressed range pressure indications (Panel F) and turbine control indications (Panel A1/B1) • Review/execute ARP A2-4-4 BOP/CSO: • Remove oscillating EPR from service • Obtain/review OP-31 – Lower MPR setpoint until MPR is in full control of pressure – Raise EPR Setpoint to maximum value (1010 PSIG) – Restore RPV pressure to normal band or as directed by SRO • Report completion of actions to SRO

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator Role Play: As Reactor Engineering inform SRO that MCPR limits are satisfied. As WEC/Mgmt acknowledge report of EPR malfunction and present operational status.	SRO: PO-5 • Acknowledge report from operator • Review Technical Specifications for limitations imposed by operating without backup pressure regulator – Directed by TC 3.1.7.c into COLR for MCPR limitations • Contacts Reactor Engineering to have RE determine current MCPR based on power level. Advises WEC/Mgmt of failed EPR and plant status.
As directed by Lead Evaluator After EPR has been removed from service and notifications regarding plant status completed insert malfunction: **TC08=TRUE (F6)** *MPR Fails Low (This failure mode is the loss of pressure signal to MPR. Results in rapidly rising pressure as MPR closes turbine CVs. Bypass valves have a delayed open due to MPR failure and EPR setpoint (1010 PSIG) and resulting pressure rise will cause a reactor scram and ERV actuation.)*	

CSO: PO-8

- Recognize/report reactor SCRAM
  - Place Mode Switch in SHUTDOWN
  - Verify reactor SCRAM
  - Confirm FW LVL SP SETDN INIT light illuminated if level <52"
- Provide SCRAM report:
  - Mode switch position
  - RPV pressure (value/trend)
  - RPV level (value/trend)
  - Reactor power
  - Control rod position

SRO: PO-8

- Acknowledges SCRAM report
- Enters EOP-2 on low RPV water level
  - Direct CSO to execute SOP-1
  - Direct BOP to restore and maintain water level (53" - 95") using condensate, feed and CRD
- Verifies no ERV cycling
  - Direct BOP/CSO to maintain pressure (800-1000 PSIG) using Turbine Bypass Valves

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
	CSO: • Acknowledge SRO direction • Execute SOP-1 actions – Place IRM range switches in Range 10 – Insert all IRM/SRM detectors – Verify recirculation flow ≈$40x10^6$ lbm/hr – Verify Turbine Trip – Place SCRAM DISCHARGE VOLUME HIGH LEVEL BYPASS switch in BYPASS (Panel "F")

BOP:

- Acknowledge SRO direction
- Execute SOP-1 actions for RPV level control
  - Confirm RPV level recovering
  - Verify #12 electric feed pump running
  - Close #13 FWP flow control valve
  - Verify RPV level >53"
  - Disengage #13 FWP
  - Close 29-10 (FWP 13 Discharge BV)
  - Verify #11/12 FWP controllers in manual with 0 output
  - Reset HPCI (Panel "E")
  - Place #12 FWP BYPASS valve in "AUTO" and set to 65-70"
- Monitor RPV Level/Pressure
  - Using Bypass Valve Opening Jack operate Turbine BV as required to maintain pressure in proscribed band
- Report actions complete to SRO

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
As directed by Lead Evaluator When SCRAM actions are complete and the plant stabilized insert malfunctions: **ED07=TRUE (F7)** **FW03B=TRUE (TUA=5 minutes) (F7)** *Electrical Fault on Powerboard 102* *Feedwater Pump #12 Trip (delayed)* *Plant Response* The following loads will be lost and not re-energized when PB102 trips: #111/112 Core Spray Pumps and Core Spray Topping Pumps #111/112 Containment Spray and Containment Spray Raw Water Pumps The following significant loads will be lost but will be re-powered when PB16B is re-energized: EDG102 Auxiliaries, RBCLC Pump #13, CRD Pump #11, RPS-UPS 162A/B, SBC161A/B, ESW Pump #11, MG167	CSO: PO-9 • Recognize/report loss of PB102 • Reports EDG 102 started but did not close in on powerboard • Recognize fault on PB102
Booth Operator Role Play as WEC and acknowledge report from SRO. Report that you will have the problem with PB102 investigated. After 10 minutes report that there is a fault on PB102.	SRO: • Acknowledge report from CSO • Directs execution of ARP A4-1-6, POWER BD 102 BUS VOLTAGE LOW • Notify WEC/Mgmt of PB102 trip

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator Role Play as WEC and inform CSO that a clearance for R1012 will be prepared. (PB102 will not be returned to service.)	CSO: • Acknowledges direction from SRO • Executes ARP A4-1-6 – Confirm alarm on computer (F138, D199) – Determine that PB102 cannot be reenergized – Place normal supply R1012 in pull-to-lock – Place EDG control switch in EMERGENCY STOP – Verify 12 CRD Pump in service – Verify RBCLC pressure ≥40 PSIG – Reset 86-16 (H panel) – Verify OPEN R1043 – Make plant announcement that Power Board 16B will be re-energized – Close PB16 A-B tie breaker R1042 – Contacts WEC to prepare a clearance for R1012 to prevent auto-start of EDG102 • Informs SRO that actions for ARP are complete BOP: • Recognize/report trip of #12 FWP • Report no Feed Pumps available • If required start CRD Pump #12 for level control.
FWP #12 Trips	

Booth Operator

Role Play as WEC/Mgmt and acknowledge report of #12 FWP trip. Inform SRO that you will dispatch personnel to investigate the problem.

(#12 FWP will not be returned to service.)

After 10 minutes report that #12 FWP tripped on electrical overload.

As directed by Lead Evaluator

Insert malfunction:

RR29=TRUE (15% in 8 minutes) (F9)

LOCA

Plant Response

Drywell pressure/temperature begins to rise. RPV pressure begins to lower, RPV water level begins to lower

Drywell pressure exceeds 2.0 PSIG

Annunciator K2-4-3 alarms

SRO:

- Acknowledge report from BOP
- Recognize only CRD/Liquid Poison pumps available for high pressure RPV makeup
- Evaluate RPV level/trend
- Notify WEC/Mgmt of problem with #12 FWP. Direct WEC to dispatch operators/maintenance to investigate.

CSO:

- Recognize/report annunciator K2-4-3, Drywell Pressure Hi-Low
- Confirm alarm computer point
- Report drywell pressure/temperature rising

SRO:

- Acknowledge report from CSO
- Direct execution of ARP K2-4-3
- Direct action to identify potential leaks

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
	CSO/BOP: • Acknowledge direction from SRO • Monitor primary containment parameters • Monitor RPV level/pressure BOP: • Recognize/report lowering RPV level • Start CRD pumps (if not running)
RPV Level begins lowering *Plant Response* *Drywell pressure exceeds 3.5 PSIG* *Core Spray pumps #121/122 start. #121 Core Spray pump trips. Core Spray Topping Pump #122 starts* *RPV Level <53"*	• Recognize/report drywell pressure >3.5 PSIG – Report EOP-4 Entry Condition • Recognize/report that Core Spray Pump #121 is not running (tripped) • Report RPV level <53" and lowering

Depending on rate of level change when EOP-2 reentered, SRO may direct alternate injection sources be lined up (e.g., Fire Water, Liquid Poison pumps to Test Tank, etc.)

SRO:

- Acknowledge reports from operators
- Enter EOP-4 and re-enter EOP-2 on High Drywell Pressure. Re-enter EOP-2 on RPV level
  - Direct Containment Spray Pumps locked out (placed in pull-to-lock)
  - Re-evaluate RPV level and trend
    - Determine that alternate injection sources will be required. (Unable to maintain >53")
  - Direct BOP to inject liquid poison from either Boron Tank per EOP-1 Att 13 or Test Tank per EOP-1 Att 12

CSO:

- Acknowledge direction from SRO
- Place all Containment Spray Pumps in "pull-to-lock"

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator If contacted to line up Liquid Poison to the Test Tank wait 5 minutes and insert remote **LP03=TRUE** *Demin Water to LP Pumps* *RPV Water Level less than +5"* Note: SRO should recognize that Containment Spray Raw Water cannot be aligned to Core Spray since the operable core spray system and containment spray system are powered from the same bus. In directing lineup of Fire Water, may direct that spool-piece be installed but valves not opened due to RPV pressure.	BOP: • Acknowledge direction from SRO • Start Liquid Poison pump – If directed to use Test Tank uses EOP-1, Attachment 12 and directs NAO/WEC to line up liquid poison pumps to the Test Tank – If injecting from the Boron Tank, starts Liquid Poison Pump • Recognize/report containment isolation • Reports water level < +5" and lowering SRO: • Acknowledge report from BOP • Determine that RPV level CANNOT be maintained above -84 inches – Directs BOP to bypass ADS and verify EC initiated ▪ May initiate and remove from service due to cooldown rate – Directs BOP to verify 2-CRD pumps injecting – Directs CSO to initiate line-up of alternate injection systems (if not done)

BOP:

- Acknowledge direction from SRO
- Bypasses ADS (Places keylock switches to BYPASS)
- Verifies EC initiated
  - If directed to remove from service will use EC STEAM IVs
- Verifies both CRD pumps running
- Reports RPV level, pressure and trend

Booth Operator

Role play as WEC/NAO and acknowledge order to lineup fire water to the feed system. When order given, insert remote:

FP04, 100%, TUA=5 minute

Wait 5 minutes then report Firewater is lined up.

CSO: **CT-2**

- Acknowledge direction from SRO
- **Contacts WEC/NAO and directs lineup of Fire Water to Feed system**

Torus Pressure reaches 13 PSIG

BOP/CSO:

- Recognize/report Torus pressure 13 PSIG

SRO: **CT-1**

- Acknowledge report
- Verify below Containment Spray Initiation Limit
- Direct initiation of Containment Sprays
  - Direct all recirculation pumps verified tripped
  - Direct all drywell cooling fans be tripped
  - **Direct CSO to initiate Containment Sprays IAW EOP-1, Attachment 17**
  - Direct CSO secure Containment Spray when drywell pressure drops below 3.5 PSIG

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
	CSO: **CT-1, 3** • Acknowledge direction from SRO – Verifies all recirculation pumps tripped ▪ Observes GREEN RRPMG breaker lights or places RRPMG Control switches to TRIP then neutral – Verifies all drywell cooling fans tripped ▪ Places DW Cooling Fan control switches to TRIP then neutral – **Initiates Containment Sprays** ▪ Start Containment Spray pump #122 ▪ Start Containment Spray pump #121 ▪ Monitor Drywell pressure ▪ Report containment spray initiated to SRO
Drywell pressure begins to lower	
Drywell pressure <3.5 PSIG	• Observes drywell pressure < 3.5 PSIG

- **Secures Containment Spray**
  - Places control switches for Containment Spray Pumps #121/122 in pull-to-lock
- Reports Containment Sprays secured

RPV Level drops to/below -84"

BOP:

- Recognize/report RPV level < -84" by Fuel Zone Indication

SRO:

- Acknowledge report from BOP
- Determine that Core Spray 12 (Pump 122) is only subsystem lined up with a pump running
- Before RPV Level reaches -109" enter EOP-8, RPV Blowdown
  - Exits EOP-2 pressure leg
  - Direct BOP place both ECs in service
  - Direct BOP to open 3-ERV

(Note: Direction may be given to either CSO or BOP to initiate ECs or open ERVs.)

As directed by Lead Evaluator

Prior to Core Spray injection insert malfunction:

CS05D, 100% in 30 seconds (F8)

Core Spray Pump 122 Suction Strainer Clogged

RPV Water level may briefly drop below -109"

Plant Response

RPV pressure lowers to <365 PSIG

BOP:

- Acknowledge SRO direction
- Verify both ECs in service
  - Place control switch for EC Steam IVs in OPEN
  - Observe RED lights illuminate
- Report ECs in service
- Open 3-ERVs
  - Using preferred sequence, place control switches for 3-ERVs to OPEN and observe pilot valve RED indicating light and acoustic monitor RED light
  - Report 3-ERVs open
- Monitor RPV pressure
- Report Core Spray injection when pressure <365 PSIG
- Observe/report cavitation of Core Spray pump 122
- Monitor RPV water level
  - Report RPV level continues to lower

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
	SRO: • Acknowledge report of core spray injection and pump cavitation • Acknowledge report of RPV water level trend
Plant Response *RPV pressure drops below 100 PSIG* *Firewater injects via feed system* *RPV water level rises above -109"*	BOP/CSO: **CT-2** • Recognize/report when RPV pressure less than firewater header pressure • **Observe rising RPV water level as firewater injects** – **Report when RPV water level rises above -109"**
TERMINATING CUE • RPV Blowdown completed • RPV Water Level > -109" and rising • Containment parameters controlled per EOP-4	
SRO Candidate Evaluator After the simulator is placed in FREEZE, direct the SRO Candidate to classify the event.	SRO: • Classify the event as an ALERT, EAL 3.1.1

Nine Mile Point 1	Scenario No. 3	Operating Test No. 1

Examiners:	Candidates:
	SRO BOP RO-4 (2 Cs) CSO SRO-1 SRO-3 RO-4 (R)

Objectives: Evaluate candidates ability to perform routine operating tasks, raise and/or lower reactor power and to respond to the following failures:

1. Channel 12 backup scram and SDV Vent and Drain Valves fail to reset,
2. Power Board 17B electric fault trip,
3. ERV 111 fails open and cannot be closed,
4. Failure to scram with power remaining above 6%,
5. Liquid Poison Pump 11 trips after start.

Evaluate the candidates' ability to execute normal, abnormal and emergency procedures while ensuring compliance with Technical Specifications.

This scenario will be classified as Site Area Emergency EAL 2.2.2

Initial Conditions:

1. IC 24, 100% Reactor Power

Turnover:

1. Plant is operating at 100% Reactor Power.
2. Manual Scram Instrument Channel test, N1-ST-W15, Sections 8.1 & 8.2 to be completed during this shift

Event No.	Malf. No.	Type	Event Description
1		N	(BOP) Manual Scram Instrument Channel test, N1-ST-W15, Sections 8.1 & 8.2.
2	Overrides F-5, Lamps, page 65, R-031-09	I	(SRO) During performance of this test Channel 12 backup scram and SDV Vent and Drain Valves fail to reset, requiring Tech Spec entry.
3	ED21	C	(BOP/SRO) Power Board 17B electric fault trip.

4	AD05 &AD06	C	(BOP/SRO) ERV 111 fails open and cannot be closed. Requires manual action to attempt to close ERV.
5		R	(CSO/SRO) Emergency Power Reduction
6	RD33A, B, C & E	M	(CSO/BOP/SRO) Manual scram to prevent exceeding 110°F in the Torus. Failure to scram, with all rods stuck at position 20. Reactor power remains above 6% (downscale)
7		C	(CSO) Manually inserts control rods using Alternate Control Rod insertion methods per N1-EOP-3.1
8	LP01A	C	(BOP/SRO) Liquid Poison Pump 11 trips after start.

NMP SIMULATOR SCENARIO

Scenario 3 **REV. 3** **No. of Pages: 29**

LOSS OF VITAL POWER BOARD - ATWS

PREPARER	Hollingsworth	DATE 9/12/02
VALIDATED	Murthy, Frechette, Morgan	DATE
GEN SUPERVISOR OPS TRAINING	Ron Thomas	DATE 9/13/02
OPERATIONS MANAGER UNIT 1	NA EXAM SECURITY	DATE
CONFIGURATION CONTROL	NA EXAM SECURITY	DATE

SCENARIO SUMMARY

Length: 60 minutes

The Crew will assume the shift with Reactor Power at 100%. The weekly surveillance, N1-ST-W15, Sections 8.1 and 8.2, are to be done on this shift. At step 8.2.3, the Crew will recognize the Channel 12 "Red" BU SCRAM/SDV VENT AND DRAIN VALVE" light does not illuminate as required. This will cause the Crew to enter Technical Specifications and determine any LCO actions required.

Following the Technical Specification determination, Power Control will contact the Control Room to inform them of a Severe Thunderstorm Warning for the area for the next hour. An electrical transient will occur, resulting in a trip of the normal supply breaker for Power Board 103 (R1013) and simultaneous trip of supply breaker for Power Board 17B (R1053) due to a failure of selective tripping. This will cause EDG103 to auto-start and pick up load on Power Board 103. An electrical fault on Power Board 17B will prevent re-energizing this board via the crosstie to PB 17A (R1052). If the crew attempts to close R1052, it will trip due to the fault on PB 17B. Following completion of the applicable Annunciator Response Procedures, Power Board 17Bwill remain unavailable. Due to the loss of critical redundant equipment (e.g., CRD Pump #12, EDG Auxiliaries, RBEVS #12, etc.) the SRO must evaluate Technical Specifications and determine LCO actions required.

Then ERV 111 will inadvertently open. The crew will respond to the ERV Open alarm (F2-4-1) and will enter N1-OP-1 to close ERV #111. All attempts to close the valve will be unsuccessful requiring a manual reactor SCRAM. Torus water temperature will be monitored and the crew may be required to place Torus cooling in service. The reactor SCRAM may be initiated as a result of Torus water temperature approaching 110°F.

When the SCRAM is initiated, the control rods will fail to fully insert due to a hydraulic lock. Due to the challenge to containment the crew will be expected to inject Liquid Poison. Due to the fault on PB 103, LP Pump #12 is not available, LP Pump #11 will trip shortly after it is started requiring alternate injection of Liquid Poison. The CREW will enter EOP-3.1 in an attempt to insert control rods. Due to the hydraulic lock, the second attempt to insert control rods by manual scram (following reset) will result in all rods being fully inserted. The crew will be forced to terminate and prevent injection to lower Reactor power. RPV pressure must be maintained below the Heat Capacity Temperature Limit (HCTL) curve. The Crew will have success inserting control rods IAW EOP 3.1.

Major Procedures:	N1-OP-01; N1-EOP-2, 3 & 4
EAL Classification:	Site Area Emergency EAL 2.2.2
Termination Criteria:	All control rods fully inserted, RPV level and pressure being maintained in prescribed bands per EOP-3with Torus cooling in progress.

I. SIMULATOR SET UP

A. IC Number: 24

B. Presets/Function Key Assignments

1. Malfunctions:

a. RD33A - Control Rod Bank Blocked Bank 1 Position 20 **Queued**

b. RD33B - Control Rod Bank Blocked Bank 1 Position 20 **Queued**

c. RD33C - Control Rod Bank Blocked Bank 1 Position 20 **Queued**

d. RD33D - Control Rod Bank Blocked Bank 1 Position 20 **Queued**

e. ED021 - PB 17B Electrical Fault **(F3)**

f. AD05 - ERV #111 Fails Open **(F4)**

g. AD06 - ERV #111 Stuck Open **(Queued)**

h. LP01A - Liquid Poison Pump Trip, TUA=15 sec. **(ET02)**

i. RD33A - Control Rod Bank Blocked Bank 1 Position 0, TRA=3 sec. **(ET03)**

j. RD33B - Control Rod Bank Blocked Bank 1 Position 0, TRA=3 sec. **(ET03)**

k. RD33C - Control Rod Bank Blocked Bank 1 Position 0, TRA=3 sec. **(ET03)**

l. RD33D - Control Rod Bank Blocked Bank 1 Position 0, TRA=3 sec. **(ET03)**

2. Remotes:

a. FW24 – HPCI Fuses FU8/FU9 (PULLED), TUA=2 min. **(F10)**

b. RP14 – Reactor Trip Bus 141/CKT5 Fuse (PULLED) **(ET01)**

c. AD01 – ERV 111 Control Power Fuses F1/F2 (PULLED), TUA=4 minutes **(F8)**

3. Overrides:

a. 02A001S011-DI-005-13, Breaker R1013 Control, POS_1, TRA=1 sec. **(F3)**

4. Event Triggers

a. ET01 – CH12 RPS Manual Scram Pushbutton Pressed,
ZLRP12F4(1) EQ FALSE

b. ET02 – Liquid Poison Pump #11 Start,
ZLLPMPAR(1) EQ TRUE

c. ET03 – RPS Jumpers/SCRAM Reset,
ZDRPJB11(5) EQ TRUE AND ZDRPREST(1) EQ TRUE This Boolean will allow the trigger to fire after the RPS jumpers are installed and the operator resets the SCRAM from "E".

5. Annunciators:

   a. None

C. Equipment Out of Service

1. None

D. Support Documentation

1. N1-ST-W15, Manual and Automatic SCRAM Instrument Channel Test

E. Miscellaneous

1. None

II. **SHIFT TURNOVER INFORMATION**

SHIFT: ☐ N ☐ D DATE: _____

PART I: To be performed by the oncoming Operator before assuming the shift.

- Control Panel Walkdown (all panels) (SSS, ASSS, STA, CSO, CRE)

PART II: To be reviewed by the oncoming Operator before assuming the shift.

- Shift Supervisor Log (SSS, ASSS, STA)
- CSO Log (CSO)
- Lit Control Room Annunciators (SSS, ASSS, STA, CSO, CRE)
- Shift Turnover Checklist (ALL)
- LCO Status (SSS, ASSS, STA)
- Computer Alarm Summary (CSO)

Evolutions/General Information/Equipment Status:

- Reactor Power = 100%
- Loadline = 103%
- None

PART III: Remarks/Planned Evolutions:

- Perform Sections 8.1 (Channel 11 Manual Scram) and 8.2 (Channel 12 Manual Scram) of N1-ST-W15, Manual And Automatic Scram Instrument Channel Test.

PART IV: To be reviewed/accomplished shortly after assuming the shift:

- Review new Clearances (SSS)
- Shift Crew Composition (SSS/ASSS)
- Test Control Annunciators (CRE)

TITLE	NAME	TITLE	NAME
SSS		CRE	
ASSS		E	
STA		E	
CSO		Other	

Scenario ID#: **Scenario 3**

INSTRUCTOR COMMENTS (Strengths, Areas for Improvement, Open Items etc.)

What Happened?	What we did?	Why? (Goals)	Other Options?

I. PERFORMANCE OBJECTIVES

A. Critical Tasks

CT-1.0 Given the plant operating at power with a stuck open ERV that cannot be closed, scram the reactor before Torus temperature exceeds 110°F, in accordance with Technical Specifications.

CT-2.0 Given the plant with a reactor scram required and the reactor not shutdown, take action to reduce power by inserting control rods to prevent exceeding the heat capacity temperature limit IAW N1-EOP-3.

CT-3.0 Given the plant during an ATWS with conditions met to perform power/level control, terminate and prevent injection, with exception of boron and CRD, into the RPV until conditions are met to re-establish injection in accordance with N1-EOP-3.

CT-4.0 Given the plant during an ATWS with conditions met to re-establish injection, operate injection systems to maintain RPV water level above –109" and at or below the level to which it was lowered in accordance with N1-EOP-3.

B. Performance Objectives

PO-1.0 Identify the implications to plant safety/continued plant operation of the failure of Reactor Protection System surveillance. (N1-ST-W15)

PO-2.0 Recognize and respond to a loss of a safety related power board in accordance with applicable annunciator response procedures. (N1-ARP-A5)

PO-3.0 Take action to prevent damage to the Emergency Diesel Generator due to a loss of EDG auxiliaries. (N1-OP-45)

PO-4.0 Recognize the impact of Technical Specifications on continued plant operation and take action required to remain within the bounds of limiting conditions for operation when a safety related power board is lost.

PO-5.0 Recognize and respond to the inadvertent opening / failure of an ERV in accordance with N1-OP-1 and H3-4-5.

PO-6.0 Monitor and control containment parameters in accordance with N1-EOP-4 to remain within design linmitations.

PO-7.0 Perform an emergency power reduction using recirculation flow and control rods prior to reaching 110°F in the Torus following a failed open ERV. (TS 3.3.2.e, N1-OP-43B)

PO-8.0 Supervise reactivity manipulations during an emergency power reduction. (GAP-OPS-05)

PO-9.0 Recognize and identify entry conditions for Emergency Operating Procedures.

PO-10.0 Carry out the actions of N1-SOP-1, Reactor Scram, when required/directed.

PO-11.0 Recognize the need for and direct alternate Boron injection. N1-EOP-3, N1-EOP-3.1)

PO-12.0 Under failure to scram conditions, with power greater than 6%, accurately determine and provide power-corrected level control bands. (N1-EOP-3)

PO-13.0 With level lowered to reduce reactor power and feed system injection restored, maintain RPV water level within directed bounds to prevent exceeding the Minimum Steam Cooling Water Level. (N1-EOP-3)

PO-14.0 Identify the appropriate method for inserting control rods when hydraulic block is suspected under failure to scram conditions. (N1-EOP-3.1)

PO-15.0 Given an event requiring activation of the Emergency Plan, the SRO will correctly classify the event per the EAL Matrix.

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Take the simulator out of freeze before the crew enters for the pre-shift walk down and briefing. As directed by Lead Evaluator Allow no more than 5 minutes to walk down the panels.	CREW • Walkdown panels • Perform annunciator checks • Conduct shift turnover brief • Assume shift, continue power operations SRO: • Conduct pre-evolution brief of N1-ST-W15 • Directs BOP to perform surveillance

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator Role play as WEC/Mgmt. if contacted by SRO acknowledge report of CRD air pressure drop and restoration. During performance of the surveillance, if CRD air pressure drops and **remains** below 60 PSIG a manual scram must be inserted. If CRD pressure drops below 60 PSIG during performance of the test, the Manager of Operations shall be informed. During performance of the surveillance a momentary drop in CRD Air Pressure is anticipated. This pressure drop is due to the location of the Scram solenoid valves in the air supply to the scram air header relative to the scram pilot valves. When the BU SCRAM/SDV isolation reopens following the reset of the scram signal, the line between the air supply and the valves re-pressurizes. This brief depressurization/re-pressurization causes the pressure drop in the air supply as indicated on the recorder on Panel "F".	BOP: • Acknowledge direction from SRO • Perform N1-ST-W15 (Channel 11): – Verify no half-scrams present – Notify CSO that a half-scram will be generated. – Depress Channel 11 Reactor Trip Pushbutton on Panel "E" ▪ Observe F1-3-1, RPS MAN RX TRIP alarms ▪ Observe RPS 11 WHITE scram group lights on Panel "F" extinguish ▪ Observe RPS 11 RED BU SCRAM SDV Vent and drain light extinguish ▪ Confirm RPS Channel 11 scram group lights on Panel "M" extinguish ▪ Confirm computer point W022 indicates TRIP YES

- Depress REACTOR TRIP RESET pushbutton on Panel "E"
  - Verify lights extinguished illuminated on Panel "E" and "M"
  - Observe F1-3-1 clears
  - Confirm computer point W022 indicates TRIP NO
  - Log drop in CRD Air Pressure on attachment.

- Report completion to SRO of Channel 11

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator When Channel 12 Reactor Trip pushbutton ("E") is depressed and released, verify activation of Remote: **RP14, Rx. Trip Bus 141 Ckt 5 Fuse Pulled = TRUE (ET01)**	BOP: • Perform N1-ST-W15 (Channel 12): – Verify no half-scrams present – Notify CSO that a half-scram will be generated. – Depress Channel 12 Reactor Trip Pushbutton on Panel "E" ▪ Observe F4-3-8, RPS MAN RX TRIP alarms ▪ Observe RPS 12 WHITE scram group lights on Panel "F" extinguish ▪ Observe RPS 12 RED BU SCRAM SDV Vent and drain light extinguish ▪ Confirm RPS Channel 12 scram group lights on Panel "M" extinguish ▪ Confirm computer point W068 indicates TRIP YES

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Plant Response *When the RESET button is depressed the CKT 5 (RED) light will remain off.*	– Depress REACTOR TRIP RESET pushbutton on Panel "E" ▪ Verify lights extinguished illuminated on Panel "E" and "M" ▪ Recognize/report failure of RED light for BU SCRAM SDV Vent & Drain to illuminate ▪ Observe F4-3-8 clears ▪ Confirm computer point W068 indicates TRIP NO ▪ Log drop in CRD Air Pressure on attachment.
Booth Operator Role-play as WEC/Mgmt. and acknowledge report from SRO. If requested to check the CKT 5 fuse, inform them that you will send I&C to investigate.	SRO: PO-1 • Acknowledge report from BOP • Contact WEC/Mgmt. and inform them of the failure of CKT 5 light to illuminate and failure of surveillance N1-ST-W15.
TS requirements of Table 3.6.2a state must have 2 operable or tripped trip systems and at least 1 instrument channel per system. Providing one channel is in the tripped condition, the technical specification is satisfied. The SRO may elect to place a manual trip in on Channel 12 due to the failure of CKT 5 to re-energize.	• Consult Technical Specifications – TS 3.6.2, Table 3.6.2a applies – Recognize that RPS Channel 12 is effectively tripped by failure of CKT 5 to re-energize.

As directed by Lead Evaluator

Booth Operator

Role-play as regional power control and advise the Control Room that a Severe Thunderstorm Warning has been issued by the National Weather Service for Oswego County for the next hour.

After the crew has been informed of the thunderstorm insert malfunction:

Breaker R1013 Trip	**(F3)**
ED21, PB17B Fault	**(F3)**

These malfunctions simulate an electrical transient and failure of selective tripping to isolate the power board.

The following loads will be lost as a result of the loss of PB103 and PB17B:

Core Spray Pump/Topping Pumps 122/112
Containment Spray Pumps 121/122
#12 Feed Pump Aux. Oil Pump
Static Batt. Charger 171A/B
RPS UPS 172A/B
ESW Pump #12
CRP Pump #12
RBCLC Pump #12
Liquid Poison Pump #12
CREVS #12
RBEVS #12
EDG #103 Auxiliaries
Condensate Transfer Pump #12
Emerg. Cond. #12 Inside Steam IV (39-09R)
Cont. Spray Raw Water Disch. BV #121/122
Cont. Spray Raw Water Intertie 121/111
Cont. Spray Raw Water Intertie 122 to Core Spray System #12
Core Spray High Point Vent #121

CSO: PO-2

- Recognize/report loss of power board #103
  - EDG #103 started and carrying PB103
  - R1013 tripped with no fault indicated (PB 103 normal supply)
  - R1053 tripped on fault (PB17B normal supply)

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator Role-play as WEC/Mgmt. and acknowledge SRO report of power board 103/17B problems. If requested, advise that you will dispatch operators to investigate R1013 (PB103) and R1053 (PB17B) trips. Wait 10 minutes then report that R1053 tripped on over-current.	SRO: • Acknowledge report from CSO • Recognize that EDG #103 auxiliaries are not powered (EDG Raw Water Pump) • Direct BOP to execute applicable ARP sections. – A5-1-2, TRANS 101S AUX FDR 103 R1013 TRIP – A5-3-7, POWER BD. 17 R1053 TRIP – A5-4-7, POWER BD 17 LOW BUS VOLTAGE • Contact WEC/Mgmt. and advise of power board problems BOP: • Execute A5-1-2 – Confirm alarm on computer (E090) – Verify R1013 OPEN – Confirm EDG 103 running – Confirm R1032 CLOSED

- Execute A5-4-7
  - Confirm alarm on computer (E175)
  - Verify the following:
    - #11 CRD Pump Running
    - RBCLC Pressure >40 PSIG
    - EDG 103 not running
    - Report EDG 103 status to SRO and that EDG103 needs to be shut down
  - Check PB17B clear of faults
  - Based on field report, recognize that PB17B cannot be re-energized

SRO:

- Acknowledge report of BOP
- Recognize that a complete loss of PB103 will occur
- Direct shutdown of EDG103 using N1-OP-45, Section G.7.0

BOP:

- Acknowledge direction from SRO
- Execute N1-OP-45, G.7.0
  - Recognize that based on unknown cause of trip for R1013, off-site power is not available and place R1013 in pull-to-lock
  - Place DIESEL GEN control switch to EM STOP
  - Verify the EDG stops and breaker R1032 opens
- Inform SRO that EDG 103 is shutdown
- Recognize and report Annunciator A5-4-3, POWER BD 103 BUS VOLTAGE LOW

SRO:

- Acknowledge report from BOP
- Direct BOP execute ARP A5-4-3

BOP:

- Executes ARP A5-4-3
  - Recognizes that PB 103 cannot be re-energized
  - Verify #11 CRD pump in service
  - Verify RBCLC pressure >40 PSIG
  - Reset 86-17
  - Recognize that PB 17B cannot be re-energized
- Report status of completed actions to SRO

SRO: PO-4

- Acknowledge report from BOP
- Review loads lost as result of PB103/17B loss (see page 13)
- Review Tech Specs for impact of loss of PB103
  - TS 3.1.4, Core Spray System
    - Allows operation for 7 days with one subsystem in each system OOS
  - TS 3.1.6.b, CRD System
    - Allows operation for 7 days with one CRD pump OOS
  - TS 3.3.7, Containment Spray System
    - Allows operation for 7 days with one subsystem in each system OOS
  - TS 3.6.3.c, Emergency Power Sources
    - Allows operation up to 7 days with one EDG OOS
  - TS 3.1.5.6, ADS
    - Requires cold shutdown <110 PSIG within 10 hours due to loss of one channel ADS confirmatory logic power

Booth Operator

Role-play as WEC/Mgmt. and acknowledge report of impending shutdown from SRO.

As directed by Lead Evaluator

Insert the following malfunction when the SRO completes briefing crew on imminent shutdown but prior to commencing the shutdown:

AD05, ERV #111 Opens (F4)

AD06, ERV #111 Sticks Open Queued

ERV #111 Sticks OPEN and will not close the remainder of the scenario.

  - TS Table 3.6.2.a(6), MSIV Position Indication
    - Allows operation to continue for 12 hours with one valve's position indication inoperable
  - Recognize that most limiting technical specification requires 10 hour shutdown to <110 PSIG
- Notify WEC/Mgmt. of impending shutdown
- Brief crew on impending shutdown and direct CSO to review N1-OP-43C section on 10-hour shutdown

BOP: PO-5

- Recognize/report inadvertent opening of ERV #111
  - Report Annunciator H3-4-5, PRESS SAFETY/RELIEF VALVES FLOW

CSO:

- Report power / level / pressure

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator Role-play as WEC/Mgmt. and acknowledge SRO report. If requested to dispatch an operator to the Aux. Control Room to monitor Acoustic Monitors, wait 3 minutes and report that ERV #111 is open.	SRO: **CT-1** • Acknowledge reports from crew • Direct BOP execute ARP H3-4-5 • Contact WEC/Mgmt. and report inadvertent opening of ERV #111 • Direct CSO to monitor Torus Temperature • Direct CSO to begin an Emergency Power Reduction (after ERV confirmed OPEN)

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator Role-play as NAO when dispatched to Aux. Control Room. Advise BOP that ERV 111 remains open regardless of actions taken. When dispatched to RB 237, wait 5 minutes and report that fuses F1 and F2 have been removed from ERV OP CHL 11.	BOP: PO-6 • Acknowledge direction from SRO • Execute ARP H3-4-5 – Confirm indications for ERV 111 on Panel "F" – Confirm alarm on computer ▪ B468, F141, D366 – Have NAO verify relief open from Aux. Control Room • Execute N1-OP-1, section H.8.0 – Depress ADS Timer Reset pushbutton – Pull fuses F15 and F30 (ERV 111 Control Power) inside Panel "F" – Dispatch NAO to RB 237 to remove F1 and F2 in ERV OP CHL 11 (ERV 111 Control Power fuses) – Determine that ERV remains open • Notify SRO that ERV 111 has not closed

OPERATOR ACTIONS

It is not expected that the CSO will have time to continue the power reduction by inserting the CRAM array. If time permits, the CSO **will** obtain the emergency power reduction procedure from the Core Reactivity Control book prior to inserting the CRAM array.

Torus Temperature exceeds 85 °F

CSO: PO-7

PO-9

- Commence emergency power reduction by reducing recirculation flow to 40 Mlbm/Hr
- Monitor reactor power, level, pressure and torus temperature
  - Inform SRO if torus temperature exceeds 85°F
  - Inform SRO if torus temperature exceeds 110°F
- Report when recirculation flow at 40 Mlbm/Hr

SRO: PO-8

- Provide reactivity oversight for emergency power reduction
- Acknowledge report of torus temperature
- Enter EOP-4, Primary Containment Control
  - Direct BOP to lockout all containment spray pumps
- Acknowledge that ERV 111 cannot be closed

BOP:

- Place control switches for containment spray pumps in pull-to-lock

Plant Response

Failure to Scram

SRO:

- Acknowledge reports of operators
- Brief crew on scram
  - BOP on level control
  - CSO on "reactor"
- Direct CSO to insert a manual scram

CSO: PO-10

- Acknowledge direction to insert a manual scram
- Place the mode switch in SHUTDOWN
- Recognize/report the failure to scram
  - Depress RPS Channel 11/12 Reactor Trip pushbuttons
  - Confirm BOP verifies ARI initiated
  - Provide SCRAM report
    - Reactor power / trend
    - RPV water level (value/trend)
    - RPV pressure (value/trend)
    - Status of main turbine
    - Status of control rods

BOP: PO-10

- When failure to scram is announced
  - Depress manual ARI initiation pushbutton (panel "F")
- After scram report complete inform SRO that ARI is verified

{Note: At this point, the SRO is in EOP-4 and EOP-3. With the expected rod pattern achieved, power will be near 6% once RRP are tripped. The failed open ERV makes pressure control not possible. Efforts to S/D are challenged by depressurization. Priority on executing EOP-3.1 may be over-shadowed by concerns for containment (HCTL).}

SRO

- Acknowledge SCRAM report
- Acknowledge Failure to Scram
- Enter EOP-2, RPV Control
- Exit EOP-2, enter EOP-3, Failure to Scram

SRO

Note: If MSIV close occurs due to RPV Lo-Lo level, they may be reopened by the CREW after installation of jumpers.

- EOP-3 actions:
  - Direct RO-BOP to bypass ADS
  - Determine MSIV status
  - Verify ARI Initiated
  - Direct Recirc flow to minimum prior to trip of pumps if turbine on line
  - Direct installation of Core Spray and MSIV (RPV-Lo^2) jumpers
  - Direct RO-CSO to execute EOP-3.1 to insert control rods
  - Direct RO to inject Liquid Poison using LP Pump #11

Jumpers installed in "N" Panel (inside) are:

MSIV Lo-Lo ISOL Bypass, Jumpers #1, 2, 8, 9

Core Spray Jumpers, #17, 18, 19, 24, 25, 26

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Booth Operator As WEC dispatch requested NAO. As NAO, when directed, wait two minutes and insert remote: **FW24, PULL HPCI FUSES (F10)** Report to RO-BOP that HPCI fuses are removed.	BOP: **CT-3** • Trip all recirculation pumps • Maintain RPV pressure within prescribed band using EC and TBV – Recognize that RPV pressure will continue to lower due to failed ERV. • **Terminate and prevent injection from Condensate and Feed by executing EOP-1, Attachment 24** – **Place #11 and #12 FWP in Pull-To-Lock** – **Direct NAO to pull HPCI Fuses** – **FCV 11/12 to MAN and close** – **Close FWP 13 BV** – **When HPCI fuses removed, reopen FW HDR IV** • Report to SRO when Terminate & Prevent is completed.

Note: Target level will be power-corrected level for –41 inches. When –41" reached, power is re-evaluated and new level band equating to –41" to –84" will be provided. As level lowers, power is expected to lower. Once conditions of EOP-3 L7 are satisfied, new level band is assigned from –41" to –109" or –84" to –109". Final level band will be assigned when level at –84" or reactor power less than 6% or all ERV closed with Drywell pressure < 3.5 PSIG. Given the conditions of the scenario, it is expected that level will be lowered to –84" (TAF).

When RO starts Liquid Poison Pump #11 ensure that trigger ET02 initiates. LP Pump #11 will trip approximately 15 seconds later. (Liquid Poison Pump #12 not powered.)

Malfunction: **LP01A** **(ET02)**

{Note: RWCU may already be isolated due to RPV Lo[2] isolations.}

Role Play:

As WEC, if contacted to lineup Alternate Liquid Poison injection inform the SRO that this will be accomplished. (Alternate LP Injection will NOT be performed.)

SRO PO-12

- Acknowledge report from RO
- Provide target level for level lowering and level control band for RO-BOP based on power correction (Table X, EOP-3)
- Provide pressure control band / method

BOP/CSO

- When starting Liquid Poison Pump #11, report initial tank level and status of Clean-up isolation.
- Recognize / report when LP Pump #11 trips

SRO PO-11

- Acknowledge report from RO
- Contact WEC and direct that Alternate Liquid Poison Injection be lined up and trouble shooting begun on LP pump #11

BOP **CT-4**

- Inform SRO when target level is reached.
- **As directed by SRO, re-establish feed to the RPV and maintain level within provided level band.**
- Recognize / report that #12 FWP did/will not start due to loss of power to Aux Oil Pump.

SRO

- Acknowledge report from operators
- Based on reported parameters, direct RO to initiate Torus Cooling in accordance with EOP-1, Attachment 16.

BOP **PO-6**

Note: Loop #111 is preferred to loop #112 due to potential for "short-cycling". Loops #121/122 are not available due to power board loss.

- Initiate Torus Cooling
  - Due to loss of PB 103, use Containment Spray/Raw Water pumps in loop #111 or #112
  - Containment Spray Raw Water pump is to be started prior to the associated Containment Spray pump.
- Report to SRO that Torus Cooling is in service.

OPERATOR ACTIONS

Booth Operator

If contacted by CSO to close 44-167, Charging Header Block Valve, wait 5 minutes and insert remote:

RD06, Charging Header Isolation

Jumpers installed are:

RPS SCRAM LOGIC RELAY BYPASS JUMPERS, Jumper #5, 6, 12, 13

CSO **CT-2**, PO-14

- Execute EOP-3.1
  - Drive Rods
    - Insert RPS jumpers per Table N1-EOP-3.1-1
    - Place the Mode Switch in REFUEL
    - Override ARI on "F" Panel
    - Bypass RWM (if required)
    - Raise drive pressure by:
      - Fully opening CRD flow control valve (Panel "F")
      - Closing 44-04, CRD Water Cont. Valve (Panel "F")
      - Directing NAO to close 44-167, Charging Water Header BV
    - Drive rods using EMER ROD IN
  - Inform SRO of ability to drive control rods.

When the SCRAM is reset insert malfunction:

RD33A, 0, TRA=3 SEC (ET03)
RD33B, 0, TRA=3 SEC (ET03)
RD33C, 0, TRA=3 SEC (ET03)
RD33D, 0, TRA=3 SEC (ET03)

This will permit all rods to be inserted to position "00" and provide appropriate indication of a successful SCRAM "Black-Black"

- Manual SCRAM
  - Reset the SCRAM
  - When F1-1-8, F3-1-4 and F4-1-1 clear
  - Insert a manual SCRAM
- Inform SRO of successful SCRAM

SRO

- Acknowledge reports from RO
- Direct RO to monitor Primary Containment Parameters
- When all rods are inserted, exit EOP-3, enter EOP-2
  - Provide RPV water level control band to RO-BOP
  - Direct Mode Switch to SHUTDOWN
  - Direct WEC to stop lining up for Alternate Boron Injection

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
TERMINATING CUE All control rods inserted to position 04 or beyond. **Primary containment parameters being controlled per EOP-4. Torus Cooling in service** • *SRO Candidate Evaluator:* After the simulator is placed in FREEZE, direct the SRO Candidate to classify the event	SRO • Classify the event as an Site Area Emergency EAL 2.2.2

Nine Mile Point 1	Scenario No. 4	Operating Test No. 1

Examiners:	Candidates:
	SRO SRO-2 SRO-4 SRO-5
	BOP SRO-1 SRO-3 RO-4
	CSO RO-1 RO-2 RO-3

Objectives: Evaluate candidates ability to perform routine operating tasks, raise and/or lower reactor power and to respond to the following failures:

1. Failure Emergency Condenser 11 Steam Valve to reopen during testing.
2. RPV Level transmitters fails downscale with RPS Channel 11 failure to trip
3. Steam Leak in Primary Containment.
4. Feedwater Flow Control Valve failures
5. Fuel Zone Level instruments lock up
6. ERV 113 failure

Evaluate the candidates' ability to execute normal, abnormal and emergency procedures while ensuring compliance with Technical Specifications.

This scenario will be classified as an Alert, EAL 3.1.1.

Initial Conditions:

1. IC 24, 100% power / 103% Rod line
2. Containment Spray Pump #111 and RAW Water Pump out of service for PM's.

Turnover:

1. The Plant is operating at 100% power.
2. Equipment out of service:
   a. #111 Containment Spray Pump for PM.
3. Complete N1-ST-Q4 Section 8.1, Quarterly Surveillance of the Emergency Condenser isolation valves.

Event No.	Malf. No.	Type	Event Description
1		N	(BOP/SRO) Complete N1-ST-Q4 Section 8.4, Quarterly Surveillance of the Emergency Condenser isolation valves.
2	Overrides	C	(BOP) Emergency Condenser 11 Steam Supply Valve 111 fails to re-open during surveillance, requiring entry into Tech Specs.

3	RR52 RP04A	I	(CSO/SRO) RPS Channel #11 Hi/Lo Rosemount fails downscale with Failure of RPS Channel #11 to trip on the failure of the Rosemount Instrument. Requires manual trip of RPS Channel 11 to comply with Tech Specs.
4	EC01 RR29	C	(BOP/CSO) Reactor Coolant System Leak in Containment (15%)
5		R	(CSO) Emergency Power Reduction due to leak.
6	Remotes FW25/26 Overrides	M	(BOP/CSO/SRO) Manual Scram due to rising Drywell Pressure. Reactor Coolant System leak rate rises to 35% Feedwater Level Control failure results in mis-positioned FW flow control valves and degraded RPV injection. Fuel Zone Level Instruments lockup resulting in unknown RPV water level and entry into EOP-7, RPV Flooding.
7	AD07C	C	(BOP/SRO) ERV 113 fails to open during RPV Depressurization requiring an additional ERV to be opened.

NMP SIMULATOR SCENARIO

Scenario 4 **REV. 1** **No. of Pages: 24**

LEAK INSIDE CONTAINMENT – LOSS OF LEVEL INSTRUMENTATION – RPV FLOODING

PREPARER	Hollingsworth	DATE 9/12/02
VALIDATED	Murtha, Frechette, Morgan	DATE
GEN SUPERVISOR OPS TRAINING		DATE 9/13/02
OPERATIONS MANAGER UNIT 1	NA EXAM SECURITY	DATE
CONFIGURATION CONTROL	NA EXAM SECURITY	DATE

SCENARIO SUMMARY

Length: 50 minutes

The Crew assumes the shift with the plant operating at 100% power, with Containment Spray Pump #111 out of service for maintenance. The Crew performs Section 8.1 of N1-ST-Q4, Reactor Coolant System Isolation Valves Operability Test. EC Steam Supply Isolation Valve 111 fails to reopen requiring the crew to consult Technical Specifications.

Following the EC surveillance, #11 Hi/Lo Rosemount fails downscale with a failure of RPS Channel #11 to trip. The Crew consults Technical Specifications and directs the manual insertion of a SCRAM on RPS Channel #11.

After inserting the half scram, a small leak develops in the containment causing containment pressure, temperature and humidity to rise. The SRO directs a power reduction to slow the rise in the containment parameters. Upon completion of the power reduction, the leak rate increases, requiring the crew to SCRAM the Reactor. Lowering RPV water level and rising Drywell pressure force entry into EOP-2, RPV Control and EOP-4, Primary Containment Control.

When the reactor SCRAM is inserted a failure of the FWLCS occurs reducing the RPV high pressure feed sources to less than the size of the leak. This requires the crew to reduce RPV pressure to allow Core Spray to inject.

The crew will lower containment pressure / temperature by initiating Containment Sprays.

The Fuel Zone level instruments fail as all other instruments trend downscale. EOP-7, RPV FLOODING is entered. When opening three ERV's, ERV-113 fails to open. The crew will open another ERV ensuring Minimum RPV Flooding Pressure is achieved. As RPV level is restored, level indication will become available. The crew may assess the validity of the available RPV level instrumentation, exit EOP-7 returning to EOP-2 and entering EOP-8.

Major Procedures: N1-EOP-02; N1-EOP-04; N1-EOP-7; N1-EOP-08
EAL Classification: Alert, EAL 3.1.1
Termination Criteria: The reactor is shutdown with the vessel depressurized, level being controlled with Core Spray and #12 Reactor Feed Pump, and containment parameters controlled per EOP-4.

SIMULATOR SET UP

A. IC Number: 24

B. Presets/Function Key Assignments

1. Malfunctions:

a.	RP04A - RPS Channel 11 Failure to Trip	**Queued**
b.	AD07C - ERV 113 Fails to Open	**Queued**
c.	RR52 - Channel 11 Hi/Lo Rosemont Fails downscale	**(F3)**
d.	EC01 - Steam Leak in Containment (15%)	**(ET04)**
e.	EC01 – Steam Leak in Containment (35%)	**(ET02)**
f.	EC01 - Steam Leak in Containment (0%)	**(ET05)**
g.	RR29 – Recirculation Loop Rupture (LOCA), (0-18% in 3 minutes)	**(ET05)**

2. Remotes:

a.	FW25, Local/Manual Position of FCV #11, 15	**(ET02)**
b.	FW26, Local/Manual Position of FCV #12, 15	**(ET02)**

3. Overrides:

a.	9S1 (EC Steam Supply Isolation Valve 111) (INOP) TUA=00:00:30	**(ET03)**
b.	5A76P1 (Channel 11 Fuel Zone) (44.0)	**(ET01)**
c.	5A77P1 (Channel 12 Fuel Zone) (45.0)	**(ET01)**

4. Annunciators:

a. None

5. Event Triggers

a. ET01 – Fuel Zone equals –14,
RRLFZ11M(1) LE –14 AND RRLFZ12M(1) LE -14

b. ET02 – Mode Switch to Shutdown,
ZDRPRUNM(2) EQ TRUE

c. ET03 – EC-11 Steam IV Closed,
ZLECMOVG(1) EQ TRUE

d. ET04 – CH 11 RPS Pushbutton,
ZLRP11F4(1) EQ FALSE

e. ET05 –,Containment Spray #122 Started
ZDCTPMPL(5) EQ TRUE

C. Equipment Out of Service

1. #111 Containment Spray Pump for Preventive Maintenance

D. Support Documentation

1. Surveillance N1-ST-Q4, Reactor Coolant System Isolation Valves Operability Test

E. Miscellaneous

1. RED DANGER Clearance Tag for #111 Containment Spray Pump (PTL)

II. **SHIFT TURNOVER INFORMATION**

SHIFT: ☐ N ☐ D DATE: _____

PART I: To be performed by the oncoming Operator before assuming the shift.

- Control Panel Walkdown (all panels) (SSS, SRO, STA, CSO, CRE)

PART II: To be reviewed by the oncoming Operator before assuming the shift.

- Shift Supervisor Log (SSS, SRO, STA)
- CSO Log (CSO)
- Lit Control Room Annunciators (SSS, SRO, STA, CSO, CRE)
- Shift Turnover Checklist (ALL)
- LCO Status (SSS, SRO, STA)
- Computer Alarm Summary (CSO)

Evolutions/General Information/Equipment Status:

- Reactor Power = 100%
- Loadline = 103%
- Containment Spray Pump #111 Out of Service (TS 3.3.7.b)

PART III: Remarks/Planned Evolutions:

- Complete N1-ST-Q4, Quarterly Surveillance Of The Emergency Condenser Loop 11 Isolation Valves Operability Test, Section 8.1.

PART IV: To be reviewed/accomplished shortly after assuming the shift:

- Review new Clearances (SSS)
- Shift Crew Composition (SSS/SRO)
- Test Control Annunciators (CRE)

TITLE	NAME	TITLE	NAME
SSS		CRE	
SRO		E	
STA		E	
CSO		Other	

Scenario ID#: **Scenario 4**

INSTRUCTOR COMMENTS (Strengths, Areas for Improvement, Open Items etc.)

What Happened?	What we did?	Why? (Goals)	Other Options?

III. PERFORMANCE OBJECTIVES

A. Critical Tasks:

CT-1.0 Given a primary system leak into the containment, when torus pressure exceeds 13 psig or before drywell air temperature exceeds 300°F, the crew will initiate Containment Sprays, while in the safe region of the Containment Spray Initiation Limit and prior to exceeding the Pressure Suppression Pressure limit IAW N1-EOP-4.

CT-2.0 Given a condition with Containment Sprays operating and a Drywell Pressure lowering, the Crew will secure Containment Sprays within 3 minutes of Drywell Pressure dropping below 3.5 psig in accordance with N1-EOP-4.

CT-3.0 Given RPV level is unknown, establish adequate core cooling by either establishing RPV pressure above Minimum RPV Flooding Pressure (72 psig above Torus pressure per N1-EOP-7) or restoring RPV level above TAF (-84 in per N1-EOP-2).

B. Performance Objectives:

PO-1.0 Identify non-compliance with acceptance criteria for performance of N1-ST-Q4

PO-2.0 Identify limitations imposed by Technical Specifications on continued operation with an Emergency Condenser inoperable. (TS 3.1.3, 3.3.4)

PO-3.0 Recognize and respond to low reactor water level conditions / indications

PO-4.0 Identify components/trip functions associated with Vessel Level Instruments (HI/LO Rosemount) and limitations imposed by Technical Specifications on continued operation with instrument(s) out of service. (TS 3.6.2)

PO-5.0 Recognize a failure of automatic protective functions associated with the Reactor Protection System and take appropriate actions to correct / compensate for this failure.

PO-6.0 Identify conditions requiring NRC notification in accordance with 10CFR50.72.

PO-7.0 Recognize and respond to rising pressure/temperature in the Primary Containment. (N1-ARP-L1, N1-ARP-K2)

PO-8.0 Correctly identify EOP entry conditions.

PO-9.0 Assess primary containment parameters to determine if reactor coolant leakage exceeds Technical Specification limits.

PO-10.0 Recognize failure of Fuel Zone Level Instrument to provide accurate indication of RPV water level.

PO-11.0 Assess the usability / validity of RPV water level instrumentation following a RPV depressurization. (N1-EOP-2)

PO-12.0 Assess the usability / validity of RPV water level instrumentation under varying Primary Containment conditions. (N1-EOP-2)

PO-13.0 Recognize the failure of ERV to operate as desired and take action required to establish Minimum RPV Flood Pressure during RPV Flooding.

PO-14.0 Control RPV Pressure and Level in accordance with N1-EOP-2.

PO-15.0 Recognize the need for and direct the installation of jumpers to support Emergency Operating Procedures. (EOP-1, Attachment 4 CSIV Jumpers)

PO-16.0 Control Primary Containment Pressure and Temperature in accordance with N1-EOP-4.

PO-17.0 Given an event requiring activation of the Emergency Plan, the SRO will correctly classify the event per the EAL Matrix.

Take the simulator out of freeze before the crew enters for the pre-shift walkdown and briefing.

As directed by Lead Evaluator

Allow no more than 5 minutes to walkdown the panels.

CREW

- Walkdown panels
- Perform annunciator checks
- Conduct shift turnover brief
- Assume shift, continue power operations

SRO

- Conducts pre-evolution brief of N1-ST-Q4, Section 8.1.
- Directs performance of N1-ST-Q4, Section 8.1.

BOP: PO-1.0

- Acknowledges direction from SRO.
- Performs Section 8.1.of N1-ST-Q4, Reactor Coolant Isolation Valves Operability Test.
  - Cycles and records closing time of 39-12R, EC Steam Supply Drain IV 112
  - Obtains Independent Verification that 39-12R is OPEN following cycling

- Cycles and records closing time of 39-11R, EC Steam Supply Drain IV 111
- Obtains Independent Verification that 39-11R is OPEN following cycling
- Cycles and records cycling time of 05-11, EC Vent Isolation Valve 112
- Obtains Independent Verification that 05-11 is OPEN following cycling
- Cycles and records cycling time of 05-01R, EC Vent Isolation Valve 111
- Obtains Independent Verification that 05-01R is OPEN following cycling

Trigger ET03 activates Override 9S1 after 30 second time delay. Causes 39-09R to fail closed.

Plant Response:

Valve 39-09R fails to open

- Closes 39-09R, EC STM ISOLATION VALVE 111 and records closure time
- Places control switch for 39-09R to "OPEN" and observes that valve does NOT reposition

- Reports EC STM ISOLATION VALVE 111, 39-09R has failed to reopen after being closed.

Booth Operator:

Role Play as WEC/Mgmt: Acknowledge report of 39-09R failure. Advise SRO that you will provide requested assistance.

The most limiting Technical Specification is TS 3.1.3.b which permits continued operation for up to 7 days providing the other EC is verified operable immediately and daily thereafter.

TS 3.2.7.b is satisfied since 39-09R is closed.

SRO:

- Acknowledges report from BOP
- Informs WEC/Management that 39-09R has failed to reopen during performance of surveillance
- Makes Technical Specification evaluation of EC11 to determine appropriate action
  - TS 3.1.3, Emergency Cooling
    - Section "b" requires EC11 return to service within 7 days and verification of operability of other EC immediately and daily thereafter (TS 4.1.3.f)
  - TS 3.2.7, RCS Isolation Valves
    - All RCS isolation valves must be operable or,
    - At least one valve in each line must be closed

Booth Operator

After Tech Spec declaration is made and as directed by Lead Evaluator insert malfunction:

RR52=TRUE **(F3)**

Channel 11 Hi/Lo Rosemount Fails Downscale. The following indications will be observed:

Rosemount level indicator on Panel "F" will be downscale

Computer point W006 will be present on alarm typer and PCS screen

Annunciator F1-1-3, RPS 11 Reactor Low Water Level

Analog Trip System light, Ch. 11 (Panel "F")

RPS Channel 11 Group Scram lights (4, White) and Backup Scram/SDV light (1, Red) remain illuminated

Annunciator F1-2-1 ***DOES NOT*** *alarm (RPS CH11 AUTO REACTOR TRIP)*

CSO:

- Recognizes and announces Annunciator F1-1-3
- Reports power-pressure-level stable to SRO
- Determines that Channel 11 Rosemount is failed downscale
- Identifies Analog Trip System trouble light on "F"

BOP:

- Identifies failed indication on "F" panel (CH 11 Rosemount)
- Obtains/executes Alarm Response Procedure for F1-1-3
  - Confirm RPS Channel 11 trip
  - Confirm alarm condition
  - Reset RPS Ch 11 when cause known and corrected

Booth Operator

Role play as WEC/Mgmt. And take report from SRO. Advise that you will provide requested assistance.

BOP:

- Report failure of RPS Channel 11 to trip
- Report indicated device from ARP based on computer point
  - Reports device 36-03A
  - Reports all other level instruments indicating normally

SRO:

- Acknowledges report from operator
- Reports instrument failure to WEC/Management
- Makes Technical Specification assessment of instrument failure
  - TS table 3.6.2.a, parameter 4 on Low Water Level Scram
    - Note "(o)" requires RPS channel 11 be placed in trip within 12 hours
  - TS table 3.6.2.k parameter 1, HPCI
    - Note "(c)1." Requires inoperable channel in trip within 24 hours
  - TS table 3.6.2.k parameter 2, Automatic Turbine Trip
    - Specification satisfied

Booth Operator

Role Play as WEC/Mgmt. And acknowledge report from SRO. Advise that you will provide requested assistance.

CUE: Recommend as plant management that SRO place RPS Channel 11 in the tripped condition if that has not been done/directed.

- Determines that RPS Channel 11 should be placed in the tripped condition
- Notifies WEC/Management of Technical Specification determination
- Direct CSO to manually insert a half-scram on RPS Channel 11

CSO:

- Acknowledge direction from SRO to place RPS Channel 11 in the tripped condition
- Place RPS 11 in the tripped condition by depressing the RPS CH 11 manual scram pushbutton on "E" panel
- CSO confirms RPS Channel 11 trip by observing indicating lights on "F" and computer point W022 on alarm typer/PCS screen
- Reports RPS Channel 11 trip to SRO

Booth Operator

Verify that EC01 is activated when RPS Channel 11 indicating lights on "F" panel are extinguished.

EC Steam Leak Inside of Containment

0 – 15% over 3 minutes

Plant Response

RPS Channel 11 scram indicating lights on "F" panel extinguish.

Annunciator F1-3-1, RPS CH 11 MAN REACTOR TRIP alarms.

Drywell pressure, temperature and humidity begin to rise.

Drywell pressure will reach 2.0 PSIG in approximately 2 minutes.

Annunciator K2-4-3, Drywell Press Hi alarms.

Computer point D320 in alarm.

CSO: PO-7.0

- Recognize/report K2-4-3, Drywell Pressure High-Low

SRO:

- Acknowledge report from operator and direct BOP to execute alarm response procedure

As drywell parameters change the SRO may direct an emergency power reduction or may direct the BOP to review procedure N1-OP-9 for venting the containment.

BOP may discuss with SRO requirement to conduct an orderly shutdown per OP-43C.

BOP:

- Acknowledges direction of SRO
- Obtains copy of ARP K2-4-3 and executes
  - Monitors containment parameters (pressure, temperature, humidity, leak recorders)
  - Verifies 70-94 is OPEN on H panel
  - Notifies Chemistry to sample containment atmosphere
  - Notifies SRO that a shutdown is required if pressure cannot be maintained.
- Recognizes/reports degrading drywell conditions (pressure/temperature rise)

Plant Response

Drywell conditions continue to degrade.

Temperature rises above 135 °F and L1-4-4 alarms

SRO: PO-8.0

- Acknowledge report from BOP
- Direct CSO to commence an emergency power reduction in accordance with OP-43 by reducing recirculation flow to 40 Mlbm/hr
- Provide reactivity oversight for power reduction

CSO:

- Acknowledges report from SRO
- Begins reducing recirculation flow using the Master Recirculation Flow Controller on "E" panel

The SRO may elect to insert a manual scram prior to drywell pressure reaching 3.5 PSIG

Manual scram expected prior to 3.0 PSIG in the drywell.

SRO: PO-9.0

- Brief crew on SCRAM responsibilities
- Direct CSO to insert a manual scram due to degrading drywell conditions

Plant Response

When SCRAM is inserted all rods will insert. RPV water level will drop below 53" and RPV pressure will begin to lower.

Booth Operator

Verify EC01 jumps to 45% when mode switch placed in SHUTDOWN.

Verify REMOTE FW25 and FW26 activate when mode switch in SHUTDOWN (Value=15%)

Manual position FCV #11 and FCV #12

Plant Response

Drywell pressure begins to rise rapidly to beyond 3.5 PSIG. This causes a RRP trip and initiation of Core Spray pumps

CSO: PO-8.0

- Acknowledge direction from SRO
- Place the Mode Switch in SHUTDOWN
- Provide SCRAM Report
  - Mode switch position
  - RPV Pressure (value/trend)
  - RPV Level (value/trend)
  - Reactor Power (APRM power level and control rod position)
- Report EOP-2 entry condition on RPV water level less than 53"

SRO:

- Acknowledge scram report from CSO
- Enter EOP-2 on RPV Water Level <43"
- Direct CSO to execute SOP-1 and provide pressure control band (800 – 1000 PSIG using Bypass Valves)
- Direct BOP to restore and maintain RPV water level to 53" – 95" using Condensate, Feed and CRD systems

CSO:

- Acknowledge direction to and execute SOP-1
  - Confirms FW LVL SP SETDN INIT light is on
  - Observe reactor power lowering
  - Place IRM Range Switches on Range 10
  - Insert IRM/SRM detectors by depressing INSERT pushbuttons on "E"
  - Verify turbine has tripped
  - Verify reactor pressure maintained below 1080 PSIG and within given band

Plant Response

RPV water level will be slow to recover due to increased size of steam leak.

Drywell and Torus pressure continue to rise.

BOP:

- Acknowledge direction from SRO to maintain level
- Once water level begins to recover:
  - Verify at least one electric FWP running
  - Place #13 FWP FCV M/A in MANUAL and dial closed
  - Verify RPV level >53"
  - Disengage #13 FWP
  - Close #13 FWP BV (29-10)
  - Verify 11/12 FCV controllers in Manual and set to zero output
  - Reset HPCI signal (Panel "E")
  - Select FWP Bypass valve and place in AUTO set 65" – 70"
  - Verify stable RPV level and secure second electric FWP
  - Close running FWP Discharge BV if required

Plant Response

Drywell temperature exceeds 150 °F

BOP: PO-8.0

- Recognizes/reports drywell pressure/temperature exceeding EOP–4 entry values

Plant Response

Torus pressure exceeds 13 PSIG or Drywell Temperature approaches 300 °F

SRO:

- Acknowledges report from operator
- Enters EOP-4 on High Drywell Temperature/Pressure
- Directs BOP to place Containment Spray pumps in pull-to-lock

BOP:

- Acknowledge direction from SRO
- Place containment spray pumps in pull-to-lock

CSO:

- Monitors containment parameters
- Reports Torus pressure exceeding 13 PSIG

SRO: CT-1.0

- Acknowledge report from CSO
- Determines that containment sprays are required
  - Verify plant within CSIL (Drywell temperature and pressure)
  - Directs verify that all RRP are tripped
  - Directs all Drywell cooling fans be tripped
  - Directs CSO to spray the containment using EOP-1 Attachment 17
  - Directs CSO to secure Containment Spray when drywell pressure < 3.5 PSIG

CSO: CT-1.0

- Verifies RRP are tripped by observing GREEN lights on for RRP MG Breakers
- Trips Drywell Cooling Fans by placing DW CLNG FAN control switches to trip and observing GREEN lights on

Booth Operator

Verify that malfunction EC01 sets to 0% and RR29 initiates (18% over 3 min.) when Containment Spray Pump #122 is started.

EC Steam leak in containment

Recirculation loop rupture (DBA)

Plant Response

Drywell pressure will begin to lower slowly.

Operator recognizes that CT SRAY 122 must be started since #111 is marked up. Operator may elect to start all three available pumps.

Drywell pressure lowers to 3.5 PSIG

RPV Water Level lowering beyond capability of FWP and CRD

Booth Operator

Verify that Overrides 5A76P1 and 5A77P1 activate when FZWLI indicates approximately "-14"

Plant Response

As FZWLI approach –15" all other instruments will be downscale and the Lo-Lo-Lo and Wide Range level instruments will be unusable due to drywell temperature.

- Operates Containment Sprays per EOP-1 Attachment 17
  - Verify started Containment Spray Pump #122
  - Verify started at least one other Containment Spray pump

CSO: CT-2.0

- Monitors drywell pressure
- Secures containment sprays when drywell pressure reaches 3.5 PSIG

BOP:

- Recognizes that RPV level is lowering
- Reports inability to restore/maintain RPV level

SRO:

- Acknowledges report from BOP
- Recognizes leak greater than capacity of available makeup sources
- Directs BOP to monitor level and report when –84" by Fuel Zone

BOP: PO-10.0

- Recognize that FZWLI have failed and no other valid level indications exist
- Report to SRO loss of all level indication

SRO: **CT-3.0**

- Acknowledge report from BOP
- Recognize override of EOP-2 (L-2/L-4) for RPV Flooding (EOP-7) is satisfied
  - Inform crew of intention to enter EOP-7
  - Verifies Torus water level > 8 FT
  - Directs BOP to open 3-ERV
  - Verifies MSIVs and EC Steam Isolation Valves CLOSED
  - Directs BOP to maintain 3-ERV open and RPV pressure 72 PSIG > Torus pressure
  - Directs Core Spray IV jumpers installed (EOP-1 Attachment 4)

Plant Response

ERV #113 will not open due to malfunction

When RPV pressure <365 PSIG the Core Spray IVs open

BOP:

- Opens 3-ERV using preferred sequence
  - Recognize/report that ERV#113 did not open
  - Opens another ERV to establish 3 open ERV
- Reports 3-ERV open
- Reports when Core Spray begins to inject (RPV pressure < 365 PSIG)

Either the CSO or BOP may be directed to install the jumpers based on activities to support EOP-4. The BOP is expected to be assigned specifically to level monitoring/restoration.

Plant Response

After Core Spray has been injecting for several minutes, level indications will begin to rise (except CH11 Rosemount).

Booth Operator

Role Play as WEC/System Engineer if asked to evaluate RPV level instrumentation. Respond that instruments may be used if responding in uniform manner and no evidence of flashing on available instruments.

Note: SRO may elect to establish RPV pressure 72 PSIG above Torus pressure instead of accepting level indications.

SRO: PO-15.0

- Directs BOP/CSO to install Core Spray IV jumpers
- Directs maintain RPV pressure 72 PSIG above Torus pressure using Core Spray, CRD, Condensate and Feed systems

CSO/BOP:

- Installs Core Spray IV jumpers per EOP-1, Attachment 4 inside "N" panel
- Monitor RPV - Torus pressure

BOP: PO-11.0

- Recognize/report when vessel level instruments begin to respond and are "on scale"

SRO: PO-11
PO-12

- Acknowledge report of vessel level instrumentation response
- Assess validity of level instrumentation to determine RPV water level
  - Determine that RPV level instrumentation is available for use

Terminating Cues:

- RPV depressurized
- RPV Level being restored/maintained with Core Spray, CRD, Condensate and Feed or RPV pressure being maintained 72 PSIG above torus pressure.
- Containment parameters being controlled per EOP-4

SRO Candidate Evaluator

After the simulator is placed in FREEZE, direct the SRO Candidate to classify the event.

SRO: **CT-3**

- When level indications are determined to be valid, exit EOP-7, enter EOP-8 and return to EOP-2 at ①
- **Direct BOP to restore and maintain RPV level above TAF (-84 inches).**

SRO: PO-17

- Classify the event as an Alert, EAL 3.1.1

Nine Mile Point 1	Scenario No. 5 (Alternate)	Operating Test No. 1
Examiners:	**Candidates:**	

Objectives: Evaluate candidates ability to perform routine operating tasks, raise and/or lower reactor power and to respond to the following failures:

1. Loss of #11 Reactor Building EVS fan, due to flow controller failure
2. Seismic Event and Emergency Condenser #12 Condensate Return Valve fails open,
3. Fuel Failure,
4. RWCU and Feedwater leak,
5. Core Spray inside IV's failure to open.

Evaluate the candidates' ability to execute normal, abnormal and emergency procedures while ensuring compliance with Technical Specifications.

This scenario will be classified as an Alert per EAL 3.1.1 and EAL 8.4.6

Initial Conditions:

1. IC 8, 48% power during power ascension.
2. EDG 102 OOS for oil change, clearance hung.

Turnover:

1. EDG 102 is out of service under clearance for an oil change.
2. Continue startup to raise power to 55% using recirculation flow.
3. Once at 55% power perform N1-ST-M8 Section 8.1 RB EVS Operability for Loop #11.
4. All appropriate Equipment Log entries have been made.

Event No.	Malf. No.	Type	Event Description
1		**R**	(RO/SRO) Raise Recirc flow to achieve 55% power
2		**N**	(BOP) Reactor Building Emergency Ventilation System (RBEVS) Operability, N1-ST-M8, Section 8.1 for Loop #11.
3	Overrides	**C**	(RO/SRO) #11 RBEVS Flow Controller Failure. System will be returned to standby lineup.

4	EC03B PC05	C	(BOP/SRO) Seismic Event and Emergency Condenser (EC) #12 Condensate Return Valve fails open, resulting in a power excursion. Requires EC to be isolated and Tech Spec entry.
5	RX01	C	(RO/BOP) Fuel Failure (50% over 10 minutes) resulting from EC transient. Offgas and Main Steam Line radiation levels rise. Manual scram will be initiated.
6	CU01 FW31	M	(RO/BOP/SRO) Reactor Water Cleanup leak (100% over 5 minutes) and a Feedwater line Break outside the Drywell, results in loss of Feedwater.
7	Overrides/ Jumpers installed	C	(BOP/SRO) Core Spray inside IV's fail to open requiring manual action to open IV's to recover RPV water level above top of active fuel.

NMP1 SIMULATOR SCENARIO

Scenario 5 (Alternate) **REV. 2** **No. of Pages: 30**

FUEL FAILURE/RPV LEAK INTO CONTAINMENT REQUIRES USE OF DRYWELL SPRAY AND CORE SPRAY TO CONTROL RPV AND CONTAINMENT PARAMETERS

PREPARER	Hollingsworth	DATE 9/12/02
VALIDATED	Murthy, Frechette, Morgan	DATE
GEN SUPERVISOR OPS TRAINING		DATE 9/13/02
OPERATIONS MANAGER UNIT 1	NA Exam Security	DATE
CONFIGURATION CONTROL	NA Exam Security	DATE

SCENARIO SUMMARY

Length: 75 minutes

The crew assumes the shift with the plant operating at approximately 50% power, EDG102 out of service for maintenance. The crew raises power to 55% using Recirculation flow. Following the power rise, the crew performs Section 8.1, of N1-ST-M8, Reactor Building Emergency Ventilation System Operability Test. The #11 RBEVS flow controller fails resulting in low loop flow. The crew will assess the condition and declare the loop inoperable per Technical Specification 3.4.4.

A seismic event occurs resulting in a break in the air line to the condensate return valve for EC #12 which fails open causing an increase in reactor power and associated fuel damage. The crew will be unable to close the condensate return valve and will secure the EC using the steam isolation valve(s). Increased radiation levels from the fuel failure may result in the crew inserting a manual scram and vessel isolation.

The seismic event also causes a leak inside the primary containment (from Reactor Water Cleanup) and outside the primary containment (Feedwater Header rupture). The Feedwater rupture causes a loss of feed. Damage is also sustained by the Core Spray Isolation Valves preventing automatic operation.

A High Drywell Pressure condition forces entry into EOP-4, Primary Containment Control. Degrading conditions require the use of Containment Spray to control Drywell pressure and Core Spray to restore and maintain RPV water level. Level restoration is further complicated by the failure of the Core Spray IVs to automatically open. The crew is required to manually open these valves from the Control Room to restore/maintain RPV water level.

Major Procedures: N1-ST-M8; N1-OP-13; N1-SOP-1, 2 & 4; N1-EOP-2, 4 & 8

EAL Classification: Alert, EAL 3.1.1 and/or EAL 8.4.6

Termination Criteria: Reactor shutdown and depressurized with RPV level and Primary Containment parameters maintained within the proscribed bands.

I. SIMULATOR SET UP

A. IC Number: 48% Power

B. Presets/Function Key Assignments

1. Malfunctions:

a. PC05 – Seismic Event Triggered (F3)

b. EC03B – EC 12 Condensate Return Line IV Fails Open, TUA=1 minute (F3)

c. RX01 - Cladding Failure (0-50% in 10 minutes), TUA=1minute (F3)

d. CU01 - RWCU leak inside the Drywell (0-100% in 5 minutes) (F4)

e. FW31 - FW line break outside the Drywell (F4)

2. Remotes:

a. IA01 – Instrument Air Supply to Breathing Air (OPEN) Preset

3. Overrides:

a. 11A10P1, 5L12/202-49C SETPT R1, Final=0.0, Ramp=00:00:03 **(ET01)**

b. 1A4S24 – DIESEL GEN 102 CONTROL, POS_1 Preset

c. 1A4S14 – DG OUTPUT BKR 1022 CTL SW OFF, POS_1 Preset

d. 12BNJ116 – EOP JUMPER FOR CS VALVE, IN Preset

e. 12BNJ117 – EOP JUMPER FOR CS VALVE, IN Preset

f. 12BNJ118 – EOP JUMPER FOR CS VALVE, IN Preset

g. 12BNJ123 – EOP JUMPER FOR CS VALVE, IN Preset

h. 12BNJ124 – EOP JUMPER FOR CS VALVE, IN Preset

i. 12BNJ125 – EOP JUMPER FOR CS VALVE, IN Preset

4. Annunciators:

a. A4-12, A4-2-4, DSL-GEN 102 R1022 TRIP CONT. VOLT.

5. Event Triggers:

   a. ET01 – EVTRG "RBEVS Start", ZLHVF53R(1) EQ TRUE

C. Equipment Out of Service

1. EDG 102 for an oil change.

D. Support Documentation

1. N1-ST-M8, Reactor Building Emergency Ventilation System Operability Test

E. Miscellaneous

1. RED Clearance/Danger Tag on EDG 102 Control Switch
2. RED Clearance/Danger Tag on EDG 102 Output Breaker, R1022
3. BREATHING AIR COMP in PTL with Yellow Clearance hung
4. Reactivity Manipulation Request (RMR) for raising power to 55% using Recirculation flow adjustment.

II. **SHIFT TURNOVER INFORMATION**

SHIFT: ☐ N ☐ D DATE: _____

PART I: To be performed by the oncoming Operator before assuming the shift.

Control Panel Walkdown (all panels) (SSS, SRO, STA, CSO, CRE)

PART II: To be reviewed by the oncoming Operator before assuming the shift.

Shift Supervisor Log (SSS, SRO, STA) • Shift Turnover Checklist (ALL)
CSO Log (CSO) • LCO Status (SSS, SRO, STA)
Lit Control Room Annunciators • Computer Alarm Summary (CSO)
(SSS, SRO, STA, CSO, CRE)

Evolutions/General Information/Equipment Status:

- Reactor Power = 48% during power ascension
- Emergency Diesel Generator 102 out of service, under clearance, for oil an change.
- All appropriate Equipment log entries have been made.

PART III: Remarks/Planned Evolutions:

- Raise reactor power to 55% with Recirculation flow.
- Perform Section 8.1, Operation Of RBEVS Loop 11, of N1-ST-M8, Reactor Building Emergency Ventilation System Operability Test

PART IV: To be reviewed/accomplished shortly after assuming the shift:

Review new Clearances (SSS) • Test Control Annunciators (CRE)
Shift Crew Composition (SSS/SRO)

TITLE	NAME	TITLE	NAME
SSS		CRE	
SRO		E	
STA		E	
CSO		Other	

Scenario ID#: **Scenario 5**

INSTRUCTOR COMMENTS (Strengths, Areas for Improvement, Open Items etc.)

What Happened?	What we did?	Why? (Goals)	Other Options?

PERFORMANCE OBJECTIVES

A. Critical Tasks:

CT-1. Given a primary system leak into the containment, when torus pressure exceeds 13 psig or before drywell air temperature exceeds 300°F, the crew will initiate Containment Sprays, while in the safe region of the Containment Spray Initiation Limit and prior to exceeding the Pressure Suppression Pressure limit IAW N1-EOP-4.

CT-2. Given degraded RPV injection sources the crew will depressurize the RPV and inject with Core Spray to restore and maintain RPV water level above – 109 inches IAW N1-EOP-2.

CT-3. Given a condition with Containment Sprays operating and a Drywell Pressure lowering, the Crew will secure Containment Sprays within 3 minutes of Drywell Pressure dropping below 3.5 psig in accordance with N1-EOP-4.

B. Performance Objectives:

PO-1. Raise reactor power using Recirculation flow adjustments while maintaining power and flow within proscribed limits in accordance with N1-OP-43B and N1-OP-1.

PO-2. Identify limitations imposed by Technical Specifications resulting from a failure of RBEVS Operability Surveillance N1-ST-M8. (TS 3.4.4)

PO-3. Respond to a Seismic Event in accordance with N1-SOP-11.

PO-4. Respond to an inadvertent initiation of an Emergency Condenser during power operations in accordance with N1-OP-13.

PO-5. Recognize an unplanned change in reactor power in accordance with N1-SOP-2.

PO-6. Identify the occurrence of Fuel Damage by monitoring process radiation instruments (Off-gas, MSL Radiation, etc.).

PO-7. Respond to High Main Steam Line radiation levels in accordance with N1-ARP-F1/F4 (F1-2-7).

PO-8. Recognize the failure of Core Spray isolation valves to automatically open at 365 PSIG.

PO-9. Identify Emergency Operating Procedure (EOP) entry conditions.

PO-10. Given an event requiring activation of the Emergency Plan, the SRO will correctly classify the event per the EAL Matrix.

Take the simulator out of freeze before the crew enters for the pre-shift walkdown and briefing.

Allow no more than 5 minutes to walk down the panels.

CREW

- Walk down panels.
- Perform Annunciator checks.
- Conduct shift turnover brief.
- Assume the shift and continue power operations.

SRO: PO-1

- Provide reactivity brief of power manipulation
- Directs RO/CSO to raise Reactor power to 55% by raising Recirculation flow (N1-OP-43B).
- Provides reactivity oversight during the Recirculation Flow adjustment.

CSO:

- Acknowledges direction from SRO.
- Raises Reactor power to 55% by raising Recirculation flow.
- Monitors computer point C875 using VAL DISP on SPDS monitor
- Verifies response of Recirculation Master Flow Controller, nuclear instrumentation and FWLCS
- Coordinates with BOP the monitoring of RPV water level and individual Recirculation Pumps to power change.
- Verifies power/flow conditions on 5-Loop Power to Flow Map on "E" panel

BOP:

- Monitors FWLCS response to power change
- Monitors individual RRP response to power change

Power manipulation completed.

SRO

- Directs performance of N1-ST-M8, Section 8.1.

Booth Operator

When operator starts RBEVS Fan #12, verify that the following override is inserted by event trigger

ZLHVF53R(1)=TRUE

11A10P1, Value 0.0, Ramp 3 sec.

RBEVS System #11 Low Flow

Indicated flow (202-49B, Panel "L") will slowly begin to rise then will fall to "0" over 3 seconds. This represents a failure of the automatic flow controller and will cause L1-1-6 to alarm.

RO PO-3.0

- Acknowledges direction from SRO.
- Performs Section 8.1 of N1-ST-M8, Reactor Building Emergency Ventilation System Operability Test.
  - Reviews procedure
  - Establishes valve lineup
    - Verify OPEN 202-36
    - Verify CLOSED 202-47
    - OPEN 202-37
    - Start EVS Fan #11 (202-53)
    - Verify OPEN 202-34
  - Observes flow indicating controller 202-49B to confirm proper operation of 202-50 (EVS #11 Inlet FCV)
  - Annunciator L1-1-6, EMER VENT SYS EXH FLOW LOW FILTER ΔP, alarms
- Reports failure of EVS #11 to attain desired flow to SRO.

SRO may direct execution of ARP of RBEVS Fan #11 rather than shutdown.

SRO

- Acknowledges report from RO-BOP
- May direct execution of ARP L1-1-6 or shutdown of #11 RBEVS per steps 8.1.13 through 8.1.19 of N1-ST-M8.

Floor Instructor/Evaluator

If the alarm typer or plant computer alarm summary screen is checked by the CREW, provide computer point: B101, EMER VENT FAN 11/12 FLOW _____ LOW

Plant Response

In manual the controller will respond and operator may establish 1600 CFM flow.

Booth Operator

If requested by BOP role-play as NAO. When instructed to confirm/verify 202-76 OFF, wait 5 minutes and inform BOP that the heater is "OFF".

BOP

- If execution of L1-1-6 ARP directed:
  - Confirms alarm
  - Determines that flow is low
  - Places RBEVS flow controller in manual and attempts to establish 1600 CFM flow
  - Reports to SRO that 1600 CFM flow is achieved
- If shutdown of #11 RBEVS is directed:
  - Verify normal RBVS in service
  - Place 202-53 (EVS Fan 11 control switch) to STOP
  - Verify 202-53 is OFF (RED light extinguished, GREEN light illuminated)
  - Place 202-53 in AUTO START
  - Place 202-37 in AUTO START
  - Verify 202-37 CLOSED
  - Verify 202-34 CLOSED
  - Confirm 202-76 (EVS Exh. Heater) OFF (RB 281 PB167)
    - Contact NAO to verify
- Report shutdown of #11 RBEVS to SRO

Booth Operator

Role Play: If contacted by SRO, as WEC/Management, acknowledge the problem and inform the SRO that you will provide assistance.

SRO PO-2

- Evaluates failure of flow controller to perform intended function
- Reviews Technical Specification 3.4.4 and declares EVS loop #11 inoperable
  - TS 3.4.4, Emergency Ventilation System
    - Requires both systems operable when Secondary Containment required
    - TS 3.4.4.d is not automatically met (fans operate ±10% design flow)
    - Operability not established therefore per TS 3.4.4.e operation may continue for up to 7 days
    - Operability of system #12 must be demonstrated within 2 hours and daily thereafter.
- Contacts WEC/Management and informs them of problem and requests assistance

As directed by Lead Evaluator

Booth Operator

Insert malfunction:

PC05, Seismic Event (F3)

EC03B, EC12 CRV Line Opens,
TUA=1 minute (F3)

RX01, Clad Failure
50% over 10 min., TUA=1 minute (F3)

H2-1-6 Alarms, Event Flag on Seismic Detection Equipment panel will be WHITE (drop-down flag)

CSO: PO-3

- Recognize/report annunciator H2-1-6, SEISMIC DETECTION EQUIPMENT EVENT
- Obtain copy of N1-SOP-11

Booth Operator

Role-play as WEC/Mgmt. if contacted and acknowledge SRO report. Advise that you will provide requested assistance.

SRO:

- Acknowledge report from CSO
- Direct BOP execute ARP H2-1-6
- Direct CSO execute N1-SOP-11
- Notify WEC/Mgmt. of Seismic Event

Booth Operator

As WEC/Mgmt. acknowledge CSO report and advise that you will provide requested assistance.

As JAF/NMP2 SRO acknowledge and confirm the seismic event

If contacted as I&C or other departments advise that you will provide requested assistance

Booth Operator

If contacted as WEC to initiate DER inform BOP that the DER will be initiated.

EC12 Condensate Return Valve Opens

Power increase >2%

CSO:

- Execute SOP-11
  - Direct BOP to confirm event flag on Seismic Equipment (Panel "J")
  - Contact WEC and direct DER initiated for SFP and RB wall crack evaluations and operators dispatched to conduct inspections of ECCS and other vital equipment
  - Confirm event with NMP2/JAF
  - Direct I&C dispatch technician to retrieve Seismic equipment tapes

BOP: PO-3

- Execute ARP H2-1-6
  - Confirm event indication flag is WHITE on Seismic Detection Panel (Panel "J")
  - If confirmed, direct WEC initiate DER for evaluation of Core Shroud repair.
- Inform SRO that actions are complete

CSO: PO-4, 5

- Recognize/report Annunciator K1-1-5, EMER COND CONDEN RET ISOL VALVE 12 OPEN
- Monitor report:
  - Reactor power change and trend
  - RPV Pressure/trend
  - RPV level/trend

Booth Operator

As WEC/Mgmt. role-play if contacted and acknowledge report. Advise you will provide requested assistance

Attempts to close 39-06 (EC 12 CRV) will fail.

After completing actions for ARP or in response to a request from the CSO (executing SOP-2), the BOP may proceed to G and J panels to evaluate MSL and Offgas radiation levels. Depending on when this occurs, the BOP may observe increasing radiation levels on both sets of instruments.

SRO: PO-5

- Acknowledge CSO report
- Direct CSO monitor reactor power
  - IF CSO reports power change >2% then direct execution of N1-SOP-2
- Direct BOP execute ARP K1-1-5
- Contact WEC/Mgmt. and notify of inadvertent opening EC#12 CRV

BOP: PO-4

- Execute ARP K1-1-5
  - Confirm alarm on computer (W074=OPEN)
    - May also confirm with EC shell temperature rise
  - Attempt to close 39-06, EC12 CRV
  - Close 39-08R or 39-10R (EC STM ISOLATION VALVE 121/122)
- Report actions completed
- Monitor/report AEOG/MSL Rad levels/trend

CSO:

- Execute N1-SOP-2, Unplanned Reactor Power Change
  - Determine power level change
  - Verify point on Power/Flow Map (not in Restricted Zone)
  - Confirm no indication of thermal-hydraulic instability
  - Determine power change due to EC initiation
- Notify SRO actions complete

SRO:

- Acknowledge reports from crew

CSO:

- Recognize/report H1-1-7/H1-3-7 in alarm

Annunciators H1-1-7, OFF GAS HI RADIATION and H1-3-7, MAIN CNDSR OG TIMER STARTED ISOL TD 15 M

Booth Operator

If contacted by SRO, role-play as WEC/Mgmt. and acknowledge report. Advise that you will provide requested assistance.

SRO: PO-6

- Acknowledge report
- Direct BOP to execute actions of H1-1-7 / H1-3-7 as applicable
- Direct CSO to commence emergency power reduction to conserve vacuum
  - Provide reactivity oversight for power reduction
- Notify WEC/Mgmt. of High Offgas Radiation

Booth Operator

As Chemistry acknowledge report from BOP and advise that you will sample coolant and off gas for gross activity (sample results will not be provided.)

F1-2-7, MAIN STEAM RAD MONITOR CH 11 HI/LO and F4-2-2, MAIN STEAM RAD MONITOR CH 12 HI/LO alarm

BOP: PO-6

- Execute H1-1-7
  - Confirm alarm on computer (E486, E487 __ MR/HR)
  - Notify Chemistry to sample offgas and reactor coolant for gross activity
  - Close turbine building roof vents (FAMP)
- Execute H1-3-7
  - Confirm alarm on computer (C138 YES)
  - Verify alarm by observing H1-1-7
  - Verify closure of BV-77-03, Offgas Block Valve

CSO:

- Acknowledge SRO report
- Commence emergency power reduction
  - Reduce recirculation flow to 40 Mlbm/Hr
  - Begin inserting CRAM array using CRAM array list from Core Reactivity Control book

CSO:

- Recognize/report alarm to SRO
- Terminate emergency power reduction

Booth Operator

If contacted by SRO, role-play as WEC/Mgmt and acknowledge the report. Advise that you will provide requested assistance.

SRO:

- Acknowledge report from CSO
- Direct BOP/CSO to execute ARP
- Contact WEC/Mgmt. (if time permits) and inform them of High Main Steam Radiation condition

BOP: PO-7

- Acknowledge direction from SRO
- Execute ARP F1-2-7/F4-2-2
  - Confirm instrument reading on "G" Panel (Msl Rad Monitors)
  - Report readings to SRO

SRO: PO-7

If MSL Radiation Monitor indicate >3.75 X Normal Full Power Background the reactor must be scrammed and isolated.

- Acknowledge reports from operators
- Direct CSO to insert a reactor scram and conduct a vessel isolation

Booth Operator

When CSO conducts vessel isolation/reactor scram, insert malfunctions:

CU01, RWCU Leak Inside DW
100% over 5 minutes **(F4)**

FW31, FW Line Break outside DW **(F4)**

CSO:

- Acknowledge direction from SRO
  - Place the reactor mode switch in SHUTDOWN
  - Simultaneously turn both CH11 and CH12 Reactor Isolation control switches to ISOLATE
  - Confirm reactor scram/isolation
  - Make SCRAM report
    - Mode switch position
    - RPV Water Level / trend
    - RPV Pressure / trend
    - Reactor Power / Rod Position
    - MSIV Closure
  - Report EOP-2 entry condition on RPV Level (<53")

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
	SRO: • Acknowledge SCRAM report • Enter EOP-2 on Low RPV Level • Provide parameter control bands to CSO/BOP: – Direct CSO to execute SOP-1 – Direct BOP to restore and maintain RPV water level 53" – 95" using Condensate, feed and CRD – Direct BOP/CSO to maintain pressure band and method of control (800-1000 PSIG using Emerg. Condensers and ERV if required)

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Despite the presence of the leak introduced at the time of the isolation, RPV level may be recovering when the BOP begins executing SOP-1	BOP: • Execute SOP-1 actions for RPV level control – Confirm RPV level recovering – Verify #12 electric feed pump running – Close #13 FWP flow control valve – Verify RPV level >53" – Disengage #13 FWP – Close 29-10 (FWP 13 Discharge BV) – Verify #11/12 FWP controllers in manual with 0 output – Reset HPCI (Panel "E") – Place #12 FWP BYPASS valve in "AUTO" and set to 65-70"
BOP may recognize loss of HP Injection sources and inability to maintain above 53" RPV level depending on length of time the clean up leak has been active.	• Recognize/report lowering RPV water level – Recognize loss of HP Injection sources – Recognize unable to maintain >53" RPV Level • Recognize/report rising drywell pressure

BOP/CSO:

- Verify Reactor Vessel Isolation
  - Execute SOP-17
    - Verify closed EC Steam Supply Drains and Vents to MSIV (39-11, 39-12, 39-13, 39-14, 05-02, 05-03) on Panel "K"
    - Verify closed MSIVs (Panel "F")
    - Verify closed Reactor Water Sample Valves on Panel "F" (63-04, 110-127, 110-128, 122-03, 63-05)
    - Verify RWCU isolated (33-01, 33-02, 33-04) on Panel "K"

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
	CSO: • Execute SOP-1 – Place IRM range switches in Range 10 – Insert all IRM/SRM detectors – Verify recirculation flow ≈$40x10^6$ lbm/hr – Verify Turbine Trip – Place SCRAM DISCHARGE VOLUME HIGH LEVEL BYPASS switch in BYPASS (Panel "F") • Recognize/report rising drywell pressure • Recognize/report lowering RPV water level
K2-4-3, DRYWELL PRESSURE HIGH-LOW *Drywell pressure >3.5 PSIG*	BOP/CSO: • Report K2-4-3, Drywell Pressure High • Monitor containment pressure/temperature – Identify DW Pressure >3.5 PSIG – Recognize Core Spray pumps start

SRO may direct lineup of Liquid Poison to Test Tank v. injecting liquid poison.

Depending on rate of RPV level decrease, SRO may direct Core Spray Jumper installation (EOP-1, Attachment 4). Jumpers installed would be:

Panel "N" Core Spray Jumpers, #17, 18, 19, 24, 25, 26

SRO:

- Acknowledge High Drywell Pressure
- Enter EOP-4 and re-enter EOP-2 on High Drywell pressure
  - Direct CSO to lock out containment spray
- Recognize loss of HP RPV Injection
  - Direct BOP to inject liquid poison

CSO:

- Place Containment Spray Pumps in pull-to-lock
- Report completion to SRO
- Monitor containment parameters and report when torus pressure >13 PSIG or Drywell temperature approaching 300°F.

BOP:

- Report continuing lowering level
- Verify Both CRD pumps running
- Inject liquid poison
  - Start either liquid poison pump
  - Report tank level and status to SRO
- Lineup liquid poison to the Test Tank
  - Contact WEC/NAO and direct performance EOP-1, Attachment 12
  - When lined up, start either Liquid Poison pump
  - Report completion to SRO

SRO: CT-1

Torus pressure 13 PSIG

- Acknowledge reports
- Direct initiation of Containment Sprays
  - BOP Verify all recirculation pumps tripped
  - CSO verify all drywell cooling fans tripped
  - CSO directed to initiated containment sprays IAW EOP-1, Attachment 17,
  - CSO directed to secure containment sprays when drywell pressure reaches 3.5 PSIG

BOP

- Verify RRP Tripped
  - Observe GREEN lights above RRP MG Breakers

CSO:

- Verify DW Cooling Fans tripped
  - Place control switches in TRIP then Neutral on Panel "L"
- Initiate Containment Sprays
  - Start #111 or #122 Containment Spray Pump
  - Verify started at least one additional containment spray pump
  - Monitor DW pressure
  - When DW pressure reaches 3.5 PSIG, stop running containment spray pumps.
- Report actions to SRO

RPV Water level cannot be maintained above –84"

SRO:

- Recognize unable to maintain RPV level above –84"
  - Direct BOP bypass ADS
  - Direct CSO verify EC initiation

OPERATOR ACTIONS

BOP:

- Bypass ADS
  - Place ADS Timer Keylock switches in Bypass
- Report when RPV Level below –84"

CSO:

- Verify EC initiation
  - Open EC Steam Isolation Valves if EC secured for pressure control
  - Monitor pressure to ensure 100°F HUR/CDR not violated

Operators will not be able to control cooldown rate due to the unisolable leak in the containment.

SRO:

- Enter EOP-8 when RPV level drops to –84"
  - Verify Core Spray loop #11/12 lined up with pumps running
  - Direct BOP open 3-ERV

RPV Level = -84"

CSO:

- Verify Emergency Condensers initiated

BOP: PO-8

- Verify ADS Bypassed
- Open 3-ERV
  - Place ERV control switches in OPEN
  - Confirm ERV open by observing pilot valve light indication, acoustic monitor alarms and steam flow indication
- Report 3-ERV open
- Monitor RPV pressure
  - Recognize/report failure of Core Spray Isol. Valves to open

RPV Pressure < 365 PSIG

SRO:

- Direct BOP to open Core Spray Isolation Valves and restore RPV Level 53-95" using Core Spray IAW EOP-1, Attachment 4

BOP:

- Manually open Core Spray Isolation Valves
  - Monitor RPV Level
  - As level rises, control rate of rise and level using "Pull-to-Stop" feature of Core Spray Isol. Valves
- Report Level restored

INSTRUCTOR ACTIONS/ PLANT RESPONSE	OPERATOR ACTIONS
Drywell Pressure reaches 3.5 PSIG	CSO: CT-3 • Terminates Containment Spray – Place running containment spray pumps in Pull-to-Lock
Terminating Cue • Core Spray injecting to maintain RPV Water Level • RPV Depressurized • Containment parameters controlled per EOP-4	
SRO Candidate Evaluator After the simulator is placed in FREEZE, direct the SRO Candidate to classify the event.	SRO: PO-10 • Classify the event as an Alert, EAL 3.1.1/EAL 8.4.6