


NMP SIMULATOR SCENARIO

NRC Scenario 1

REV. 0

No. of Pages: 49

RECIRC FLOW UNIT FAILURE/FEEDPUMP TRIP WITH PARTIAL RUNBACK/TURBINE HIGH VIBRATION/FAILURE TO SCRAM

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GEN SUPERVISOR OPS TRAINING	<u></u>	DATE <u>3/16/05</u>
OPERATIONS MANAGER	<u>NA Exam Security</u>	DATE _____
CONFIGURATION CONTROL	<u>NA Exam Security</u>	DATE _____

SCENARIO SUMMARY

Length: 2 hours

Initial Power Level: 100%, above the 100% Rod Line

The scenario begins at 100% reactor power. The crew will add water to the Suppression Pool using the High Pressure Core Spray System (CSH) per normal operating procedure N2-OP-33, High Pressure Core Spray. While water is being added to the Suppression Pool, Recirc Flow Unit input to APRM/RBM fails downscale resulting in APRM high power scram signals inputted into the Power Range Monitoring System logic modules. The crew will bypass the affected instrument per normal operating procedure and annunciator response procedures.

The crew experiences a Reactor Feedwater pump trip and partial automatic Recirc Flow Control Valve (FCV) Runback. The partial runback occurs due to a trip RCS FCV hydraulic power units. The result is slowly lowering reactor water level due to failure of reactor power to be automatically reduced to within the capacity of the single remaining operating Feedwater pump. Reactor water level will slowly approach the automatic scram low water level of 159 inches. The crew will manually insert CRAM rods to reduce power approximately 10% to within the capacity of the single remaining operating Feedwater pump (65%). This action will return reactor water level to the normal band of 178 to 187 inches.

After the plant is stable, the total Steam flow signal to Feedwater Level Control operates erratically resulting in water level transient. The crew will take manual control of Feedwater to stabilize level. Manual level control will be required for the remainder of the scenario.

An inadvertent opening of an ADS/SRV valve occurs. The crew will take actions required by procedures to close the valve before a manual scram is required at Suppression Pool water temperature of 110°F.

When the ADS/SRV is closed, Main Turbine vibration begins to rise. The crew will manually scram the reactor and trip the Main Turbine when procedure limits of 12 mils are exceeded, since there are no automatic turbine trips associated with turbine vibration. When the reactor is scrammed all control rods will fail to fully insert resulting in reactor power level of approximately 20%. Heat will be added to the containment while operating SRVs for pressure control. The transient is complicated by loss of the remaining operating Feedwater pump and the inability to maintain water level above MSCRWL (-39 inches). The crew will perform an RPV Blowdown to lower RPV pressure which allows the use of RHS via Shutdown Cooling line. This is the last remaining preferred injection system. If, in the SRO's judgment, additional injection sources are required to restore and maintain RPV water level above MSCRWL, Alternate Injection systems can now be lined up to restore and maintain level above -39 inches. The crew will execute Alternate Control Rod Insertion procedures to fully insert the stuck control rods, such that the reactor will remain shutdown.

Major Procedures Exercised: EOP-RPV, PC, C5, C2. SOP-6, 29,101D, 21 and 9.

EOP-6 Attachment 14

EAL Classification: SAE 2.2.2 Any RPS scram setpoint has been exceeded AND automatic and manual scrams fail to result in a control rod pattern which assures reactor shutdown conditions without boron AND EITHER Power >4% OR Suppression Pool temperature >110°F

Termination Criteria: RPV Blowdown is complete and RPV level is restored and maintained in normal level band 160 to 200 inches and all control rods are fully inserted.

I. SIMULATOR SET UP

A. IC Number: IC-20 or equivalent.

B. Presets/Function Key Assignments

1. Malfunctions:

a.	RD17Z	RD17 for All Banks, 17	QUEUED
b.	RD17Z	RD17 for All Banks, 00 TUA 5 seconds	ET01
c.	RP12A	RRCS Failure (Div I)	QUEUED
d.	RP12B	RRCS Failure (Div II)	QUEUED
e.	CU08	Reactor Water Cleanup Isolation Fail, TRUE	QUEUED
f.	RR08B	RR Flow Unit Failure Downscale B	F3
g.	FW03A	Feedwater Pump Trip P1A, TRUE	F4
h.	RR31	HPU B PMP Number 2 Failure, TRUE TUA 2 seconds	F4
i.	RR30	HPU B PMP Number 1 Failure, TRUE TUA 2 seconds; TRA 10 seconds	F4
j.	FW35	Steam Flow Input Fails to FW Control, TRUE RELATIVES USED TO CAUSE ERRATIC OPERATION	F5
k.	TU02	Main Turbine Vibration High Value 9; Ramp Time 3:00 minutes	F6
l.	MC01	Main Condenser Air Inleakage Value 15; Ramp Time 3:00 minutes	F6
m.	MC01	Main Condenser Air Inleakage Value 100; Ramp Time 5:00 minutes	ET02
n.	FW02A	Condensate Booster Pump Trip P2A, TRUE TUA 8:00 minutes for all 3 FW02s	ET02
o.	FW02B	Condensate Booster Pump Trip P2B, TRUE	ET02
p.	FW02C	Condensate Booster Pump Trip P2C, TRUE	ET02
q.	RP14A	RRCS ARI Failure/Defeated Div I, TRUE TUA 1:30 minutes	F8
r.	RP14B	RRCS ARI Failure/Defeated Div II, TRUE TUA 1:30 minutes	F8
s.	RP02	RPS Failure to Scram Automatic, TRUE TUA 1:30 minutes	F9

- | | | | |
|----|------|--|------|
| t. | RC02 | RCIC Failure Isolation of RCIC, TRUE | ET03 |
| | | TUA 1:00 minute | |
| u. | RH08 | Group 5 Isolation Failure SDC MOVs, TRUE | F10 |
| | | TUA 2:00 minutes | |

2. Remotes:

- | | | | |
|----|-------|---|----|
| a. | MS06A | Defeat Level 1 MSIV Isolation, DEFEATED | F7 |
| | | TUA 1:30 minutes | |
| b. | MS06B | Defeat Level 1 MSIV Isolation, DEFEATED | F7 |
| | | TUA 1:30 minutes | |
| c. | MS06C | Defeat Level 1 MSIV Isolation, DEFEATED | F7 |
| | | TUA 1:30 minutes | |
| d. | MS06D | Defeat Level 1 MSIV Isolation, DEFEATED | F7 |
| | | TUA 1:30 minutes | |

3. Overrides:

- a. None

4. Annunciators:

- a. None

C. Equipment Out of Service

1. All OPRMs are inoperable due to electronic circuitry deficiencies

D. Support Documentation

1. Working copy of N2-OP-33, H.3.0 for use by crew OR plastic sleeve procedure sections to facilitate placekeeping. An already place-kept copy of F.1.0 is to be made and provided with turnover sheet, since the scenario assumes this section has already been completed.

E. Miscellaneous

1. Red rod line sign posted
2. At APRM #2 Voter Module ensure Memory reset. At APRM Module, select Trip Status and Reset Memory, to ensure no pre-existing trip lights are in on both the voter module and the APRM.

3. EVENT TRIGGERS

- a. ET01 Mode Switch in Shutdown with Scram Reset (Event Trigger 82)
Automatically resets RD17Z to 00 when RPS is reset during EOP-6 Att 14

to allow rods to be scrammed to 00. Setup such that the Console Operator does NOT have to manually clear RD17 following RPS reset.

- b. ET02 Mode Switch in Shutdown (Event Trigger 8) Initiates increase in MC01 magnitude to 100% AND all three Condensate Booster Pump trip FW02 malfunctions with Ramp Time of 5:00 minutes after Mode Switch is placed in SHUTDOWN for reactor scram.
- c. ET03 RCIC Turbine Speed >72% in auto (Event Trigger 49) Initiates malfunction RC02 RCIC Isolation following RCIC start after 1:30 minutes.

II.

SHIFT TURNOVER INFORMATION

OFF GOING SHIFT: ☐ N ☐ D DATE: _____

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

- Control Panel Walkdown (all panels) (SM, CRS, STA, CSO, CRE)

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

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

Evolutions/General Information/Equipment Status:

- Reactor Power = 100%
- Loadline = >100%
- All OPRMs are inoperable since yesterday, due to electronic circuitry deficiencies.

TS 3.3.1.1 Required Action F.1 and F.2 are in place for Function 2e. Engineering and I&C are actively pursuing resolution and will have issue resolved by tomorrow.

PART III: Remarks/Planned Evolutions:

- Raise Suppression Pool Water level to 200 feet using CSH pump per N2-OP-33. Establish CSH pump flow rate of 5500 to 6000 gpm. N2-OP-33 F.1.0 Standby Condition Status Checks are complete.

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

- Review new Clearances (SM)
- Shift Crew Composition (SM/CRS)
- Test Control Annunciators (CRE)

TITLE	NAME	TITLE	NAME
SRO			
ATC RO			
BOP RO			

Scenario ID#

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 the plant at power and inadvertent opening of an ADS/SRV valve, the crew will close the SRV to preclude a manual scram if Suppression Pool temperature reaches 110°F, per N2-SOP-34
- CT-2.0 Given a failure of the reactor to scram and RPV Blowdown required, the crew will avoid exceeding HCTL by a combination of terminating and preventing injection, injecting boron and operating Suppression Pool Cooling per N2-EOP-C5.
- CT-3.0 Given a failure of the reactor to scram and the RPV has been blown down per EOP-C2, the crew will resume injection when RPV pressure lowers below the MSCP, to restore and maintain RPV water level between the MSCWL and 202.3 inches.
- CT-4.0 Given a failure of the reactor to scram the crew will fully insert all control rods using alternate methods per N2-EOP-6 Attachment 14

B. Performance Objectives:

- PO-1.0 Given the plant with direction to raise Suppression Pool water level, the crew will lineup High pressure Core Spray and raise level to 200 feet per N2-OP-33.
- PO-2.0 Given downscale failure of a Recirc Flow Unit, the crew will bypass APRM 2 per applicable Annunciator Response Procedures and N2-OP-92.
- PO-3.0 Given the reactor plant operating at full power when a Feedwater pump trip and failure of RCS to completely runback, the crew will perform a Rapid Power Reduction, insert scram rods to lower power

and stabilize the plant before a low level scram occurs per N2-SOP-6, SOP-29 and SOP-101D

- PO-4.0 Given the plant operating at power and misoperation of FWLC system due to failed steam flow input signal, the crew will take manual control of FWLC and stabilize level per N2-SOP-6
- PO-5.0 Given the plant operating at power with an inadvertent opening of an ADS/SRV the crew will close the valve before Suppression Pool temperature reaches 110°F to preclude a manual scram requirement, per N2-SOP-34.
- PO-6.0 Given the plant operating at power with high Main Turbine Vibration, the crew will initiate a manual scram and manual turbine trip when vibration exceed 12 mils per applicable Annunciator Response Procedures and N2-SOP-21.
- PO-7.0 Given a failure of the reactor to scram, the crew will establish control rod insertion in accordance with EOP-6, Attachment 14.
- PO-8.0 Given a failure of the reactor to scram with power 4% or above and reactor water level 100 inches or above, the crew will terminate and prevent injection with the exception of SLS, CRD and RCIC.
- PO-9.0 Given a failure of WCS to isolate when SLS is injected, the crew will manually close WCS containment isolation valves from P602.
- PO-10.0 Given a failure of the reactor to scram with loss of Feedwater the crew will perform an RPV Blowdown and inject with alternate ATWS injection systems to restore and maintain RPV water level above MSCRWL per EOPs.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 1

**Suppression Pool Fill Utilizing CSH Pump
PO-1.0**

Crew

- Crew conducts a pre-brief, walks down the panels, and tests annunciators.

SRO

- Directs Suppression Pool fill per N2-OP-33, H.3.0
- Enters Tech Spec 3.5.1 (as directed from N2-OP-33) Condition B and initiates Required Actions
B.1 Verify by administrative means RCIC System is OPERABLE when RCIC is required to be OPERABLE. (Completion Time is Immediately)
AND
B.2 Restore HPCS System to OPERABLE status.
(Completion Time is 14 days)

BOP RO

- Verify Subsection F.1.0, Standby Condition Status Checks is complete. (*Actual performance is NOT required because completion was provided in Shift Turnover information.*)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

After the CSH pump is started, Suppression Pool Level (SPL) will rise from initial level of 199.8 feet. It will take about 3 minutes to raise SPL to 200 feet.

- ☐ Verify SM has declared CSH System inoperable.

CAUTIONS

DO NOT ALLOW THE CSH PUMP TO OPERATE IN A RUNOUT FLOW CONDITION OF > 7175 GPM OR PUMP DAMAGE MAY OCCUR.

MINIMIZE AMOUNT OF TIME CSH IS OPERATING ON MINIMUM FLOW OR PUMP DAMAGE MAY OCCUR.

- ☐ Start CSH*P1, HPCS PUMP 1.
- ☐ Verify open CSH*MOV105, MINIMUM FLOW BYPASS VLV.
- ☐ Monitor CST AND Suppression Pool Levels.
- ☐ Raise rate of transferring water from CST to Suppression Pool (5500 to 6000 gpm) by performing the following:
 - ☐ Throttle open CSH*MOV111, TEST RETURN TO SUPPRESSION POOL.
 - ☐ WHEN CSH System Flow is > 634 gpm, verify closed CSH*MOV105, MINIMUM FLOW BYPASS VLV.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 2

Recirc Flow Unit B Failed Downscale

PO-2.0

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate malfunction** by depressing F3 key:

**RR08B, RR Flow Unit Failure Downscale B
(F3)**

2/4 MDL 1-4 have received one of the two

- WHEN desired Suppression Pool Level is reached, close CSH*MOV111, TEST RETURN TO SUPPRESSION POOL.
- WHEN HPCS SYSTEM FLOW is less than 634 GPM, verify open CSH*MOV105, MINIMUM FLOW BYPASS VLV.
- Stop CSH*P1, HPCS PUMP 1.
- Verify closed CSH*MOV105, MINIMUM FLOW BYPASS VLV.
- Notify SM that 2CSH*MOV111 is closed AND operability concern per DER 2-98-0557 no longer exist.
- Restore CST Level, as required, per N2-OP-4.

ATC RO

- Identifies and reports annunciators to SRO
- Implements ARP actions (Significant ARP 603202 603217)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

required trips. An additional trip from any unbypassed APRM will cause a reactor SCRAM.

Rod withdrawal block.

The following annunciators alarm:

603202 APRM TRIP SYSTEM

UPSCALE/INOPERABLE

603208 APRM TRIP SYSTEM UPSCALE

603217 FLOW REFERENCE OFF NORMAL

603218 OPRM TRIP ENABLED

603442 CONTROL ROD OUT BLOCK

At P603 Rod Select Matrix Right Side

APRM 2 Amber UPSC ALARM lit

APRM 2 Red UPSC TRIP OR INOP lit

OPRM 2 White TRIP ENABLED lit

FLOW White CAMPAR lit

Process Computer points alarm consistent with conditions. RDSBC12, NMPUC08, NMPBC47, NMPBC33, NMPBC22, NMPBC17, NMP2C121, NMP2C108

At P608 backpanel, APRM 2 Display includes FLOW 0.0% (pre-failure value is 95.5% flow) 2/4 MDL 2 Module (and 1,3,4 modules) indicate APRM 2 HIGH/INOP TRIP red LED lit

These are 603202 actions

- ☐ Determine by Red UPSC/INOP light on 2CEC*PNL603 which APRM Channel has alarmed. (APRM 2 is the affected instrument)
- ☐ IF a SCRAM has occurred, THEN enter N2-SOP-101C, Reactor Scram. *(No scram occurs)*
- ☐ IF NO SCRAM has occurred, THEN perform the following:
 - ☐ Check the other APRM channels to verify that NO SCRAM should have occurred.
 - ☐ IF a SCRAM should have occurred, THEN enter the Emergency Operating Procedures. *(Scram should not have occurred)*
 - ☐ IF NO SCRAM should have occurred, THEN perform the following:
 - ☐ IF required, THEN lower Reactor Power per N2-OP-101D or N2-SOP-101D. *(Not required because instrument failure is the cause)*

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

*Other FLOW indications on APRM 1,3,4
chassis reads about 95.5%.*

Role Play:

If asked report all other Voter Module
indications are consistent with Voter module 2
indications.

Note

ARP actions for 603202 and 603217 will likely
be performed concurrently or 603217 actions
may be performed before 603202 actions.

- ☐ Refer to Technical Specifications for actions. (Inform SRO to perform)
- ☐ Bypass the affected APRM per N2-OP-92. (See later Scenario steps for bypassing the APRM)
- ☐ Reset the memory on the following per N2-OP-92, Section F.8.0:
 - 2/4 MDL 1
 - 2/4 MDL 2
 - 2/4 MDL 3
 - 2/4 MDL 4
- ☐ Troubleshoot and correct the cause of the alarm.

ATC RO/BOP RO

These are 603217 actions

- ☐ Determine which channel is in alarm and whether UPSC or COMPAR amber light(s) are illuminated on 2CEC*PNL603.
 - ☐ COMPAR (generated by RBM)
At 2CEC*PNL608 determine

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

*Failed Flow Unit is bypassed by bypassing
APRM 2*

*After APRM 2 is bypassed all annunciators
and P603 indications return to pre-transient
conditions.*

which flow channel is high/low
by comparison of flow
indications.

- IF desired, THEN bypass the
affected APRM per N2-OP-92.

ATC RO/BOP RO

Bypass APRM 2 with Bypassing
Joystick per N2-OP-92 H.2.

APRM channel bypass can be
performed by placing the APRM
BYPASS joystick to the APRM
channel to be bypassed. This action
will also bypass the associated
Recirculation Flow circuitry and
OPRM. Only 1 APRM
channel may be bypassed.

The actions in this section are
performed at 2CEC*PNL603 unless
otherwise noted.

CAUTION

Bypass joysticks can become
electrically misaligned after numerous
bending motions due to "Metal
Creep". Any bypass function should

be verified by channel BYPASS lights to ensure that only the intended channel is bypassed.

- ☐ Verify NO other APRM in bypass for the instrument to be bypassed.
- ☐ Place the APRM BYPASS joystick to the bypass position 2.
- ☐ IF APRM 2 was bypassed, THEN verify the following:
 - ☐ APRM 2 BYPASS light is lit on 2CEC*PNL603.
 - ☐ BYP is displayed in inverse video in the header for APRM 2 (2 - 4) Chassis at H13-P608.
 - ☐ Blue BYPASSED LED is lit for APRM 1 (2 - 4) on EACH 2/4 MDL at H13-P608.
- ☐ Report APRM 2 bypassed to SRO

EVENT 2 SRO Actions

SRO

- ☐ Directs APRM 2 bypassed
- ☐ Notifies Operations and Plant Management
- ☐ Contacts WEC SRO for assistance and work planning
- ☐ Enters Tech Spec 3.3.1.1 RPS Function 2 APRMs. No action is required since only 1 APRM

EVENT 3

Feedwater Pump A trip with partial RCS

FCV runback

PO-3.0

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate malfunction** by depressing F4key:

FW03A Feedwater Pump Trip P1A, TRUE

RR31 HPU B PMP Number 2 Failure, TRUE

TUA 2 seconds

RR30 HPU B PMP Number 1 Failure, TRUE

TUA 2 seconds; TRA 10 seconds

channel is inoperable.

- ❑ Refer to TRM 3.3.2 Control Rod Block Instrumentation Function 4.
- ❑ 2 channels are required for the “function”, which is to initiate a rod block. With 1 channel inoperable, 3 channels are still operable. No other action is required.
- ❑ Conducts post event brief

SRO

- ❑ Directs entry into:
 - ❑ N2-SOP-6 Feedwater Failures
 - ❑ N2-SOP-29 Sudden Reduction In Core Flow
 - ❑ N2-SOP101D Rapid Power Reduction
 - ❑ Directs Cram Rod insertion (SOP-29 and SOP-101D action)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

The following annunciators alarm:

851509 REACTOR FEED PUMP1A/1B/1C AUTO TRIP

*851519 REAC FEED PMP 1A/1B/1C MOTOR ELEC
FAULT*

602210 FCV A PART CLOSURE RFP TRIP

602222 FCV B PART CLOSURE RFP TRIP

602102 RECIRC FCV B HYDRAULICS INOPERABLE

602104 RECIRC FCV B BACK UP HYDR INOPERABLE

602106 RECIRC FCV B MOTION INHIBIT

603139 REACTOR WATER LEVEL HIGH/LOW

At P603

*RPV water level slowly lowers and reaches its'
lowest values of about 162 inches after about 4
minutes (Low Level scram setpoint is 159.3 inches)*

- When conditions stabilize, enters Tech Spec 3.4.1 Condition B Required Action to "Declare the recirculation loop with lower flow to be "not in operation." With Completion time of 2 hours. With both recirculation loops operating but the flows not matched, the flows must be matched within 2 hours. If matched flows are not restored, the recirculation loop with lower flow must be declared "not in operation," as required by Required Action B.1. This Required Action does not require tripping the recirculation pump in the lowest flow loop when the mismatch between total jet pump flows of the two loops is greater than the required limits. Now the one loop part of the LCO statement applies. Those action (single loop) are required to be completed within 4 hours.

*APRM power lowers to about 75% and Total Core
Flow is reduced to about 74 Mlbm/hr. A successful
runback would result in power level of about 65%,*

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

which is within the capacity of one Feedwater pump.

FWS-LV10B goes to 100% open

At P851

*Feedwater Pump B amps rise to about 530 (max)
and flow rises to top scale 24,000 gpm*

At P602

*RCS FCV A goes to minimum (correct response)
RCS FCV B goes to about 70% (incorrect
response due to HPU trips)
Loop Flow A about 20 Mlbm/hr
Loop Flow B about 55 Mlbm/hr (Flow Mismatch
Tech Spec entry is required)*

*When control rods are inserted, reactor power
will lower. Inserting the first 4 cram rods
results in lowering power from 75% to about
63%. As power is lowered to single Feedwater
pump capacity, RPV water level will rise and
return to within the normal level band of 178
inches to 187 inches and Feedwater Pump B .
FWS-LV10B throttles closed to flow return
pump flow and amps to normal values.*

Note

Crew initiates N2-SOP-29 flowchart decision
blocks by answering "YES/NO" questions.

ATC RO

- ☐ Reports Feedwater Pump A trip
and RPV water level low alarms
- ☐ Monitors reactor power, pressure
and water level
- ☐ Enters N2-SOP-6
 - ☐ Places LV10A in MAN and full
closes
- ☐ When directed, inserts Cram Rods
using Continuous Insert button for
rapid Power reduction

SRO/BOP RO/ATC RO

- ☐ Enter and implement the flowchart
actions per N2-SOP-29 when
directed from SOP-29.1
 - ☐ Is a Recirc pump in service?

YES

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Note

With operation above the 100% rod line, the crew will insert CRAM rods. It is expected that the ATC RO will insert the first four cram rods to position 00 using P603 CONTINUOUS INSERT pushbutton. (EVENT 2 Reactivity Manipulation for ATC RO)

Reactor Power will lower and Rod Line will be reduced below 100% rod line

With OPRMs inoperable the crew will monitor APRM and LPRMs for power oscillations and manually scram, if observed.

CONSOLE OPERATOR

If directed to remove Condensate Demineralizers from service due to the power reduction, **manually enter REMOTES**, as required to establish the directed number of in-service demineralizers:

**FW01A-H, CONDENSATE DEMINERALIZER,
OFF**

- ☐ Is core flow to left of natural circ line? **NO**
- ☐ Core flow AND Power within Scram Region? **NO**
- ☐ Core flow AND power within Exit Region? **NO**
- ☐ Reduce rodline below 100% by inserting CRAM rods. (***Also being inserted to lower power for SOP-101D actions by ATC RO***)
- ☐ > 3 OPRMs operable? **NO**
- ☐ Plant in Heightened Awareness Zone? **NO**
- ☐ Recover per Attachment 2. Note that actual recovery action to reset the motion inhibit cannot be performed until repairs are completed on HPUs)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Plant should now be stabilized at about 60-65% power. The crew will make notifications and Plant Management will be consulted to establish coordination and overall direction as to how recovery will be implemented.

SRO should address

- ☐ *RCS Flow Mismatch*
- ☐ *RCS FCV motion inhibit requires repairs of HPU's*
- ☐ *Electric Fault trip of Feedwater Pump A*
- ☐ *Bypassed APRM 2 due to failed Flow Unit*

SRO

- ☐ Conducts post event brief

EVENT 4

Steam Flow Signal Failure

PO-4.0

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate malfunction and relatives** by depressing F5 key:

FW35 Steam Flow Input Fails to FW, TRUE

Steam flow signal operation becomes erratic. Feedwater flow and RPV water level becomes unstable.

603139 RPV WATER LEVEL HIGH/LOW

603307 RWM ROD BLOCK

ATC RO

- ☐ Identifies and reports misoperation of FWLC to SRO
- ☐ Enters N2-SOP-6
- ☐ Places FWS-HIC1010B (LV10B) controller OR Master FWLC controller to MANUAL
- ☐ Stabilizes RPV water level between 160 to 200 inches (178 to 187 inches normal band)

EVENT 5

**Inadvertent opening of ADS/SRV PSV121
PO-5.0**

**This event should proceed while the crew
is discussing placing FWLC to single
element in response to the previous event.**

CONSOLE OPERATOR

When directed by Lead Evaluator, manually
enter override:

**P628 SWITCH Page 2 of 3 P628-B22C-S4A-
A; P628 ADS Valve PSV121, OPEN**

The following annunciators alarm:

601537 ADS VALVES/SAFETY VALVES LEAKING
601548 SAFETY/RELIEF VALVE OPEN
601553 ADS ACC TANK 32/33/34 PRESSURE LOW
851506 CONDENSATE TRANSFER PUMP 1A/1B
AUTO START

SRO

- ☐ Directs entry into N2-SOP-6 for misoperation of FWLC
- ☐ Conducts post event brief
- ☐ Notifies Operations and Plant Management
- ☐ Contacts WEC SRO for assistance and work planning

SRO

- ☐ Directs entry into N2-SOP-34
- ☐ Declares PSV121 ADS valve inoperable.
- ☐ Refers to Tech Specs 3.5.1. With one ADS valve inoperable no actions is required. Currently the minimum number of REQUIRED ADS valves is still met with one valve inoperable.
- ☐ Refers to Tech Spec 3.6.1.7.2 and

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

851507 CNST XFER PMP DISCH HEADER
PRESSURE LOW

*At P601 MSS*PSV121 red light lit and DIV I
MSS*PSV121 OPEN white postage stamp lit
indicating valve is open.*

*At P603, MWe drop is observed as turbine
control valve closes slightly.*

*Suppression Pool temperature rises and
approaches 90°F.*

recognizes requirement to perform
N2-OSP-ISC-M@002 within 12
hours.

- May direct one loop of RHS placed
in Suppression Pool Cooling.
 - IF RHS is placed in
Suppression Pool Cooling,
declares RHS inoperable for
LPCI mode and enters Tech
Spec 3.5.1 CONDITION A
REQUIRED ACTION A.1 with 7
day COMPLETION TIME.

- IF Suppression Pool Temperature
exceeds 90°F, enters EOP-PC.
- Notifies Operations and Plant
Management.
- Contacts WEC SRO for assistance
and work planning.
- Conducts post event brief.

EVENT 5 BOP RO Actions

BOP RO

- Reports annunciators
- Enters and executes N2-SOP-34
 - Identify which SRV is open. (PSV121)
 - Place the keylock switch for PSV21 to
the OFF position.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ☐ Did the SRV close? **NO**
(Detail 1)
Use one or more of following indications to verify SRV status:
 - ☐ SPDS Computer
 - ☐ ERF Computer Points
MSSZC111; MSSZC128
 - ☐ Reactor Power Change
 - ☐ Generator Output Change
 - ☐ Steam Flow/Feed Flow Mismatch
 - ☐ Accoustic Monitor
- ☐ Reduce power to approximately 85%
per N2-SOP-101D. (N/A, currently
below 85% power)
- ☐ **IF** Average Suppression Pool
temperature is approaching 110°F.....
THEN Scram the reactor per N2-SOP-
101C and continue here.
- ☐ Proceeds to back panel P628 with
fuse pullers and protective safety
equipment (PPE). Using **Detail 2**,
remove the fuses for the affected SRV
in the following order until the SRV
closes:
 1. C Solenoid fuse
 - 2. A Solenoid fuse (CT-1.0)**

PSV121 remains open after pulling F79 and

- ☐ For 2MSS*PSV121 C Solenoid
P628 Strip K F79 and F80

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

F80. At P601 position indicating (red and green) lights for PSV121 are now deenergized. PSV 121 closes when F9A and F10A are pulled.

Generator MWe rises and ERF Computer Points indicate SRV is closed.

EVENT 5 ATC RO Actions

pulled

- ☐ For 2MSS*PSV121 A Solenoid P628 Strip F9A and F10A (CT-1.0)

- ☐ Did SRV close? **NO** for C solenoid but **YES** when A solenoid fuses are pulled.

Detail 1

Use one or more of following indications to verify SRV status:

- ☐ SPDS Computer
- ☐ ERF Computer Points MSSZC111; MSSZC128
- ☐ Reactor Power Change
- ☐ Generator Output Change
- ☐ Steam Flow/Feed Flow Mismatch
- ☐ Accoustic Monitor
- ☐ Exits SOP-34 and informs SRO SRV is closed.
- ☐ If directed starts RHS in Suppression Pool Cooling.

ATC RO

- ☐ Monitors parameters to assist in determining SRV position.
- ☐ Monitors and control RPV water level in directed band in manual.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 6

**Rising Main Turbine Vibration with minor
Main Condenser Air In-leakage PO-6.0**

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate
malfunction** by depressing F6 key:

**TU02 Main Turbine Vibration High (F6)
Value 9; Ramp Time 3:00 minutes
MC01 Main Condenser Air Inleakage (F6)
Value 15; Ramp Time 3:00 minutes**

*Main Turbine vibration and Offgas Train flow
rise.*

*After about 1:30 minutes Turbine vibration
reaches 7 mils and the following annunciators
alarm:*

*851140 TURBINE GENERATOR VIBRATION
HIGH*

851306 OFFGAS SYSTEM TROUBLE

SRO

- ☐ May direct further power reduction
by Cram rod insertion
- ☐ When vibration or vacuum limits
are exceeded, directs reactor
scram and turbine trip.
- ☐ Notifies Operations and Plant
Management
- ☐ Contacts WEC SRO for assistance
and work planning
- ☐ Conducts post event brief

After about 3 minutes Turbine vibration reaches 12 mils requiring a manual reactor scram and turbine trip. The following annunciators alarm:

851129 TURBINE GENERATOR VIBRATION HIGH-HIGH

BOP RO

- Reports and implements annunciator 851129 actions by monitoring for condition that require further actions:
- May initiate Process Computer Group Point 14 to monitor turbine vibration on CRT display.
- IF any Bearing Vibration is 10 mils for 15 minutes. Trip OR verify Main Turbine Tripped in accordance with N2-SOP-21, Turbine Trip.
- IF any Bearing Vibration is 12 mils, verify Main Turbine Trip in accordance with N2-SOP-21.
- Refer to N2-OP-21 Section H.1.0, Operation With High Vibration in Alarm or High Vibration Trip Disabled.
- IF any Bearing Vibration is >9 mils with >3 mils/minute rate of change THEN trip OR verify Main Turbine Tripped in accordance with N2-SOP-21, Turbine Trip.
- IF Bearing Vibration is projected to exceed 30 mils

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

following a Turbine Trip THEN
break condenser vacuum in
accordance with N2-OP-21,
Subsection H.1.4.

- WHEN any vibration limit is exceeded or when directed, enters N2-SOP-21 and implements flowchart actions
 - Has Turbine tripped? **NO**
 - Power >25%? **YES**
 - **SCRAM** the reactor per N2-SOP-101C. (ATC RO to perform action).
 - Manually trip Turbine using TRIP pushbuttons. (BOP RO to perform action).
- Did the Turbine trip using TRIP pushbuttons? **YES**
- Verify MSV/ CV/ CIVs closed AND TBVs open to control pressure.
- Verify the following:
 - House loads transfer
 - Megawatts are ~ 0
 - R230, R925 open
 - 41M, 41E open
 - MDS1/233N open

EVENT 6 ATC RO actions

The crew is directed to manually scram and trip the turbine on either of two parameters during this event. The crew must take these actions based on high turbine vibration (>12mils) or lowering condenser vacuum (prior to 22.1 inch Hg, automatic turbine trip setpoint.

ATC RO

- ☐ Monitors reactor power, level and pressure
- ☐ If directed, implements N2-SOP-9 actions for lowering condenser vacuum
 - ☐ If directed, lowers power per N2-SOP-101 D to stabilize vacuum. (Since already operating at reduced power, a further power reduction is not likely to be directed).
- ☐ Verify proper operation of:
 - ☐ SJAE per N2-OP-9
 - ☐ Off-gas per N2-OP-42
 - ☐ Circ Water per N2-OP-10A
- ☐ Reactor Power >25%? **YES**
- ☐ IF Condenser vacuum is approaching 22.1 inches Hg..... THEN....
 - ☐ Scram the reactor per N2-SOP-101C
 - ☐ Trip the turbine per N2-SOP21

EVENT 7 and 8 PO-7.0 and 8.0**Manual Reactor Scram and ATWS**

The following preset malfunction become active:

RD17Z RD17 for All Banks, 17 QUEUED

RP12A RRCS Failure (Div I) QUEUED

RP12B RRCS Failure (Div II) QUEUED

Reactor is manually scrammed by placing the Mode Switch in Shutdown. RPS trips but Control rods insert only to position 17 (blanks on 4 Rod Display) due to "hydraulic lock". Reactor power will be stabilized at about 20%. RPV water level will lower and EOP entry conditions are met. All turbine bypass valves open as pressure rises and some SRVs begin to cycle.

The following also occur (become active and start timing) when the Mode Switch is placed in Shutdown, Event Trigger ET02:

MC01 Main Condenser Air Inleakage

Value 100; Ramp Time 5:00 minutes

TUA 8:00 minutes for all 3 FW02A, B and C

FW02A Condensate Booster Pump Trip

P2A

SRO

- ☐ Directs Mode Switch placed in Shutdown
- ☐ Repeats back scram report
- ☐ Enters EOP-RPV on low RPV water level (<159 inches) AND Reactor power above 4% when a scram is required.
- ☐ When determines the reactor will not stay shutdown without boron based on current rod positions, EXITS EOP-RPV and ENTER EOP-C5

NOTE: SRO will direct EOP-C5 LEVEL, PRESSURE and POWER actions concurrently

- ☐ Directs from EOP-C5 Level Actions
 - ☐ Inhibit ADS
 - ☐ Prevent HPCS injection by placing HPCS pump in PTL
 - ☐ May direct EOP-6 Attachment 2 to prevent Main Turbine trip from RCIC injection. (If manual turbine trip is delayed because of the ATWS, this action may

**FW02B Condensate Booster Pump Trip
P2B**

**FW02C Condensate Booster Pump Trip
P2C**

When SPT reaches 110°F terminate and prevent injection a second time is required.

NOTE

When using Fuel Zone Instruments, the value of -14 inches (TAF) and -39 inches (MSCRWL) is corrected for RPV pressure using Fig. Z curves. Typically at 800 -1000 psig, -14 inches = -55 inches AND -39 inches = -70 inches. Therefore a level band between -14 and -39 is directed as -55 to -70 inches when corrected using Fig. Z

be directed).

- May direct EOP-6 Attachment 10 to prevent low level MSIV closure. (Since condenser vacuum is lowering, this action may not be directed. MSIVs will automatically close on low vacuum even if low level jumpers are installed).

- With power >4% and level above 100 inches directs terminating and prevent injection at P603 except boron, CRD and RCIC to standard level band of 50 to 80 inches with Feedwater system.
- Directs terminating and preventing injection at P601.
- Per override L-5, IF power is >4% AND level > -14 inches (TAF) AND an SRV is open AND SPT >110°F, directs injection terminated and prevents again UNTIL either
 - APRM are dnsc OR
 - RPV Level reaches TAF (about -55 inches corrected per Fig Z)
 - Records Fuel Zone Level

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

As the SRO directs initial EOP-C5 actions and the ROs perform those actions, the following conditions should be achieved, before conditions further degrade (loss of Condensate Booster Pumps occurs eight minutes after the Mode Switch is placed in Shutdown:

Level stabilized and controlled 50 to 80 inches with FW and RCIC. Other injection sources have been "terminated and prevented" from injecting except boron, CRD and RCIC.

Pressure stabilized and controlled 800 to 1000 psig with BPVs and SRVs. SRVs only after MSIV closure.

Both loops of SLS are injecting at 86 gpm. As Suppression Pool water temperature rises, RHS is placed in Suppression Pool Cooling lineup.

□ Directs injection using only Detail G systems to restore and maintain level above MSCRWL

□ Directs from EOP-C5 PRESSURE Actions

□ RPV pressure stabilized below 1052 psig with EHC (Bypass Valves) and SRVs. Standard pressure band 800 to 1000 psig

□ When MSIV close, standard pressure band 800 to 1000 psig with SRVs

□ Restore pneumatics to the Drywell

□ WAIT until Cold Shutdown boron weight is injected (SLS tank level below 1450 gallons).

□ Directs from EOP-C5 POWER Actions

□ Mode switch in Shutdown

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

**EVENT 8 and 9 ATC RO Actions as
directed. PO-8.0**

- ☐ Initiate RRCS (EOP-6 Att 13)
- ☐ Reduce Recirc to minimum
- ☐ With power >4%, trip the RCS pumps
- ☐ When pressure and level are under control, directs control rod insertion per EOP-6 Attachment 14
- ☐ BEFORE SPT reaches 110°F, directs SLS boron injection
- ☐ WAIT until boron injection is no longer required before terminating SLS injection.

- ☐ WHEN SPT reaches 90°F enters EOP-PC
 - ☐ Directs both loops of RHS placed in Suppression Pool Cooling

ATC RO

- ☐ Places Mode Switch in Shutdown
- ☐ Provides scram report, including APRMs are not downscale and all rods are not fully inserted
- ☐ Initiates RRCS by arming and depressing manual initiation pushbuttons per EOP-6 Att 13
- ☐ Terminates and prevents P603 injection by placing FW control in

EVENT 7 and 8 BOP RO Actions as directed.

CONSOLE OPERATOR

IF requested to bypass MSIV low level isolations per EOP-6 Attachment 10, **immediately activate remote timer** by depressing **F7** key **THEN WAIT** until the 1:30 minute TUA timer times out and report the jumpers are installed

MS06A Defeat Level 1 MSIV Isolation, DEFEATED, TUA 1:30 minutes

MS06B Defeat Level 1 MSIV Isolation, DEFEATED, TUA 1:30 minutes

MS06C Defeat Level 1 MSIV Isolation, DEFEATED, TUA 1:30 minutes

MS06D Defeat Level 1 MSIV Isolation, DEFEATED, TUA 1:30 minutes

manual and fully closing LV10s

- When level drops below 100 inches, establishes RPV injection by reopening LV10s to maintain level in directed band (50 to 80 inches).

BOP RO

- Inhibits ADS using 2 keylock switches
- Places HPCS pump control switch in PTL
- If directed, bypasses MSIV low level isolations per EOP-6 Attachment 10
- Manually operates SRV to maintain pressure in directed band (800 to 1000 psig)
- Restores pneumatics (at P851) to Drywell by using keylocks to override and reopen IAS*SOV166 and 184.
- Restores pneumatics (at P601) to Drywell by using keylocks to override and reopen IAS*SOV164 and 165.
- Terminates and prevents Div I

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

**1:00 minute after RCIC starts, ET03 activates
malfunction RC02 RCIC FAILURE –
ISOLATION OF RCIC, TRUE**

EVENT 9 WCS Isolation Failure PO-9.0

ECCS injection at P601 by
performing:

- ☐ Arm and depress Div I ECCS manual initiation pushbutton.
- ☐ Override closed CSL Injection MOV (amber light stays on).

- ☐ Place CSL pump in PTL.
- ☐ Override closed RHS A Injection MOV (amber light stays on).

- ☐ Terminates and prevents Div II ECCS injection at P601 by performing:

- ☐ Arm and depress Div II ECCS manual initiation pushbutton.
- ☐ Override closed RHS C Injection MOV (amber light stays on).
- ☐ Place RHS C pump in PTL.
- ☐ Override closed RHS B Injection MOV (amber light stays on).

- ☐ When RCIC isolates, reports RCIC isolation to SRO

- ☐ Injects SLS boron injection using keylock switches

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

**CU08 Reactor Water Cleanup Isolation Fail,
TRUE malfunction becomes effective**

*WCS*MOV102 and 112 isolation valves fail to
close when SLS switches are placed in ON.
When P602 control switches are used, the
WCS isolation MOVs will close.*

- ☐ SLS*MOV1A and 1B open
- ☐ SLS*P1A and 1B start
- ☐ Explosive Valves fire
- ☐ Pump pressure and flow rise
- ☐ SLS tank level begins to lower
- ☐ Identifies failure of WCS isolation

- ☐ Manually closes WCS isolation
valves MOV102 and 112 at
P602

**EVENT 10 Trip of all Condensate Booster
Pumps PO-10.0**

Eight minutes after the Mode Switch is placed
in Shutdown, ET02 automatically activates the
following malfunctions:

**FW02A Condensate Booster Pump Trip P2A
FW02B Condensate Booster Pump Trip P2B
FW02C Condensate Booster Pump Trip P2C**

ATC RO

- ☐ Reports loss of all Condensate
Booster Pumps and Feedwater
Pumps
- ☐ Reports lowering RPV water level
- ☐ Closes FWS-LV10s for tripped
Feedwater Pumps
- ☐ Lineup systems as directed

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

*All three Condensate Booster Pumps trip.
Feedwater pump suction pressure drops.
Feedwater pumps automatically trip on low
suction pressure.*

*RPV water level falls below MSCRWL and
cannot be restored until additional systems are
lined up for injection. As RPV water level
drops, core voiding results in lowering reactor
power and pressure.*

SRO

- ☐ Acknowledges loss of Feedwater
- ☐ Directs RHS injection through Shutdown Cooling per EOP-6 Attachment 30. (Requires installation of jumpers to defeat RHS Shutdown Cooling interlocks AND RPV pressure reduced below 350 psig)
- ☐ Per L-10 Conditional Step, determines RPV water level cannot be restored and maintained above MSCRWL with Detail G Preferred Systems AND EOP-C2 has not been entered yet..... EXITS C5 Level and Pressure legs AND ENTERS EOP-C2 to perform an RPV Blowdown
- ☐ Executes EOP-C2 as follows:
 - ☐ Determines reactor will NOT stay shutdown without boron (Step 2)
 - ☐ Determines SPL is above 192 feet (Step 3)
 - ☐ Directs terminate and prevent all RPV injection except boron, CRD and RCIC (Step 4)
 - ☐ Directs all 7 ADS valves open

- (Step 5)
- ❑ When all 7 ADS valves are reported open, continues in C2 to WAIT blocks (Step 16 then 17) AND ENTERS (RETURN TO) EOP-C5 at 10
 - ❑ RETURNS TO EOP-C5 at 10
 - ❑ Determines 2 or more SRVs are open (L-12)
 - ❑ WAITS until RPV pressure drops below value in Table J (below 165 psig with 7 SRVs open; L-13)
 - ❑ Directs injection using only Detail G systems slowly start injecting to restore and maintain level above MSCRWL (RHS through Shutdown Cooling per EOP-6 Attachment 30 should now be established; L-14)
 - ❑ Determines capability of RHS to restore and maintain level above MSCRWL (L-15)
SRO may decide that RHS alone will not restore water level above MSCRWL and

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 10 BOP RO Actions, when directed

- direct Alternate ATWS System Injection from Detail H systems (L-16 and L-17)
- Likely to direct injection with HPCS, LPCS or RHS LPCI
- ☐ Returns to EOP-C5 at 9, since level was intentionally lowered prior to entering EOP-C2
- ☐ Restores and maintains water level between MSCRWL and level recorded in step L-9 number 4 using Detail G and it's OK to use Detail H systems

BOP RO

- ☐ Performs RPV Injection Via Shutdown Cooling Return per EOP-6 Attachment 30 Injection via RHS B (A)
- Verify closed the following valves:
- ☐ RHS*MOV15B (A), OUTLET TO DRYWELL SPRAY
- ☐ RHS*MOV8B (A), HEAT EXCHANGER 1B (A) INLET BYPASS VLV (WHEN possible)
- ☐ RHS*MOV33B (A), OUTLET TO SUPPR POOL SPRAY
- ☐ RHS*FV38B (A), RETURN TO

CONSOLE OPERATOR

When requested by BOP RO/ATC RO to "defeat Group 5 isolation interlocks for 2RHS*MOV40A or B" per EOP-6 Attachment 30, **immediately activate remote timer** by depressing **F10** key **THEN WAIT** until the 2:00 minute TUA timer times out and report the jumpers are installed and leads are lifted.

**RH08 Group 5 Isolation Failure SDC MOVs,
TRUE (F10)**

NOTE

Per EOP-C5 Step L-13 and L-14, injection is NOT allowable until RPV pressure drops below 165 psig with 7 SRVs open. The crew SHALL NOT establish injection when RPV pressure drops below 350 psig. This would violate the EOP step and Critical Task.

SUPPR POOL COOLING

- ☐ RHS*MOV24B (A), LPCI B (A) INJECTION VLV
- ☐ RHS*MOV40B (A), SDC B RETURN
- ☐ RHS*MOV104, RHR B TO REACTOR HEAD SPRAY

Defeat Group 5 isolation interlocks for 2RHS*MOV40B as follows (Figure 30-2):

*(2CEC*PNL622)(NOT actually performed)*

- ☐ Lift AND tape the lead on terminal point BB-62
- ☐ Install EOP Jumper #9 on terminal points BB-41 AND BB-60
- ☐ Verify RHS*P1B (A), PMP 1B (A) is running.
- ☐ Verify open SWP*MOV90B (A), HEAT EXCHANGER 1B SVCE WTR INLET VLV.
- ☐ WAIT UNTIL reactor pressure has been reduced to less than 350
- ☐ Throttle open RHS*MOV40B (A), SDC B (A) RETURN to a maximum of 7450 gpm on E12-603B (A), RHR B (A) TOTAL

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

CONSOLE OPERATOR

When requested by BOP RO/ATC RO to place radiation monitor SWP*RE23B (A) in service (if not already in service), **manually activate remotes**, then report RE23B (A) is in service:

NOTE: USE REMOTES FOR RE 23A IF APPROPRIATE:

RM02 SWP23B Rad Detector Online/Offline, ON

RM03 SWP23B Process Monitor Sample Pump, ON

FLOW meter to control RPV water level

- ☐ Throttle open SWP*MOV33B (A), HEAT EXCHANGER 1B SVCE WTR OUTLET VLV THROTTLE to establish approximately 7400 gpm on E12-R602B (A), SVCE WTR TO RHR B (A) HX FLOW meter

- ☐ Request Rad Monitor SWP*RE23B (A) placed in service

- ☐ EOP-6 Attachment 30 is complete

- ☐ Confirms P601 system injection to RPV is terminated and prevented

- ☐ Opens all 7 ADS valves by arming and depressing ADS MANUAL INITIATION pushbuttons on P601
- ☐ Reports 7 ADS valves are open
- ☐ Reports when RPV pressure drops below Table J value of 165 psig with 7 SRVs open
- ☐ **Injects with systems to restore**

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

CONTINGENCY: IF ALL (including Fuel Zone) water level instruments are downscale, the Crew will enter EOP-C4, RPV Flooding temporarily. When RPV water level starts to rise (level can now be determined, EOP-C4 is exited (step 1 override) and EOP-C5 re-entered at 6 and EOP-C2 re-entered at 25.

Alternate Control Rod Insertion

Appropriate sections to be performed are
3.3 Additional Manual Scram Initiation
3.5 Manual Control Rod Insertion (Driving rods with RDS). These sections are performed concurrently.

CONSOLE OPERATOR

WHEN requested to reset ARI per EOP-6 Attachment 14, **immediately activate remote timer** by depressing **F8** key **THEN WAIT** until

and maintain RPV water level in directed band (CT-3.0)

- ☐ **RHS Via Shutdown Cooling**
- ☐ **HPCS**
- ☐ **LPCS**
- ☐ **LPCI**

ATC RO

- ☐ Using EOP-6 Attachment 14 Flowchart determines appropriate sections (3.3 and 3.5) to be performed.

Performs section 3.3

- ☐ Reset ARI by directing fuses pulled per 3.3.1

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

the 1:30 minute TUA timer times out and
report the fuses are pulled

**RP14A RRCS ARI Failure/Defeated Div I,
TRUE TUA 1:30 minutes**

**RP14B RRCS ARI Failure/Defeated Div II,
TRUE TUA 1:30 minutes**

CONSOLE OPERATOR

WHEN requested to defeat RPS per EOP-6
Attachment 14, **immediately activate remote
timer** by depressing **F9** key **THEN WAIT** until
the 1:30 minute TUA timer times out and
report the jumpers are installed

**RP02 RPS Failure to Scram Automatic,
TRUE
TUA 1:30 minutes**

CONSOLE OPERATOR

WHEN RPS is reset, **verify** change in status of
malfunction RD17Z

**RD17Z RD17 for All Banks, 00 ET01
TUA 5 seconds**

ET01 Mode Switch in Shutdown with

- ☐ Defeat RPS interlocks by
directing/installing RPS jumpers
- ☐ Reset RPS by momentarily placing
the following switches to RESET:
(2CEC*PNL603)
REACTOR SCRAM RESET LOGIC A
REACTOR SCRAM RESET LOGIC C
REACTOR SCRAM RESET LOGIC B
REACTOR SCRAM RESET LOGIC D
- ☐ Ensure the eight white PILOT
SCRAM VALVE SOLENOIDS
lights are lit.
- ☐ Ensure SCRAM DISH VOLUME
VENT VLVS RDS*AOV124/132
indicate open.
- ☐ Ensure SCRAM DISH VOLUME

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Scram Reset.

IF ET01 fails to reset RD17Z to
00.....MANUALLY delete RD17Z after
RPS is reset to allow control rod
inserting when additional manual scram
signal is inserted.

NOTE:

After RPS is reset and while waiting for
indication that the SDV is drained, ATC RO
should proceed to section 3.5 to implement
action to manually insert rods by driving in
using RDS. It takes about 10 minutes for the
SDV annunciators to clear, indicating that the
SDV is drained

NOTE:

At the examiners discretion, time compression
may be used to shorten the time while waiting
for the SDV to drain. This is accomplished by
directing the CONSOLE OPERATOR to
override OFF SDV annunciator 603109 or
603409, to simulate SDV is drained.

DRAIN VLVS RDS*AOV123/130
indicate open.

- Using one OR more of the
following, ensure the Scram
Discharge Volume (SDV) is
drained:
 - Annunciator 603109, RPS A
DISCH VOLUME HIGH LEVEL
TRIP, clear
 - Annunciator 603409, RPS B
DISCH VOLUME HIGH LEVEL
TRIP, clear
 - Annunciator 603130, SDV
LEVEL HIGH, clear

ATC RO

**While waiting for SDV to drain
performs section 3.5**

- Verify the following pumps are
running (*starts 2nd RDS pump
using control switch*):

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ☐ RDS-P1A, CRD PUMP 1A
- ☐ RDS-P1B, CRD PUMP 1B
- ☐ Place controller 2RDS-FC107, CRD FLOW CONTROL, in MANUAL

CAUTION

To prevent pump motor damage or tripping the supply breaker, motor current shall not exceed 40 amps for RDS-P1A or RDS-P1B.

- ☐ Depress the OPEN pushbutton on 2RDS-FC107 UNTIL the controller output meter shows 100% OR RDS pump motor current approaches 40 amps
- ☐ Check that RDS System flow rises on C12-R606, CRD SYSTEM FLOW.

NOTE: In the following step it is expected that RDS System Flow will drop.

- ☐ Close 2RDS-PV101, DRIVE WTR PRESS CONTROL MOV, to maximize Drive Water ΔP .
- ☐ Ensure RDS Drive Water ΔP rises on C12-R602, DRIVE WTR DIFF

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

When the SDV alarms clear the ATC RO will initiate another scram by tripping RPS using manual scram pushbuttons. All rods will fully insert.

PRESSURE

- Using an SHH 5366 key, bypass the RWM by taking the RWM Operator Console BYPASS/OPERATE/TEST switch to the BYPASS position
- Using Figures 14-2 AND 14-3, track the status of the control rods, as the rods are inserted.
- Starting with a control rod at OR near the center, select a control rod to be driven in on the Rod Select Matrix

ATC RO

Return to Section 3.3

- **WHEN the SDV is drained, initiate a manual scram**
 - **Arm and depress manual scram pushbutton (CT-4.0)**
- Check for control rod motion AND control rod positions
 - Confirm all rods fully inserted
 - Report control rod status to SRO

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

TERMINATION CRITERIA

RPV Blowdown is complete and RPV level is restored and maintained in normal level band 160 to 200 inches and all control rods are fully inserted.

EVENT 11 SRO Admin JPM 5-1

SRO

Classify the event as SAE 2.2.2

Evaluator to perform SRO Admin JPM for emergency classification.

V. POST SCENARIO CRITIQUE

A. NA, NRC Exam

VI. REFERENCE EVENTS AND COMMITMENTS

A. Reference Events

None

B. Commitments

1. None

VII. LESSONS LEARNED

EVALUATED SCENARIO CHECKLIST

1. Additional Information about these checks:

For continuing training, can be found in NUREG 1021, ES 604 and Appendix D.

For initial training, can be found in NUREG 1021, ES 301 and Appendix D.

2. Qualitative Attributes

X	Realism/Credibility
X	Event Sequencing
X	Simulator Modeling
X	Evaluating Crew Competencies

3. Quantitative Attributes

6	Total Malfunctions
2	Malfunctions after EOP Entry
2	Abnormal Events
1	Major Transients
2	EOPs Used
2	EOP Contingency Procedures Used
	Simulator Run Time
	EOP Run Time
4	Crew Critical Tasks (if applicable per Attachment 6.)

4. Developmental Checks:

Does every event have either a Critical Task(s) or Performance Objective?

Is Criteria given for sequencing to subsequent events?

Is termination criteria clear and unambiguous?

Does termination criteria allow verification that all CT, PO standards are met?

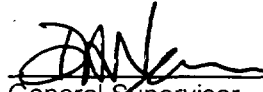
Constellation Energy Group
OPERATOR JOB PERFORMANCE MEASURE

Title: Emergency Classification for Scenario 1

Revision: NRC 2005

Task Number: 3440190303

Approvals:

 3/17/05
General Supervisor Date
Operations Training (Designee)

NA EXAMINATION SECURITY
General Supervisor Date
Operations (Designee)

NA EXAMINATION SECURITY
Configuration Control Date

Performer: _____(RO)

Trainer/Evaluator: _____

Evaluation Method: **PERFORM**

Evaluation Location: **SIMULATOR FOLLOWING SCENARIO AS SRO**

Expected Completion Time: 15 minutes Time Critical Task: YES Alternate Path Task: NO

Start Time: _____ Stop Time: _____ Completion Time: _____

JPM Overall Rating: Pass Fail

NOTE: A JPM overall rating of fail shall be given if any critical step is graded as fail. Any grade of unsat or individual competency area unsat requires a comment.

Comments:

Evaluator Signature: _____

Date: _____

Recommended Start Location: (Completion time based on the start location)
Simulator or other designated location.

Simulator Set-up:
N/A

Directions to the Instructor/Evaluator

To be performed as an administrative JPM.

Directions to Operators:

Read Before Every JPM Performance:

For the performance of this JPM, I will function as the SSS, CSO, and Auxiliary Operators. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary.

Read Before Each Evaluated JPM Performance:

This evaluated JPM is a measure of your ability to perform this task independently. The Control Room Supervisor has determined that a verifier is not available and that additional / concurrent verification will not be provided; therefore it should not be requested.

Read Before Each Training JPM Performance:

During this Training JPM, applicable methods of verification are expected to be used. Therefore, either another individual or I will act as the additional / concurrent verifier.

Notes to Instructor / Evaluator:

1. Critical steps are identified as **Pass/Fail**. All steps are sequenced critical unless denoted by a "•".
2. During Evaluated JPM:
 - Self-verification shall be demonstrated.
3. During Training JPM:
 - Self-verification shall be demonstrated.
 - No other verification shall be demonstrated.

References:

1. EPIP-EPP-02, Classification of Emergency Conditions at Unit 2.
2. EPMP-EPP-0102, Unit 2 Emergency Classification Bases.
3. EPIP-EPP-18, Activation and Direction of the Emergency Plan.
4. NUREG K/A 2.4.40 Knowledge of the SROs responsibilities in emergency plan implementation (4.0).

Tools and Equipment:

1. None.

Task Standard: Scenario properly diagnosed and classified as a Site Area Emergency

Initial Conditions:

1. High Turbine vibration led to a reactor SCRAM and turbine trip
2. Control rods inserted to position 17
3. RPV injection was terminated and prevented per EOP-C5 to lower power
4. Ask the operator for any questions

Initiating Cue:

“(Operator's name), assume the role of the SM/ED and determine the emergency classification of this event.”

Performance Steps	Standard	Grade	Comments
1. Provide repeat back of initiating cue. <i>Evaluator Acknowledge repeat back providing correction if necessary</i>	Proper communications used for repeat back (GAP-OPS-O1)	Sat/Unsat	
RECORD START TIME _____			Start time is logged to determine total classification time.
2. Obtain a copy of the reference procedure and review/utilize the correct section.	<input type="checkbox"/> EPIP-EPP-02 obtained. Attachment 1, Section 2.2.2 is referenced.	Sat/Unsat	
3. RPS setpoint has been exceeded <u>AND</u> Automatic & Manual scrams have failed to assure the reactor is shutdown under all conditions <u>AND</u> either Reactor power was >4% <u>OR</u> Suppression Pool temperature was >110F.	<input type="checkbox"/> Site Area Emergency is declared per EAL 2.2.2.	Pass/Fail	The time elapsed between START TIME and determination MUST BE <15minutes to pass the JPM.

End of JPM

TERMINATING CUE: Scenario properly diagnosed and classified as a Site Area Emergency.

RECORD STOP TIME _____

Initial Conditions:

1. High Turbine vibration led to a reactor SCRAM and turbine trip
2. Control rods inserted to position 17
3. RPV injection was terminated and prevented per EOP-C5 to lower power
4. Ask the operator for any questions

Initiating Cue:

"(Operator's name), assume the role of the SM/ED and determine the emergency classification of this event."

ATTACHMENT 1 (Cont)

2.2.2 Site Area Emergency

Any RPS scram setpoint has been exceeded

AND

Automatic and manual scrams fail to result in a control rod pattern which assures reactor shutdown under all conditions without boron.

AND Either:

Reactor power >6%

OR

Torus temperature >110°F

NUMARC IC:

Failure of Reactor Protection system instrumentation to complete or initiate an automatic reactor trip once a Reactor Protection system setpoint has been exceeded and manual scram trip was not successful.

FPB Loss/Potential Loss:

N/A

Mode Applicability:

Power Operation

Basis:

This condition indicates failure of the Reactor Protection System to shut down the reactor (automatically or manually) and maintain it shutdown under all conditions without boron. Under these conditions, the reactor is producing more heat than can be removed using available safety systems. A Site Area Emergency is indicated because conditions exist leading to imminent or potential loss of both the fuel clad and the primary containment.

The failure of automatic initiation of a reactor scram followed by an unsuccessful manual initiating actions which can be rapidly taken at the reactor control console does not, by itself, lead to imminent loss of either fuel clad or primary containment barriers. It is the continued criticality under conditions requiring a reactor scram along with the continued addition of heat to the containment which poses the imminent threat to primary containment or fuel clad barriers. In accordance with the EOPs, Liquid Poison System is initiated based on heat addition to containment in excess of safety system capability under failure to scram conditions.

ATTACHMENT 1 (Cont)

An immediate manual scram is any set of actions by the reactor operator at the reactor control console which causes control rods to be rapidly inserted into the core and brings the reactor subcritical, including manual scram pushbuttons, ARI and mode switch.

PEG Reference(s):

SS2.1

Basis Reference(s):

1. N1-EOP-3, Failure to Scram
2. "Methodology for Development of Emergency Action Level" NUMARC/NESP-007 Revision 2 - Questions and Answers, June 1993

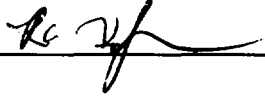
NMP SIMULATOR SCENARIO

NRC Scenario 2

REV. 0

No. of Pages: 42

RDS PUMP SWAP/RCS SEAL LEAK/LOSS OF LINE 5 WITH EDG FAILURES/RCS LEAK WITH DEGRADED ECCS REQUIRES RPV BLOWDOWN

PREPARER	<u>G. Bobka</u>	DATE <u>2/1/05</u>
VALIDATED	<u>B. Weaver, B. Moore, P. Brennan</u>	DATE <u>3/7/05</u>
GEN SUPERVISOR OPS TRAINING	<u></u>	DATE <u>3/16/05</u>
OPERATIONS MANAGER	<u>NA Exam Security</u>	DATE _____
CONFIGURATION CONTROL	<u>NA Exam Security</u>	DATE _____

SCENARIO SUMMARY

Length: 2 hours

Initial Power Level: 100%, above the 100% Rod Line

The scenario begins at 100% reactor power. The crew will swap Control Rod Drive Pumps to return RDS-P1B to service and remove RDS-P1A from service. After the normal evolution is complete, an outer seal leak develops on Recirc Pump (RCS) A. N2-SOP-29.1 is entered RCS pumps is removed from service and isolated. The crew will also enter N2-SOP-29 due to reduced core flow and insert Cram Rods to lower rod line below 100%. The crew will stabilize the plant in single loop and the SRO will implement the required single loop Tech Spec actions.

With the plant now stable, Control Rod Drive suction filter clogging results in the trip of the operating RDS pump and several accumulator trouble alarms. The crew will enter N2-SOP-30, trip Reactor Water Cleanup due to loss of pump seal cooling, swap RDS pump suction filters and restart an RDS pump.

A loss of one offsite 115 KV power Line 5 will occur. The Division I and Division III EDGs will fail to start. Manual operator action will be required to start the Division I EDG and preclude a manual scram. The Division III High Pressure Core Spray EDG cannot be started. The crew will implement the actions required by N2-SOP-3 to restore Service Water System flow to the Turbine and Reactor Building non safety related headers which have isolated due to the off site power loss.

A small reactor coolant leak develops inside the Drywell. This results in rising drywell temperatures and pressure. The crew will take manual action and scram the reactor. N2-EOP-RPV, PC are entered. The event is complicated by degraded ECCS response and loss of

electrical power. An RPV Blowdown is required to establish injection with the only remaining Low Pressure ECCS systems RHR B and C. Suppression Chamber Spray and Drywell Spray should be established to control primary containment pressure and temperature, as the LOCA becomes more severe. Drywell and Suppression Chamber Sprays will be complicated by loss of electrical power and degraded ECCS systems. The only remaining system that can be used for sprays, will also be required for RPV injection.

Major Procedures Exercised: EOP-RPV, PC, C-2. SOP-29.1, 29,30 and 3

EAL Classification: ALERT 3.1.1 Primary containment pressure cannot be maintained <1.68 psig due to coolant leakage.

Termination Criteria: RPV Blowdown is complete and RPV level is maintained above TAF. Drywell Spray is initiated.

I. SIMULATOR SET UP

A. IC Number: IC-20 or equivalent.

B. Presets/Function Key Assignments

1. Malfunctions:

a.	DG04A	DG 1 UV LOCA Fail to Start, TRUE	QUEUED
b.	RH14B	ECCS Fails to Initiate (DivII), TRUE	QUEUED
c.	CS03	HPCS Diesel Engine Failure, TRUE	QUEUED
d.	EG15B	No Transfer to Reserve SWG003, TRUE	QUEUED
e.	RR16A	RR Pump Upper Seal Failure (P1A), Value 0.25; Ramp Time 1:00 minute	F3
f.	RR16A	RR Pump Upper Seal Failure (P1A), Value 0.75; Ramp Time 1:00 minute	F4
g.	RD18	CRD Suction Filter Clogged, TRUE	F5
h.	RD063419	34-19 Rod Failure Accum Trouble, TRUE TUA 2:00 minutes	F5
i.	RD062227	22-27 Rod Failure Accum Trouble, TRUE TUA 2:20 minutes	F5
j.	ED02A	Loss of Off-Site 115KV Line 5, TRUE	F6
k.	RR20	RR Loop Rupture – DBA LOCA Value 1.5	F7
l.	RR20	RR Loop Rupture – DBA LOCA Value 10; Ramp Time 10:00 minutes	ET01

2. Remotes:

a.	RH33	2RHS*MOV24A 600V BKR STATUS, OPEN	QUEUED
b.	CS17	2CSL*MOV104 600V BKR STATUS, OPEN	QUEUED
c.	RH48	2RHS*MOV15B EOP Jumper, TRUE	F8
d.	RH50	2RHS*MOV25B EOP Jumper, TRUE	F8

3. Overrides:

a.	P601 LAMP RHS A /LPCS RTN TO SUPP POOL MOV30A GREEN,OFF	(PAGE 42)	QUEUED
----	--	-----------	--------

4. Annunciators:

- a. None

C. Equipment Out of Service

1. Division I Low Pressure ECCS

- a. CSL with Red Clearance applied to components
 - i. CSL*P1 Pump in PTL
 - ii. CSL*MOV104 Injection Valve Breaker open
- b. RHS with Red Clearance applied to components
 - i. Pump Red Clearance PTL
 - ii. RHS*MOV24A Injection Valve Breaker open
 - iii. RHS*MOV30A closed using keylock switch

D. Support Documentation

- None

E. Miscellaneous

1. Red rod line sign posted

2. EVENT TRIGGERS

- a. ET01 Mode Switch in Shutdown (Event Trigger 8) Initiates increase in RR20 magnitude to 10% with Ramp Time of 10:00 minutes after Mode Switch is placed in SHUTDOWN for reactor scram.

II.

SHIFT TURNOVER INFORMATION

OFF GOING SHIFT: ☐ N ☐ D DATE: _____

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

- Control Panel Walkdown (all panels) (SM, CRS, STA, CSO, CRE)

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

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

Evolutions/General Information/Equipment Status:

- Reactor Power = 100%
- Loadline = >100%
- Division I Low Pressure ECCS systems are INOPERABLE (pre-planned)

Corrective Maintenance on broken motor operator for RHS*MOV30A Return to Suppression Pool. Scheduled return to service is late on the next shift.

TS 3.5.1 Required Action C.1 was entered 12 hours ago. Required Action C.1

Action to restore one subsystem with 72 hour Completion Time.

TS 3.6.1.6 Drywell Spray Required Action A.1 with 7 day Completion Time

TS 3.6.2.3 Suppression Pool Cooling Required Action A.1 with 7 day Completion Time

TS 3.6.2.4 Suppression Pool Spray Required Action A.1 with 7 day Completion Time

- Corrective Maintenance has been completed on RDS-P1B and it is to be placed in service for Post Maintenance Testing. When the pump is running contact the WEC to dispatch the assembled PMT crew to the pump to obtain all required data.

PART III: Remarks/Planned Evolutions:

- Place RDS-P1B in service for Post Maintenance Testing.

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

- Review new Clearances (SM)
- Shift Crew Composition (SM/CRS)
- Test Control Annunciators (CRE)

TITLE	NAME	TITLE	NAME
SRO		BOP RO	
ATC RO			

Scenario ID#

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 the plant at power with RPV pressure >900 psig and two inoperable scram accumulators, the crew will restore charging water pressure >940 psig within 20 minutes of meeting conditions for entering TS 3.1.5 Condition B, by restarting an RDS pump and avoiding the requirement to immediately scram the reactor per N2-SOP-30 and Tech Spec 3.1.5.

CT Justification: Failure to restore Charging Header Pressure by restarting RDS pump results in "direct adverse consequences and a challenge to plant safety" by requiring a manual scram transient to be initiated. Per Tech Spec Basis 3.1.5 "With two or more control rod scram accumulators inoperable and reactor steam dome pressure >900 psig, adequate pressure must be supplied to the charging water header. With inadequate charging water pressure, all of the accumulators could become inoperable, resulting in a potentially severe degradation of the scram performance.

Therefore, within 20 minutes from discovery of charging water header pressure < 940 psig concurrent with Condition B, adequate charging water header pressure must be restored. The allowed Completion Time of 20 minutes is considered a reasonable time to place a CRD pump into service to restore the charging header pressure, if required. This Completion Time also recognizes the ability of the reactor pressure alone to fully insert all control rods."

CT-2.0 Given degraded RPV injection sources, the crew will establish RPV injection using available Preferred Injection Systems listed in Table E1 of EOP-RPV to RESTORE AND MAINTAIN RPV water level above MSCRWL (-39 inches Fig Z) to preclude executing EOP-C3 or Flooding the Drywell by entering SAPs, per N2-EOP-RPV.

CT Justification: Failure to restore and maintain RPV water level above -39 inches by implementing actions per EOP-RPV will result in "adverse consequences" to the plant by abandoning the EOP injection strategy and implementing Drywell Flooding (from EOP-RPV Step L-16) used in the SAPs. It is expected that proper implementation of EOP-RRV will result in performing an RPV Blowdown by opening 7 ADS valves to reduce RPV pressure and manual injecting RHS Pump B and RHS Pump C (either both or any one pump) which are capable of recovering level above -39 inches and ultimately above -14 inches (TAF). Water level is expected to drop below -39 inches for several minutes while executing the steps to blowdown and establish injection. There is no specific time constraints attached to this CT. As long as the crew recovers level without entering EOP-C3, Steam Cooling or the SAPs, this would demonstrate satisfactory completion of the CT.

B. Performance Objectives:

- PO-1.0 Given the plant with direction to swap Control Rod Drive pumps, the crew will start RDS-P1B and secure RDS-P1A per N2-OP-30
- PO-2.0 Given the plant with an RCS pump seal leak, the crew will remove the pump from service per N2-SOP-29.1 and N2-SOP-29, then continue to operate the plant in single loop per with N2-OP-29.
- PO-3.0 Given the plant operating at power and a Control Rod Drive pump trip with accumulator trouble alarms, the crew will restart an RDS pump within 20 minutes per N2-SOP-30
- PO-4.0 Given the reactor plant operating at power when a loss of offsite line 5 with EDG failures occurs, the crew will take action to start the

failed EDG and stabilize service water in accordance with N2-SOP-03. (Operator actions with PRA significance)

- PO-5.0 Given a reactor plant operating at power with a LOCA in progress, the crew will manually scram the reactor plant prior to reaching 1.68 psig in the Containment.
- PO-6.0 Given a loss of all high pressure injection the crew will restore and maintain RPV water level above TAF after performing an RPV Blowdown per N2-EOP-RPV and N2-EOP-C2. (Operator actions with PRA significance)
- PO-7.0 Given a failure of Low Pressure ECCS pumps to start on high drywell pressure signal, the crew will manually start the Low Pressure ECCS pumps per EOP Bases and Operations Manual
- PO-8.0 Given the plant with a LOCA and conditions met for containment spray, the crew will initiate Containment Spray per N2-EOP-PC and EOP-6 Attachment 22.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 1

RDS Pump Swap

PO-1.0

Role Play

When dispatched as additional operators to support the pump swap with activities such as performing prestart verifications and monitoring, respond as required. There will be no unusual conditions or readings to be reported for this evolution.

Crew

- Crew conducts a pre-brief, walks down the panels, and tests annunciators.

SRO

- ☐ Directs RDS-P1B started and RDS-P1A placed in standby per N2-OP-30, F.2.0
- ☐ After RDS-P1B is placed in service, contacts WEC to dispatch team to perform Post Maintenance Testing requirements.

BOP RO

- ☐ Dispatches AO to perform prestart lineup
- ☐ IF RDS is supplying WCS pump seal cooling, THEN station personnel at locations to simultaneously monitor WCS pump seal parameters during RDS pump changeover.
- ☐ Start the standby CRD pump

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

2RDS-P1B CRD PUMP 1B by placing its control switch to START, THEN release to Normal-After-START.

- Stop the CRD pump to be shutdown 2RDS-P1A, CRD PUMP 1A by taking its control switch to STOP AND releasing to Normal-After-STOP.
- Directs local monitoring of operating WCS pump(s) seal cavity temperatures
- IF WCS pump seal cooling is being supplied from RDS, THEN directs verification of seal cooling flow between 1-4 gpm as indicated locally.
- As required, directs adjusting RPV Level Instrumentation Backfill
- Reports RDS-P1B in service and RDS-P1A in standby.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 2

RCS Pump A outer seal leakage PO-2.0

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate malfunction** by depressing F3 key:

RR16A, 0.25, Ramp Time 1:00 Min (F3)

RRP1A upper seal cavity press lowers to about 220 psig

Annunciator 602109 Recirc Pump 1A Outer SL Leak High alarms after about 1 minute.

BOP RO

- ☐ Identifies and reports annunciator 602109 to SRO
- ☐ Implements ARP 602109 actions
 - ☐ Monitor DW Equipment Drain Tank leak rate. Refer to ITS 3.4.5 RCS Operational Leakage.
- ☐ Monitor upper and lower seal cavity pressures using P602 pressure indicators.
- ☐ Monitor upper and lower seal cavity temperatures using P614 recorder points 8 and 9 and Process Computer points RCSTA15 and RCSTA17.
- ☐ Enter N2-SOP-29.1 and performs concurrently with ARP actions.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

CONSOLE OPERATOR

After the crew enters N2-SOP-29.1 and is monitoring parameters activate malfunction by depressing F4 key:

RR16A, 0.75, Ramp Time 1:00 Min (F4)

Upper Seal pressure drops below 100 psig which requires the RCS pump to be tripped

SRO/BOP RO

- ☐ Implements SOP-29.1 Actions while monitoring Seal Action leg conditions that may require pump trip
- ☐ Establish periodic monitoring of pump conditions.
- ☐ If applicable, monitor DER/DFR leakage for indication of degradation (TS 3.4.5).
- ☐ If conditions warrant, shutdown the affected pump per N2-OP-29, G.2.0.
- ☐ Refer to N2-OP-29, H.4.0, if both seal injection and cooling water are lost.

BOP RO

- ☐ Implements SOP-29.1 Seal Actions
 - ☐ **IF ANY of THESE OCCUR**
 - ☐ **Upper seal cavity pressure < 100 psig**
 - ☐ Upper seal cavity pressure > 920 psig
 - ☐ Lower seal cavity pressure > 1200 psig
 - ☐ Outer seal leakage > 1.2 gpm

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

*Annunciator 602115, Recirc Pmp 1A seal
staging flow high/low*

*RCS Pump A is manually tripped and isolated
by closing RCS*MOV10A and 18A with the
following alarms*

*602207 RECIRC PMP 1A LOW SPEED AUTO
TRANSFER NOT AVAILABLE*

*603139 REACTOR WATER LEVEL
HIGH/LOW*

603218 OPRM TRIP ENABLED

*Reactor Water Cleanup is manually realigned
for single loop by lowering system flow and
closing WCS*MOV105. When WCS flow is
lowered, the in-service filter demineralizer
HOLD Pumps start with the following P602
alarms*

602317 RWCU FILTER DEMIN 1 TROUBLE

602318 RWCU FILTER DEMIN 1 TROUBLE

Note

Crew initiates N2-SOP-29 flowchart decision
blocks by answering "YES/NO" questions.

- ☐ Seal staging flow > 1.8 gpm
- ☐ DFR > 1 gpm rise

.....**THEN CONTINUE AT A (when
seal pressure drops below
100 psig)**

- ☐ **Trip the affected pump
AND enter N2-SOP-29.**

Recirculation pump should
be tripped by opening
RECIRC PMP 1A(1B)
MOTOR BRKR 5A by
placing control switch to
STOP or PTL.

- ☐ Lower WCS flow to < 450
gpm (by throttling MOV200)
- ☐ Close WCS*MOV105.
- ☐ Close RCS*MOV10A
- ☐ Close RCS*MOV18A
- ☐ When time permits, perform
N2-OP-29, H. (Single Loop
Operations)

SRO/BOP RO/ATC RO

- ☐ Enter and implement the flowchart
actions per N2-SOP-29 when
directed from SOP-29.1

- ☐ Is a Recirc pump in service?

YES

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Note

With operation above the 100% rod line, the crew will insert CRAM rods. It is expected that the ATC RO will insert the first four cram rods to position 00 using P603 CONTINUOUS INSERT pushbutton. (EVENT 2 Reactivity Manipulation for ATC RO)

Reactor Power will lower and Rod Line will be reduced below 100% rod line

- ☐ Is core flow to left of natural circ line? **NO**
- ☐ Core flow AND Power in Scram Region? **NO**
- ☐ Core flow AND Power in Exit Region? **NO**
- ☐ Reduce rodline below 100% by inserting CRAM rods. (**EVENT 2 Reactivity Manipulation for ATC RO**)
- ☐ > 3 OPRMs operable? **YES**
- ☐ Plant in Heightened Awareness Zone? **YES**
- ☐ Recover per Attachment 2

SOP-29 Attachment 2 actions

IF one Recirc. Pump tripped AND NOT in Natural Circulation, perform the following:

- ☐ Verify Recirc Flow Controller in LOOP MANUAL for BOTH loops
- ☐ Close Flow Control valve for the tripped pump
- ☐ Reduce flow rate of operating loop to less than 41,800 gpm

**INSTRUCTOR ACTIONS/
PLANT RESPONSE**

OPERATOR ACTIONS

as indicated by flow recorder at
2CEC*PNL602

- ☐ Notify I&C to perform APRM
Scram AND Rod Block AND
rod block monitor setpoint
change
- ☐ Reduce thermal power to less
than 70% of rated
- ☐ IF pump speed does NOT
indicate 0 rpm one minute
AFTER pump trip, close
2RCS*MOV18A OR
2RCS*MOV10A
- ☐ IF NOT able to start the tripped
pump, perform N2-OP-29,
Subsection H.6.0, Single
Recirculation Loop Operation
AND exit this attachment.

EVENT 2 SRO ACTIONS

SRO

- ☐ Direct trip of RCS Pump A and
ensure actions of SOP-29,
Attachment 2 and OP-29, G.2.0
are taken to place in shutdown
condition.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ☐ Enters N2-SOP-29.
- ☐ Directs scram rods inserted.
- ☐ Refer to ITS 3.4.5 for RCS leakage requirements.
- ☐ Refer to ITS 3.4.1 for single loop operation. Condition C LCO requirements are currently not met until actions are complete to adjust APLHGR, MCPR, RPS APRM Scram and Rod Block settings for single loop operation. The Completion Time is 4 hours
- ☐ Notify I&C to reduce APRM scram and rod block monitor trip setpoints. May be done by contacting WEC SRO.
- ☐ Notifies Operations and Plant Management
- ☐ Contacts WEC SRO for assistance and work planning.

EVENT 3

PO-3.0

Operating Control Rod Drive Pump trip

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate malfunction** by depressing F5 key:

RD18 CRD Suction Filter Clogged, TRUE

RD063419 34-19 Rod Failure Accum

Trouble, TRUE, TUA 2:00 minutes

RD062227 22-27 Rod Failure Accum

Trouble, TRUE, TUA 2:20 minutes **(F5)**

RDS P1A trips

RDS flow and charging pressure drop to 0

The following annunciators alarm:

603318 CRD Pmp Suction Fltr Diff Press

High (first alarm)

After the RDS pump trips then:

603308 CRD Pmp 1A/1B Auto Trip

603309 CRD Pmp 1A Suct Press Low

603311 CRD Charging Wtr Press Low

603315 CRD PMP 1B Suct Press Low

603446 CRD Pmp Disch Hdr Press Low

ATC RO

- ☐ Acknowledge and report
- ☐ Enter N2-SOP-30
- ☐ Monitor for override conditions and performs actions if required

IF THESE OCCUR

- ☐ RPV pressure is >900 psig
AND
- ☐ Two or more accumulators
for withdrawn control rods are
inoperable AND
- ☐ Charging water header
pressure <940 psig for 20
minutes

THEN

- ☐ **SCRAM** the reactor per N2-SOP-101C.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

*After 2:00 minutes, 603441 Rod Drive
Accumulator Trouble alarms
Rod and Detector Display Amber Trouble light
is lit for the affected accumulators
Accumulator 34-19 after 2:00 minute delay
Accumulator 22-27 after 2:20 minute delay*

Note

While executing actions to restart an RDS pump the crew will monitor the "flowchart override" conditions and initiate a manual scram, if required. It is NOT expected to meet any of the required manual scram conditions.

ROLE PLAY

Report as operator dispatched that both accumulator 34-19 and 22-27 pressure read 900 psig.

Annunciator 602324, RWCU PUMP CLG WTR TEMP HIGH, is expected to be received after several minutes with no operating RDS pump.

- ☐ Dispatches operator to report accumulator pressure for 34-19 and 22-27
- ☐ Implements pump recovery actions

- ☐ Is RDS pump operating? **NO**

IF Annunciator 602324, RWCU PUMP CLG WTR TEMP HIGH, is received. **THEN** Remove WCS from service as follows:

- ☐ Throttle WCS*MOV200 until in service filters on hold.
- ☐ Trip WCS pumps.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

NOTE

RDS pump restoration is expected to be completed in less than 15 minutes.

CONSOLE OPERATOR

WHEN dispatched to swap RDS suction filter
DELETE malfunction RD18 WAIT 3 minutes and report to control room that suction filters are swapped.

AFTER RDS pump is operating delete malfunction RD06 to clear accumulator trouble condition.

Following RDS pump restart and flow control valve operation, system flow and pressure are restored to normal. Associated alarms will clear.

IF An RDS pump can NOT be restored to service within 15 minutes OR indications of system breach exist.

THEN.....Isolate RDS backfill by closing 2RDS-V20 (preferred) OR 2RDS-V2058.

- ☐ Shift 2RDS-FC107 (RDS flow controller) to Manual.
- ☐ Close FCV to minimum position.
- ☐ Determines trip is caused by low suction pressure
- ☐ Dispatches operator to swap RDS suction filters per N2-OP-30, Section F.1.0.
- ☐ **Start a RDS pump (within 20 minutes of 2nd inoperable accumulator with Charging header pressure < 940 psig. (CT-1.0)**
- ☐ WHEN a RDS pump is running, perform the following:
 - ☐ Adjust RDS flow using 2RDS-FC107 to approximately 63 gpm.
 - ☐ Place 2RDS-FC107 in Auto.
 - ☐ IF WCS OR RPV backfill

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 3 SRO Actions

was removed from service,
THEN restore per SM/CRS.

- ☐ Verify WCS/RCS seal flows
and backfill flows per N2-
OP-30, Sections F.2.5
through F.2.9
- ☐ WHEN charging water
header pressure has been
restored above 940 psig,
exit this procedure (N2-
SOP-30).

- ☐ Report RDS pump is restarted

SRO

- ☐ Directs entry into SOP-30
- ☐ Declares two accumulators
inoperable with their pressure
below 940 psig and enters Tech
Spec 3.1.5 Condition B and
implements the REQUIRED
ACTIONS

B. Two or more control rod scram
accumulators inoperable with
reactor steam dome pressure >900
psig.

B.1 Restore charging water header
pressure to >940 psig. Completion

EVENT 4

PO-4.0

Loss of Line 5 with EDG Failures

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate malfunction** by depressing F6 key:

**ED02A, Loss of Off-Site 115KV Line 5,
TRUE**

**DG04A, DG 1 UV LOCA Start Failure is now
in effect**

*Multiple 86 devices and annunciators actuate on P852. Div I and Div III EDG fail to start on undervoltage. 4160 VAC Emergency Switchgear ENS*SWG101 and 102 deenergize. HPCS is now unavailable due to*

Time is 20 minutes from discovery of Condition B concurrent with charging water header pressure < 940 psig

AND

B.2.1 Declare the associated control rod scram time "slow."

Completion Time is 1 hour.

OR

B.2.2 Declare the associated control rod inoperable.

Completion Time is 1 hour.

BOP RO

- ☐ Recognize and report Loss of Line 5 and Division I and Division III EDGs failed to start.
- ☐ Enters and executes N2-SOP-3
 - ☐ Determines that both Divisions (I and II) have not lost power
 - ☐ Determines Division I EDG did not energize the bus
 - ☐ Starts Division I EDG from P852 and reports EDG started

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

*SWG102 loss and is not recoverable.
SWP Non Essential MOVs close, isolating
SWP flow to CCS and CCP heat exchangers.
The Div I EDG will start when manually started
fro P852.*

- ☐ Verifies output breaker 101-1 closes and observes ENS*SWG101 is energized
- ☐ At P601, verifies Div II SWP Non-Essential MOVs close
- ☐ After EDG energizes ENS*SWG101, verifies:
 - ☐ Div I SWP Non-Essential MOVs close
 - ☐ One Div I SWP pump restarts
- ☐ WHEN SWP Pump restarts
 - ☐ Open ALL SWP Non-Essential MOVs
 - ☐ Throttle SWP Pump Discharge MOV74's to maintain pump flow below 10,000 gpm
 - ☐ Start a 3rd Div II SWP Pump and reopen MOV74's
- ☐ Verify proper operation of EDG
 - ☐ Voltage 4160 VAC
 - ☐ Frequency 60 Hz
 - ☐ SWP flow > 780 gpm
- ☐ Restore pneumatics to Drywell
 - ☐ At P851 open IAS*SOV166
 - ☐ At P601 open IAS*SOV164
- ☐ Refer to Attachment 1 for subsequent actions and fault

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Role Play: If dispatched to perform switchyard to electrical power distribution panel walkdowns, wait approximately 5 minutes then report back that all indications are good and only targets found were Div I under voltage trips.

CONSOLE OPERATOR

WHEN requested to start CMS10 sample pumps, **manually activate** remotes as requested

RM03 for CMS*RE10A, ON

identification

ATC RO

Subsequent Actions (N2-SOP-3 Attachment 1)

- ☐ Reports GTS running on the Reactor Building
- ☐ Restores drywell cooling by restarting unit coolers on P873.
- ☐ Secures CWS blowdown if required.
- ☐ Restores CMS.
 - ☐ Open 2CMS*SOV62B
 - ☐ Open 2CMS*SOV60A
 - ☐ Open 2CMS*SOV62A
 - ☐ Open 2CMS*SOV60B
- ☐ Restart or verify in standby the Div I H2/O2 Monitor in accordance with N2-OP-82 (May not be performed)
- ☐ Notify Rad Protection to start 2CMS*RE10A AND verify the monitor is on line and working properly
- ☐ Notify Rad Protection to start 2CMS*RE10B AND verify the monitor is on line and working properly

SRO

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Line 5 loss with CSH EDG failing to start results in loss of power to HPCS. HPCS is now inoperable and with LPCS already inoperable for maintenance, Tech Spec 3.5.1 Condition H is entered. This is the most restrictive LCO.

- ☐ Directs entry into N2-SOP-3
- ☐ Directs subsequent and fault identification actions
- ☐ Declares HPCS inoperable AND with LPCS already inoperable enter Tech Spec 3.5.1 Condition H

Condition H not met for HPCS and Low Pressure Core Spray (LPCS) Systems inoperable.

REQUIRED ACTION H.1 Enter LCO 3.0.3

COMPLETION TIME Immediately

- ☐ Enters Tech Spec LCO 3.0.3
LCO 3.0.3 When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in:

- a. MODE 2 within 7 hours;
- b. MODE 3 within 13 hours; and
- c. MODE 4 within 37 hours.

- ☐ Enters Tech Spec 3.5.1 Condition B

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

TS 3.8.1 Condition D is most restrictive after LCO 3.0.0 considerations, with 12 hour completion time for line or EDG restoration. Then 72 hours for the other component.

for HPCS inoperable

- High Pressure Core Spray (HPCS) System inoperable.

- REQUIRED ACTIONS

B.1 Verify by administrative means RCIC System is OPERABLE when RCIC is required to be OPERABLE.

Completion Time is
Immediately

AND

B.2 Restore HPCS System to OPERABLE status.

Completion Time is 14 days

- Enters Tech. Spec. 3.8.1 and Condition A

- Condition A not met for Line 5

- REQUIRED ACTION A.1 directs N2-OSP-LOG W001 performed within 1 hour and every 8 hours thereafter.

- AND A.2 is not applicable under current conditions

- AND A.3 Restore required offsite circuit to OPERABLE status. Completion Time 72 hours

**INSTRUCTOR ACTIONS/
PLANT RESPONSE**

OPERATOR ACTIONS

- ☐ Condition B not met for Div III
EDG

- ☐ Condition D not met Line 5
AND Div III EDG
One required offsite circuit
inoperable.
AND
One required DG inoperable.
REQUIRED ACTION
D.1 Restore required offsite
circuit to OPERABLE status.
Completion Time 12 hours
OR
D.2 Restore required DG to
OPERABLE status. Completion
Time 12 hours

- ☐ Conducts crew briefing
- ☐ Notifies Operations and Plant
Management
- ☐ Contacts WEC SRO for assistance
and work planning.

**EVENT 5 RCS Coolant Leakage into the
Drywell**

PO-5.0

CONSOLE OPERATOR

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

When directed by Lead Evaluator, **activate malfunction** by depressing F7 key:

RR20 RR Loop Rupture – DBA LOCA

Value 1.5

*RCS coolant leakage into DW is initiated. IF CMS*RE10s have been returned to service following power loss, annunciator 851254 PROCESS AIRBORNE RAD MONITOR ACTIVATED alarms.*

*DRMS computer indicates CMS*RE10s alarming.*

Drywell floor drain leak rate rising.

Drywell pressure begins to rise.

DWP slowly rises and 603140 DRYWELL PRESSURE HIGH/LOW alarms at about 0.78 psig

A manual scram should be directed prior to the

BOP RO

- ❑ Reports alarm 851254 and implements actions
- ❑ Determine the source(s) of the alarm by reviewing the status of the DRMS monitors using the STATUS GRID function of the DRMS console. Color-coded identification is used for status of normal (green), alert alarm (yellow), high radiation (red), suspect data (white), and equipment failure (blue). For applicable alarm response refer to Table 851254. For alert response refer to step e.
- ❑ If there has been an increase in containment activity as evidenced by an alert or High Rad alarm on the gaseous or particulate channel of CMS*RE10A or B:
 - ❑ Notify the SM.
 - ❑ Notify the Rad. Prot. Department.
 - ❑ Attempt to identify the cause

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

*automatic high drywell pressure RPS trip
setpoint of 1.68 psig*

of the increase, notify
Chemistry to sample
containment.

- Verify Reactor Coolant
leakage is within Tech.
Spec. limits (see Tech.
Spec. 3.4.3.2). {ITS 3.4.5}

EVENT 5 and 6 SRO Actions
PO-5.0 and 6.0

SRO

CONSOLE OPERATOR

WHEN Mode Switch is placed in Shutdown ,
verify change in status of malfunction RR20

- Updates crew and identifies the
threshold DWP value that the
reactor will be scrammed at when
reached.
- When DWP threshold is reached,
directs manual scram
- Receive and repeat back scram
report
- Enters EOP-RPV on low RPV
water level at 159 inches
- Directs initial level restored and
maintained 160 inches to 200
inches with Feedwater, CRD, RCIC
(L-3)
- Directs RPV pressure band 800 to
1000 psig with EHC in automatic
using BPV (P-5)

RR20 RR Loop Rupture – DBA LOCA Value
10; Ramp Time 10:00 minutes ET01

ET01 Mode Switch in Shutdown.

IF ET01 fails to trigger RR20**MANUALLY**
enter RR20, 10%, Ramp Time 10:00 minutes

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Detail E1 Preferred Injection Systems

- Condensate/Feedwater (tripped)
- RCIC (available)
- HPCS (power loss)
- LPCS (not available)
- LPCI (B and C only available)
- RHS through Shutdown Cooling (RHS B after depressurizing)

Detail F Injection Subsystems

- Condensate/Feedwater (NO)

- Enters EOP-PC on high Drywell pressure when DWP reaches 1.68 psig
 - May direct Suppression Chamber and Drywell spray initiation. If this is directed, the SRO will have to redirect RHS for injection, when level drops below TAF -14 inches.
- When loss of high pressure feed systems occurs determines RPV water level cannot be maintained above -14 inches (TAF)
- May direct SLS injected from Boron Tank
- Transition to EOP-RPV at 2
- Directs ADS inhibited (L-5)
- Directs level restored and maintained above -14 inches (Fig Z) with Preferred Injection Systems from Detail E1 (L-6)
- Are 2 or more Subsystems Detail F lineup? (L-7) YES; LPCI B and LPCI C
- WAIT until level drops to -14 inches (Fig Z) (L-9)
- Is any Subsystems Detail F lineup with a pump running? (L-10) YES; LPCI B and LPCI C

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- HPCS (NO)
- LPCI A (NO)
- LPCI B (YES)
- LPCI C (YES)
- LPCS (NO)

After applying Fuel Zone Correction using Fig Z, TAF -14 inches is about -52 inches AND MSCRWL -39 inches is about -72 inches at 800 psig.

When RPV injection is established with RHS B and C systems, RPV water level will turn and be restored above -39 inches. After level is restored, SRO should direct RHR system A

- ☐ Is any injection source lineup with a pump running? (L-12) YES; LPCI B and LPCI C
- ☐ BEFORE water level drops to -39 inches (Fig Z)ENTER EOP-C2 RPV Blowdown while continuing here (EOP-RPV step L-16)
- ☐ Executes EOP-C2 as follows:
- ☐ Determines reactor WILL stay shutdown without boron (Step 2)
- ☐ Drywell Pressure? Above 1.68 psig (Step 9)
- ☐ Prevent LPCS and LPCI injection not needed for core cooling. (Step 10) Current conditions require injection, so NO system injection is to be prevented.
- ☐ Determines SPL is above 192 feet (Step 11)
- ☐ Directs all 7 ADS valves open (Step 12)
- ☐ When all 7 ADS valves are reported open, continues in C2 to WAIT blocks (Step 16 then 17)
- ☐ **Continues EOP-RPV actions at step L-16 and directs RPV water level restored and maintained above -39 inches (Fig Z) with**

**INSTRUCTOR ACTIONS/
PLANT RESPONSE**

OPERATOR ACTIONS

lined up for Containment Spray

**Preferred Injection Systems from
Detail E1**

- ☐ **RHS B and RHS C (LPCI) are
to be injected (CT-2.0)**
- ☐ Determines RPV water level can
be restored and maintained above
-14 inches (Fig Z) per Step L-4
override and returns to EOP-RPV
at 1
- ☐ Directs RPV water level is restored
and maintained 160 to 200 inches
using RHS C and RHS B
- ☐ **WHEN** water level is restored
above -14 inches, directs RHS B
lined up for Containment Spray

SRO Actions directed from EOP-PC

These actions are directed from EOP-
PC

- ☐ Directs RHR Loop B placed in
Suppression Chamber Spray but
only if pump is not needed for
core cooling.
- ☐ **WAIT** until Suppression Chamber
Pressure is above 10 psig
- ☐ Verify DW parameters are inside
Drywell Spray Initiation Limit (EOP-
PC Fig K)
- ☐ Directs tripping RCS Pumps
(Should already be tripped)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Defeating Drywell Spray interlocks is necessary due to Div II ECCS initiation logic failure (malfunction RH14B).

EVENT 5 and 6 ATC RO/BOP RO as directed
PO-5.0 and PO-6.0

- ☐ Directs Drywell Unit Coolers tripped (Should already be tripped)
- ☐ Directs RHS B lined up for Drywell Spray per EOP-6 Attachment 22
- ☐ Defeating Drywell Spray interlocks is necessary

ATC RO

- ☐ WHEN DWP reaches pre-determined value and when directed by the SRO, places Mode Switch in Shutdown
- ☐ Provides scram report to SRO
- ☐ Performs Scram Actions per N2-SOP-101C
 - ☐ Verify automatic responses:
 - ☐ All rods full in
 - ☐ Rx power lowering
 - ☐ Turbine tripped/TSVs & TCVs shut
 - ☐ Generator tripped and house loads transferred
 - ☐ SDV Vents & Drain valves closed
 - ☐ RCS pumps downshift
 - ☐ RPV pressure on TBVs OR SRVs
 - ☐ FWLC controlling level >

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

159.3 inches

- ❑ IF all Feedwater pumps have tripped THEN place all FWS-LV10 and 55 controllers in manual and verify valves are full closed
- ❑ IF scram cannot be reset, if directed by SRO closes RDS-V28 Charging Header Isol by dispatching operator.
- ❑ Perform the following as time permits:
 - ❑ Fully insert IRMs AND SRMs.
 - ❑ Energize 2WCS-MOV107 (2NHS-MCC008-2E).
 - ❑ If required, secure makeup to the Cooling Tower.
 - ❑ At 2CEC-PNL842, shutdown HWC.
- ❑ IF WCS is in one pump three filter lineup.....**THEN** throttle close 2WCS*MOV200 (AND if required, throttle open 2WCS-MOV110) to obtain approximately 225 gpm WCS flow.
- ❑ Maintains RPV water level in directed band

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

BOP RO Actions performed as directed

When RPV water level drops to 108.8 inches RCIC starts and water Level 2 containment isolation occurs. Standby Gas Treatment systems and Control Building Special Filter Trains start.

EVENT 7 Division II Low Pressure ECCS Systems fail to start PO-7.0

After RPV Blowdown, RHS Injection MOVs must be opened from P601 to establish injection. When level begins to rise and transitions from Fuel Zone to Wide Range instruments, action should be taken to

- ☐ Reports NPS-SWG003 de-energized and resulting loss of Feedwater system

BOP RO

- ☐ When RPV level drops to 108 inches report RCIC start
- ☐ Inhibits ADS using 2 keylock switches
- ☐ When DWP reaches 1.68 psig
 - ☐ Inform SRO of EOP entry condition
 - ☐ Verify Div II ECCS systems start
 - ☐ Report failure to start
 - ☐ **Manually start RHS C Pump (CT-2.0)**
 - ☐ **Manually start RHS B Pump (CT-2.0)**
 - ☐ Report pumps started
- ☐ Opens all 7 ADS valves by arming and depressing ADS MANUAL INITIATION pushbuttons on P601
- ☐ Reports 7 ADS valves are open
- ☐ **Injects with systems to restore and maintain RPV water level in directed band (CT-2.0)**
 - ☐ **RHS Via Shutdown Cooling**
 - ☐ **LPCI B (RHS), opens MOV24B**

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

close RHS LPCI injection MOVs to prevent overfilling the RPV (control level below 202 inches). This will also allow RHS B loop to be diverted to Containment Spray.

Containment Spray
PO-8.0

CONSOLE OPERATOR

WHEN requested to defeat Drywell Spray valve interlocks per EOP-6 Attachment 22, **WAIT 2 minutes then activate remote** by depressing **F8** key. Report the jumpers are installed

RH48 2RHS*MOV15B EOP Jumper, TRUE
F8

RH50 2RHS*MOV25B EOP Jumper, TRUE
F8

☐ **LPCI C (RHS), opens MOV24C**

☐ When directed initiates Drywell Spray using RHS B per EOP-6 Attachment 22 step 3.2.2 (2CEC*PNL601).

☐ IF Drywell spray valve interlocks are not met, defeat the RHS*MOV15B/25B interlock by performing the following:

NOTE: Dispatches another operator to install jumpers

- ☐ At 2CEC*PNL704A, install EOP Jumper #33 from terminal strip TC110, TB2 terminal 7 to terminal strip TC112, TB2 terminal 19. (Figure 22-2)
- ☐ At 2CEC*PNL704A, install EOP Jumper #34 from terminal strip TC108, TB1 terminal 2 to terminal strip TC108, TB1 terminal 4. (Figure 22-3)

NOTE: Verifying SWP*MOV90B open may be delayed until after sprays are in service.

- Verify open SWP*MOV90B, HEAT EXCHANGER 1B SVCE WTR INLET VLV
- Verify closed AND IF possible overridden, RHS*MOV24B, LPCI B INJECTION VLV
- Verify running RHS*P1B, PMP 1B
- IF Suppression Chamber Sprays are required concurrently with Drywell Sprays, perform the following:
 - Open RHS*MOV33B, OUTLET TO SUPPR POOL SPRAY
 - Verify approximately 450 gpm on SUPPR SPRAY HEADER FLOW (2RHS*FI64B)
 - Verify closed, RHS*FV38B, RETURN TO SUPPR POOL COOLING
 - Verify open, RHS*MOV4B, PMP 1B MINIMUM FLOW VLV
 - Open RHS*MOV25B, OUTLET TO DRYWELL SPRAY
 - Open RHS*MOV15B, OUTLET

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

CONSOLE OPERATOR

When requested by BOP RO/ATC RO to place radiation monitor SWP*RE23B in service (if not already in service), **manually activate remotes**, then report RE23B is in service:

RM02 SWP23B Rad Detector Online/Offline, ON

RM03 SWP23B Process Monitor Sample Pump, ON

TERMINATION CRITERIA

RPV Blowdown is complete and RPV level is maintained above TAF. Drywell Spray is initiated.

TO DRYWELL SPRAY

- ☐ Verify closed, RHS*MOV4B, PMP 1B MINIMUM FLOW VLV
- ☐ Verify approximately 7450 gpm on DRYWELL SPRAY HEADER FLOW (2RHS*FI63B)
- ☐ Verify open SWP*MOV90B, HEAT EXCHANGER 1B SVCE WTR INLET VLV
- ☐ Throttle open SWP*MOV33B, HEAT EXCHANGER 1B SVCE WTR OUTLET VLV to establish Service Water flow to RHR Heat Exchanger 1B of approximately 7400 gpm (E12-R602B)
- ☐ WHEN possible, close RHS*MOV8B, HEAT EXCHANGER 1B INLET BYPASS VLV
- ☐ Request Rad Monitor SWP*RE23B placed in service.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 8 SRO Admin JPM 5-2

SRO

Classify the event as ALERT 3.1.1

Evaluator to perform SRO Admin JPM
for emergency classification.

V. POST SCENARIO CRITIQUE

- A. After the second caucus, convene the crew in the classroom for a facilitative critique on:
 - 1. What the crew saw and how they responded to each event?
 - 2. Why the crew responded the way they did or their goal?
 - 3. What went well during the scenario (STRENGTHS)?
 - 4. What the crew could have done better (AREAS FOR IMPROVEMENT)?
- B. Ensure the expectations in each performance objective are discussed.
- C. PERFORMANCE EXPECTATIONS (Attachment 7), that were not met, should be addressed.
- D. Review the Critical Tasks if applicable.
- E. At the conclusion, review the strengths and areas for improvement for improvement. Review video tape if appropriate.
- F. Significant comments from the post scenario discussion should be recorded to allow later retrieval and follow-up.

VI. REFERENCE EVENTS AND COMMITMENTS

A. Reference Events

None

B. Commitments

1. 10CFR55.45
2. 10CFR55.59

VII. LESSONS LEARNED

None

EVALUATED SCENARIO CHECKLIST

1. Additional Information about these checks:

For continuing training, can be found in NUREG 1021, ES 604 and Appendix D.

For initial training, can be found in NUREG 1021, ES 301 and Appendix D.

2. Qualitative Attributes

X	Realism/Credibility
X	Event Sequencing
X	Simulator Modeling
X	Evaluating Crew Competencies

3. Quantitative Attributes

6	Total Malfunctions
2	Malfunctions after EOP Entry
3	Abnormal Events
1	Major Transients
2	EOPs Used
1	EOP Contingency Procedures Used
	Simulator Run Time
	EOP Run Time
2	Crew Critical Tasks (if applicable per Attachment 6.)

4. Developmental Checks:

Does every event have either a Critical Task(s) or Performance Objective?

Is Criteria given for sequencing to subsequent events?

Is termination criteria clear and unambiguous?

Does termination criteria allow verification that all CT, PO standards are met?

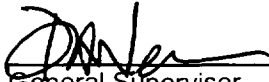
Constellation Energy Group
OPERATOR JOB PERFORMANCE MEASURE

Title: Emergency Classification for Scenario 2

Revision: NRC 2005

Task Number: 3440190303

Approvals:


General Supervisor
Operations Training (Designee)

3/17/05
Date

NA EXAMINATION SECURITY
General Supervisor
Operations (Designee)

Date

NA EXAMINATION SECURITY
Configuration Control
Date

Performer: _____(RO)

Trainer/Evaluator: _____

Evaluation Method: **PERFORM**

Evaluation Location: **SIMULATOR FOLLOWING SCENARIO AS SRO**

Expected Completion Time: 15 minutes Time Critical Task: YES Alternate Path Task: NO

Start Time: _____ Stop Time: _____ Completion Time: _____

JPM Overall Rating: Pass Fail

NOTE: A JPM overall rating of fail shall be given if any critical step is graded as fail. Any grade of unsat or individual competency area unsat requires a comment.

Comments:

Evaluator Signature: _____

Date: _____

Recommended Start Location: (Completion time based on the start location)
Simulator or other designated location.

Simulator Set-up:
N/A

Directions to the Instructor/Evaluator
To be performed as an administrative JPM.

Directions to Operators:
Read Before Every JPM Performance:

For the performance of this JPM, I will function as the SSS, CSO, and Auxiliary Operators. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary.

Read Before Each Evaluated JPM Performance:

This evaluated JPM is a measure of your ability to perform this task independently. The Control Room Supervisor has determined that a verifier is not available and that additional / concurrent verification will not be provided; therefore it should not be requested.

Read Before Each Training JPM Performance:

During this Training JPM, applicable methods of verification are expected to be used. Therefore, either another individual or I will act as the additional / concurrent verifier.

Notes to Instructor / Evaluator:

1. Critical steps are identified as **Pass/Fail**. All steps are sequenced critical unless denoted by a "•".
2. During Evaluated JPM:
 - Self-verification shall be demonstrated.
3. During Training JPM:
 - Self-verification shall be demonstrated.
 - No other verification shall be demonstrated.

References:

1. EPIP-EPP-02, Classification of Emergency Conditions at Unit 2.
2. EPMP-EPP-0102, Unit 2 Emergency Classification Bases.
3. EPIP-EPP-18, Activation and Direction of the Emergency Plan.
4. NUREG K/A 2.4.40 Knowledge of the SROs responsibilities in emergency plan implementation (4.0).

Tools and Equipment:

1. None.

Task Standard: Scenario properly diagnosed and classified as an Alert

Initial Conditions:

1. A LOCA has occurred causing a SCRAM on high DW pressure
2. N2-EOP-C2 was performed to allow low pressure injection to recover RPV water level.
3. The lowest actual RPV water level during this event was -50 inches
4. Ask the operator for any questions

Initiating Cue:

"(Operator's name), assume the role of the SM/ED and determine the emergency classification of this event."

Performance Steps	Standard	Grade	Comments
1. Provide repeat back of initiating cue. <i>Evaluator Acknowledge repeat back providing correction if necessary</i>	Proper communications used for repeat back (GAP-OPS-O1)	Sat/Unsat	
RECORD START TIME _____			Start time is logged to determine total classification time.
2. •Obtain a copy of the reference procedure and review/utilize the correct section.	<input type="checkbox"/> EPIP-EPP-02 obtained. Attachment 1, Section 3.1.1 is referenced.	Sat/Unsat	
3. Primary Containment pressure has exceeded 1.68 psig.	<input type="checkbox"/> Alert is declared per EAL 3.1.1.	Pass/Fail	The time elapsed between START TIME and determination MUST BE <15minutes to pass the JPM.

End of JPM

TERMINATING CUE: Scenario properly diagnosed and classified as a Alert.

RECORD STOP TIME _____

Initial Conditions:

1. A LOCA has occurred causing a SCRAM on high DW pressure
2. N2-EOP-C2 was performed to allow low pressure injection to recover RPV water level.
3. The lowest actual RPV water level during this event was -50 inches
4. Ask the operator for any questions

Initiating Cue:

"(Operator's name), assume the role of the SM/ED and determine the emergency classification of this event."

ATTACHMENT 1 (Cont)

3.1 Containment Pressure

3.1.1 Alert

Drywell pressure cannot be maintained < 3.5 psig due to coolant leakage

NUMARC IC:

N/A

FPB Loss/Potential Loss:

RCS Loss

Mode Applicability:

Power Operation, Hot Shutdown

Basis:

The primary containment pressure value is the drywell high pressure scram setpoint and is indicative of a LOCA event. The term "cannot be maintained below" is intended to be consistent with the conditions specified in the Primary Containment Control EOP indicative of a high energy release into containment for which normal containment cooling systems are insufficient.

PEG Reference(s):

RCS2.1

Basis Reference(s):

1. N1-ARP-F1, annunciator 1-5
2. N1-ARP-F4, annunciator 1-4
3. N1-EOP-4, Primary Containment Control


NMP SIMULATOR SCENARIO

NRC Scenario 3

REV. 0

No. of Pages: 39

TRANSFER MODE SWITCH TO RUN/CONTROL ROD DRIFT/UNISOLABLE RCIC STEAM LEAK WITH RPV BLOWDOWN

PREPARER	<u>G. Bobka</u>	DATE <u>2/10/05</u>
VALIDATED	<u>R. Lange, B. Moore, M. Smith</u>	DATE <u>2/16/05</u>
GEN SUPERVISOR OPS TRAINING	<u></u>	DATE <u>3/16/05</u>
OPERATIONS MANAGER	<u>NA Exam Security</u>	DATE _____
CONFIGURATION CONTROL	<u>NA Exam Security</u>	DATE _____

SCENARIO SUMMARY

Length: 2.5 hours

Initial Power Level: 4.5% with Mode Switch in STARTUP

The scenario begins at about 4.5% reactor power, during plant startup. The crew will continue the startup by withdrawing control rods to raise power above 5% with subsequent Mode Switch transfer to RUN. IRM A failure due to an inop trip occurs resulting in a trip of RPS trip system A. The crew will bypass the failed instrument and reset the resulting RPS channel trip.

Feedwater Pump A minimum flow valve fails open with a concurrent failure of RPV Narrow Range level input to Feedwater Level Control System (FWLC). With the level transmitter failed as-is, an RPV water level transient results requiring crew to take manual control of level control valve to prevent an automatic protective trip function per N2-SOP-6. When level is stabilized the crew will then transfer to redundant Narrow Range transmitter per normal operating procedures and subsequently return FWLC to automatic control.

The startup now continues by withdrawing control rods to raise power to above 5% and the Mode Switch is transferred to RUN. The scenario can continue regardless of whether the crew actually places the Mode Switch to RUN. Control Rod 34-27 will drift out. N2-SOP-8 will be executed to fully insert and isolate the control rod. With power level below RWM setpoint the RWM must be bypassed to insert the drifting rod. Service Water Pump A trips occurs requiring a standby pump to be placed in service.

The major transient begins when a RCIC Steam Leak into Reactor Building occurs. Automatic and manual attempts to isolate the RCIC steam line will be unsuccessful. Entry in EOP-SC is required and the reactor will be manually scrammed. Reactor Building Ventilation System fails to isolate on high radiation level. This requires action to close Secondary Containment Isolation Dampers and manually start Standby Gas Treatment systems to terminate a potential ground level release pathway. When Reactor Building temperatures exceed 212°F an RPV Blowdown is required. EHC

Pump A trips to disable the Bypass Valves as a means of rapidly reducing RPV pressure to mitigate the steam leak. ADS/SRV PSV 126 fails to open during RPV Blowdown due to Loss of N₂ supply, requiring operator action to open an additional SRV to obtain the number directed by EOP-C2.

Major Procedures Exercised: EOP-RPV, SC, C-2. N2-SOP-6 and N2-SOP-8

EAL Classification: SAE 3.4.1 Main Steam Line, RCIC steam line or Reactor Water Cleanup isolation failure AND release pathway, outside normal process system flowpaths from unisolable system exists outside primary containment

SAE 4.1.1 Primary system is discharging into RB resulting in RB area temperatures >212°F in more than one area, N2-EOP-SC

Termination Criteria:RPV Blowdown is complete and RPV level is maintained above TAF.

I. SIMULATOR SET UP

A. IC Number: IC-10 or equivalent.

- ☐ RWM Step 29
- ☐ Pull rods to raise power to about 4.5%. Initial IC power level is 2.5%. Start of RWM step 31 will result in the proper initial scenario power level.
- ☐ Remote MS03 Cond Low Vac Bypass OFF
- ☐ Reset CSH HI WTR LEVEL SEAL IN
- ☐ Place EHC Pump B (TME-P1B) in P-T-L and hang red clearance tag on control switch.

B. Presets/Function Key Assignments

1. Malfunctions:

- | | |
|--|--------|
| a. PC06, Secondary Containment Isolation Failure, TRUE | QUEUED |
| b. RC11, RCIC Isolation Failure, TRUE | QUEUED |
| c. AD08C, ADS Valve N ₂ Supply Severed (MSS*PSV126), TRUE | QUEUED |
| d. NM09G, IRM Channel Failure INOP (A), TRUE | F3 |
| e. FW30A, Reactor NR Level Transmitter Failure As Is (4A), TRUE | F4 |
| f. FW16A, FW Pump Recirc Valve Failure Open (FV2A), TRUE | F4 |
| TUA 3 seconds | |
| g. RD05 3427, Control Rod Failure Drift Out, TRUE | F5 |
| h. CW01A Service Water Pump Trip A, TRUE | F6 |
| i. RC12, RCIC Steam Leak in RB 215' Elevation | |
| 25% Ramp Time 10 minutes | F8 |
| j. RC12, RCIC Steam Leak in RB 215' Elevation | |
| 60% | F9 |
| k. TC15A, EHC Pump A Trip, TRUE | ET02 |
| l. TC15B, EHC Pump B Trip, TRUE | ET02 |

2. Remotes:

- | | |
|---------------------------------|--------|
| a. MS03 Cond Low Vac Bypass OFF | QUEUED |
|---------------------------------|--------|

3. Overrides:

- | | |
|---|--------|
| a. MOV 121, Switch Steam Supply Line Isolation (Outboard), OPEN | Queued |
| b. MOV 128, Switch Steam Supply Line Isolation (Inboard), OPEN | Queued |
| c. MOV 128, Light Steam Supply Inboard Isolation INOP Amber, ON | F7 |
| d. MOV 128, Light Steam Supply Line Isolation (Outboard) Green, OFF | F7 |

- e. MOV 128, Light Steam Supply Line Isolation (Outboard) Red, OFF F7
 - f. MOV 121, Light Steam Supply Line Isolation (Outboard) Green, ON ET01
 - g. MOV 121, Light Not Fully OPEN, Amber , ON ET01
- 4. Annunciators:
 - a. AN601305, RCIC System Inoperable, ON F7
 - b. AN601319, RCIC Valves Motor Overload, ON F7
- C. Equipment Out of Service
 - a. TMB-P1B EHC Pump B in P-T-L with red clearance on control switch
- D. Support Documentation
 - a. N2-OP-101A, Plant Startup complete through E.3.3
- E. Miscellaneous
 - 1. EVENT TRIGGERS
 - a. ET01 ANN 601157 RB GEN TEMP HIGH IN ALARM (Event Trigger 68)
When alarm actuates this results in indications of cause of the isolation failure.
 - b. ET02 650 psig PAM A (Event Trigger 001). Trips EHC pump resulting in loss of Turbine Bypass Valves.

II.

SHIFT TURNOVER INFORMATION

OFF GOING SHIFT: ☐ N ☐ D DATE: _____

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

- Control Panel Walkdown (all panels) (SM, CRS, STA, CSO, CRE)

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

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

Evolutions/General Information/Equipment Status:

- Reactor Power = 4.5% approx
- RPV Pressure 925 psig
- Bypass Valve #1 is full open and #2 is partially open
- Feedwater Pump A in service with FWS-LV55A in AUTO (HIC137)
- EHC Pump B is out of service for motor repair. Red clearance issued.

Scheduled return to service date is May 20.

PART III: Remarks/Planned Evolutions:

- Continue plant startup to place the reactor mode switch to RUN per N2-OP-101A. Currently at step E.3.3

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

- Review new Clearances (SM)
- Shift Crew Composition (SM/CRS)
- Test Control Annunciators (CRE)

TITLE	NAME	TITLE	NAME
SRO			
ATC RO			
BOP RO			

Scenario ID#

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

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

PERFORMANCE OBJECTIVES

A. Critical Tasks:

- CT-1.0 Given a condition requiring automatic isolation of Secondary Containment and a failure of Ventilation isolation, the crew will manually isolate the reactor building by closing Secondary Containment isolation dampers and start GTS, within 5 minutes of discovery.
- CT-2.0 Given an unisolable RCIC steam leak and secondary containment temperature approaching maximum safe values in one area, the crew will enter EOP-RPV and initiate a manual reactor scram before performing an RPV Blowdown.
- CT-3.0 Given an unisolable RCIC steam leak and secondary containment temperature above maximum safe values in more than one area, the crew will perform an RPV Blowdown per EOP-C2.

B. Performance Objectives:

- PO-1.0 Given the plant during startup and an IRM INOP trip, the crew will bypass the failed IRM and reset RPS trip systems per N2-OP-92 and N2-OP-97.
- PO-2.0 Given a failed open Feedwater pump minimum flow valve with RPV level instrument failure resulting in lowering RPV water level, the crew will manually control level to avoid a reactor scram per N2-SOP-6 and N2-OP-3.
- PO-3.0 Given the reactor plant during startup and a control rod drifting out, the crew will fully insert and disarm the control rod per N2-SOP-8.
- PO-4.0 Given a Service Water Pump trip the crew will start a standby pump to restore the plant to 4 operating pumps per N2-OP-11.

PO-5.0 Given a RCIC steam leak and temperatures approaching 212°F, the crew will manually scram per N2-EOP-SC and EOP-RPV.

PO-6.0 Given a RCIC steam leak and temperatures in two areas exceeding 212°F, the crew will perform an RPV Blowdown per N2-EOP-C2.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

The crew continues the startup per N2-OP-101A E.3.3 (EVENTS 3 and 4)

EVENT 1

IRM A Failure Inop Trip

PO-1.0

CONSOLE OPERATOR

When power is above 5% or when directed by Lead Evaluator, **activate malfunction** by depressing F3 key:

Crew

- Crew conducts a pre-brief, walks down the panels, and tests annunciators.

SRO

- ☐ Directs plant startup continued

ATC RO

- ☐ Continue to withdraw control rods UNTIL APRM downscale lights have cleared.
- ☐ Verify APRMs reading greater than 5% by placing IRM/APRM recorder select switch to APRM.
- ☐ In EACH Reactor Protection Division leave one IRM/APRM recorder select switch placed in the APRM position.

SRO

- ☐ Acknowledges report of IRM A INOP trip and RPS A half scram
- ☐ Directs IRM A bypassed

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

**NM09A, IRM CHANNEL FAILURE-INOP (A),
TRUE, (F3)**

IRM A channel fails upscale resulting in RPS trips system A trip. On left side of P603, the 4 white RPS scram lights are off. For IRM A the RED UPSC TR OR INOP light is on, indicating the effected channel. Rod withdrawal block.

The following annunciators alarm:

603102 RPS A NMS TRIP

603110 RPS A AUTO TRIP

603201 IRM TRIP SYSTEM A UPSCALE/INOPERABLE

603442 CONTROL ROD OUT BLOCK

- ☐ Directs RPS trip system A reset
- ☐ Notifies Operations and Plant Management
- ☐ Contacts WEC SRO for assistance and work planning
- ☐ Enters Tech Spec 3.3.1.1 RPS Function 1 IRMs. No action is required since only 1 IRM channel is inoperable. (NOTE Also see TRM 3.3.2 Control Rod Block Instrumentation Function 2)
- ☐ Conducts post event brief
- ☐ May place startup activities on hold to resolve IRM failure

ATC RO

- ☐ Identifies and reports annunciators to SRO
- ☐ Implements ARP 603102 actions. 603110 actions are similar.

These are 603102 actions

- ☐ IF a SCRAM has occurred, THEN enter N2-SOP-101C, Reactor Scram. (Scram should NOT have occurred)
- ☐ IF NO SCRAM has occurred, THEN perform the following:
 - ☐ Check the other IRM channels to verify that NO SCRAM should have occurred.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ☐ IF a SCRAM should have occurred, THEN enter the Emergency Operating Procedures. (Scram should NOT have occurred)
- ☐ IF NO SCRAM should have occurred, THEN perform the following:
 - ☐ Troubleshoot AND correct the cause of the alarm.
 - ☐ Refer to Technical Specifications for actions.
 - ☐ IF desired, THEN bypass the applicable IRM per N2-OP-92.
- ☐ WHEN the initiating signal is cleared OR bypassed, THEN reset the half SCRAM per N2-OP-97.

ATC RO

These are 603201 actions

- ☐ At P603 determine by red UPSCL/INOP light which IRM channel is tripped. (Determines IRM A is INOP)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

ATC RO Bypass IRM A

- ☐ Verify associated range switch setting is correct.
- ☐ Consult with S.S.S. and bypass faulty channel.

ATC RO

These actions are taken to bypass IRM A, when directed

CAUTION

Bypass joysticks can become electrically misaligned after numerous bending motions due to "Metal Creep". Any bypass function should be verified by channel BYPASS lights to ensure that only the intended channel is bypassed.

- ☐ Verify NO other IRM in bypass for the instrument to be bypassed.
- ☐ Place the IRM BYPASS joystick to the bypass position.
- ☐ IF IRM A was bypassed, THEN verify the IRM A BYPASS light is lit on 2CEC*PNL603 OR H13-P606

When IRM is bypassed the following annunciators clear:

603102 RPS A NMS TRIP

603201 IRM TRIP SYSTEM A UPSCALE/INOPERABLE

603442 CONTROL ROD OUT BLOCK

INSTRUCTOR ACTIONS/

PLANT RESPONSE

ATC RO Reset of Tripped Protective System
Channel (RESET HALF SCRAM)

*When RPS A trip system is reset the following
PILOT SCRAM VALVE SOLENOID white
lights A, C, E AND G light and 603110 RPS A
AUTO TRIP clears..*

**EVENT 2 Feedwater Pump A Minimum Flow
Valve fails open with RPV Narrow Range A
level transmitter failed as is. PO-2.0**

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate
malfunction** by depressing F4 key:

**FW16A, FW PUMP RECIRC VALVE
FAILURE – OPEN (FV2A), TRUE**

OPERATOR ACTIONS

ATC RO

**These actions are taken to reset the
RPS trip, when directed**

- ☐ Determine which protective channel is tripped by verifying which SCRAM solenoid lights on 2CEC*PNL603 are de-energized.
- ☐ At 2CEC*PNL603, reset SCRAM signals by momentarily placing the applicable switches to RESET as follows:

For RPS A:

- ☐ REACTOR SCRAM RESET LOGIC A
- ☐ REACTOR SCRAM RESET LOGIC C
- ☐ Verify PILOT SCRAM VALVE SOLENOID white lights A, C, E AND G are lit.

ATC RO

- ☐ Reports alarms
- ☐ Monitors RPV water level and identifies difference between RX LEVEL NARROW RANGE A indicator and B and C indicators

**INSTRUCTOR ACTIONS/
PLANT RESPONSE**

FW30A, REACTOR NR LEVEL

**TRANSMITTER FAILURE – AS IS (C33-
N004A), TRUE**

RX LEVEL NARROW RANGE A indicator is now failed at current value of about 183 inches. Feedwater Pump A minimum flow valve opens diverting feedflow from the RPV. RX LEVEL NARROW RANGE B and RX LEVEL NARROW RANGE C indicators slowly lower. With A failed, FWLC does not compensate for the transient.

The following annunciator alarm:

851456 CNST SYSTEM TROUBLE/ NO BACKUP PMP AVAILABLE

851457 CNST BSTR PMP SYS TROUBLE/NO BACKUP PMP AVAILABLE

851546 CNST PUMP DISCH HEADER FLOW LOW

NOTE:

May have to prompt SRO to use N2-OP-3 steps E.3.27 – E.3.30 to place FWLC in AUTO with HIC137 controlling FWS-LV55A.

OPERATOR ACTIONS

- ☐ Determines FWR-FV2A is ramped to 100% open
- ☐ Enter SOP-6 due to lowering water level
- ☐ Places FWS-LIK1055A (LV55A) to manual
- ☐ Restores water level as directed. (178 to 187 inches)
- ☐ Determines RX LEVEL NARROW RANGE A indicator is malfunctioning. Recommends changeover to RX LEVEL NARROW RANGE B
- ☐ If directed, inserts control rods to lower power
- ☐ Per N2-OP-3 F.8.5, change Narrow Range Level Instruments as follows:
 - ☐ IF "B" Level Instrument is required, place LEVEL A/B CONTROL switch REACTOR WTR LEVEL C33A-S1 in LEVEL B position
- ☐ As directed, place FWLC in auto (N2-OP-3 E.3.27 – E.3.30)
 - ☐ Adjust adjust 2CNM-HIC137, FEEDWATER LO FLOW

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

CONTROLLER, tape setpoint to obtain equal signals as read in the input (vertical) AND output (horizontal) signal on 2FWS-LV55A(B) controller.

- ☐ Verify 2CNM-HIC137 indicator is in the green band.
- ☐ Depress Auto (A) pushbutton on 2FWS-LV55A(B) controller.
- ☐ Verify that Reactor water level is being maintained at the desired setpoint.

SRO

- ☐ Directs entry into SOP-6 due to malfunctioning FWLC
- ☐ Determines RX LEVEL NARROW RANGE A instrument is inoperable
- ☐ Refers to Tech Spec 3.3.2.2 for Feedwater System and Main Turbine High Water Level Trip Instrumentation

LCO 3.3.2.2 Three channels of feedwater system and main turbine high water level trip instrumentation shall be OPERABLE.

APPLICABILITY: THERMAL
POWER \geq 25% RTP.

No action is required since power is below 25%.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

NOTE:

May have to prompt SRO to use N2-OP-3 steps E.3.27 – E.3.30 to place FWLC in AUTO with HIC137 controlling FWS-LV55A.

- ☐ May direct control rods inserted to lower power
- ☐ Directs FWLC system placed on RX LEVEL NARROW RANGE A instrument and FWLC returned to automatic control per N2-OP-3
- ☐ Notifies Operations and Plant Management
- ☐ Contacts WEC SRO for assistance and work planning
- ☐ Conducts post event brief

Note: Events 3 and 4 were performed in parallel with malfunction related events.

EVENT 5 **PO-3.0**
Control Rod 34-27 Drift

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate malfunction** by depressing F5 key:

RD05 3427, Control Rod Failure Drift Out, TRUE **F5**

Control Rod 34-27 slowly drifts outward and power slowly rises. RWM Display indicates

SRO

- ☐ Directs entry into N2-SOP-8
- ☐ Provides reactivity oversight
- ☐ Refer to TS 3.1.3, Control Rod Operability.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

34-27 is drifting out.

The following annunciators alarm

603307 RWM ROD BLOCK

603443 CONTROL ROD DRIFT

- ☐ Refer to TS 3.1.5, Control Rod Scram Accumulator Operability.
- ☐ Notifies Operations and Plant Management
- ☐ Contacts WEC SRO for assistance and work planning
- ☐ Conducts post event brief
- ☐ May place startup continuation on hold to resolve current equipment deficiencies.

ATC RO

- ☐ Reports alarms and implements Annunciator 603443 actions
 - ☐ Determine whether alarm is valid by checking the Full Core Display AND Four Rod Display.
 - ☐ IF alarm is valid, enter N2-SOP-08, Unplanned Power Changes, AND execute concurrently with this ARP.
 - ☐ Refer to N2-OP-95A, F.3.0, Rod Drift Indication, to reset Drift alarm.
- ☐ Enters N2-SOP-8
 - ☐ IF More than one control rod has scrammed OR drifted,
 - ☐ THEN SCRAM the reactor per N2-SOP-101C. Scram not required, only 1 rod is drifting

Note

Crew initiates N2-SOP-8 flowchart decision blocks by answering "YES/NO" questions.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ☐ Power change due to Recirc FCV motion? **NO**
- ☐ Power on APRMs rising OR expected to rise? **YES**
- ☐ Reduce Reactor power to approximately 85% per N2-SOP-101D. **NA, Power is below 5%**
- ☐ Monitor Offgas AND Main Steam Line Radiation Monitors for evidence of Fuel Element Failure.
- ☐ IF Cause due to Control Rod DriftTHEN Continue at A (of SOP-8)

ATC RO

These are "A" actions

- ☐ Identify which control rod is drifting and in what direction
CR _____ IN / OUT
- ☐ Using INSERT pushbutton, fully insert drifted control rod.
- ☐ Bypass the RWM if necessary.
Uses keylock switch and bypasses RWM.
- ☐ Can control rod be fully inserted? **YES**
- ☐ Release the insert pushbutton.

Rod will insert to full in after bypassing RWM and using INSERT pushbutton.

After releasing the insert pushbutton, the rod

INSTRUCTOR ACTIONS/
PLANT RESPONSE

will drift out again.

OPERATOR ACTIONS

CONSOLE OPERATOR

When dispatched to isolate HCU 34-27,
manually enter REMOTE :

RD08 34-27, HCU Isolation for Inserted Rod
Wait one minute, then report HCU 34-27
isolated.

CAUTION FOR CONSOLE OPERATOR
IF Instructor Station locks up with REMOTE
RD08 core grid displayed THEN select rod 31-
18 on the map. This should release the grid
and allow continued console operation.

*After isolating the HCU, and the INSERT
pushbutton is released, 34-27 no longer drifts
out. With rod fully inserted, APRM power is
lower. Annunciator 603215 APRM TRIP
SYSTEM DOWNSCALE may alarm
intermittently (at 4%).*

- ☐ Did the control rod remain fully inserted? **NO**
- ☐ Depress and hold INSERT pushbutton to maintain control rod fully inserted.
- ☐ When control rod is fully inserted, close the following valves at the HCU for the drifting control rod.
2RDS*V103
2RDS*V105
- ☐ Release INSERT pushbutton.
- ☐ Is the control rod drifting out?
NO
- ☐ IF required, disarm the control rod per N2-OP-30.
- ☐ Refer to TS 3.1.3, Control Rod Operability.
- ☐ WHEN directed by the SM, exit this procedure.
- ☐ Refer to TS 3.1.5, Control Rod Scram Accumulator Operability.
- ☐ Contact Maintenance for troubleshoot/repair plan as required.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 6

Service Water Pump A Trip PO-4.0

CONSOLE OPERATOR

When power directed by Lead Evaluator,
activate malfunction by depressing F6 key:

**CW01A, Service Water Pump Trip (P1A),
TRUE, (F6)**

*Service Water (SWP) Pump A trips. Flows rise
on the remaining operating SWP pumps.*

The following annunciators alarm:

*601113 Service Water Pump 1A/1C/1E PUMP
AUTO TRIP/FAIL TO START*

*601114 Service Water Pump 1A/1C/1E Motor /
Feeder Electrical Fault.*

Role Play

IF dispatched to perform prestart checks when
starting pump per N2-OP-11 E.2.0, WAIT
about 2 minutes and report ready to start the
standby pump.

SRO

☐ Refers to Tech Spec

3.7.1 Service Water (SW) System
and Ultimate Heat Sink (UHS)

LCO 3.7.1 Division 1 and 2 SW
subsystems and UHS shall be
OPERABLE.

AND

**Four OPERABLE SW pumps
shall be in operation.**

APPLICABILITY: MODES 1, 2,
and 3

CONDITION E. One required SW
pump not in operation.

REQUIRED ACTION E.1 Restore
required SW pump to operation.

COMPLETION TIME 72 hours

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ☐ Notifies Operations and Plant Management
- ☐ Contacts WEC SRO for assistance and work planning
- ☐ Conducts post event brief

BOP RO

- ☐ Recognizes and reports condition of the SWP*P1A tripped to the SRO.
- ☐ Performs actions required by N2-ARP-01, 601113 (or 601114 actions are the same):
 - ☐ IF required, throttle 2SWP*MOV74A(B,C,D,E,F) to maintain running SWP Pump flow 10,000 gpm. (*Pumps B, C and D will require throttling*)
 - ☐ Start additional Service Water Pumps, as required, at P601 as follows:
 - IF time permits per N2-OP-11 Section E.2.0, OR
 - Place associated pump control switch to START
 - ☐ Place the tripped Service Water Pump control switch in "PULL-TO-LOCK", at P601.
 - ☐ Notifies SRO to refer to Technical Specifications.
 - ☐ Dispatches AO to investigate the cause of P1A trip.

Role Play: As the AO, wait three minutes and report that Service Water Pump P1A, 86-lockout relay is tripped.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 7 SRO Tech Spec

**2ICS*MOV128 Breaker Trip, Containment
Isolation Valve Failed Open**

CONSOLE OPERATOR:

When directed by the Lead Evaluator, insert
the following overrides for ICS*MOV128
breaker trip, by depressing F7 key:

**MOV*128, Steam Supply Line Isolation
(Inboard) Green "OFF"**

**MOV*128, Steam Supply Line Isolation
(Inboard) Red "OFF"**

**MOV*128, Steam Supply Inboard Isolation –
INOP Amber "ON"**

AN601305, RCIC System Inoperable "ON"

**AN601319, RCIC Valve Motor Overload
"ON"**

All on F7

**MOV*128 Steam Supply Line Isolation
(Inboard) – "OPEN"**

Queued

- ☐ Reopen any MOV74's
previously throttled

BOP RO

- ☐ Recognizes and reports RCIC
Inboard Isolation Valve failure.

These are 601305 actions

- ☐ At 2CEC*PNL601, determine IF
any INOP Status Lights are
energized.
- ☐ IF any INOP Status Lights are
energized, refer to their applicable
Alarm Response Procedure.
- ☐ Determines INOP status light lit for
TURB STM SPLY INBD ISOL VLV
ICS*MOV128

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

These are MOV128 Inop Status light actions

- ☐ Using the energized red OR green indicating lights, confirm power
- ☐ available to ICS*MOV128, TURBINE STM SUPPLY INBOARD ISOL VLV.
- ☐ IF power is NOT available, dispatch an operator to 2EHS*MCC302.
- ☐ Confirm 2EHS*MCC302 Bkr. 14A, 2ICS*MOV128 Power Supply, is ON.

SRO

- ☐ Acknowledges BOP RO report.
- ☐ Refers to T.S. 3.6.1.3, Primary Containment Isolation failure.

From Bases B.3.6.1.3

The power operated, automatic isolation valves are required to have isolation times within limits and actuate on an automatic isolation signal. The valves covered by this LCO are listed with their associated stroke times in Ref. 1. (TRM)

CONDITION A One or more penetration flow paths with one PCIV inoperable except due to leakage not

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

within limit.

REQUIRED ACTION

A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

- COMPLETION TIME (for A.1) 4 hours except for main steam line. (Determines penetration must be isolated within 4 hours.)

AND

REQUIRED ACTION

A.2 Verify the affected penetration flow path is isolated.

COMPLETION TIME (for A.2) Once per 31 days for isolation devices outside primary containment

- Refer to TRM If necessary
TRM 3.6.1 Primary Containment
Isolation Valves

The Primary Containment Isolation Valves and, if applicable, valve groups, isolation signals, and isolation times are listed in Table T3.6.1-2.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Role Play: When dispatched by the BOP RO,
ask for panel and breaker numbers.
Wait two (2) minutes and report breaker in the
tripped condition. "No cause is apparent."

**EVENT 8 and 9 Unisolable RCIC Steam
Reactor Building Ventilation Fails to isolate**

CONSOLE OPERATOR:

After Tech Specs are reviewed by the SRO for
MOV*128 failure or when directed by Lead
Evaluator, insert the following malfunction by
depressing F8 key:

**RC12, RCIC Steam Leak in Reactor
Building, 25% over 10 minute ramp** **F8**

*The following annunciator alarms:
851254 Process Airborne Rad Monitor
Activated*

- ☐ May enter Tech. Spec. 3.5.3 for
RCIC inoperable.
- ☐ Notifies Operations and Plant
Management
- ☐ Contacts WEC SRO for assistance
and work planning
- ☐ Conducts post event brief

- ☐ BOP RO
- ☐ Check DRMS CRT Display to
determine RB HVR*RE32A/B
alarming.

**These are 851254 Corrective
Actions**

On High Radiation Level

- ☐ Verify Automatic Response has

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

**Malfunction PC06 becomes active
PC06, Secondary Containment Isolation
Failure, TRUE**

Reactor Building Ventilation fails to isolate

***Event 8 SRO enters and directs EOP-SC
actions.***

occurred, as applicable.

**Gaseous Rad Level High initiates
the following (CT-1.0, also
redirected from EOP-SC):**

- ☐ **RX Bldg Vent Emergency
*UC413A(B) starts. Suction Test
DMPR*AOD34A(B) will be open
after manual start.**
- ☐ **Shuts RX Bldg Ventilation Supp
Air Isol DMPR *AOD1A/B.**
- ☐ **Shuts RX Bldg Ventilation Exh
Air Isol DMPR *AOD9A/B.**
- ☐ **Shuts RX Bldg Ventilation
Refuel Area Exh Air Isol DMPR
*AOD10A/B.**
- ☐ **Initiates Standby Gas
Treatment Filter Train A or B
Start Signal.**
- ☐ Identify Area affected, and
verify level reading.
- ☐ Refer to Emergency Plan
Procedure EPIP-EPP-21.
Evacuates Reactor Building,
when directed.
- ☐ Refer to N2-EOP-SC (SRO).

SRO

- ☐ Enters and directs actions per
EOP-SC when HVR Exhaust
radiation is above an isolation
setpoint (HVR*RE32A/B exceed
DRMS Red setpoint)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Annunciator 601157 Reactor Building General Areas Temperature High is received and RCIC Steam Line should isolate as temperature rises above 135°F. WCS system isolates. WHEN 601157, Reactor Building General Areas Temperature High is received, Event Trigger ET01 activates:

MOV*121, Steam Supply Line Isolation (Outboard) – Green – “ON”

MOV*121, Not Fully Open – Amber – “ON”

ET01

MOV*121 Steam Supply Line Isolation (Outboard) – “OPEN” Queued (Prevents valve from closing)

*MOV*128 has no power and MOV*121 appears to be closing.*

However, RCIC steam line pressure stay up and temperatures in the area are still rising.

Thus, no isolation of the RCIC Steam Line has occurred. Fire panel 849107 FIRE DETECTED PNL103 SE QUAD 215 alarms as a result of steam discharging into the area.

- **IF HVR Exhaust radiation exceeds an isolation setpoint THEN verify (Override SC-1) (CT-1.0)**
 - **HVR isolates**
 - **HVR*UC413A or B starts**
 - **GTS starts**
 - **HVR Unit Coolers start**
- **IF any area temperature is above the isolation setpoint THEN GO to 28 (Step SC-2)**
- **Isolate all discharges into affected areas except systems needed for fire fighting or other EOP actions (Step SC-4)**
 - **Directs BOP RO to manually isolate RCIC Steam Line.**
- **IF “primary system” is discharging into the Reactor Building (YES RCIC, Conditional Step SC-4)...THEN GO to 29**

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Event 8 SRO enters and directs EOP-RPV actions.

EOP-RPV Detail E1 Systems

- ☐ Condensate/Feedwater
- ☐ CRD
- ☐ RCIC
- ☐ HPCS
- ☐ LPCS
- ☐ LPCI
- ☐ RHS through Shutdown Cooling

EOP-RPV Detail E2 Systems

- ☐ RHS Service Water Crosstie
- ☐ Fire Systems
- ☐ ECCS Keep-Full
- ☐ SLS, test tank
- ☐ SLS, boron tank
- ☐ Condensate Transfer

- ☐ **BEFORE any area temperature reaches Maximum Safe Value (Detail S; 212°F) (Step SC-7 and SC-8)....ENTER RPV Control, while continuing in EOP-SC (CT-2.0)**

These actions are directed by the SRO from EOP-RPV

- ☐ ENTER SCRAM PROCEDURE N2-SOP-101C, while continuing in EOP-RPV (Step 3)
- ☐ Executes LEVEL and PRESSURE legs concurrently

LEVEL ACTIONS DIRECTED BY SRO

- ☐ Restore and maintain RPV water level between 159.3 inches and 202.3 inches using one or more Preferred Injection Systems (Detail E1) Step L-3. *SRO should direct control between 159 to 200 inches.*
- ☐ IF level cannot be restored and maintained above 159.3 inches....THEN maintain level above -14 inches (Fig Z)
 - ☐ OK to augment with Alternate Injection systems if needed (Detail E2) *(Use of these is*

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS
NOT expected)

**PRESSURE ACTIONS DIRECTED
BY SRO**

- ☐ IF RPV Blowdown (EOP-C2) is anticipated.....THEN Rapidly depressurize the RPV using the Main Turbine Bypass Valves. OK to exceed 100°F/hr cooldown. (Step P-1 Override). *(This is an expected action because EOP-C2 will be necessary due to rising Reactor Building temperatures).*
- ☐ Is any SRV Cycling? **NO** (Step P-2)
- ☐ Stabilize RPV Pressure below 1052 psig using Main Turbine Bypass Valves. (Step P-4). *SRO should direct control between 800 to 1000 psig with BPVs.*
 - ☐ Use Alternate Pressure Control Systems, if needed.
 - ☐ Restore pneumatics to drywell, if necessary.
- ☐ WAIT until shutdown cooling pressure interlock clears 128 psig (Step P-7) BEFORE proceeding to Step P-8. While in Step P-7 or sooner, the SRO will likely return to EOP-SC actions and may be waiting for 2 areas to reach 212°F

INSTRUCTOR ACTIONS/
PLANT RESPONSE

SRO enters and directs EOP-SC actions.

Event 8 BOP RO Actions

*At back panel LDS Temperature Monitoring
Panels P632 and P642 the first area in alarm
and to reach 212 °F*

E31-N619A and N620A

E31-N619B and N620B

If "anticipating" RPV Blowdown, all 5 BPVs are

OPERATOR ACTIONS

**These actions are directed by SRO
when returning to EOP-SC**

- WAIT until 2 or more areas are above Maximum Safe Value for the same parameter (Step SC-9 and 10), THEN proceed to SC-10 to enter EOP-C2.

BOP RO

- Recognize and reports increasing area temperatures and in the Reactor Building.
- Uses EOP-6 Attachment 28 to monitor and report temperature conditions.
- Confirms WCS and RHR isolation.
- Reports failure of RCIC to automatically isolate.
- Attempts to manually isolate the RCIC Steam Line by closing MOV*121 using keylock switch.
- Monitors back panels for trending area temperatures and radiation levels.
- Reports levels and trends to the SRO.
- IF directed to rapidly depressurize the RPV using the Main Turbine Bypass Valves, opens all 5 BPVs using the BYPASS JACK INCREASE pushbutton. OK to exceed 100°F/hr cooldown. (Step

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

opened. RPV pressure lowers. RPV pressure drops to about 650 psig, the following malfunction activate from ET02:

TC15A, EHC Pump A Trip, TRUE

TC15B, EHC Pump B Trip, TRUE

EHC Pump A trips and as EHC pressure lowers, the BPVs will close to to loss of fluid pressure.

P-1 Override). (This is an expected action because EOP-C2 will be necessary due to rising Reactor Building temperatures).

- ☐ Reports trip of EHC pumps and loss of BPVs, if used for rapid depressurization.

Event 8 ATC RO Scram Actions

ATC RO

These are N2-SOP-101C Scram Actions

- ☐ IF Automatic Scram is anticipated AND time permits.....THEN Reduce Recirc Flow to 55 mlbm/hr per N2-SOP-101D. (NA, at 4% power)
- ☐ **IF Mode switch is NOT in REFUEL position.....THEN Place MODE Switch to SHUTDOWN position. (CT-2.0)**
 - ☐ Provides Scram report to SRO
- ☐ IF RPS is NOT tripped.....THEN Arm AND depress BOTH Manual Scram pushbuttons on either side of 2CEC*PNL603. (NA, RPS trips)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ☐ Verify automatic responses.
 - ☐ All rods full in
 - ☐ Rx power lowering
 - ☐ Turbine tripped/TSVs & TCVs shut
 - ☐ Generator tripped and house loads transferred
 - ☐ SDV V&D valves closed
 - ☐ RCS pumps downshift
 - ☐ RPV pressure on TBVs OR SRVs
 - ☐ FWLC controlling level > 159.3"
- ☐ IF All feedwater pumps have tripped...THEN Place ALL 2FWS-LV10 and LV55 controllers to "manual" and verify the valves are full closed.
- ☐ IF the Reactor scram can be promptly reset (and remain reset)... THEN Reset the scram.
- ☐ IF the Reactor scram CANNOT be reset....THEN Close 2RDS-V28 if directed by the SM/CRS.
- ☐ Performs LEVEL control actions as directed by SRO from EOPs
- ☐ Performs PRESSURE control actions as directed by SRO from EOPs
- ☐ WHILE continuing, perform the following as time permits:

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

IF Feedwater Pumps trip on high level (above 202.3 inches), an FWS Pump Restart can be performed per N2-SOP-101C, Level Control Actions Detail 1. Since RPV pressure will drop below 500 psig during the scenario (RPV Blowdown), Condensate Booster Pump injection can be used instead of Feedpump restart.

- ☐ Fully insert IRMs AND SRMs.
- ☐ Energize 2WCS-MOV107 (2NHS-MCC008-2E).
- ☐ If required, secure makeup to the Cooling Tower.
- ☐ At 2CEC-PNL842, shutdown HWC.
- ☐ IF WCS is in one pump three filter lineup....THEN Throttle close 2WCS*MOV200 (AND if required, throttle open 2WCS-MOV110) to obtain approximately 225 gpm WCS flow.

These actions are used to restart a tripped Fedwater pump, if directed

- ☐ Is at least 1 condensate pump running? **YES**
- ☐ Verify the following:
 - ☐ Out of service condensate, booster and feedpumps in PTL.
 - ☐ 2 condensate pumps running.
 - ☐ 2 booster pumps running.
 - ☐ 2FWR-FV2s closed.
 - ☐ The following controllers in manual with 0% output:
 - ☐ 2FWS-HIC55s
 - ☐ 2FWS-HIC1010s
 - ☐ 2FWS-HIC1600
 - ☐ IF required, reset Level 8

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

pushbuttons.

- ❑ Start feedwater pump as follows:
 - ❑ Confirm suction pressure > 500 psi.
 - ❑ Verify aux oil pump running.
 - ❑ Place pump switch to red flag.
 - ❑ WHEN 2FWS-FV2A/B/C ~ 15% open, confirm pump start.
 - ❑ Confirm flow ~ 8000 gpm.
 - ❑ Inject with 2FWS-LV55A/B (open 2FWS-V103A/B if required)
 - ❑ OR verify open 2FWS- MOV47 A/B/C AND inject with 2FWS-LV10A/B/C as required.
 - ❑ IF required, reset setpoint setdown per N2-OP-3, H.1.0.
 - ❑ For automatic control, refer to N2-OP-3, H.9.12 OR H.9.13.
 - ❑ Verify aux oil pump stops.

Event 10 Second Area Temperature reaches 212°F

Second area temperature reaches 212°F (E31-N601E and N601F). RPV Blowdown is required.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Event 10 BOP RO actions

BOP RO

- ☐ Report second area temperature reaching 212°F.
- ☐ If required restore pneumatics to drywell
 - ☐ At P851 IAS*SOV166 and 184
 - ☐ At P601 IAS *SOV164 and 165
- ☐ **When directed, open seven (7) ADS / SRVs by using keylock switch for EACH ADS valve at control room back panel P631 and P628. (CT-3.0)**
- ☐ Recognizes and reports failed ADS / SRV to the SRO.
- ☐ Open additional non-ADS SRV from P601 control switch to achieve 7 open valves.

Event 10 SRO enters and directs EOP-C2 actions.

These actions are directed by the SRO from EOP-C2

- ☐ Will the reactor stay shutdown without boron? **YES** all rods are fully inserted (Step 2)
- ☐ Drywell Pressure? **Below 1.68 psig** (Step 9, then bypass step 10)
 - ☐ Suppression Pool Level?
Above EI 192 ft (Step 11)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 10 ADS Valve fails to open

When ADS Valves are opened AD08C, ADS Valve N₂ supply severed becomes active.

PSV 126 does not indicate open at P601, even though back panel indication is that the valve opened (ADS solenoid is energized).

TERMINATION CRITERIA

RPV Blowdown is complete and RPV level is maintained above TAF.

NOTE SRO Classification is not required because Surrogate SRO is used in this scenario.

- ☐ **Open all 7 ADS Valves (Step 12) (CT-3.0)**
 - ☐ OK to exceed 100°F/hr
 - ☐ Restore pneumatics to drywell if necessary
 - ☐ *Per Ops Manual, with no RHS pumps running, opening the 7 ADS valves is performed by placing individual keylock switch for EACH ADS valve to open at control room back panel P631 and P628.*
- ☐ Can all 7 ADS Valves be opened? **NO** (Step 13)
- ☐ Open other SRVs until a total of 7 are open (Step 14)
- ☐ WAIT until shutdown cooling pressure interlock clears 128 psig (Step 16) BEFORE proceeding to Step 17.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

V. POST SCENARIO CRITIQUE

A. NA, NRC Exam

VI. REFERENCE EVENTS AND COMMITMENTS

A. Reference Events

None

B. Commitments

1. None

VII. LESSONS LEARNED

EVALUATED SCENARIO CHECKLIST

1. Additional Information about these checks:

For continuing training, can be found in NUREG 1021, ES 604 and Appendix D.

For initial training, can be found in NUREG 1021, ES 301 and Appendix D.

2. Qualitative Attributes

X	Realism/Credibility
X	Event Sequencing
X	Simulator Modeling
X	Evaluating Crew Competencies

3. Quantitative Attributes

6	Total Malfunctions
2	Malfunctions after EOP Entry
2	Abnormal Events
1	Major Transients
2	EOPs Used
1	EOP Contingency Procedures Used
NA	Simulator Run Time
NA	EOP Run Time
2	Crew Critical Tasks (if applicable per Attachment 6.)

4. Developmental Checks:

Does every event have either a Critical Task(s) or Performance Objective?

Is Criteria given for sequencing to subsequent events?

Is termination criteria clear and unambiguous?

Does termination criteria allow verification that all CT, PO standards are met?


Constellation Energy Group
OPERATOR JOB PERFORMANCE MEASURE

Title: Emergency Classification for Scenario 3

Revision: NRC 2005

Task Number: 3440190303

Approvals:


General Supervisor
Operations Training (Designee)

3/17/05
Date

NA EXAMINATION SECURITY
General Supervisor
Operations (Designee)

Date

NA EXAMINATION SECURITY
Configuration Control
Date

Performer: _____ (RO)

Trainer/Evaluator: _____

Evaluation Method: **PERFORM**

Evaluation Location: **SIMULATOR FOLLOWING SCENARIO AS SRO**

Expected Completion Time: 15 minutes Time Critical Task: YES Alternate Path Task: NO

Start Time: _____ Stop Time: _____ Completion Time: _____

JPM Overall Rating: Pass Fail

NOTE: A JPM overall rating of fail shall be given if any critical step is graded as fail. Any grade of unsat or individual competency area unsat requires a comment.

Comments:

Evaluator Signature: _____

Date: _____

Recommended Start Location: (Completion time based on the start location)
Simulator or other designated location.

Simulator Set-up:
N/A

Directions to the Instructor/Evaluator
To be performed as an administrative JPM.

Directions to Operators:
Read Before Every JPM Performance:

For the performance of this JPM, I will function as the SSS, CSO, and Auxiliary Operators. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary.

Read Before Each Evaluated JPM Performance:

This evaluated JPM is a measure of your ability to perform this task independently. The Control Room Supervisor has determined that a verifier is not available and that additional / concurrent verification will not be provided; therefore it should not be requested.

Read Before Each Training JPM Performance:

During this Training JPM, applicable methods of verification are expected to be used. Therefore, either another individual or I will act as the additional / concurrent verifier.

Notes to Instructor / Evaluator:

1. Critical steps are identified as **Pass/Fail**. All steps are sequenced critical unless denoted by a "•".
2. During Evaluated JPM:
 - Self-verification shall be demonstrated.
3. During Training JPM:
 - Self-verification shall be demonstrated.
 - No other verification shall be demonstrated.

References:

1. EPIP-EPP-02, Classification of Emergency Conditions at Unit 2.
2. EPMP-EPP-0102, Unit 2 Emergency Classification Bases.
3. EPIP-EPP-18, Activation and Direction of the Emergency Plan.
4. NUREG K/A 2.4.40 Knowledge of the SROs responsibilities in emergency plan implementation (4.0).

Tools and Equipment:

1. None.

Task Standard: Scenario properly diagnosed and classified as a Site Area Emergency

Initial Conditions:

1. Reactor building temperatures rise to an isolation setpoint.
2. RCIC has failed to isolate.
3. Reactor building temperatures and radiation levels continue to rise.
4. N2-EOP-SC does not yet require RPV Blowdown.
5. Ask the operator for any questions.

Initiating Cue:

“(Operator’s name), assume the role of the SM/ED and determine the emergency classification of this event.”

Performance Steps	Standard	Grade	Comments
1. Provide repeat back of initiating cue. <i>Evaluator Acknowledge repeat back providing correction if necessary</i>	Proper communications used for repeat back (GAP-OPS-O1)	Sat/Unsat	

RECORD START TIME _____

Start time is logged to determine total classification time.

2. •Obtain a copy of the reference procedure and review/utilize the correct section.	<input type="checkbox"/> EPIP-EPP-02 obtained. Attachment 1, Section 3.4.1 is referenced.	Sat/Unsat	
3. RCIC Steam Line isolation failure <u>AND</u> a release pathway outside normal system flowpaths from an unisolable system, exists outside primary containment.	<input type="checkbox"/> Site Area Emergency is declared per EAL 3.4.1.	Pass/Fail	The time elapsed between START TIME and determination MUST BE <15minutes to pass the JPM.

End of JPM

TERMINATING CUE: Scenario properly diagnosed and classified as a Site Area Emergency.

RECORD STOP TIME _____

Initial Conditions:

1. Reactor building temperatures rise to an isolation setpoint.
2. RCIC has failed to isolate.
3. Reactor building temperatures and radiation levels continue to rise.
4. N2-EOP-SC does not yet require RPV Blowdown.
5. Ask the operator for any questions.

Initiating Cue:

"(Operator's name), assume the role of the SM/ED and determine the emergency classification of this event."

ATTACHMENT 1 (Cont)

3.4 Containment Isolation Status

3.4.1 Site Area Emergency

MSL, EC steam line or Reactor Water Clean-up isolation failure

AND

A release pathway, outside normal process system flowpaths from the unisolable system, exists outside primary containment.

NUMARC IC:

N/A

FPB Loss/Potential Loss:

RCS Loss, Containment Loss

Mode Applicability:

Power Operation, Hot Shutdown

Basis:

This EAL covers containment isolation failures allowing a direct flow path to the environment. A release pathway outside primary containment exists when steam flow is not prevented by downstream isolations. In the case of a failure of both isolation valves to close but in which no downstream flowpath exists, declaration under this EAL would not be required. The conditions of this EAL represent the loss of both the RCS barrier and the primary containment barrier and thus justifies declaration of a Site Area Emergency.

PEG Reference(s):

PC2.1

Basis Reference(s):

None


NMP SIMULATOR SCENARIO

NRC Alternate Scenario 4

REV. 0

No. of Pages: 42

FAILED DW/SC VACUUM BREAKER/HPCS SPURIOUS INJECTION/FEEDWATER HEATER TUBE LEAK WITH FEEDWATER FAILURE/STEAM LEAK SCRAM/ RPV FLOODING

PREPARER	<u>M. Alexander</u>	DATE <u>3/3/05</u>
VALIDATED	<u>M. Greer, J. Emery, P Nichols</u>	DATE <u>3/17/05</u>
GEN SUPERVISOR OPS TRAINING	<u></u>	DATE <u>3/17/05</u>
OPERATIONS MANAGER	<u>NA Exam Security</u>	DATE _____
CONFIGURATION CONTROL	<u>NA Exam Security</u>	DATE _____

SCENARIO SUMMARY

Length: 2.0 hours

Initial Power Level: 100%, above the 100% Rod Line

The scenario begins at 100% reactor power. The crew will perform surveillance test N2-OSP-ISC-M@002. During the test, Drywell to Suppression Chamber Vacuum Breaker 2ISC*RV34A will fail partially open. Tech Spec entry is required and the valve must be closed within 72 hours.

Following Tech Spec review a spurious start of HPCS with injection into the vessel occurs. This requires the crew verify drywell pressure and reactor water level in normal band and place HPCS in P-T-L.

After Tech. Specs and Reporting requirements have been evaluated, a high pressure feedwater heater tube leak occurs coincident with a feedwater master controller failure. The crew enters and executes the actions of N2-SOP-8 and lowers power to approximately 85% due to the partial loss of feedwater heating and resulting unplanned power change. The feedwater malfunction requires feedwater to be placed in manual per N2-SOP-6.

A steam leak develops inside the drywell requiring a manual scram due to rising drywell pressure. A failure of the reactor mode switch occurs when the mode switch is taken to shutdown, requiring the use of the manual RPS pushbuttons IAW with SOP-101C immediate actions. Manual RPS actuation will still fail to actuate RPS, requiring the crew to enter and execute N2-EOP-C5. Once the action of manually initiating RRCS occurs ARI fully inserts all control rods. This allows the exit of N2-EOP-C5 and re-entry into N2-EOP-RPV.

The event is further complicated when a loss of offsite 115KV line 6 occurs with the division II diesel generator already out of service for pre-planned maintenance. This results in a loss of all

division II emergency power, rendering both of the division II low pressure ECCS systems incapable of injection to the RPV.

RPV level instrument reference leg flashing will occur which will require the crew to enter and execute N2-EOP-C4 to flood the RPV due to loss of level indication. RPV level will be raised and maintained at the main steam lines and then the decision to remove RHR 'A' from injection to allow Drywell and Suppression chamber sprays is made.

Major Procedures Exercised: EOP-RPV, PC, C-5, C-4. N2-SOP-6, N2-SOP-8, N2-SOP-101D and N2-SOP-101C.

EAL Classification: Site Area Emergency, EAL 2.1.2, RPV water level cannot be maintained > top of active fuel -OR- RPV Flooding is required.

Termination Criteria: RPV Blowdown is complete and RPV level is maintained at the elevation of the main steam lines and containment sprays in service.

I. SIMULATOR SET UP

A. IC Number: IC-20 or equivalent.

B. Presets/Function Key Assignments

1. Malfunctions:

- | | |
|--|------------------|
| a. DG01C, Diesel Generator Number 3 Failure to Start, TRUE | QUEUED |
| b. RP03, Reactor Protection System Failure To Scram, TRUE | QUEUED |
| c. CS01A, HPCS Inadvertent Initiation K29 (Drywell Pressure High),
TRUE | F3 |
| d. FW15, Feedwater Master Controller Failure As - Is, TRUE | F4 |
| e. FW22A6, FW Heater Tube Leak (A6), 50%, 3 min ramp | F4 |
| f. MS03, Steam Leakage Inside the Primary Containment, 5%, 1min
ramp | F5
(Relative) |
| g. MS03, Steam Leakage Inside the Primary Containment, 30% | ET04 |
| h. MS04, Steam Line Rupture Inside Primary Containment, 75% | ET02 |
| i. ED02B, Loss of Off-Site 115KV Line 6, TRUE | ET02 |
| j. RR50, Reference Leg Flashing, TRUE, TUA=30 sec | ET02 |
| k. CS06, Low Pressure Core Spray Pump Trip, TRUE, TUA = 15
Seconds | ET01 |

2. Remotes:

- | | |
|--|----|
| a. RH27, RHS*MOV15A 600 V BKR Status, OPEN | F6 |
| b. RH16, Manual Handwheel Ops – RHS*MOV15A, OPEN | F7 |

3. Overrides:

- | | |
|---|--------|
| a. P628 Lamp, Vacuum Bkr 2ISC*RV34A Inboard Green, ON | Queued |
| b. P628 Lamp, Vacuum Bkr 2ISC*RV34A Inboard Red, ON | ET03 |
| c. P601 Switch, RHR A injection MOV24A, CLOSE | ET02 |

4. Annunciators:

- | | |
|---|------|
| a. AN601556, Drywell Vac Bkr Inbd Disc Open, ON | ET03 |
|---|------|

C. Equipment Out of Service

- a. 2EGS*EG3 Start switch in P-T-L with red clearance applied.

D. Support Documentation

- a. N2-OSP-ISC-M@002, DRYWELL VACUUM BREAKER OPERABILITY TEST, completed up to and including step 8.2.4.

E. Miscellaneous

1. EVENT TRIGGERS

- a. ET01 #005 DRYWELL PRESSURE greater than 1.68 psig
- b. ET02 #030 Drywell Pressure >5# (19.7 psia)
- c. ET03 #092 2ISC-RV34A test pushbutton depressed
- d. ET04 #008 Mode Switch in Shutdown

2. At P851, open IAS*SOV167, PRIMARY CONTAINMENT OUTBOARD ISOLATION TO DRYWELL , for N2-OSP-ISC-M@002

3. At P851, open IAS*SOV185, PRIMARY CONTAINMENT INBOARD ISOLATION TO DRYWELL , for N2-OSP-ISC-M@002

II.

SHIFT TURNOVER INFORMATION

OFF GOING SHIFT: ☐ N ☐ D DATE: _____

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

- Control Panel Walkdown (all panels) (SM, CRS, STA, CSO, CRE)

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

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

Evolutions/General Information/Equipment Status:

- Reactor Power = 100%
- Loadline = >100%
- N2-OSP-ISC-M@002, DRYWELL VACUUM BREAKER OPERABILITY TEST is in progress.
- 2EGS*EG3, is out of service for preplanned maintenance. Day one of three day LCO (Tech. Spec. 3.8.1 condition B.). Scheduled return to service is late next shift.

PART III: Remarks/Planned Evolutions:

- Continue with N2-OSP-ISC-M@002, DRYWELL VACUUM BREAKER OPERABILITY TEST and perform step 8.3 only.

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

- Review new Clearances (SM)
- Shift Crew Composition (SM/CRS)
- Test Control Annunciators (CRE)

TITLE	NAME	TITLE	NAME
SRO			
ATC RO			
BOP RO			

Scenario ID#

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 an unplanned power change that is or is likely to cause reactor power as indicated on APRMs to rise, the crew will make an initial reactor power reduction to approximately 85% as indicated on APRMs per SOP-8 and in accordance with SOP-101D.
- CT-2.0 Given RPV level indication is no longer valid, the crew will execute EOP-C4 to open SRVs with a minimum of 6 and a maximum of 7 ultimately opened.
- CT-3.0 Given RPV Flooding in progress with RPV level below the main steam lines, the crew will establish injection to the RPV to restore and maintain RPV level at or above the main steam lines.
- CT-4.0 Given the situation, RPV flooded to the main steam lines and RHR Loop "A" not needed to run in the LPCI mode to maintain level, divert RHR "A" to spray the Suppression Chamber and the Drywell.

B. Performance Objectives:

- PO-1.0 Given the plant experiencing an inadvertent initiation of HPCS the crew will act to place the HPCS in a safe configuration.
- PO-2.0 Given the plant operating at rated power and a loss of a high pressure heater, the crew will lower power and monitor feedwater temperature and verify limits per N2-SOP-8.
- PO-3.0 Given a reactor plant performing a power reduction from rated with a feedwater control malfunction, the operating crew will take

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

manual control of feedwater level prior to any automatic actions occurring.

PO-4.0 Given a reactor plant operating at power with a LOCA in progress, the crew will manually scram the reactor plant prior to reaching 1.68 psig in the Containment.

PO-5.0 Given the situation, RPV flooded to the main steam lines and RHR Loop "A" not needed to run in the LPCI mode to maintain level, divert RHR "A" to spray the Suppression Chamber and the Drywell.

EVENT 1

**2ISC*RV34A Exercise and Position
Indication Test**

PO-1.0

Crew

- Crew conducts a pre-brief, walks down the panels, and tests annunciators.

SRO

- Directs N2-OSP-ISC-M@002, DRYWELL VACUUM BREAKER OPERABILITY TEST continued at step 8.3.
- Repeats back communication of Vacuum breaker failure.
- Refers to Tech. Spec. 3.6.1.7 and performs required actions.
 - Enters condition A and takes required action A.1 to restore to OPERABLE status within 72 hours
 - Enters condition B and takes required action B.1 to close RV34A within 72 hours.

BOP RO

- Opens 2ISC*RV34A, VACUUM BREAKER INBOARD, by depressing AND holding VACUUM BREAKER 2ISC*RV34A

**INSTRUCTOR ACTIONS/
PLANT RESPONSE**

OPERATOR ACTIONS

*When 2ISC*RV34A pushbutton is depressed the valve will indicate intermediate position (both red and green light on) and will not reclose.*

Annunciator 601556 DRYWELL VACUUM BRKR INBOARD DISC OPEN alarms

INBOARD TEST pushbutton.

- Verifies the following:
 - Position indication lights for 2ISC*RV34A indicate open. [(Green Light ON, Red Light ON)]
 - Annunciator 601556 DRYWELL VACUUM BRKR INBOARD DISC OPEN alarms on 2CEC*PNL601.
 - Computer pt. ISCBC37, RV33A/34A DW VAC BRKR IN is generated in the OPEN condition.
 - Position indication lights for 2ISC*RV34B indicate closed. (Green illuminated, Red extinguished)
- Reports to SRO that 2ISC*RV34A failed to fully .
- Releases VACUUM BREAKER 2ISC*RV34A INBOARD TEST pushbutton.
- Reports to SRO that 2ISC*RV34A failed to reclose and remains intermediate.

EVENT 2

Spurious start and injection of HPCS.

PO-1.0

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate malfunction** by depressing **(F3)** key:

CS01A, "HPCS Inadvertent Initiation K29
(Drywell Pressure High)"

HPCS automatically starts and injects into the RPV. Reactor pressure lowers and FWS-LV10 controllers respond by closing down to maintain RPV level in normal band. The Division III diesel generator starts and runs unloaded in response to HPCS start signal.

The following annunciators alarm:

852311 EDG 2 TROUBLE

852317 EDG2 RUNNING

603139 REACTOR WATER LEVEL HIGH/LOW

SRO

- ☐ Repeats back start of HPCS and EGS*EG2.
- ☐ Directs RO to verify Drywell pressure and reactor water level in normal band.
- ☐ Acknowledges report that RPV level and Drywell pressure are normal

- ☐ Directs RO to place HPCS control switch in P-T-L and/or closure of CSH*MOV107.
- ☐ Refers to Tech. Spec. 3.5.1 and performs required actions.
 - ☐ Enters condition B and takes required action B.1 to verify by administrative means that RCIC is OPERABLE immediately

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

CONSOLE OPERATOR

If requested for HPCS trip unit indication, report all trip units are indicating normal and untripped.

FWLC system will respond and no operator actions are expected to occur other than confirming proper FWLC response.

and action B.2 to restore HPCS to OPERABLE status within 14 days.

- ❑ Identifies 8 hour reportable condition requirement of 10CFR50.72.b.3.v and 50.73.a.2.v. for unplanned inoperability.
- ❑ Notifies Operations and Plant management.
- ❑ Contacts WEC SRO for assistance and work planning.

ATC RO

- ❑ Identifies and reports annunciators to SRO.
- ❑ Implements the actions of ARP 603139
- ❑ Confirms FWLC system is responding properly to the rise in water level.

These are 603139 actions:

- ❑ IF RPV pressure \geq 900 psig, enter N2-SOP-06, Feedwater Failures.
- ❑ IF RPV pressure $<$ 900 psig, perform the following as required:
- ❑ HIGH LEVEL

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ❑ Reduce feed rate to the RPV by the following as required:
 - ❑ Closing Feedwater Level Control valves FWS-LV10s, LV55s OR CNM-LV137.
 - ❑ Raise reject flow rate by throttling open WCS*FV135.
 - ❑ Reduce CRD flow by throttling closed RDS-FC107.
- ❑ Shutdown Feedwater pumps, Feedwater Booster pumps OR Condensate pumps.
- ❑ Closing 2FWS-MOV21s OR 2FWS-MOV47s OR 2CNM-MOV84s.
- ❑ Restore feed AND condensate to the RPV per N2-OP-3.

BOP RO

- ❑ Recognizes and reports HPCS injecting.
- ❑ Verifies Drywell pressure and reactor water level are normal.
- ❑ Places HPCS control switch in P-T-L and/or closes CSH*MOV107.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

NOTE: Crew is likely to have 2EGS*EG2 remain running until additional resources can be obtained.

- ❑ Implements ARP 852317, 601706 and 851311 and 852319.

These are 852311 actions:

- ❑ Dispatch an operator to 2CES*IPNL413, 2EGS*EG2 GENERATOR SWITCHBOARD.
- ❑ IF a local alarm is energized, refer to the applicable Alarm Response Procedure.

These are 852317 actions:

- ❑ Confirm that 2EGS*EG2 is required to be running.
- ❑ IF 2EGS*EG2 is required to be running, operate the diesel generator in accordance with N2-OP-100B, HPCS DIESEL GENERATOR.
- ❑ IF 2EGS*EG2 is NOT required to be running, shutdown the diesel generator per N2-OP-100B.
- ❑ AFTER 2EGS*EG2 is shutdown, confirm the alarm clears.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

When HPCS is placed in P-T-L the following occurs:

852311 EDG 2 TROUBLE clears

603139 REACTOR WATER LEVEL HIGH/LOW clears

601706 HPCS SYSTEM INOPERABLE

852319 EDG 2 DC CONT POWER FAILURE

Pump Motor BRKR #2 system status light illuminates.

**EVENT 3 High pressure feedwater heater
tube leak and feedwater master controller
failure.**

PO-2.0 & PO-3.0

CONSOLE OPERATOR

When directed by Lead Evaluator, **activate
malfunctions** by depressing **(F4)** key:

These are 852319 actions:

- ❑ Using the Process Computer,
determine which computer point(s)
brought in the alarm.
- ❑ Notify the SM to evaluate the effect
on the operability of 2EGS*EG2,
DIVISION 3 diesel generator AND
2ENS*SWG102, Division 3
Emergency Switchgear.
- ❑ Dispatch an operator to
2ENS*SWG102 to check for de-
energized amber circuit monitoring
lights.

These are 601706 actions:

- ❑ Refer to the applicable INOP
STATUS LIGHT for response.
- ❑ Refer to Technical Specifications
for required action.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

FW15, "Feedwater Master Controller Failure

As – Is"

FW22A6, "FW Heater Tube Leak (A6)", 50%,
3 min ramp

ATC RO

- ❑ Reports alarms to CRS
- ❑ Performs ARP 603139 actions.
- ❑ Recognizes and reports megawatts electric change, thermal power rise and rise in APRM power.
- ❑ Monitors and reports RPV water level and identifies that during the downpower the Feedwater master controller is not responding.
- ❑ Enters SOP-6 due to lowering reactor water level as directed by CRS.
- ❑ Places 2FWS-HIC1600 (Feedwater Master Controller) in manual.
- ❑ Controls water level in manual in assigned band.

These are 603139 actions:

- ❑ IF RPV pressure \geq 900 psig, enter N2-SOP-06, Feedwater Failures.
- ❑ IF RPV pressure $<$ 900 psig, perform the following as required:
- ❑ LOW LEVEL
 - ❑ Raise feed rate to the RPV by

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

The following annunciators alarm:

603139 REACTOR WATER LEVEL HIGH/LOW
851420 6TH PT HEATER 6A/6B/6C WATER LEVEL
HIGH
851430 6TH PT HEATER EMER DRN VLV
26A/26B/26C OPEN

*Reactor water level high alarm due to reduced steam
flow and failed feedwater controller*

ANY of the following:

- ❑ Reduce reject flow by closing WCS*FV135.
- ❑ Raise CRD injection flow to approximately 63 gpm.
- ❑ Restore feed AND condensate to the RPV per N2-OP-3.

BOP RO

- ❑ Implements ARP actions for 851420 and 851430

These are 851420 actions:

- ❑ Using computer point HDLLC07 (08,09), determine which heater level is high.
- ❑ Dispatch an operator to 2CES-IPNL204 to verify the validity of the alarm and stabilize heaters as required.
- ❑ Verify the normal and emergency drain controllers are in automatic and setpoints correct per N2-OP-08.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ❑ Verify HDH-LV6A (B,C), normal level control valve, is modulating.
- ❑ If required, adjust 6th point heater level per N2-OP-08, Subsection F.1.0.
- ❑ If required, request Tech Support/I&C assistance to determine cause.
- ❑ To reset normal level control valves to automatic operation, perform Section H.13.0 of N2-OP-08.
- ❑ Return the system to normal operation per N2-OP-8.

These are 851430 actions:

- ❑ Using computer points HDHZC01, HDHZC02, AND HDHZC03, determine which valve is alarming.
- ❑ At 2CES-IPNL204, verify alarming valve is modulating.
- ❑ Verify the NORMAL DRAIN AND EMERGENCY DRAIN Controllers for the alarming valve are in automatic AND the setpoints are per N2-OP-8, Attachment 1.
- ❑ Investigate AND determine the cause of the open valve.
- ❑ Take the appropriate actions to return the system to normal

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

*After approximately 3 minutes annunciator 851410 6TH
PT HEATER 6A/6B/6C WATER LEVEL HI-HI alarms*

ESS-MOV3A closes

*The following annunciators alarm due to auto isolation of
6th point heater::*

*851418, 4TH PT HEATER 4A/4B/4C WATER LEVEL
HIGH*

*851419, 5TH PT HEATER 5A/5B/5C WATER LEVEL
HIGH*

*851420, 6TH PT HEATER 6A/6B/6C WATER LEVEL
HIGH*

Core thermal power rises

APRM power rises.

operation.

- ❑ Implements ARP actions for 851410.

These are 851410 actions:

- ❑ Enter N2-SOP-08, UNPLANNED POWER CHANGES, AND execute concurrently with this procedure.
- ❑ Using computer points HDHLC04, HDHLC05, OR HDHLC06, determine which heater level is HIGH-HIGH.
- ❑ Dispatches operator to 2CES-IPNL204 to confirm the validity of the alarm.
- ❑ Verify the automatic responses have occurred.
- ❑ Verify the NORMAL DRAIN AND EMERGENCY DRAIN Controllers for the alarming heater are in automatic AND the setpoints are per N2-OP-8, Attachment 1.
- ❑ IF 2FWS-E6A (B, C) high level is valid, verify 2DSR-LVX65A AND B (LVY65A AND B, LVZ65A AND B) are closed.
- ❑ Verify 6TH PT HTR E6A (B, C) NORMAL LVL DR, HDH-LV6A (LV6B, LV6C) is open.
- ❑ Verify the 6TH PT HTR E6A (B, C)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- HIGH LVL DR, HDH-LV26A (LV26B, LV26C) is modulating.
- ❑ Investigate further IF necessary AND determine the cause of the high-high level.
 - ❑ Take the appropriate actions to return the system to normal operation.
 - ❑ Enters and performs the actions of N2-SOP-8 for unplanned power changes as directed by the CRS.
 - ❑ **Lowers power to approximately 85% using recirc. flow IAW SOP-101D as directed by CRS. (CT-1.0)**
 - ❑ Monitors Main steam line and offgas radiation monitors for evidence of fuel failure.
 - ❑ Verifies feedwater temperatures are within limits of figure 1 of N2-SOP-8.
 - ❑ Verifies 2CNM-AOV101, LOW PRESS HTR STRING BYPASS VLV, is closed.
 - ❑ Verify that 2ESS-MOV3A, 6TH POINT HEATER A EXTRACTION STM ISOL VLV, for the affected Heater is closed

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- At 2CES-IPNL204, transfer Sixth Point Feedwater Heater A level control to 2HDH-LV26A as follows:
 - Lower 2HDH-LIC26A tape setpoint UNTIL 2HDH-LV26A begins to open
 - Place 2HDH-LIC6A in MANUAL AND close 2HDH-LV6A
 - Exit this procedure AND enter N2-OP-8 at Subsection H.2.0
- Makes plant announcement Stating entry into N2-SOP-6 and N2-SOP-8 using GAITRONICS.

SRO

- Acknowledges report of feedwater Master controller Failure.
- Directs entry into SOP-6.
- Assigns reactor water level band.
- Acknowledges report of power rise.
- Directs entry into N2-SOP-08 unplanned power changes due to loss of feedwater heating.
- Directs power reduced to approximately 85% IAW N2-SOP-101D using recirc. Flow.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

EVENT 4 Steam Leak inside the primary containment.

PO-4.0

CONSOLE OPERATOR

After power reduction is complete, reactor water level is stable in assigned band and when directed by Lead Evaluator, **activate malfunction** by depressing **(F5)** key:

MS03, Steam Leakage Inside the Primary Containment at 5%.

- ❑ Repeats back communication that feedwater is not responding.
- ❑ Directs entry into N2-SOP-06 for feedwater failures.
- ❑ Notifies Operations and Plant management.
- ❑ Contacts WEC SRO for assistance and work planning.
- ❑ Determines further power reduction to 80% required per N2-OP-8 using N2-OP-101D.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Event 4 BOP RO Actions

*Annunciator 851254, PROCESS AIRBORNE
RADN MON ACTIVATED alarms*

*DRMS system indicates CMS-10A-1 and
CMS10B-1.(Gaseous Drywell area radiation
monitors)channels in red alarm.*

*Drywell pressure starts to slowly rise
Drywell floor drain leak rate rises*

*After approximately 2.5 minutes drywell
pressure reaches 0.75 psig which causes
annunciator 603140, DRYWELL PRESSURE
HIGH/LOW to alarm.*

*After approximately 3.5 minutes DRMS system
indicates CMS-10A-2 and CMS10B-
2.(Particulate Drywell area radiation
monitors)channels in alarm which causes
annunciator 851254, PROCESS AIRBORNE
RADN MON ACTIVATED to reflash.*

BOP RO

- ☐ Reports annunciator 851254 to
CRS.
- ☐ Reviews ARP actions.

These are 851254 actions:

- ☐ Identifies from table 851254 that
corrective action 'b' is required.
 - ☐ If there has been an increase in
containment activity as
evidenced by an alert or High
Rad alarm on the gaseous or
particulate channel of
CMS*RE10A or B:
 - ☐ Notify the SM.
 - ☐ Notify the Rad. Prot.
Department.
 - ☐ Attempt to identify the cause of

the increase, notify Chemistry to sample containment.

- Verify Reactor Coolant leakage is within Tech. Spec. limits (see Tech. Spec. 3.4.3.2). {ITS 3.4.5}

These are 603140 actions:

- Check Drywell pressure indications to determine whether drywell pressure is high OR low.
- Monitor other primary containment parameters such as:
 - Drywell Pressure in PSIA (2CMS-PI178 or Computer Point CMSPA05)
 - Drywell Temperatures
 - Drywell Leak Rates
 - Radiation Levels
- IF Drywell pressure change is NOT due to Barometric change, OR as directed by SM/CRS, perform the following:
 - IF pressure is high, perform N2-OP-61A, Subsection H.1.0.
 - Reports DRMS indications to CRS
 - If directed by CRS, reduces power

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

When Mode Switch is taken to shutdown malfunction MS03, Steam Leakage Inside the Primary Containment, 30% becomes active.

PO-4.0

The Rate of Drywell Pressure rise increases

IAW N2-SOP-101D to 55mlbm/hr.

- ❑ Recognizes and reports drywell floor drain leak rate rising.

SRO

- ❑ Determines high Drywell pressure scram is imminent.
- ❑ May direct power reduction per SOP-101D, by directing Recirc Flow reduced to 55 Mlb/hr.
- ❑ Directs mode switch to shutdown.
- ❑ Acknowledges RPS failure.
- ❑ Acknowledges scram report.

BOP RO

- ❑ If directed reduces Recirc Flow reduced to 55 Mlb/hr
- ❑ Places the mode switch in shutdown when directed by CRS. Provides scram report.
- ❑ Recognizes and reports RPS failure to trip.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

**Event 4 SRO enters and directs EOP-C5
and EOP-RPV actions.**

- ❑ Arm's and depresses manual scram pushbuttons.
- ❑ Performs actions of N2-SOP-101C.

SRO Actions

- ❑ Acknowledges failure to scram
- ❑ Enters EOP-RPV
- ❑ Exits EOP-RPV and enters EOP-C5.
- ❑ Directs ADS inhibited
- ❑ Directs HPCS be placed / verified in P-T-L.
- ❑ Directs RRCS initiation per EOP-6 Att. 13.
- ❑ Acknowledges all rods fully inserted.
- ❑ Exits EOP-C5 and enters EOP-RPV.
- ❑ Directs Level control with condensate and feedwater with a band between 159.3 and 202.3 inches.
- ❑ Directs pressure control with EHC in automatic with a band of 800-1000 psig.
- ❑ Directs actions of N2-SOP-101C.
- ❑ Acknowledges high drywell pressure trip (1.68 psig)
- ❑ Enters EOP-PC on high DWP.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ❑ May direct RHR 'A' or 'B' to suppression chamber sprays.
- ❑ May Direct start of a fifth service water pump.
- ❑ May direct restoration of pneumatics.
- ❑ May direct LPCS and LPCI injection prevented if determined not needed for core cooling.

ATC RO

- ❑ Maintains reactor water level in manual.

BOP RO

- ❑ Inhibits ADS
- ❑ Verifies HPCS in P-T-L
- ❑ Initiates RRCS
- ❑ Reports ARI successful and provides scram report.
- ❑ Verifies:
 - ❑ All rods full in
 - ❑ Rx power lowering
 - ❑ Turbine tripped/TSVs & TCVs shut
 - ❑ Generator tripped and house loads transferred
 - ❑ SDV V&D valves closed
 - ❑ RCS pumps downshift
 - ❑ RPV pressure on TBVs OR SRV's.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

The following annunciator alarms:

851244, REACTOR BLDG AREA RADN MON
ACTIVATED

- May perform the following as time permits:
 - Fully insert IRMs AND SRMs.
 - Energize 2WCS-MOV107 (2NHS-MCC008-2E).
 - If required, secure makeup to the Cooling Tower.
 - At 2CEC-PNL842, shutdown HWC.
- IF WCS is in one pump three filter lineup....THEN Throttle close 2WCS*MOV200 (AND if required, throttle open 2WCS-MOV110) to obtain approximately 225 gpm WCS flow.

Drywell pressure reaches 1.68 psig

Low pressure ECCS systems receive initiation signal.

When Drywell Pressure reaches 1.68 psig malfunction CS06, Low Pressure Core Spray Pump Trip, TRUE, TUA = 15 seconds becomes active.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Event 4 SRO enters and directs EOP-PC actions when drywell pressure exceeds 1.68 psig.

Annunciator 601559, "Primary Containment Temperature High" Alarms

These actions are directed by the SRO from EOP-PC

- ❑ Executes DRYWELL TEMPERATURE, SUPPRESSION POOL WATER LEVEL, PRIMARY CONTAINMENT PRESSURE, SUPPRESSION POOL TEMPERATURE and HYDROGEN legs concurrently.
- ❑ Verifies Suppression Pool Water Level below 217 ft.
- ❑ Directs RHRA(B) placed in suppression chamber sprays IAW EOP-6 Att 22.
- ❑ Acknowledges report that CSL tripped.
- ❑ Acknowledges EOP-PC entry on primary containment high.

Event 4 RO EOP-PC actions

These are the RO EOP-PC actions:

- ❑ Suppression Chamber Spray using RHS A(B). (2CEC*PNL601)

NOTE: Verifying SWP*MOV90A(B) open may be delayed until after sprays are in service.

- ❑ Verify open SWP*MOV90A(B), HEAT EXCHANGER 1A(B), SVCE WTR OUTLET INLET VLV

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- Verify closed AND IF possible overridden, RHS*MOV24A(B), LPCI A(B) INJECTION VLV
- Verify running RHS*P1A, PMP 1A(B)
- IF operation in Containment Spray mode AND a trip of 2RHS*P1A(B) occurs, perform emergency refill per Section 3.3
- Open RHS*MOV33A(B), OUTLET TO SUPPR POOL SPRAY
- Verify approximately 450 gpm on SUPPR SPRAY HEADER FLOW. (2RHS*FI64A(B))
- Verify RHS*MOV4A(B), PMP 1A(B) MINIMUM FLOW VLV position as follows:
 - IF RHS A(B) is in Suppression Pool Cooling/Spray, verify closed 2RHS*MOV4A(B)
- OR
- IF RHS A(B) is in Suppression Chamber Spray ONLY, verify open 2RHS*MOV4A(B)
- Verify open SWP*MOV90A(B), HEAT EXCHANGER 1A(B), SVCE WTR INLET VLV.

NOTE: Post LOCA, in order to supply greater than 2000 gpm SWP to RHR Heat Exchangers with less than 5 SWP pumps in service it may be necessary to isolate Turbine Bldg. loads IAW N2-OP-31Section H.12.0.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- Throttle open SWP*MOV33A(B), HEAT EXCHANGER 1A(B) SVCE WTR OUTLET VLV to establish Service Water flow to RHR Heat Exchanger 1A(B) of approximately 7400 gpm. (E12-R602A(B))

NOTE: 2RHS*MOV8A(B) is interlocked in the open position for 10 minutes following a Division I ECCS initiation.

- WHEN possible, close RHS*MOV8A(B), HEAT EXCHANGER 1A(B) INLET BYPASS VLV.
- Notify Radiation Protection to start Radiation Monitor 2SWP*RE23A(B)

Drywell pressure rises and exceeds 5 psig.

**When Drywell Pressure reaches 5.0 psig,
the following malfunctions become active:**

**MS04, Steam Line Rupture Inside Primary
Containment, 75%**

**ED02B, Loss of Off-Site 115KV Line 6,
TRUE**

**RR50, Reference Leg Flashing, TRUE,
TUA=30 sec**

*With Loss of line 6 and division II EDG out of
service, Division II LP ECCS lose power*

Drywell pressure rises more rapidly

Reactor water level rises to level 8 due to swell

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

and trips FWS pumps.

Reactor pressure drops rapidly within the discharge head of both CSL and RHR 'A', however CSL tripped on motor electrical fault and RHR 'A' injection valve fails to open. No injection is attained from LP ECCS.

SRO Actions

- ☐ Acknowledges the following:
 - ☐ Loss of 115KV off-site line 6.
 - ☐ Loss of division II power, loss of Division II LP ECCS.
 - ☐ Level 8 Feedwater pump trip
 - ☐ Rapidly lowering reactor pressure
 - ☐ Rapidly rising containment pressure.
 - ☐ Reference leg flashing indications on all level instruments.
- ☐ Exits EOP-RPV and Enters EOP-C4.

Event 4 SRO RPV Flooding Actions

SRO RPV Flooding Actions:

- ☐ Will the reactor stay shutdown without boron. **YES**
- ☐ Verifies Suppression Pool level above 192 ft.
- ☐ Directs opening of all 7 ADS valves
 - ☐ Restore pneumatics to the drywell if necessary

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Detail Q1

Condensate/Feedwater

O.K. to defeat the high RPV water level
interlock (EOP-6 Att 20)

CRD (OP-30, Section H.3.0)

HPCS (EOP-6 Att 3)

Use the CST suction if possible. OK to
defeat the high suppression pool level
suction transfer (OP-33 Section H.7.0)

LPCS (EOP-6 Att 3)

LPCI (EOP-6 Att 3)

Inject through the HX's as soon as possible
RHS through shutdown cooling (EOP-6 Att 30)

OK to defeat isolations

Inject through the HX's as soon as
possible

RHS service water crosstie (EOP-6 Att 5)

Fire System (EOP-6 Att 6)

ECCS Keep Full (EOP-6 Att 7)

Condensate Transfer (EOP-6 Att 8)

SLS, test tank (EOP-6 Att 9)

SLS, boron tank (OP-36A, Section H.1)

- ☐ O.K. to exceed 100F/hr
Cooldown.
- ☐ Can 7 ADS valve be opened. **YES**
- ☐ Directs closure of:
 - ☐ MSIV's
 - ☐ Main Steam Line Drain
Isolations
 - ☐ RCIC / RHS steam Isolations
- ☐ Using RPV Flooding Systems
(Detail Q1), flood the RPV to the
main steam lines.
- ☐ Acknowledges report that
RHS*MOV24A will not open.
- ☐ May direct RO to dispatch field
operator to open RHS*MOV24A
manually.
- ☐ WAIT until:
 - ☐ RPV level can be determined
OR
 - ☐ Main Steam Lines are flooded
OR
 - ☐ Core damage is detected
- ☐ IF RPV has been flooded to the
Main Steam Lines perform the
following:
 - ☐ Close the following valves:
 - ☐ MSIV's (slow close, OP-1
Section G.2.0
 - ☐ Main Steam line drain
isolations

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

- ☐ RCIC / RHS steam isolations
- ☐ Control injection into the RPV to maintain Main Steam Lines flooded with injection as low as practicable.
- ☐ WAIT until:
 - ☐ RPV level can be determined
 - OR
 - ☐ Core damage is detected

ATC RO

- ☐ Reports the following to SRO:
 - ☐ Loss of 115KV off-site line 6.
 - ☐ FWS pumps tripped on level 8.
 - ☐ Rapidly lowering RPV pressure.
 - ☐ Rapidly rising containment pressure.
 - ☐ Loss of division II power and loss of division II LP ECCS.
 - ☐ Indications of reference leg flashing on Panel 603.
- ☐ Closes MSIV's when directed by SRO.
- ☐ Verifies steam line drains shut.
- ☐ Injects with condensate as directed by SRO.

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

With the loss of Division II power, no Division II LP ECCS will be running and therefore only the 7 division I ADS solenoids will illuminate.

Console Operator

If directed as auxiliary operator to manually open 2RHS*MOV24A, perform the following:
(2 options available, see below)

If RHR'A' injection is not desired perform the following:

Insert remote function RH33, "RHS*MOV24A 600 Volt Breaker Status," OPEN

BOP RO

- ❑ Reports indications of reference leg flashing on panel 601.
- ❑ **Opens 7 ADS valves, when directed, by arming and depressing all four ADS pushbuttons on panel 601.**
(CT-2.0)
 - ❑ Verifies seven division I ADS solenoid lights illuminate.
 - ❑ Verifies 7 ADS tank accumulator pressure indicate normal.
- ❑ Reports to SRO that 7 ADS valves are open.
- ❑ **When directed, takes HPCS out of P-T-L**
 - ❑ **Verifies and reports HPCS injection.**
- ❑ **If directed, attempts injection with RHR 'A'.**
 - ❑ **Reports failure of RHS*MOV24A to open.**
 - ❑ **May dispatch field operator to manually open RHS*MOV24A.**
(CT-3.0)

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

Wait 5 minutes and report that 2RHS*MOV24A clutch will not engage and you can't get the valve open.

If RHR'A' injection is desired perform the following:

Insert **remote function RH33**, "RHS*MOV24A 600 Volt Breaker Status," OPEN

Insert **remote function RH22**, "Manual Ops – RHS*MOV24A," Final Value 1.0, 2 minute ramp.

Report that 2RHS*MOV24A is being manually opened.

Console Operator

When directed as auxiliary operator to defeat the HPCS high water level interlock, perform the following:

Insert **remote function CS14**, "OPS-CSH01 PNL 625 TST. SW CSH*MOV107", **TEST**

Report that the HPCS high water level trip has been defeated.

Reactor water level continues to rise to the

- ❑ Defeats HPCS high RPV water level interlock per EOP-6 Att 20.
- ❑ Verifies and reports reactor water level at the main steam lines as

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

level of the main steam lines.

Level verified at main steam lines as indicated by ADS SRV Tailpipe temperatures lowering below 200°F while all Non-ADS SRV tailpipe temperatures remain approximately 220°F.

**Event 4 SRO Actions for Drywell and
suppression Chamber sprays
PO-5.0**

indicated by lowering ADS SRV tailpiece temperatures on Panel 614 temperature recorder B22-R614.

SRO

- ☐ Determines that level is being maintained at the main steam lines using HPCS.
- ☐ Verifies suppression pool water level below EL. 217 ft.
- ☐ Verifies suppression chamber pressure is above 10 psig.
- ☐ Verifies inside the drywell spray initiation limit (Fig K).
- ☐ Verifies all recirculation pumps tripped.
- ☐ Verifies all drywell unit coolers tripped.
- ☐ Directs RHR 'A' be placed in Drywell and Suppression Chamber sprays IAW EOP-6 Att 22.
- ☐ Acknowledges report from RO that Drywell and Suppression Chamber Sprays are in service.

**EVENT 4 RO Actions for Drywell and
Suppression Chamber spray:**

**EOP-6 Att 22 RO actions for Drywell
spray and suppression chamber
sprays: (CT-4.0)**

- ☐ Drywell Spray using RHS A
(2CEC*PNL601).

NOTE: Verifying SWP*MOV90A open
may be delayed until after sprays
are in service.

- ☐ Verify open SWP*MOV90A, HEAT
EXCHANGER 1A SVCE WTR
INLET VLV.
- ☐ Verify closed AND IF possible
overridden, RHS*MOV24A, LPCI A
INJECTION VLV.
- ☐ Verify running RHS*P1A, PMP 1A.
- ☐ IF RHS A Suppression Chamber
Spray is required concurrently
with Drywell Sprays, perform the
following:
 - ☐ Open RHS*MOV33A, OUTLET
TO SUPPR POOL SPRAY.
 - ☐ Verify approximately 450 gpm
on SUPPR SPRAY HEADER
FLOW (2RHS*FI64A).
- ☐ IF operating in the Containment
Spray mode AND a trip of

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

2RHS*P1A occurs, perform
emergency refill per Section 3.3.

- ❑ Verify closed, RHS*FV38A,
RETURN TO SUPPR POOL
COOLING.
- ❑ Verify open, RHS*MOV4A, PMP
1A MINIMUM FLOW VLV.
- ❑ Open RHS*MOV25A, OUTLET TO
DRYWELL SPRAY.
- ❑ Open RHS*MOV15A, OUTLET TO
DRYWELL SPRAY.
- ❑ Verify closed, RHS*MOV4A, PMP
1A MINIMUM FLOW VLV.
- ❑ Verify approximately 7450 gpm on
DRYWELL SPRAY HEADER
FLOW (2RHS*FI63A).
- ❑ Verify open SWP*MOV90A, HEAT
EXCHANGER 1A SVCE WTR
INLET VLV.

NOTE: Post LOCA, in order to supply
greater than 2000 gpm SWP to
RHR Heat Exchangers with less than
5 SWP pumps in service it
may be necessary to isolate Turbine
Bldg. loads IAW N2-OP-31
Section H.12.0.

- ❑ Throttle open SWP*MOV33A,
HEAT EXCHANGER 1A SVCE

INSTRUCTOR ACTIONS/
PLANT RESPONSE

OPERATOR ACTIONS

WTR OUTLET VLV to establish
Service Water flow to RHR Heat
Exchanger 1A of approximately
7400 gpm (E12-R602A).

NOTE: 2RHS*MOV8A is interlocked
in the open position for 10 minutes
following a Division I ECCS initiation.

- ❑ WHEN possible, close
RHS*MOV8A, HEAT
EXCHANGER 1A
INLET BYPASS VLV.
- ❑ Notify Radiation Protection to start
Radiation Monitor
2SWP*RE23A
- ❑ Reports to SRO that Drywell and
Suppression Chamber Sprays are
in service using RHR 'A'.

TERMINATION CRITERIA

RPV Blowdown is complete and RPV level is
maintained at the elevation of the main steam lines
and containment sprays in service.

Event 4 SRO Admin JPM 5-4

SRO

Classify the event as SAE 2.1.2
Evaluator to perform SRO Admin JPM
for emergency classification.

V. POST SCENARIO CRITIQUE

A. NA, NRC Exam

VI. REFERENCE EVENTS AND COMMITMENTS

A. Reference Events

None

B. Commitments

1. None

VII. LESSONS LEARNED

EVALUATED SCENARIO CHECKLIST

1. Additional Information about these checks:

For continuing training, can be found in NUREG 1021, ES 604 and Appendix D.

For initial training, can be found in NUREG 1021, ES 301 and Appendix D.

2. Qualitative Attributes

X	Realism/Credibility
X	Event Sequencing
X	Simulator Modeling
X	Evaluating Crew Competencies

3. Quantitative Attributes

6	Total Malfunctions
2	Malfunctions after EOP Entry
2	Abnormal Events
1	Major Transients
2	EOPs Used
1	EOP Contingency Procedures Used
NA	Simulator Run Time
NA	EOP Run Time
2	Crew Critical Tasks (if applicable per Attachment 6.)

4. Developmental Checks:

Does every event have either a Critical Task(s) or Performance Objective?

Is Criteria given for sequencing to subsequent events?

Is termination criteria clear and unambiguous?

Does termination criteria allow verification that all CT, PO standards are met?

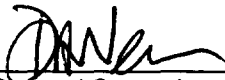
Constellation Energy Group
OPERATOR JOB PERFORMANCE MEASURE

Title: Emergency Classification for Scenario 4

Revision: NRC 2005

Task Number: 3440190303

Approvals:


General Supervisor
Operations Training (Designee)

3/17/05
Date

NA EXAMINATION SECURITY
General Supervisor
Operations (Designee)

Date

NA EXAMINATION SECURITY
Configuration Control
Date

Performer: _____ (RO)

Trainer/Evaluator: _____

Evaluation Method: **PERFORM**

Evaluation Location: **SIMULATOR FOLLOWING SCENARIO AS SRO**

Expected Completion Time: 15 minutes Time Critical Task: YES Alternate Path Task: NO

Start Time: _____ Stop Time: _____ Completion Time: _____

JPM Overall Rating: Pass Fail

NOTE: A JPM overall rating of fail shall be given if any critical step is graded as fail. Any grade of unsat or individual competency area unsat requires a comment.

Comments:

Evaluator Signature: _____

Date: _____

Recommended Start Location: (Completion time based on the start location)
Simulator or other designated location.

Simulator Set-up:
N/A

Directions to the Instructor/Evaluator
To be performed as an administrative JPM.

Directions to Operators:
Read Before Every JPM Performance:

For the performance of this JPM, I will function as the SSS, CSO, and Auxiliary Operators. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary.

Read Before Each Evaluated JPM Performance:

This evaluated JPM is a measure of your ability to perform this task independently. The Control Room Supervisor has determined that a verifier is not available and that additional / concurrent verification will not be provided; therefore it should not be requested.

Read Before Each Training JPM Performance:

During this Training JPM, applicable methods of verification are expected to be used. Therefore, either another individual or I will act as the additional / concurrent verifier.

Notes to Instructor / Evaluator:

1. Critical steps are identified as **Pass/Fail**. All steps are sequenced critical unless denoted by a "•".
2. During Evaluated JPM:
 - Self-verification shall be demonstrated.
3. During Training JPM:
 - Self-verification shall be demonstrated.
 - No other verification shall be demonstrated.

References:

1. EPIP-EPP-02, Classification of Emergency Conditions at Unit 2.
2. EPMP-EPP-0102, Unit 2 Emergency Classification Bases.
3. EPIP-EPP-18, Activation and Direction of the Emergency Plan.
4. NUREG K/A 2.4.40 Knowledge of the SROs responsibilities in emergency plan implementation (4.0).

Tools and Equipment:
1. None.

Task Standard: Scenario properly diagnosed and classified as a Site Area Emergency.

Initial Conditions:

1. MODE Switch and Manual SCRAM pushbuttons failed to trip RPS.
2. Manual initiation of RRCS caused all control rods to insert to 00.
3. LOCA occurs causing loss of RPV level instrumentation.
4. RPV has been flooded to the Main Steam Lines.
5. Ask the operator for any questions

Initiating Cue:

"(Operator's name), assume the role of the SM/ED and determine the emergency classification of this event."

Performance Steps	Standard	Grade	Comments
1. Provide repeat back of initiating cue. <i>Evaluator Acknowledge repeat back providing correction if necessary</i>	Proper communications used for repeat back (GAP-OPS-O1)	Sat/Unsat	
RECORD START TIME _____			Start time is logged to determine total classification time.
2. •Obtain a copy of the reference procedure and review/utilize the correct section.	<input type="checkbox"/> EPIP-EPP-02 obtained. Attachment 1, Section 2.1.2 is referenced.	Sat/Unsat	
3. RPV water level cannot be maintained > top of active fuel <u>OR</u> RPV flooding is required.	<input type="checkbox"/> Site Area Emergency is declared per EAL 2.1.2.	Pass/Fail	The time elapsed between START TIME and determination MUST BE < 15minutes to pass the JPM.

End of JPM

TERMINATING CUE: Scenario properly diagnosed and classified as a Site Area Emergency.

RECORD STOP TIME _____

Initial Conditions:

1. MODE Switch and Manual SCRAM pushbuttons failed to trip RPS.
2. Manual initiation of RRCS caused all control rods to insert to 00.
3. LOCA occurs causing loss of RPV level instrumentation.
4. RPV has been flooded to the Main Steam Lines.
5. Ask the operator for any questions

Initiating Cue:

"(Operator's name), assume the role of the SM/ED and determine the emergency classification of this event."

ATTACHMENT 1 (Cont)

2.1.2 Site Area Emergency

RPV water level cannot be restored and maintained > -84 in.(TAF)

OR

RPV Flooding is required

NUMARC IC:

Loss of reactor vessel water level has or will uncover fuel in the reactor vessel.

FPB Loss/Potential Loss:

Fuel Clad Potential Loss, RCS Loss

Mode Applicability:

Power Operation, Hot Shutdown, Cold Shutdown, Refuel

Basis:

The RPV water level used in this EAL is the top of active fuel (TAF). This value corresponds to the level which is used to indicate challenge to core cooling and loss of the fuel clad barrier.

Uncovery of the fuel irrespective of the event that causes fuel uncovery is justification alone for declaring a Site Area Emergency. This includes events that could lead to fuel uncovery in any plant operating mode including cold shutdown and refuel. Escalation to a General Emergency occurs through radiological effluence addressed in EAL 1.3.3 for drywell radiation and in the EALs defined for Category 5.0, Radioactivity Release.

The terminology of "cannot be restored and maintained" that is used is intended to be consistent with the EOP terminology using the same wording. Momentary drops below the level limit would not require classification at this level.

This determination includes making an evaluation that considers both current and future system performance in relation to the current value and trend of the parameter(s). Neither implies that the parameter must actually exceed the limit before the classification is made nor that the classification must be made before the limit is reached.

This definition would require the emergency classification be made prior to water level dropping below TAF if, based on an evaluation of the current trend of RPV water level and in consideration of current and future injection system performance, that RPV water level will not likely be maintained above TAF.

ATTACHMENT 1 (Cont)

The EOPs require RPV Flooding under conditions where RPV water level cannot be determined. The operator is directed to establish RPV Flooding conditions to assure adequate core cooling while attempting to restore RPV water level indication. Because actual RPV water level is not known under these conditions, it must be assumed that RPV water level is below the TAF thus warranting declaration of a Site Area Emergency.

PEG Reference(s):

SS5.1

FC2.1

RCS4.1

Bases Reference(s):

1. N1-EOP-2, Level Control
2. N1-SAP-2, RPV/Containment/Radioactivity Release Control