Post-examination Comments

TURKEY POINT DEC. 2003
EXAM 50-250/2003-301

DECEMBER 3 - 15,2003

1. Licensee Submitted Post-examination Commen

FPL

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L-2003-317

Mr. Luis A. Reyes
Regional Administrator, Region II
Attn: Michael E. Ernstes
U. S. Nuclear Regulatory Commission
Sam Nunn Atlanta Federal Center
61 Forsyth Street, S. W., Suite 23T85
Atlanta, GA **30303**

We: Turkey Point Units 3 and **4**
Docket Nos. 50-250 and 50-251
SRO Written License Examination Comments

The provisions of NUREG-1021, Operator Licensing Examiner Standards, Examiner Standards ES-402, Administering Initial Written Examinations, allow the opportunity for submittal of comments on the written portion **of** the SRO License Examination to the NRC.

This letter documents that Florida Power and Light Co. is submitting comments and recommendations for your review and approval for questions **#1** and # **46** related to the site-specific written examination administered at Turkcy Point on December 15,2003. Additionally, question #33 is being subniitted for consideration for applicant Timothy Scott. *Mr.* Scott inadvertently bubbled in the wrong item on his scantron answer sheet. The supporting information for these questions is enclosed.

Should there be any questions, please contact Gregory Laughlin at (305) 2464274.

Very truly yours,

Terry Jones
Vice Resident
Turkey Point Nuclear Plant

SM

cc: Michael E. Emstes, Chief, Operator Licensing and Human Performance Branch, Region II, USNRC
Chief Examiner, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant
Document Control Desk, USNRC, Washington, D.C.

Turkey Point 2003 NRC Written SRO Exam
Post-Exam Review Recommendations
December 18,2003

Q# 1) Accept either "B" or "C" response as correct.

"C" response is correct per the answer key. It is supported by its reference: BD-ONOP-003.6, Page ***6***.

Post-exam review revealed that "B" response is also correct. Refer to 3-ONOP-003.6, CAUTION on Page 22 which states " ***Pressurizer level should be monitored closely on the operable instrumentation during performance of the following steps to avoid uncovering the pressurizer heaters or causing a high level trip."***

The "following steps" referred to in the CAUTION are steps associated with maintaining pressurizer level and pressure control.

This CAUTION clearly states **that** operators must use care when controlling pressurizer level (via chaging pump speed control) to prevent a reactor trip on high pressurizer level. This concern forms the basis for the " B response, making the "B" response also correct.

Note that the distractor analysis says that *"pressurizer* ***level is not a concern because pressure will increase to the PORV setpoint prior to pressurizer level trip criteria being reached."*** The distractor analysis is correct in that pressure will likely increase to 2335 psig as level increases. POKV-456 will auto-open and relieve pressure down to 2315 psig at which time it will close. The PORV will then cycle open and closed between these pressure values while level continues to rise. Level will increase to its auto-trip setpoint **of** 92% or until operators manually trip the reactor **at 80%** level as directed by their Operations Department Instruction (ODI) #23. Therefore the distractor analysis is flawed because pressurizer level remains **a** concern even while the PORV is cycling.

Finally the issue of identifying the ultimate basis for minimizing charging flow must be addressed. With letdown isolated as a result of the loss of 3P06, pressurizer level and pressure will continuously rise at a rate dictated by the charging flow rate. An ONOP-003.6 objective is to maintain stable conditions with near normal parameter values until 3P06 can be restored. Either event (PORV cycling or reactor ***trip*** on high level) is undesirable and the procedure gives guidance to minimize charging flow to preclude both. Therefore precluding both events becomes the ultimate basis of reducing charging flow.

References Provided:
3-ONOP-003.6, "Loss of 120V Vital Instrument Panel 3P06"
3-ONOP-004.6, Basis Document
ODI-CO-023, **"Manual** Reactor Trip Guidelines"
Simulator generated curve: PRZ. Pressure & Level following loss of 3P06

1.

Which ONE of the following is the basis for reducing charging flow to the minimum required to maintain RCP Seal Injection following a loss of 120V Vital Instrument Panel 3P06, as required by Step 3.a, of 3-ONOP-003.6, "Loss of 120V Vital Instrument Panel 3P06?"

A. Reducing charging flow assures proper back pressure on the RCP # 2 seal and ensures the # 2 seal is not cocked.

B. Reducing charging flow extends the time for recovery without tripping the Reactor on high pressurizer level.

C. Minimizing the fill rate of the pressurizer extends the time for recovery without lifting a pressurizes PORV due to compressing the bubble.

D. Minimizing charging pump speed ensures that a loss of charging does not occur due to low oil pressure to ensure that RCP Seal Injection is maintained.

1. 004A1.04 1 SRO

Which ONE of the following is the ~~design~~ basis for reducing charging flow to the minimum required to maintain RCP Seal Injection ~~using the "3B" or "3C" charging pump in manual speed~~ following a **loss** of 120V Vital Instrument Panel 3P06, as required by Step 3.a, of 3-ONOP-003.6, "Loss of 120V Vital Instrument Panel 3P06?"

A. Reducing charging flow ~~manually would~~ assures proper back pressure on the RCP # 2 seal and ensures the # **2** ~~RCP~~ seal is not cocked.

B. Reducing charging flow ~~manually will~~ extends the time ~~frame~~ for recovering without tripping the Reactor on high pressurizer level.

C. Minimizing the fill rate of the pressurizer ~~manually will~~ extends the time ~~frame~~ for recovery without lifting a ~~the~~ pressurizer PQRV due to compressing the bubble.

D. Minimizing charging pump speed ~~manually will~~ ensures that a loss of charging does not occur due to low oil pressure tu ensure that RCP Seal Injection is maintained ~~not lost~~.

Distractor Analysis:

A. Incorrect. This ***is*** the basis for having RCS pressure greater than 325 psig.

B. Incorrect. In this case pressurizer level is not a concern because pressure will increase *to the* PORV setpoint prior to pressurizer level trip criteria being reached.

C. Correct. The **loss** of 3P06 directly affects the normal control ***of*** the pressurizer pressure and level. Operator attention is necessary to maintain the pressurizer in normal level and pressure.

D. Incorrect. Operational experience at PTN has shown that Charging pumps are prone to auto trip on low oil pressure when the speed of the charging pump is reduced to low values of less than **20%** demand .

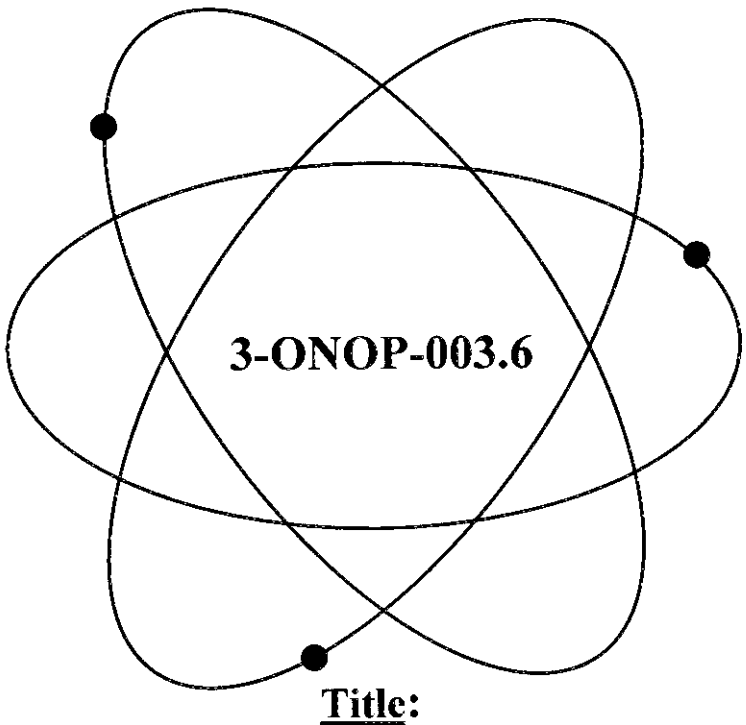
Answer: C

Reason for Revision: Eliminated unnecessary words. Minor wordsmithing.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3



Title:

Loss of 120V Vital Instrument Panel 3P06

Safety Related Procedure	
Responsible Department:	**Operations**
Revision Approval Date:	**7/31/03**

RTSs *93-0728P, 93-0099P, 93-1422P, 95-0463P, 96-0087P, 96-0602P, 97-0752P, 97-1334P, 97-1417P, 98-0851P, 98-1272P, 00-0439P, 02-0294P, 02-0593P, 03-0467P*
OTSC *0547-00*
PC/Ms *93-005, 94-034, 95-102, 97-036, 98-025*

W97:bc/sw/sw/mrg

LIST OF EFFECTIVE PAGES

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1.0 PURPOSE

This procedure provides instructions to be followed upon receipt of Loss of 120V Vitall Instrument Panel 3P06.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 Indications

2.1.1 Power Range N-41 Failure (NIS Racks Channel I Lights Out)

2.1.2 Loss of Channel I Vital Instrumentation/Indications

2.1.3 Transfer of Feedwater Control from Automatic to Manual for Steam Generator A

2.I.4 Loss of Power to Pressurizer pressure control Auto/Manual Station (auto lockup)

2.1.5 Loss of Power to the Pressurizer Spray Valve Auto/Manual Station (auto lockup)

2.1.6 Loss of Pressurizer Heaters (Control and Backup)

2.1.7 Isolation of CVCS Letdown Flow

2.1.8 Loss of Power to Pressurizer Level Auto/Manual Station (auto lockup)

2.1.9 Loss of Power to 3A Charging Pump Auto/Manual Station (auto iockup)

2.1.10 RCP Thermal Barrier Cooling Water Valve, MOV-3-626, closes

2.1.11 PORV-456 Auto Open Disabled (if in OMS LOW PRESSURE OPS)

2.1.12 Loss of Power to S t e m Generator C Auto/Manual Station (auto lockup)

2.2 Alarm

2.2.1 F 1/2, VITAL AC BUS INVERTER TROUBLE

2.2.2 B 6/5, POWER RANGE LOSS OF DETECTOR VOLTAGE

2.2.3 B 7/1, NIS/RPI ROD DROP ROD STOP

2.2.4 C 6/1, SG A LEVEL DEVIATION

2.2.5 A 1/5RCP SEAL LEAKOFF HI FLOW

2.2.6 A 6/4, RCP SEAL WATER LO DP

2.2.7 A 7/6, RCP C SEAL WATER BYPASS LO FLOW (if CV-3-307 Open)

2.2.8 H 7/5, CSP A/B COOLING WATER LO FLOW

2.2.9 A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW

2.2.10 H 6/2, RHR HX HI/LO FLOW

2.2.11 X 4/1, ARMS HI RADIATION

2.2.12 H 1/2, SFP HI TEMP

2.3 General

2.3.1 Loss of the 120V Vital Instrument Panel 3P06 results in a loss of automatic feedwater control, and a loss of power to all channel I instrumentation. ENCLOSURE 1 of this procedure contains a list of instrumentation lost in the Control Room due to the loss of Vital Instrunlent Panel 3P06.

2.3.2 **As** with any loss of a vital AC panel, early diagnosis and recovery is of greatest assistance toward unit restoration.

3.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

3.1 References

3.1.I Technical Specifications

1. Section 3.3.2. ESFAS Instrumentation
2. Section 3.8.1.1, Diesel Generators
3. Section 3.8.3.1, Onsite Power Distribution
4. Section 3.4.9.3, Overpressure Mitigating Systems

3.1.2 FSAR

I. Section 8.2-7, Electrical

3.1.3 Plant Drawings

I. 5610-E-855, Breaker List

3.1.4 Procedures

1. 3-GOP-103, Power Operation to Hot Standby
2. 3-EOP-E-0, Reactor Trip or Safety Injection
3. 0-OP-003.3, 120V Vital Instrument System

3.I.5 Plant Change/Modifications

1. PC/M 93-005, Elimination of Turbine Runback Dropped Rod
2. PC/M 94-035, RTDP Related RPS/ESFAS Setpoint Changes
3. PC/M 95-102, Abandonment of the CO7 Panel and Sample Train Reconfiguration
4. PC/M 97-036, Quarterly MEP
5. PC/M 98-025, Repowering Of KHR Pressure Interlock (PC-3/4-600X)

3.2 Records Required

3.2.1 The date and time procedure completed shall be logged in the Reactor Control Operator (RCO) logbook(s). Also, any problems encountered while performing the procedure should be logged (i.e., malfunctioning equipment, delays due to changes in plant conditions, etc.).

3.3 Commitment Documents

3.3.1 CTRAC 90-0248

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If the pressurizer spray valves were open prior to the loss of 3P06, a Reactor Trip may occur due to QTAT or low pressurizer pressure.

NOTES

- *Step 1 is an immediate action step.*
- *All 3P06 (RED) channel indication/controls are affected by failure of 3P06. Enclosure 1 provides a listing of lost functions, indications, and controls.*

1 **Check If A Reactor Trip Has Occurred**

Perform the following:

a. **IF** a reactor trip is required, **THEN** manually trip the reactor **AND** perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure.

b. **IF** reactor trip is **NOT** required, **THEN** go to Step 2.

2 **Check Unit Operating In Modes 1 Through 3 Prior To Loss Of 3P06**

Perform the following:

a. **IF** RCS solid, **THEN** perform the fallowing to prevent RCP damage **AND** maintain RCS pressure:

1) Stop All RCPs

2) Stop and start charging pumps as necessary to maintain RCS pressure

b. **IF** RHR cooling is in service, **AND** MOV-3-750 is closed or stroking closed, **THEN** stop the operating RHR pump(s) **AND** go to 3-ONOP-050, LOSS OF RHR, while continuing with this procedure.

c. **IF** OMS is in LOW PRESSURE OPS **AND** PORV-3-456 is required to be open for pressure control, **THEN** manual action shall be taken to control RCS pressure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	**Control Pressurizer Pressure As Follows:**	
	a. Reduce charging flow to minimum required to maintain RCP seal injection using the 38 **OR** 3C charging **pumps** in **MANUAL** speed control	
	b. Check Pressurizer PORVs – CLOSED	b. **IF** PRZ pressure less than setpoint, **THEN** manually close PORVs. **IF** any PRZ PORV can **NOT** be closed, **THEN** manually close its block **valve.**

STEP	RESPONSE	RESPONSE NOT OBTAINED

NOTES

- *VCT Temperature indication, TI-3-116, should be monitored in lieu of Excess Letdown, TI-3-139, which is de-energized.*
- *Excess letdown flow must be established slowly to minimize thermal stresses on the Excess LTDN Heat Exchanger (5 to 10 minutes).*

4 Maintain **Pressurizer Level As Follows:**

a. Place Pressurizer Level control switch in Position 3 (Ch 2 & 3)

b. Place Excess Letdown in service as follows:

1) Verify Excess LTDN HX CCW Outlet, CV-3-739, open

2) Verify Excess LTDN Divert to WDS, CV-3-389, is aligned to the VCT (switch to NORMAL)

3) Open Excess LTDN Stop Valve, cv-3-38?

4) Open Excess LTDN Flow Controller, HCV-3-137 **AND** adjust flow to control Pressurizer Level

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTIONS

- ***Reducing feed flow to less than steam flow by 655,000 lbs/hr will result in a reactor trip due to low level trip logic on Channel 1 of each steam generator.***
- ***Steam Generator 3A level controls are in MANUAL and 3A FW Bypass Valve fails closed.***
- ***3A Steam Generator Level Recorder is DE-ENERGIZED***
- ***Steam Generator 3C level controls are in AUTO LOCKUP***

NOTE

3B Steam Generator Level Controller should remain in AUTOMATIC.

5 **Control Steam Generator Water Levels As Follows:**

- 3A Steam Generator by manual control of Feedwater flow
- 3C Steam Generator by adjusting the following parameters:
  - Blowdown flow
  - Feed flow
  - Turbine load
  - Steam Flow

6 **Maintain The Following Plant Parameters - STABLE:**

- Tavg
- Reactor power
- Pressurizer Pressure
- Pressurizer Water level
- Steam Generator Water level

IF any reactor trip setpoint is approached or exceeded, **THEN** manually trip the reactor **AND** perform 3-EOP-E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	**Check Power Restored To 3P06**	Perform the following: a. Continue efforts to restore power to 3P06. b. **IF** power can **NOT** be restored to 3P06 within 1 hour, **THEN** perform the actions required by Technical Specifications as directed by the NPS. c. Return to Step 1

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Auto/Manual controllers should NOT be returned to AUTO until vital power has been completely restored.

NOTE

When power is restored to a Manual/Auto station, the AUTO light should turn on, after approximately 15 seconds the MANUAL light should turn OR. When the MANUAL light turns on, manual control of the process is available.

8	**Restore Equipment B0 AUTOMATIC Controls As Follows:**		
	a. Pressurizer Pressure Control using section 2 of ATTACHMENT 4		
	b Steam Generator bevel control as follows:		
	1) Manually control feed flow to return steam generator to required band for plant operating mode		
	2) Manually adjust feed flow to match steam flow		
	3) Place the steam generator level controls to AUTO		
	4) Repeat Steps 8.b.I) through **8.b.3)** until all steam generator controls are in AUTO		
	c. Direct the Operators to return all controls listed on ENCLOSURE 1 to AUTOMATIC using appropriate plant procedures	c.	**IF** AUTOMATIC control is **NOT** available **OR** desired. **THEN** maintain controls in MANUAL.
	d. Verify all annunciators indicate correctly for the current plant status	d	Perform the actions of the appropriate Annunciator Response procedure for the affected alarms.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Go To Appropriate Procedure As Determined By The Nuclear Plant Supervisor	

END OF TEXT

ENCLOSURE 1
(Page 1 of 4)

CONTROL ROOM FUNCTIONS AND INDICATIONS LOST ON LOSS OF 3P06

FUNCTIONS, Ooerating

Lock up of Pressurizer Pressure Controllers causing spray valves to stay as is
Lose Auto and Manual Control of C Feedwater Control Valve, FCV-3-498
Lose Auto Control of A Feedwater Control Valve, FCV-3-478
Lose RCP Thermal Barrier Cooling Water, MOV-3-626 closes
Lose Auto and Manual 3A Charging Pump Control causing Auto Lock-up
Lose Auto Speed Control of 3B and 3C Charging Pumps
Lose the Auto Makeup Control to the Volume Control Tank
Lose power to Control Relay from MOV-3-115C which opens LCV-3-115B Letdown Isolation
Pressurizer heaters de-energize
Lose Auto and Manual control of PCV-3-145, Letdown Pressure Controller
Loss of 3B Diesel Load Sequencer, 3C23B-1 deenergized
Lose AMSAC A Processor
Lose the Ability to Block the Source Range Trip
Lose Feedwater Isolation signal (Reactor Trip with Tavg ≤554°F)

NOTES

- *The following conditions exist which affect Pressurizer Pressure control:*
  - *Pressurizer Pressure Controller PC-444J - AUTO LOCKUP*
  - *PZR Spray Valve Controllers -AUTO LOCKUP*
  - *PZR heaters deenergized*
  - *Letdown isolation*
  - *3A charging pump - AUTO LOCKUP*
  - *3B AND 3C Charging pump loss of auto speed control*
- *Minimum charging flow for seal injection should be maintained due to loss of thermal barrier cooling water caused by closure of MOV-3-626.*

ENCLOSURE 1
(Page 2 of 4)

CONTROL ROOM FUNCTIONS AND INDICATIONS LOST ON LOSS OF 3P06

NOTES

- *With vital panel 3P06 deenergized, 3B bus sequencer is out of service resulting in the foilowing Tech Spec implications:*

  1. *AFW actuation from bus stripping on 3B 4KV bus will NOT be generated, placing the unit in a shufdown action statement (Tech Spec 3.3.2, Table 3.3-2, functional unit 6.d action 23 invokes Tech Spec 3.0.3.)*

  2. ***Loss** of Power signals are lost via the 38 bus sequencer, placing **the** unit in a shutdown action stafement (Tech Spec 3.3.2, Table 3.3-2, Functional Unit 7a, b and c)*

  3. *Bus stripping will NOT automatically occur, 38 EDG will NOT automatically close in on the bus and is **out** service; actions of Tech Spec 3.8.1.1 apply.*

INDICATORS

TI-3-401	RX Vessel Leak of Temp
TI-3-133	Seal Water Return Temp
TI-3-139	Excess LTDN HX Temp
PI-3-121	Charging Pumps Disch Press
TI-3-123	Regen Hx Outlet Temp
TI-3-141	LTDN Kelief To PRT Temp
TI-3-143	Non-Regen HX LTDN Temp
FI-3-150	Low Pressure Letdown Flow Indication
FR-3-154B	#1 Seal Leakoff Recorder Low Range (Fails **As** Is)
FR-3-154A	#1 Sed Leakoff Recorder High Range (Fails As Is)
PI-3-154	C RCP Seal AP
PI-3-128A	B RCP Thermal Barrier AP
PI-3-402	RCS Press NR
PI-3-403	RCS Press WR
TI-3-465	Pzr Safety Valve Temp
TI-3-467	Pzr Safety Valve Temp
TI-3-469	Pzr Safety Valve Temp
TI-3-463	PZR Relief Temp
TI-3-45?	PZR Spray Loop B Temp
TI-3-451	PZR Spray Loop C Temp
TI-3-412B	A Loop Ovpwr AT
TI-3-412A	**A** Loop AT
TI-3-412C	**A** Loop Ovtemp ΔT

ENCLOSURE 1
(Page 3 of 4)

CONTROL ROOM FUNCTIONS AND INDICATIONS LOST ON LOSS OF 3P06

INDICATORS

TI-3-412D	A Loop Temp Avg
PI-3-455	PZR Press Ch I
LI-3-459A	PZR Level Prot/Cont.
FI-3-414	RCS Flow Loop A
FI-3-424	RCS Flow Loop B
FI-3-434	RCS Flow Loop C
TR-3-412	Delta-T Recorder
NR-3-46	NIS Overpower Recorder
LI-3-474	A Stm Gen Level
LI-3-484	B Stm Gen Level
LI-3-494	C Stm Gen Level
LR-3-477	Stm Gen Wide Range Level (Fails As Is)
FR-3-478	3A Stcam Generator Recorder
LI-3-470	Pzr Relief Tk Level
TI-3-471	Pzr Relief Tk Temp
PI-3-472	PZR Relief Tank Pressure
PC-3-444H	Auto Manual Station for Pzr Spray Valve PCV-3-455H
PC-3-444G	Auto Manual Station for Pzr Spray Valve PCV-3-455A
PC-3-444J	Auto Manual Station for Pressurizer Pressure Controller
SC-3-151A	Auto Manual Station Charging Pump A Control
PC-3-145B	Auto Manual Station Low Pressure Letdown Pressure
FC-3-113A	Auto Manual Station Boric Acid to Blend System
NI-3-6649B 1/B2	Gammametrics Backup NIS
N-3-31	Source Range Counts and Source Range Startup Rate
N-3-35	Inter Range Current Current and Startup Rate
N-3-41	Power Range and Axial Flux Difference
LC-3-478A	Stm Gcn A Control Valve Controller, Lose Inst, MAN Control Only
FCV-3-479	3A FW Bypass Valve
U-3	Pressurizer Safety Valve Acoustic Monitoring System
NIS Rack Ch 1	(N-31, N-35, N-41)
RI-3-6311B	Containment High Radiation
TI-3-610B	CCW Pump Inlet Temp
TI-3-607B	B CCW HX Outlet Temp
FI-3-613B	13 CCW HX HDR Flow
RI-3-6311B	Containment High Radiation (VPC)

ALARMS

A 1/1, RCP THERMAL BARR COOLING WATER HI FLOW
A 1/5, KCP SEAL LEAKOFF HI FLOW (C RCP only)
A 614, RCP SEAL WATER 1.0 DP (C RCP)
C 6/1, SG A LEVEL DEVIATION
H 112, SFP €€ITEMP
H 413, RIIR PP A COOLING WATER LO FLOW
H 715, CSP A/B COOLING WATER LO FLOW
X 3/6, SI PP COOLING WATER LO FLOW

ENCLOSURE 1
(Page 4 of 4)

CONTROL ROOM FUNCTIONS ANI) INDICATIONS LOST *ON* LOSS OF 3P06

NOTE

The following listed are shutdown mode concerned failures, and are in addition io power mode failures.

FUNCTIONS. Shutdown

Lose RHR Suction, MOV-3-750 closes from Loss of PT-3-403
Lose Auto/Manual Control of FCV-3-605
Lose Pressure Control by HCV-3-142, fails closed.
PORV-3-456 Auto Open signal from OMS is defeated, consult Tech Specs if OMS is required to he operable.
Lose ability to open MOV-3-862B/863B due to a loss of power to PC-3-600X
Lose B Gammametrics

INDICATORS

PT-3-403	RCS pressure
HIC-3-142	RHR LTDN To CVCS
FC-3-605C	**Auto** Manual Station RHR Ht Exchanger Bypass Flow Control

Amber Safety Injection Lights for the following valves:
- MOV-3-744B
- MOV-3-843B
- MOV-3-862B
- MOV-3-863H
- MOV-878A
- MOV-3-865B
- MOV-3-860B
- MOV-3-861B
- MOV-3-864B
- MOV-3-866B

ALARMS

H 1/2, SFP HI TEMP
H 6/2, RIIR HX HI/LO FLOW
H 7/3, RHR PP A COOLING WATER LO FLOW
X 3/6, SI PP COOLING WATER LO FLOW

ATTACHMENT 1
(Page 1 of 2)

RESTORATION OF 3P06 VITAL INSTRUMENT AC BUS

1. In the Inverter Room, perform the following:

   a. Proceed to the 3C inverter.

   b. Open the 3C inverter System Output breaker, CB6.

2. In the Cable Spreading Room, perform the following:

   a. At Vital Instrument Panel 3P06, place all breakers to OFF.

   b. At Subpanel 3P21, place all breakers to OFF.

3. Check 4P06 being powered by CS Inverter at 4P06A Vital Instrument AC Selector Switch in the Cable Spreading Room.

4. **IF** 4P06 is powered by the CS Inverter, **THEN** notify the Nuclear Plant Supervisor.

CAUTION

DO NOT proceed with this procedure if 4P06 is powered by the CS Inverter.

5. **IF** 4P06 is **NOT** powered from CS Inverter, **THEN** place SPARE inverter CS in service to supply 3P06 Vital Instrument AC Bus load **as** follows:

   a. At Vital Instrunlent Panel 3P06A in the Cable Spreading Room, place Vital Instrument AC Selector Switch 3P06A to the ALTERNATE SUPPLY STANDBY STATIC INVERTER CS position.

ATTACHMENT 1
(Page 2 of 2)

RESTORATION OF 3P06 VITAL INSTRUMENT AC BUS

CAUTION

If System Output Breaker, CB6, has tripped, this would indicate an overcurrent condition and the amps should be monitored when each breaker on the Vital and Subpanel is closed. Amps should stabilize at less than 63. This will require a second operator at the CS inverter or at ERDADS to monitor amperage.

6. Notify the Control Room that circuits on 3P06 are about to be energized.

7. At Vital Instrument Panel 3P06, place the following breakers in the ON position:

   a. 3P06 - Main

   b. 3P06-4, (energizes LC460CX).

   c. 3P06-8, (energizes AUTO/MANUAL station for Steam Generator C).

8. At Panel 3P06, place the remaining breakers in the ON position using Attachment 2. **AND** allowing five (5) seconds between each breaker.

9. At Subpanel 3P21, place breakers in the ON position using Attachment 3 **AND** allowing five (5) seconds between each breaker.

10. In the Inverter Room, at the (locked) Alternate Source Transfer Switch 3Y05B, perform the following:

    a. Unlock Alternate Source Transfer Switch **AND** place in the BACKUP TO SPARE INVERTER CS position.

11. At Spare Inverter CS (3Y06), place the Synch Selector Switch inside the inverter panel in the NORMAL (down) position.

12. Notify the Control Room when all breakers are closed.

ATTACHMENT 2
(Page 1 of 2)

120V AC VITAL INSTRUMENT PANEL 3P06 NORMAL ALIGNMENT

Component Number	Component Description	Normal Position
3P06A	Instrument AC Selector Switch	ALTERNATE
3P06-Main	Feed Bkr from Selector Switch 3P06A	ON
3P06-1	3QR1 - Process Protection Rack 1	ON
3P06-2	3QR2 - Process Protection Rack 2	ON
3P06-3	3QR3 - Process Protection Rack 3	ON
3P06-4	3QR5 - Process Protection Rack 5	ON
3P06-5	3QR6 - Process Protection Rack 6	ON
3P06-6	3QR10 - Process Protection Rack 10	ON
3P06-7	C25 - Boron Recycle and WDS Panel	ON
3P06-8	3C01 - Control Console, Left Section	ON
3P06-9	S P A R E	*ON
3P06-10	3QR47 - Misc. Relay Rack 47 and TB3200 Gamma Metrics Hi Flux at Shutdown	ON
3P06-11	3QR32 & 3QR37 - Reactor Protection Rack 32 (Train A) and Rack 37 (Train B)	ON
3P06-12	TB3134 - CCW From RCP Hi Flow FC-3-626 and TIC-3-651 SFP Cooling Hi Temp	ON
3P06-13	3QR59 - Nuc Inst Rack 59 (Ch 1 Source & Inter Range Cont Pwr)	ON
3P06-14	3X12; Nuclear Inst. Rack Solatron A	ON

*Note: All breakers shall be in the ON position to reduce confusion and **have** conformity.

ATTACHMENT 2
(Page 2 of 2)

120V AC VITAL INSTRUMENT PANEL 3P06 NORMAL ALIGNMENT

Component Number	Component Description	Normal Position
3P06-15	3QR46 Misc. Relay Rack 46	ON
3P06-16	3QR30 - Area Radiation Monitor Rack 30	ON
3P06-17	3C03 - Vertical Board, Section A Right	ON
3P06-18	3QR59 - Nuc Inst Rack 59 (Ch 1 Power Range Cont Pwr)	ON
3P06-19	3C41 - Lighting Remote Control Relay Panel	ON
3P06-20	3E03 - No. 3 Gen Excitation Swgr Cabinet Ground Detection	ON
3P06-21	2R20 - Power Supply DDPS AC Monitor	ON
3P06-22	Emergency Load Sequencer Panel - 3B (3C23B-1)	ON
3P06-23	Safety Valve Pos Ind Power Supply - 3QR66	ON
3P06-24	Emergency Load Sequencer Panel - 3B (3C23B-1)	ON

W97:bc/sw/sw/mrg

ATTACHMENT 3
(Page 1 of 1)

120V VITAL INSTRUMENT AC SUBPANEL 3P21 NORMAL BREAKER ALIGNMENT

Component Number	Component Description	Normal Position
3P21-1	RAT-3-6311B Ctmt Hi Range Monitor	ON
3P21-2	PR-3-6306B Ctmt Press Recorder	ON
3P21-3	Transducer Cabinet SPDS/SAS C300B	ON
3P21-4	RR-3-6311B Ctmt Radiation & Hydrogen Recorder	ON
3P21-5	Emergency Diesel Generator 3B Current Xducer	ON
3P21-6	Wide Range Rad Monitor C212	ON
3P21-7	S P A R E	*ON
3P21-8	S P A R E	*ON
3P21-9	Relay Rack 3QR47 Power - RHR Interlock PC-3-600X	ON
3P21-10	RHR & HHSI Valve Position Indication	ON
3P21-11	S P A R E	*ON
3P21-12	Charcoal Filter Dousing Valve Actuation Flow Switches at C281B	ON

*Note: All breakers shall be in the ON position to reduce confusion and have conformity.

ATTACHMENT 4
(Page I of 2)

PRESSURIZER LEVEL AND PRESSURE CONTROL WITH 3P06 DE-ENERGIZED

SECTION 1

CAUTION

Pressurizer level should be monitored closely on the operable instrumentation during performance of the following steps to avoid uncovering the pressurizer heaters or causing a hi level trip.

NOTE

PCV-3-145 is *in AUTO-LOCKUP.* ***The*** *letdown orifice which* ***was*** *in service prior to the loss of 3P06 should* ***be*** *used when restoring letdown*

1. Perform the following:

   a. Verify Pressurizer PORVs are closed.

   b. Verify Pressurizer Level control selector switch in Position **3** *(CH 2, & 3).*

   c. Proceed to Rack 46 (Front) **AND** manually hold in Relay LC 460 CX.

   d. Operate heaters as necessary to return pressure to normal.

   e. Restore letdown as follows:

      1j Verify Letdown orifice isolation valves - CLOSED

      2) Open Letdown From Regen Heat Exchanger Isolation CV-3-204

      3) Open High Pressure Letdown Isolation From Loop B Cold Leg, LCV-3-460

      4) Open letdown orifice isolation valve to establish desired flow.

2. **IE** pressure is **NOT** increasing with heaters energized, **THEN** proceed to Rack 20 front **AND** remove the power fuse from the front of PC-444 C&D to close the Pressurizer Spray Valves.

ATTACHMENT 4
(Page 2 of 2)

PRESSURIZER LEVEL AND PRESSURE CONTROL WITH 3P06 DE-ENERGIZED

3. **IF** the above preferred method of energizing pressurizer heaters **AND** restoring letdown flow is **NOT** successful, **THEN** proceed as follows:

   a. Proceed to the Unit 3 West electrical penetration room **AND** perform the following:

      1) Select LOCAL control of **3A** Backup Group Pressurizer heaters.

      2) Push START/STOP pushbuttons as necessary to control heater operation.

   h. **IF** necessary, **THEN** restore Letdown flow by holding valve handswitches in the OPEN position to initiate normal letdown,

SECTION 2

I. **WHEN** power to the Vital AC bus is restored, **THEN** perform the following:

   a. **IE** relay LC460CX in Rack 46 is being held in, **THEN** release hold on relay.

   b. **IF** the power fuses for Pressurizer Spray valves were removed in Section 1, Step 2, **THEN** replace the power fuses for PC-444C and PC-444D in Rack 20.

   c. Restore pressnre control using **3-OP-041.2,** PRESSURIZER SYSTEM.

FINAL PAGE

FOLDOUT PAGE FOR PROCEDURE 3-ONOP-003.6

1. Dispatch an operator to restore power to 3P06 using Attachment 1.
2. Dispatch an operator to restore pressurizer pressure **AND** level controls using Attachment **4.**
3. **IF** a Reactor Trip has occurred, **THEN** perform the following:
   - **a.** Close MOV-3-1407
   - **b.** Close MOV-3-1408
   - **b.** Close MOV-3-1409

\W97:bc/sw/sw/mrg

Florida Bower & Light Company

Turkey Point Nuclear Plant

Unit 3 & 4 (Master)

BASIS DOCUMENT

FOR:

***-ONOP-003.6**

DATED:

10/7/02

TITLE:

Loss of 120V Vital Instrument Panel *P06

W97:/bc/sw

BASIS DOCUMENT

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	10/07/02
2	10/07/02
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15	10/07/02

NOTE

The intent of this document is to provide justification and explanations for selected procedural information. The Basis Document does not contain the procedure content as a whole and will not be re-dated unless the procedure change affects the content of this document.

BASIS DOCUMENT

1.0 PURPOSE

1.1 Self-explanatory

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 Indications

*The indications listed are plant parameters and system responses caused by a loss of 120V Vital Instrument Panel *P06. Many indications will be received, however only those indications requiring immediate operator attention are referenced.*

2.1.1 Instrument bus *P06 supplies power to the NIS rack PR-N41 module.

2.1.2 Loss of instrument bus *P06 results in the loss of all Channel I Vital Instrumentation/Indications (See Enclosure 1).

2.1.3 Instrument bus *P06 supplies power to Steam Generator ***A** Feedwater Controller (FC-478), located in Process Control Rack 6. Upon loss of *P06, Steam Generator ***A** feedwater flow control automatically transfers to manual. This transfer is indicated by lights on Steam Generator ***A** Auto Manual Station (FC-478F), on the console. Specifically, the Auto light goes out and the Man light comes on.

2.1.4 Instrument bus *P06 supplies power to the Pressurizer Spray Valve Auto Manual Station (PC-444J), located on the console. **All** lights at PC-444J go out, while the associated automatic controller (PC-444A), located in Process Control Rack 20, transfers to auto lockup.

2.1.5 Instrument bus *P06 supplies power ***to*** the Pressurizer Pressure Controls Auto Manual Stations (PC-444G **and** PC-444H), located on the console. All lights at PC-444G and PC-444H go out while. associated automatic controllers (PC-444C and PC-444D), located in Process Control Rack 20, transfer to auto **lockup. As** a consequence, pressurizer spray valves PCV-455A and PCV-455B remain as is. Closure of pressurizer spray valves upon loss of *P06 is covered in a later section of this document.

BASIS DOCUMENT

2.1.6 Instrument Bus PO6 supplies power to the Pressurizer Level Comparator, LC-3-46OC. During normal operations, LC-460C de-energizes relay LC–46OX at 14 percent pressurizer level to trip all Control and Backup pressurizer heaters should they become uncovered. On a loss of *P06, LC–460X is de-energized, tripping all pressurizer heaters regardless of pressurizer level.

2.1.7 De-energizing LC-460X on a loss of *P06 also isolates CVCS Letdown flow. Letdown flow is isolated by the closure of orifice isolation valves 200A, 200B and 200C and letdown isolation valve, LCV-460. During normal operations, isolation would occur at 14 percent pressurizer lcvel to prevent loss of reactor coolant inventory.

2.1.8 Instrument Bus *P06 supplies power to Pressurizer Level **Auto** Manual Station, LC-459G. Loss of *P06 results in all lights at LC-459G going out and Pressurizer Level Controller LC-459F, transferring to auto lockup. Manual operation of charging pumps may be necessary.

2.1.9 Instrument Bus *P06 supplies power to ***A*** Charging Pump Auto Manual Station, SC-151A. Loss of *P06 results in all lights at SC-151A going out and +**A** Charging Pump controller transferring to auto lockup.

2.1.10 Instrument Bus PO6 supplies power to FIC-*-626, which fails high when it loses power, resulting in MOV-*-626 going closed.

2.1.11 Loss of power to PT-*-403 prevents the automatic functions of PORV-*-456 from opening the valve.

2.1.12 (Unit **3)** Instrument Bus 3P06 supplies power to Steam Generator 3C Auto Manual Station (FC-3-498F), located on the console. Loss of 3P06 results in all lights at FC-3-498F going out and Stcam Generator **3C** Feedwater Flow Controller (FC-3-498) in the process control racks transferring to auto lockup.

BASIS DOCUMENT

2.2 Alarms

2.2.1 Panel F, Window 1i2 is a common annunciator indicating the receipt of any of several local inverter alarms.

2.2.2 Panel B, Window 6/5 reflects a loss of voltage to a NIS power range module.

2.2.3 Panel B, Window *7il* reflects the actuation of an NIS Rod Drop Relay which in turn generates an auto rod withdrawal stop signal. (NC-41KX).

2.2.4-
2.2.12 Alarms are the result of a loss of power to the relays allowing them to makeup the alarm circuits.

2.3 General

2.3.1 Self Explanatory

2.3.2 Self Explanatory

3.0 **REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS**

Self explanatory

BASIS DOCUMENT

PROCEDURE STEPS

CAUTION

This caution alerts the operator to a potential automatic reactor trip.

NOTES

- *Immediate actions are those actions which the operator should be able to perform before opening and reading the emergency procedures. Alfhough the operator should memorize immediate actions, they need not be memorized verbatim. The operator should know them well enough to complete the intent of each step.*
- *Provides reminders that *P06 is the RED channel **and** that Enclosure 1 is available to determine what functions, indications, and controls are lost.*

1. This step checks if a reactor trip has occurred. If a reactor trip has not occurred the operator is directed to check if a reactor trip is required. If a reactor trip is required, the operator is directed to manually trip the reactor and perform EOP-E-0 concurrently. If a trip is not required, the operator is directed to the applicable procedure step.

2. This step is written to direct the operator to check for loss of RHR if the unit is not operating in MODES 1-3. Automatic RHR flow control is lost. MOV-*-750 fails closed when PC-*-403 loses power and PCV-*-142 fails closed which may lead to an RCS overpressure condition.

3. The loss of *P06 directly affects the normal control of pressurizer pressure and level. Operator attention to the pressurizer is necessary to maintain pressure and level in normal ranges.

   a. Minimizing the fill rate of the pressurizer will extend the time **frame** for recovery without lifting a PZR PORV due to compressing the bubble.

   b. Power operated relief valve, PCV-455C, receives its control signal from pressure comparator, PC-444A. Upon loss of *P06, PC-444A output signal locks up as is, with the possibility of maintaining PCV-455C in the open position. For this reason, pressurizer PORVs should be verified shut to prevent inadvertent depressurization of the RCS.

BASIS DOCUMENT

PROCEDURE STEPS

NOTES

- *Provides the operator with an alternate temperature indication for the VCT.*
- *Reminds the operator to **use** caution when changing Excess Letdown Heat Exchanger temperatures.*

4. Gives actions that must be taken to restore manual control of PRZ pressure.

   a. The function of the Pressurizer Level control switch is to transfer the output of pressurizer level channels I, II and 111 to level comparators LC-459C and LC-460C. This allows flexibility of operation for testing and loss of channel conditions. On loss of *P06, both pressurizer level channei I and LC-460C arc de-energized. Placing the switch in CH3, CH2 (position *3)* selects out de-energized channel I level transmitter, LT-459, although LC-460C remains de-energized.

   b. Excess letdown *is* available and placing it in service will assist in maintaining pressurizer level.

CAUTIONS

- *Channel I level protection circuits for A, B, and C Steam Generators introduce a low-low level signal (10 percent) to the trip matrix upon **loss** of power. Reducing feed flww less than steam flow by 20 percent of full flow (0.665 x 10^6 lbm/hr) would complete the reactor trip logic, even though steam generator levels may be normal. Caution must be used when reducing feed flow less than steam flow to prevent a reactor trip.*
- *Self explanatory*
- *Self explanatory*
- ***Self explanatory (Unit 3 ONLY)***

BASIS DOCUMENT

PROCEDURE STEPS

NOTE

- *Self explanatory*
- *Self explanatory*

5. Monitoring steani generator levels is important since ***A** Feedwater Flow Controller is in manual. The operator must maintain manual control of ***A** Steam Generator level to prevent a reactor trip.

   (Unit 3) The operator must maintain control of 3C Steam Generator level to prevent a reactor trip. Monitoring steam generator levels is important since 3C Feedwater Flow Controller is locked up at signal prior to vital bus loss. However, since no turbine runback has occurred, feed/steam mismatch is slight or non-existent and any change in steam generator level will be slow. Steam Generator 3C level adjustments may be made using careful control of all steam generator parameters.

6. The operator is directed to maintain key plant parameters stable.

7. The operator is directed to check if power has been restored to *P06. If conditions stabilize and *P06 is still not recovered, the operator is directed to perform the following:

   a. Continue efforts to restore *P06.

   b. If pourer cannot be restored within the prescribed time frame a unit shutdown is commenced to ensure compliance with Tech Specs. If the NPS determines the unit cannot be shut down safely with the manual controls, the unit may be tripped and stabilized using the EOP network.

   c. If one hour has not elapsed and power is not restored to *P06, the operator is looped back to Step 1 to maintain the unit stable.

BASIS DOCUMENT

PROCEDURE STEPS

CAUTION

It is possible to shift the controller to AUTO approximately 15 seconds after the MANUAL light comes on; however, the controller should remain in MANUAL until vital bus power has been completely restored. This prevenfs operating the controller in AUTO with deenergized controller input signals and aiso allows input signals to stabilize.

NOTES

- *When power is restored to a Manual/Auto station, the AUTO light comes on. In approximately 15 seconds, the MANUAL light comes on and the AUTO light goes off. Manual control is available at the time the MANUAL Light comes on.*
- *During Law Pressure OPS (Shutdown) PORV-456 has dual power feeds.* ***boss*** *of *P06-5 will cause PT-403 to de-energize and disable the auto open feature of this PORV. This loss will not result in an indication in the Control Room for the PORV. Refer to Technical Specification for PORV operability.*

8. When the Vital **AC** bus is restored, all altered controls should he returned to normal alignments before continuing power operations.

   a. Manual control of pressurizer level is restored using Attachment **4.**

   b. Steam generator level control is restored by matching steam flow and feed flow on each steam generator and then placing the feedwater regulating valve controls to automatic.

   c. The operators are directed to use Enclosure I to restore the remaining affected controls to automatic. Caution should be used to ensure the process signals are stable and ready to be returned to automatic.

   d. Self explanatory

9. The Nuclear Plant Supervisor will determine the appropriate plant procedure **to** be used for continued operation.

BASIS DOCUMENT

ENCLOSURE 1

Provides a comprehensive list of lost functions, indications. and controls not specifically addressed in the procedure. Knowledge of' these functions, indications, and controls is important if vital instrument power is not restored promptly.

ATTACHMENT 1

1. This step directs the operator to attempt to restore *P06.

   a. Inverter *C is located in the Inverter Room adjacent to the Control Room,

   b. Opening inverter *C output breaker isolates the failed inverter from *P06.

2. This step prepares *P06 for restoration.

   a. Opening all breakers on *P06 prevents current surges when *P06 is reenergized,

   b. Opening *P21 breakers also prevents current surges upon reenergizing the vital bus.

3. Ensuring the &P06 is not being powered by the CS inverter prevents parallel powering of 3P06 and 4P06. If CS inverter is powering &P06, discontinue this procedure.

4. If &P06 is being powered by CS inverter, the Nuclear Plant Supervisor should be notified. The course of action at this time will depend on the status of Unit & and the &C inverter.

BASIS DOCUMENT

ATTACHMENT 1 (Cont'd)

CAUTION

It is possible to align the output of the spare inverter CS to vital buses 3P06 and 4806 simultaneously. Although inverter CS load capacity is sufficient to power both buses, parallel operation of two vital buses on one inverter is prohibited. This prevents a single failure (inverter CS) from impacting both units (3806 and 4P06) simultaneously.

5. If available, the step transfers *P06 to the spare inverter by providing instructions for placing the spare inverter in service.

   a. Designated switch operation is performed at Vital Instrument Panel *P06A. Placing the Vital Instrument **AC** Selector Switch *P06A to the ALTERNATE SUPPLY STANDBY INVERTER **CS** position, places the CS spare inverter in service.

   b. Alternate source Transfer Switch *Y05B is located in the Inverter Room.

      (1) Placing the Alternate Source Transfer Switch in the BACKUP TO SPARE INVERTER CS position, ensures that the CVT will be available to carry Vital Instrument **AC** loads in the event Spare Inverter CS fails.

   c. Placing the Synch Selector Switch in the NORMAL position, enables the inverter to adjust its frequency to match that **of** the *Y05B CVT.

BASIS DOCUMENT

ATTACHMENT I (Cont'd)

CAUTION

Warns the operator about amperage limitations.

6. Keeps the Control Room aware of what actions are being taken or are about to be taken in the field.

7. With CS inverter supplying power to *P06, vital loads may be energized by placing the following breakers to the ON position:

   a. Placing *P06-Main to ON energizes the supply side **of** all *P06 ioad breakers.

   b. *P06-4 energizes relay LC-460CX. Manual operation of LC-460CS may now be discontinued.

   c. 3P06-8 energizes Steam Generator 3C Auto Manual feedwater controller. Steam Generator 3C may then be controlled in manual. (Unit **3** ONLY)

8. Attachment 3 lists loads on Vital Panel *P06.

9. Attachment 2 lists loads on Sub-panel *P21.

10. This notification permits the Control Room to return to normal indication and control of reactor plant parameters.

ATTACHMENT 2

Provides the required breaker alignment for panel *P06.

ATTACHMENT 3

Provides the required breaker alignment for panel *P21

ATTACHMENT 4, Section 1

This attachment gives necessary instructions for manually controlling pressurizer pressure and level when *P06 is de-energized, and for restoring pressurizer level and pressure controls when *P06 is restored.

BASIS DOCUMENT

ATTACHMENT 4, Section 1 (Cont'd)

CAUTION

Self explanatory

NOTES

Self explanatory

1. The loss of *P06 directly affects the normal control of pressurizer pressure and level. Operator attention to the pressurizer is necessary to maintain pressure and level in normal ranges.

   a. Power operated relief valve, PCV-455C, receives its control signal from pressure comparator, PC-444A. PC-444A output signal locks up as is on loss of power with the possibility of maintaining PCV-455C in the open position. For this reason. pressurizer PORVs should be verified shut to prevent inadvertent depressurization of the RCS.

   b. On loss of *P06, both pressurizer level channel I and LC-460C are deenergized. Placing the switch in CH3, CH2 (position *3)* selects out de-energized channel I level transmitter, LT-459, although LC-460C remains de-energized.

   c. *P06 supplies power to the pressurizer level comparator, LC-460C. On loss of *P06 and LC-460C, pressurizer level comparator relay LC-460CX de-energizes and operates contacts in the control circuits for letdown isolation valve LCV-460, orifice isolation valves, 200A, 200B and 200C, control group heaters and backup group heaters. As a result, all pressurizer heaters are de-energized and letdown flow is isolated. To regain normal control of pressurizer heaters and letdown flow, LC-460C.X must be operated manually. LC-460CX is a type BF relay located adjacent to LC-459CX in the front of Aux. Relay Rack 46. The relay is manually operated by depressing the pushbutton located on the relay face. This method of regaining pressure control was chosen because it does not defeat the low level protection feature. If an actual low level signal is present, reiay LC-459CX will de-energize pressurizer heaters, preventing heater damage. It is important here to note that only relay LC-460CX should be held in. Do not attempt to hold in both relays.

BASTS DOCUMENT

ATTACHMENT 4, Section 1 (Cont'd)

d. Normal control of pressurizer heaters is now available and may be operated if necessary to return pressure to normal.

e. Actions required to restore letdown,

2. If operating pressurizer heaters does not increase RCS pressure, Pressurizer Spray Valves, PCV-455A and B may he partially open. On loss of *P06, Spray Valve Auto Manual stations (PC-444G and H) are de-energized, causing their associated automatic controllers (PC-444C and D) to lock up as is. The spray valves then remain in the same position as they were when *P06 was lost. To shut PCV-455A and B, proceed to the front of Rack 20 and de-energize PC-444C and D by removing the power fuses located on the face of each controller. Spray Valve proportional controllers now sense a zero volt input and shut the spray valves.

3. If the preferred method of restoring pressurizer heaters and letdown flow are not successful, the operator is given alternate methods below.

a. Provisions have been made for local control of pressurizer heater backup group **A** in the Unit 3 West (Unit *3* Worth) electrical penetration room. A local/remote selector switch and start/stop pushhuttons are located near heater group A breaker panel. To gain local control, place the selector switch in the local position. Operate the heater group with the start/stop pushhuttons as needed to control pressurizer pressure. Local status lights indicate breaker position. An annunciator at Panel F in the Control Room indicates local control of backup group A. This method of heater control bypasses low pressurizer level heater protection. The heaters must he manually de-energized if pressurizer level drops below 14 percent.

b. Holding the control switches in open will bypass LC-460CX contacts in the valve control circuits, allowing valves to open.

ATTACHMENT 4 Section 2

1. Provides actions to restore pressurizer controls.

a. With power restored LC-46OC and pressurizer level *is* greater than 14 percent, normal pressurizer heater and letdown control should he available.

b. This action will restore normal operation of the pressurizer spray valves.

c. Self explanatory

BASIS DOCUMENT

FOLDOUT PAGE

1. Self explanatory

2. Self explanatory

3. Feedwater isolation will not occur following a reactor trip with Tavg less than 554°F because power is lost to the feedwater isolation circuit. Therefore, if a reactor trip has occurred, feedwater isolation is provided by closing the feedwater isolation MOVs.

Florida Power & Light Company

Plant Turkey Point - Nuclear

1.0 REVIEW AND APPROVAL

Operations Supervisor: _____ 1-9-02
Date

Operations Manager: _____ 1-9-02
Date

THIS INSTRUCTION EXPIRES FEBRUARY 13, 2004

2.0 PURPOSE

2.1 To provide the Control Room Operators Manual Reactor Trip Guidelines to be used during operation of the plant. Guidelines which will allow the operator to manually trip the reactor and turbine prior to reaching an automatic trip setpoint.

3.0 SCOPE

3.1 This instruction applies when either unit is in Modes 1 or 2.

3.2 This instruction does not conflict or supersede any approved plant procedures OF Quality Instructions.

3.3 On-Shift personnel shall adhere to the following guidelines during operation of the plant to allow precluding an Automatic Trip.

4.0 RESPONSIBILITIES

4.1 The Nuclear Plant Supervisor is responsible for:

4.1.1 Ensuring that all On-Shift personnel diligently monitors the Control Room and Plant instrumentation for adverse trends.

4.1.2 Ensuring that if one of these setpoints is reached or if control of the plant is in question that a preemptive trip is called for. Rapidly changing parameters need not require reaching one of these setpoints prior to ordering a Manual Reactor Trip.

4.2 All On-Shift Licensed Operators are responsible for:

4.2.1 Taking timely and proper actions to ensure safe operation of the facility.

4.2.2 Initiating Engineered Safeguards Features or Reactor Trip Actuation if indicators exceed automatic setpoints.

4.2.3 Informing the NPS/ANPS, and taking action should any Manual Trip Guideline be exceeded.

5.0 INSTRUCTIONS

5.1 IF one of these setpoints is reached or a preemptive trip is called for **THEN,** Trip the Reactor and Turbine AND go to **E-0** Reactor Trip or Safety Injection.

TRIP	**MANUAL SETPOINT**
Source Range Hi Flux OR Intermediate Range Hi Flux OR Power Range Hi Flux Lo Setpoint	Any unexplained increase in Reactor Power, IR amps, or Source Counts
Power Range Hi Flux Hi Setpoint	Power at 103%and increasing
Pressurizer Lo Pressure	2000 psig decreasing
Pressurizer Hi Pressure	2350 psig
Lo Steam Generator Level	15%Narrow Range
Pressurizer High Level	At 80%on 2/3 channels

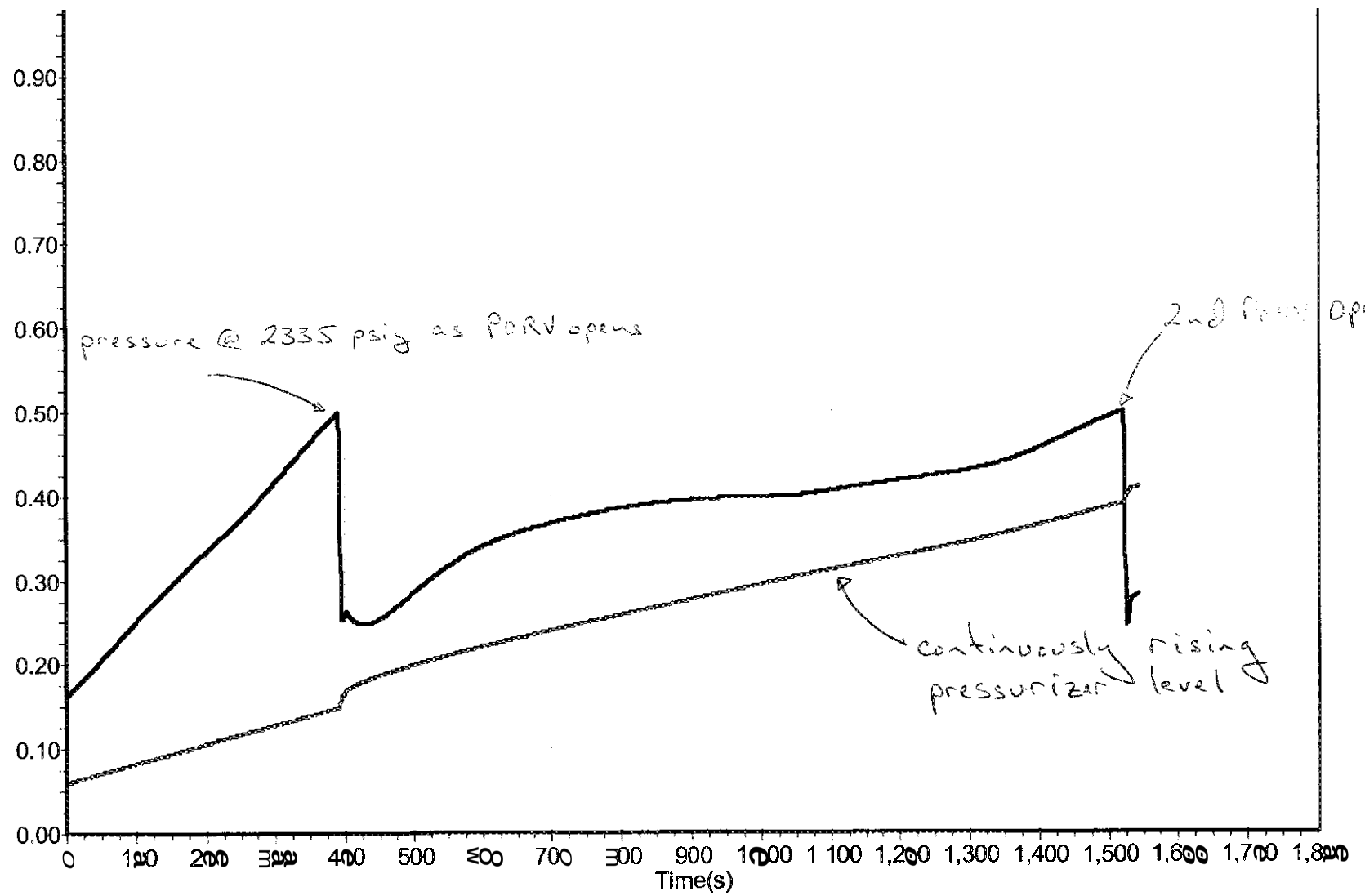
5.2 **IF any of these guidelines are exceeded and Reactor Power is ABOVE 10% THEN, Trip the Reactor AND Turbine and go to E-0, Reactor Trip or Safety Injection:**

TRIP	MANUAL SETPOINT
Lo Vacuum MWe	24.5 Inches of Vacuum Decreasing≤ 531 22 Inches of Vacuum Decreasing > 531 MWe
S/G Hi Level	75%Narrow Range

5.3 **IF any of these guidelines are exceeded AND Reactor Power is BELOW 10% THEN, Trip the Turbine and Maintain Stable plant conditions**

TRIP	MANUAL SETPOINT
Lo Vacuum	24.5 Inches of Vacuum Decreasing
S/G Hi Level	75%Narrow Range

TC 6 (EOL) Loss of 3POA



PRESSURIZER PRESSURE	PSIA	F14.7	(2200.00- 2500.00)
H1-LT-460 TRANSMITTER OUTPUT SIG.	%LEVEL	F10.6	(50.00- 100.00)

Turkey Point 2003 NRC Written SRO Exam
Post-Exam Review Recommendations
December 18,2003

Q# *33*. Provide credit to Tim Scott for this question.

At the conclusion of the written exam, the proctor collected all exam materials from each applicant, including Tim Scott. Subsequently during an informal grading of the exams, it was noted by the grader that Mr. Scott had correctly identified response "C" on his exam but had bubbled in response "D" on his scantron form.

It was noted that Mr. Scott had annotated "Stm Space LOCA" on his question, indicating that he understood what the question was trying to test.

It was also noted that Mr. Scott's error may have been his lack of experience with 5-response type scantron forms. **Ail** scantron graded exams at Turkey Point use 4-response forms. On a 4-response form, the "C" response is the second from the right. Mr. Scott filled in the response that was second from the right. Unfortunately on a 5-reponse scantron form, the second-from-right response is "D" .

Mr. Scott's original Q# **33** is attached. Note that this error was discovered immediately following the time when he turned the exam in. This original Q#33 was removed from the rest of the exam and has been under our control, stored in the exam room vault since that time. Mr. Scott **has** not had access to this question since turning his exam in.

A comparison of ail of the questions on Mr. Scott's exam and his scantron sheet revealed no additional errors of this nature.

Document Provided:

Tim Scott's original Q# ***33***

33.

The crew is responding in accordance with E-1, Loss of Reactor or Secondary Coolant. Pressurizer level has risen continuously even though the RCS pressure has been dropping steadily. **All** Reactor Coolant pumps are in operation.

Which ONE of the foilowing leak locations is consistent with the plant conditions just described?

Weld break on:

A. the pressurizer sample line.

B. one of the CRDM nozzle penetrations

C. the line to Pressurizer PORV Block valve MQV-536.

D. the Charging header connection to the RCS.

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Post-Exam Review Recommendations
December 18,2003

Q# 46. Accept either "C" or "D" response as correct.

Note that the question stem states that RCS temperature is increasing, implying a changing, dynamic plant condition.

As the operators progress through ONOP-050 unable to start any RHR pumps, Step 5 RNO will transition them forward to Step 20.

At Step 22 with two Steam Generators available, they will establish secondary feed and open steam dump to atmosphere valves to stabilize RCS temperatures. This admission of secondary feed to the steam generators and opening steam dump valves will quickly cool steam generators which will automatically establish natural circulation.

These very same actions also remove the last impediment to starting an RCP (S/G secondary water **20"** higher than RCS temps) allowing RCP start.

Natural circulation is the "preferred method of heat removal'; until the process of starting an RCP is complete. Then the preferred method will be forced circulation via the running RCP.

Responses "C" and "D" are both correct.

References Provided:

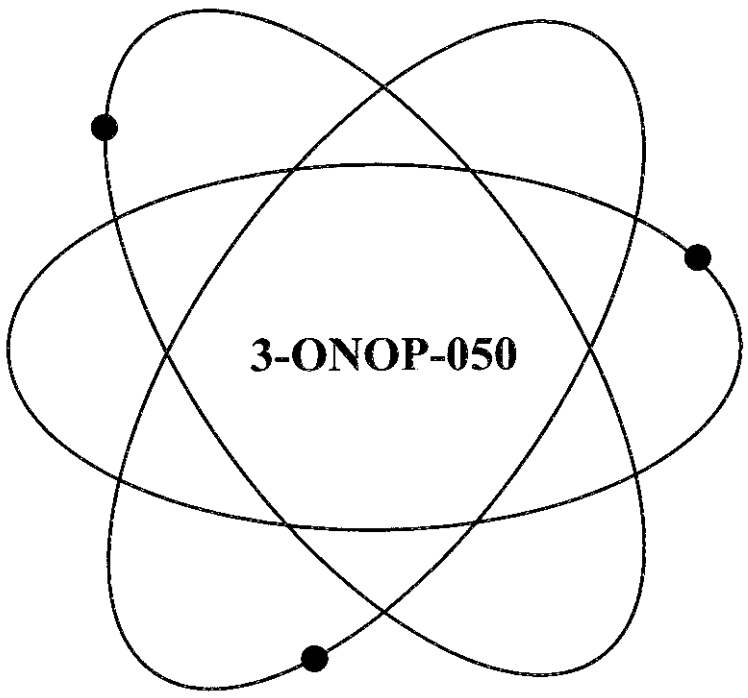
3-ONOP-050, "Loss of RHR".

This procedure may be affected by an O.T.S.C. (On The Spot Change) verify information prior to use
Date verified_____ Initials_____

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3



Title:

Loss of RHR

Safety Related Procedure

Responsible Department:	Operations
Revision Approval Date:	10/16/98C1

RTSs *93-1422P, 94-0349P, 94-1102P, 95-0957P, 95-1012P, 96-1534P 96-1456P, 98-0588P, 98-0929P*
PCIM *89-332, 96-081*
OTSC *0412-95*

LIST OF EFFECTIVE PAGES

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13	10/16/98
14	10/16/98
15	10/16/98C
16	10/16/98C
17	10/16/98
18	10/16/98
19	10/16/98
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27	10/16/98

1.0 PURPOSE

1.1 This procedure provides instructions to be followed in the event of a loss of flow in the RHR system.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 Annunciators

2.1.1 H 612, RIIR HX HI/LO FLOW

2.1.2 H 6/4, RHR PP A/B TRIP

2.1.3 I 716, RHR SUMP PUMP ROOM A HI LEVEL

2.1.4 I 816, RHR SUMP PUMP ROOM B HI LEVEL

2.1.5 I 3/6, RHR SUMP HX ROOM HI LEVEL

2.1.6 I 713, RX VESSEL DRAINDOWN LO-LO-LEVEL

2.1.7 A 7/1, PRT HI/LO LEVEL HI PRESS/TEMP

2.1.8 A 916, RKK MOV-750/751 LETDOWN ISOLATION

2.2 Indications

2.2.1 Neither RHR pump is operating when required for decay heat removal

2.2.2 Loop 3C RHR Suction Stop Valve(s), MOV-3-750 or MOV-3-751, indicate closed when RHR is required for decay heat removal

2.2.3 Rapid increase in RCS pressure and OMS actuation when the RCS is solid

2.2.4 Low flow indicated on FI-3-605

3.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

3.1 References

3.1.1 Technical Specifications for Turkey Point Unit 3 and Unit 4

3.1.2 'Turkey Point Unit 3 and Unit 4 Final Safety Analysis Report

3.1.3 Operating Diagrams

1. 5613-M-3050, Residual Heat Removal System
2. 5613-M-3062, Safety Injection System

3.1.4 Procedures

1. 3-ONOP-030, Loss of Component Cooling Water
2. 3-ONOP-041.3, Excessive Reactor Coolant System Leakage
3. 3-ONOP-041.8, Shutdown LOCA [Mode 5 or 6]
4. 3-OP-041.1, Reactor Coolant Pump
5. 3-OP-050, Residual Heat Removal System
6. 3-OP-073, Condensate System
7. 0-OP-074.1, Standby S/G Feedwater System

3.1.5 Plant Change/Modifications

1. PC/M 89-332, Generic Letter 88-17, Loss of Decay Heat Removal Programmed Enhancement - RCS Redundant Level Monitors
2. PC/M 96-081, Setpoint Change for RCP Seal Leakoff Low Flow

3.1.6 Miscellaneous Documents

1. JPN-PTN-SEMJ-89-094, Adequacy of Core Cooling
2. JPN-PTN-SENP-92-009, Substantial Safety Hazards Evaluation Related to Pressurizer Vents at Cold Shutdown
3. Westinghouse Technical Bulletin ESBU-TU-93-01-Revision 1
4. Westinghouse EOP Rev 1C Changes

3.2 Records Required

3.2.1 None

3.3 Commitnient Documents

3.3.1 NRC Inspection Report 89-053, March 14, 1990

3.3.2 NRC IEIN No. 86-101, Loss of Decay Heat Removal Due to Loss of Fluid Levels In Reactor Coolant System

3.3.3 NRC Generic Letter 88-17, Loss of Decay Heat Removal

3.3.4 NRC IN-92-16, Loss of Flow from the Residual Heat Removal Pump During Refueling Cavity Draindown

3.3.5 INPO SOER 85-4, Loss or degradation of Residual Heat Removal Capability in PWRs (CTRAC No. 85-1178-34)

3.3.6 INPO SER 17-86, Loss of Shutdown Cooling Flow (CTRAC No. 87-0823)

3.3.7 INPO SER 23-86, Loss of Decay Heat Removal Flow (CTRAC No. 86-0982)

3.3.8 INPO OE-1744, RRR Gas Binding Due to Erroneous Half Loop Indication (CTRAC No. 85-1178-34)

3.3.9 INPO SER 9-92, Loss of Residual Heat Removal with Reduced Reactor Vessel Water Level

3.3.10 JPN-PTN-SENP-95-026, CCW Flow Balance and Post-Accident Alignment Requirements to Support Thermal Up-Rate (LER 250/95-006)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If leakage from the RHR system is discovered, the leak should be isolated using 3-ONOP-041.3, EXCESSIVE REACTOR COOLANT SYSTEM LEAKAGE.

NOTES

- *Steps 1 through 3 are IMMEDIATE ACTION steps*
- *If loss of RHR is due to a loss of off-site power capability, power and RHR flow should be restored utilizing 3-ONOP-004, LOSS OF OFFSITE POWER or 3-EOP-ECA-0.0. LOSS OF ALL AC. During a loss of power, this procedure should be used to establish containment closure and alternate cooling if RHR flow remains unavailable.*

1 *Dispatch* An **Operator Po Monitor RHR Pumps AB Follows:**

a. *Obtain* radio

b. *Monitor* RHR pump *locally*

c. *Maintain communication with control* room

d. *Stay near* RHR *pump until normal* RHR flow **is restored**

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

RCS heatup rate *is* required *to* be monitored by the *Shift* Engineer *or* any *available* operator while efforts continue *to* restore ***RHR*** *cooling.*

2 **Monitor RCS Heatup Rate As Follows:**

a. Plot core exit temperature every minute for 5 minutes

a. **IF** core exit temperatures are **NOT** available, **THEN** perform the following:

1) Assume a 12°F per minute heatup rate unless the refueling cavity **is** flooded. **IF** the refueling cavity is flooded, **THEN** use 4°F per minute.

2) Observe NOTE prior to Step 3 **AND** go to Step **3**

b. Calculate RCS heatup rate

c. Determine time required to reach saturation in RCS

d. Report results to unit RCO and NPS

e. Repeat this *step* every 15 minutes until RHR cooling is Restored

STEP	CTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

interrupt feafure *for MOV-3-750* and *MOV-3-751 is only functional* with *OMS in LO PRESS OPS.*

3	**Check Loop 36 RHR Pump Suction Stop Valves - OPEN** • MBV-3-750 • MOV-3-751	Perform the following a. Stop RHR pumps. b. **IF** a momentary pressure spike has caused either or both valves to start closing, **THEN** perform the following at the Pushbutton Interrupt switches: 1) Determine affected valve(s). • Yellow light -ON 2) Verify over pressure signal **NOT** present: • Blue light -ON 3) Push Interrupt Pushbutton for affected valve(s). **4)** Verify yellow light - DE-ENERGIZES. 5) **WHEN** blue light BE-ENERGIZES , **THEN** verify affected valve(s) - OPEN. 6) Go to Step 4. c. **IF** RCS pressure GREATER THAN 525 psig, **THEN** perform the following: 1) Stop the charging pump(s). 2) Reduce RCS pressure to *450* psig d. **IF** Loop 3C RHR Pump Suction Stop Valve(s) were **NOT** closed to isolate system leakage, **THEN** reopen RHR Loop Suction Stop Valve(s). **IF** either valve can **NOT** be opened, **THEN** direct an operator to locally reopen Loop 3C RHR Pump Suction Stop Valve(s). e. **IF** either valve can **NOT** be reopened, **THEN** observe NOTE prior to Step 20 **AND** go to Step 20.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	**Verify RHR Discharge To Cold Leg Isolation Valves - OPEN** • MOV-3-744A • MOV-3-744B	**IF** RHR Discharge To Cold Leg Isolation valve(s) were **NOT** closed to isolate system leakage, **THEN** perform the following: a. Reopen RHR discharge valve(s). b. **IF** at least one valve can **NOT** be opened, **THEN** perform the following: 1) Stop RHR pump(s). 2) Direct operators to locally reopen RHR Discharge To Cold Leg Isolation Valve(s). 3) Observe NOTE prior to Step 20 **AND** go to Step 20.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	**Check RHR Pumps- ANY RUNNING**	Perform the following: a. Close RHR Heat Exchanger Outlet Flow valve, HCV-3-758. b. Close RHR Heat exchanger Bypass Flow valve, FCV-3-605. c. Verify MOV-3-750 and MOV-3-751 - OPEN d. Attempt to restart previously running RHR pump. e. **IF** previously running RHR pump can **NOT be** started, **THEN** start alternate RHR pump. f. **IF** neither RHR pump can be started, **THEN** perform the following: 1) Direct appropriate personnel to restore at least one RHR pump to operable status. 2) Observe NOTE prior to Step 20 **AND** go to Step 20. g. Return RHR Heat Exchanger Bypass Flow valve, FCV-3-605, to AUTOMATIC operation at desired flow. h. Open RHR Heat Exchanger Outlet Flow valve, HCV-3-758, **as** necessary to maintain desired RCS temperature.
6	**Verify RHR Pump NOT Cavitating** • Running RHR pump amps - STABLE • RHR flow - STABLE • RHR pump noise level - NORMAL	Go to Step 42
7	**Check For WHR Flow Control Valve Failure** a. Verify RHR Heat Exchanger Bypass Flow. FCV-3-605 - MAINTAINING DESIRED FLOW IN AUTOMATIC b. Go to Step 18	a. Go to Step 8.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	**Control RHR Bypass Flow**	
	a. Manually control RHR Heat Exchanger Bypass flow, FCV-3-605, to establish desired flow	a. Perform the following at the 10 foot elevation platform in the RHR Heat Exchanger room to locally control RHR flow: 1) Remove seal and place Safe shutdown FCV-3-605 Manual Control Air Isolation Valve, 3-40-1895, in MANUAL. 2) Verify Safe Shutdown FCV-3-605 Manual Control Air Vent Valve, 3-40-1896, in NORMAL. 3) Adjust Safe Shutdown FCV-3-605 Manual Controller, PCV-3-605, to establish desired flow. 4) Observe CAUTION prior to Step 9 **AND** go to Step 9.
	b. Go to Step 10	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If only two CCW* Heat Exchangers are in *service* and *MOV-3-749A* and *MOV-3-749B* are *open, two CCW Pumps* are required *to be* maintained *in PULL-TO-LOCK.

9 **Check Desired RHR Heat Exchanger Bypass Flow, FCV-3-605 - BEING MAINTAINED USING SAFE SHUTDOWN MANUAL CONTROL**

Perform the following:

a. Close RHR Heat Exchanger Bypass Flow valve, FCV-3-605.

b. Open RHR Heat Exchanger Outlet Flow Value, HCV-3-758, to establish between 3500 and 3700 gpm.

c. Locally open breakers for RHR Heat Exchanger Outlet Component Cooling Water valves.

* 30617 for MOV-3-749B
* 30721 for MQV-3-749A

d. Control the cooldown by locally throttling both of the RHR Heat Exchanger outlet Component Cooling Water MOVs while maintaining CCW flow through both RHR Heat Exchangers.

* MOV-3-749A
* MOV-3-749B

10 **Notify Appropriate Personnel To Correct RHR Flow Control Failure**

11 **Verify RHR Pump NOT Cavitating**

Go to Step 12

a. Running RHR Pump

- Amps - STABLE
- Flow - STABLE
- Noise level - NORMAL

b. Go to Step 14

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	**Reduce RHR Flow To Stop Cavitation**	
	a. Adjust automatic setpoint for RHR Heat Exchanger Bypass Flow, FCV-3-605, to establish RHR flow between 1000 and 1500 gprn	a. Perform the following: **1)** **Take** manual control of RHR Heat Exchanger Bypass Flow, FCV-3-605, to establish between 1000 and *1500* gpm. **2)** **IF** manual control can **NOT** be established, **THEN** perform the following: a) Remove seal **and** place SAFE SHUTDOWN FCV-3-605 MANUAL AIR ISOLATION VALVE, 3-40-1895, in MANUAL. **b)** Verify SAFE SHUTDOWN FCV-3-605 MANUAL CONTROL AIR VENT VALVE, 3-40-1896, in NORMAL. c) Adjust SAFE SHUTDOWN FCV-3-605 MANUAL CONTROLLE R, PCV-3-605, to establish between *1000* to 1500 gpm.
13	**Verify RHR Pump Cavitation Has Stopped** • Running RHR pump amps – STABLE • RHR flow – STABLE • RHR pump noise level - NORMAL	Perform the following: a. Stop RHR pumps b. Observe NOTE prior to Step 20 **AND** go to Step 20.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	**Establish RHR Flow**	
	a. Check RHR pumps - ALL STOPPED	a. Go to Step 15.
	b. Verify RCS temperature – **LESS** THAN 350°F	**b.** Observe NOTE prior to Step 20 **AND** go to Step 20.
	c. Close RHR Heat Exchanger Outlet Flow valve, HCV-3-758	
	d. Close RHR Heat Exchanger Bypass Flow valve, FCV-3-605	
	e. Start previously running RHR pump	e. Start alternate RHR pump. **IF** neither RHR pump can be **started, THEN** observe NOTE prier to Step 20 **AND** go to Step 20.
	f. Establish 1500 gpm RHW flow as fellows: • Slowly open RHR Heat Exchanger Outlet Flow valve, HCV-3-758	
	g. Check RHR Pump **NOT** Cavitating • Check RHR pump amps - STABLE • Check RHR flow - STABLE • RHR pump noise level - NORMAL	g. Return to Step 12.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Increase **RHR Flow**	
	a. **IF** RHR flow is less than desired flow, **THEN** increase RHR Flow 500 gpm from current value as follows: • Adjust RHR Heat Exchanger Bypass Flow valve, FCV-3-605	a. **IF** FCV-3-605 is fully open. **THEN** open RHR Heat Exchanger Outlet Flow valve, HCV-3-758, to establish desired flew.
	b. Verify RHR pump **NOT** Cavitating • Running RHR pump amps -STABLE • Check RHR flow - STABLE • RHR pump noise level - NORMAL	b. Perform the following: 1) Decrease RHR flow 500 gpm from current value. 2) Return to Step 12.
	c. Check RHR flow - GREATER THAN **OR** EQUAL TO 3000 GPM	c. Perform the following: • **IF** RHR flow is **less** than 3000 gpm BUT increasing, **THEN** return to Step 15a. **OR** * **IF** RHR flow can **NOT** be restored, **THEN** go to Step 16.
	d. Go to Step 18	
16	**Check If RCS** - OPERATING **DRAINED DOWN (LESS THAN 10% COLD CAL PZR LEVEL)**	Qbserve NOTE prior to Step 20 **AND** go to Step 20.
17	GO **TO 3-ONOP-041.8, SHUTDOWN LOCA [MODE 5 OR 6]**	
18	Maintain Stable Plant Conditions	
	a. Verify RCS temperature – STABLE **OR** DECREASING	a. Perform the following: • Adjust HCV-3-758 to obtain desired cooldown rate. • Adjust FCV-3-605 to maintain desired RHR flow rate.
	b. Verify RCS temperature – LESS THAN 200°F **OR** trending to NPS DESIRED TEMPERATURE	b. Observe NOTE prior to Step 20 **AND** go to Step 20.
19	***Go* to** Step ***34***	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

RCS heatup rate *is* required to be monitored by *the* Shift Engineer or any other available operator while efforts continue *to* restore *RHR* cooling.

20 **Continue To** Monitor **RCS Heatup Rate As Follows:**

a. Plot core exit temperature every minute for 5 minutes

a. **IF** core exit temperatures are **NOT** available, **THEN** perform the following:

1) Assume a 22°F per minute heatup rate unless the refueling cavity is flooded. **IF** the refueling cavity is flooded, **THEN** use 4°F per minute.

2) Go to Step 21.

b. Calculate RCS heatup rate

c. Determine time required to reach saturation in RCS

d. Report results to unit RCO and NPS

e. Repeat this step every 15 minutes until RHR cooling is restored

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Isolate Containment If Required	
	a. Direct appropriate personnel to close any open containment penetrations: • Equipment hatch • Airlocks • Refueling transfer tube • Any other openings	
	b. Direct personnel to stop work on all RCS openings	
	c. Check RCS temperature – GREATER THAN **200°F**	c. **WHEN** RCS temperature is greater than 200°F, **THEN** do Steps 21d, 21e, 21f, 219 and 21h. Continue with Step ***22.***
	d. Announce over the plant PA system: • Attention **all** personnel inside Unit **3** Containment Evacuate Unit **3** Containment	d. Request NPS pass supervisory announcement over radio to order personnel out of containment.
	e. Actuate Containment Evacuation Alarm	
	f. Announce over the plant PA system: • Attention **all** personnel inside **Unit 3** Containment Evacuate Unit **3** Containment	f. Request NPS pass supervisory announcement over radio to order personnel out of containment.
	g. Actuate Containment Isolation Phase A:	
	1) Manually actuate containment isolation phase A	
	2) Containment isolation phase **A** valve white lights on VPE - ALL BRIGHT	2) **IF** any containment isolation phase A valve is **NOT** closed, **THEN** manually close valve. **IF** valve(s) can **NOT** be manually closed, **THEN** manually or locally isolate affected containment penetration.
	h. Reset Phase **A** Containment Isolation	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	**Establish** Secondary **Heat Sink**	
	a. Verify at least two S/Gs available: • Secondary side manways - INSTALLED • S/G hot leg manway – INSTALLED • LI-3462 -GREATER THAN 10% • RCS Loops – FILLED	a. Perform the following: 1) **IF** RCS temperature is decreasing, **THEN** continue efforts to restore RHR cooling **AND** go to Step 32. 2) **IF** RCS temperature is increasing, **THEN** go to 3-ONOP-041.8. SHUTDOWN **LOCA** [MODE 5 OR 6]
	b. Establish S/G makeup to the available S/Gs using one of the following methods: * Start a standby feedwater pump using 0-OP-074.1, STANDBY STEAM GENERATOR FEEDWATER SYSTEM **OR** * Start a condensate pump using *3-OP-073*, CONDENSATE SYSTEM **OR** * Start a condensate transfer pump aligned to *SIG* fill line	b. Perform the following: 1) **IF** RCS temperature is decreasing, **THEN** continue efforts to restore RKR cooling **AND** go to Step *32.* 2) **IF** RCS temperature is increasing, **THEN** go to 3-QNOP-041.8. SHUTDOWN LOCA [MODE 5 OR 61
	c. Open available S/G Steam dump to atmosphere valves **as** necessary to maintain desired RCS temperatures	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

The effectiveness *of* steaming the available *S/Gs* may NOT be readily apparent during natural circulation. *Plant* conditions should be allowed *to* stabilize prior *to* performing *Step 23.*

23	**Determine if Blowdown Should Be Established**		
	a. Core exit temperatures – INCREASING	a.	Go to Step 26
	b. Available S/G steam dump to atmosphere valves - FULL OPEN	b.	Open available S/G Steam dump to atmosphere valves as necessary to maintain desired RCS temperatures. **IF** RCS temperature can be controlled using steam dump to atmosphere valves, **THEN** go to Step 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	**Align Blowdown From Available S/G(s)**	
	a. Verify RE-19, SIG Blowdown Radiation Monitor. - INSERVICE	a. Direct Nuclear Chemistry to sample available S/G(s) for activity.
	b. Prepare for blowdown:	b. Go to Step *26*
	1) Place blowdown keylock switch(s) for available S/G(s) in DRAIN/FILL position: • HS-3-1427X for SIG A • HS-3-1426X for *SIG* 5 • HS-3-1425X for S/G C	
	2) Verify S/G Liquid Sample valve(s) on availabie S/G(s) - OPEN: • MOV-3-1427 for SIG A • MOV-3-1426 for SIG E • MOV-3-1425 for S/G C	
	3) Verify Blowdown Flow valves CLOSED: • FCV-3-6278A • FCV-3-6278B • FCV-3-6278C	
	4) Locally close SIG blowdown Manual Containment Isolation valve(s) on available S/G(s): • SGB-3-007 for S/G A • SGB-3-008 for S/G B • SGB-3-009 for SIG C	
	5) Open Blowdown Containment Isolation valve(s) on available S/G(s): • CV-3-6275A for S/G A • CV-3-6275B for *SIG* B • CV-3-6275C for SIG C	
	6) Locally open SIG Blowdown Manual Containment Isolation valve(s) on available S/G(s): • SGB-3-007 for S/G A • SGB-3-008 for S/G 5 • SGB-3-009 for SIG C	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Establish **Blowdown From** Available **S/G(s)**	
	a. Align blowdown to discharge canal:	
	1) Open Blowdown Tank Vent To Atmosphere, CV-3-6267A	
	2) Close Blowdown Tank Vent To Feedwater Heaters, CV-3-6267B	
	3) Close Blowdown Tank To Condenser, HIS-3-6265A	
	4) Open Blowdown Tank to Canal, HIS-3-62658	
	b. Locally throttle open Blowdown Flow Valve on available S/G(s) to obtain maximum flow • FCV-3-6278A for S/G A • FCV-3-6278B for *SIG* B • FCV-3-6278C for S/G C	
26	**Maintain** Level **In** Available **S/G(s)**	
	a. Check narrow range levels - GREATER THAN 6%	a. Increase S/G makeup to available S/G(s).
	b. Continue S/G makeup to maintain narrow range level between 6% and 50%	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	Determine **If One RCP Should Be** Started	
	a. RCS - INTACT	a. Go to Step 32
	b. Verify RCS Cold Leg Temperature - GREATER THAN 275°F	b. Perform the following: 1) Locally obtain S/G secondary temperature measurements. Refer to 3-OP-041.1, Reactor Coolant Pump, for methods of obtaining S/G temperatures. 2) **IF** any S/G secondary water temperature is greater than 10°F above any RCS cold **leg** temperature, **THEN** go to Step 32.
2%	Check Plant Conditions **For** Starting Desired **RCP**	Perform the following: 1. Verify natural circulation using ATTACHMENT 1. **IF** natural circulation can **NOT** be verified, **THEN** increase dumping steam. 2. Go to Step 32.
	a. A or B 4KV bus - ENERGIZED FROM STARTUP TRANSFORMER	
	b. Number one seal **AP** – GREATER THAN 200 PSID	
	c. Thermal barrier ΔP – GREATER THAN 0 INCHES OF WATER	
	d. Verify proper number one seal leak-off flow - GREATER THAN 0.8 GPM	
	e. RCP number one seal leak-off temperature - LESS THAN 225°F	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

CCW System ***load*** requirements ***of 3-OP-030, COMPONENT COOLING WATER SYSTEM, shall NOT be*** exceeded.

29 Maintain **Proper CCW** System Alignment **For RCP** Operation

a. CCW Heat Exchangers - THREE IN SERVICE

a. Perform the following:

1) Start or stop CCW pumps as necessary to establish ONLY ONE RUNNING CCW PUMP.

2) **IF** MOV-3-749A and MOV-3-749B are open, **THEN** stop and place in PULL-TO-LOCK all except one running CCW pump.

3) Go to Step 29c.

b. CCW pumps - ONLY TWO RUNNING

b. Start *or* stop CCW pumps as necessary to establish ONLY TWO RUNNING CCW PUMPS.

c. Check CCW from RHR Heat Exchangers - AT LEAST ONE CLOSED

- MOV-3-749A
- MOV-3-749B

c. Perform the following:

1) Isolate one Emergency Containment Cooler by placing one ECC Control Switch in STOP, then go to Step 29d

2) **IF** unable to isolate one ECC, **THEN** stop all RCP's **AND** verify natural circulation using ATTACHMENT 1. Go to Step 32.

d. Verify B CCW header flow - NORMAL

d. Perform the following:

1) Verify natural circulation using ATTACHMENT 1. **IF** natural circulation can **NOT** be verified, **THEN** increase dumping steam.

2) Go to Step 32

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Establish **Proper CCW** Vatve **Alignment For RCP Operation**	
	a. RCP Thermal Barrier CCW Outlet, MOV-3-626 – OPEN	a. IF containment isolation phase B actuated, CCW radiation levels are normal. and RCP number one seal leak-off temperature is less than 225°F, THEN manually open MOV-3-626. MOV-3-626 can NOT be manually opened, THEN direct the operator to locally open MOV-3-626.
	b. Verify the following valves – OPEN • MOV-3-716A, RCP CCW Inlet • MOV-3-716B, RCP CCW Inlet • MOV-3-730, RCP Bearing CCW Outlet	b. IF containment isolation phase B NOT actuated, THEN manually open MOV(s). IE MOV(s) can NOT be manually opened, THEN direct operator to locally open MOV(s).
	c. Open CCW Po Normal Containment Cooler valves • MOV-3-1417 • MOV-3-1418	
	d. Reset and start normal containment coolers	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

if possible, *RCPs B or* C should be run *to* provide normal *PZR* spray. *RCP A* does ***MOT*** provide adequate spray flow.

31 **Try To Start One RCP**

a. Start oil lift pump

b. Check that the oil lift pump has been running - AT LEAST 2 MINUTES

b. **WHEN** 2 minute oil lift pressure time delay is satisfied, **THEN** verify Permissive To Start light ON **AND** perform Steps 31c, 31d and 31e. Continue with Step 32.

c. Start one RCP

c. Perform the following:

1) Verify natural circulation using ATTACHMENT 1. **IF** natural circulation can **NOT** be verified, **THEN** increase dumping steam.

2) Stop oil lift pumps.

3) Go to Step 32

d. Check that the RCP has been running - GREATER THAN 1 MINUTE

d. **WHEN** RCP has been running greater than 1 minute, **THEN** stop oil lift pump **AND** continue **at** Step 32.

e. Stop the oil lift pump

32 **Maintain Stable Plant Conditions:**

a. Maintain PZR pressure - STABLE

b. Maintain PZR level – STABLE

b. **IF** PZR level can **NOT** be maintained, **THEN** perform 3-ONOP-044.3, EXCESSIVE REACTOR COOLANT SYSTEM LEAKAGE while continuing with this arocedure.

c. Maintain intact S/G narrow range levels - STABLE

d. Maintain RCS average temperature - STABLE AT DESIRED TEMPERATURE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	**Verify RHR Flow Restored**	Return to Step **14**
34	**Go To Appropriate Plant Procedure As Determined By The Nuclear Plant Supervisor**	

END OF TEXT

ATTACHMENT 1
(Page 1 of 1)

NATURAL CIRCULATION INDICATIONS

The following conditions support or indicate natural circulation flow:

- RCS subcooling based on core exit TCs - GREATER THAN 30°F[210°F]
- S/G pressures - STABLE OR DECREASING
- RCS hot leg temperatures -STABLE OR DECREASING
- Core exit TCs -STABLE OR DECREASING
- RCS cold leg temperatures - WITHIN 35°F OF SATURATION TEMPERATURE FOR S/G PRESSURE

FINAL PAGE