FPL

AUG 1 4 2002

L-2002-155
10 CFR 50.90
10 CFR 50.91

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

RE: Turkey Point Unit 4
Docket No. 50-251
Proposed License Amendment
Inoperable Rod Position Indication
NRC Requested Referenced Documents for Review

Florida Power & Light Company (FPL) submitted the Proposed License Amendment for an Inoperable Rod Position Indication via letter L-2002-152, dated July 29, 2002. Per telephone conference on July 30, 2002, the Staff requested FPL to provide the attached documents needed to complete their review. Attachment 1 provides the final mark-up of the changes to procedure 0-OP-28.2, Shutdown Margin Calculation. Attachment 2 provides a training activity plan for Operations personnel regarding the plant conditions affected by the inoperable Rod Position Indication for Shutdown Bank A, rod C-9, and the proposed alternate monitoring method. Attachment 3 provides a discussion of the unit shutdown Mode requirements for RPI repair implementation.

Please contact Walter Parker, Licensing Manager, at (305) 246-6632, if there are any questions.

Sincerely,

Terry Jones for

J. P. McElwain
Vice President
Turkey Point Plant

OIH

Attachments

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant
Mr. W. A. Passetti, Florida Department of Health

A001

STATE OF FLORIDA )
) ss.
COUNTY OF MIAMI-DADE )

J. P. McElwain being first duly sworn, deposes and says:

That he is Vice President, Turkey Point Plant, of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

Terry Jones TERRY O. JONES for
J. P. McElwain

STATE OF FLORIDA

COUNTY OF Miami-Dade

Sworn to and subscribed before me

this 14 day of August, 2002

by, T. O. Jones who is personally known to me.

Darius D. Reid
Signature of Notary Public-State of Florida

NOTARY PUBLIC STATE OF FLORIDA
OFFICIAL NOTARY SEAL
DARIUS D REID
COMMISSION NUMBER
CC800424
MY COMMISSION EXPIRES
JAN. 3,2003

Name of Notary Public (Print, Type, or Stamp)

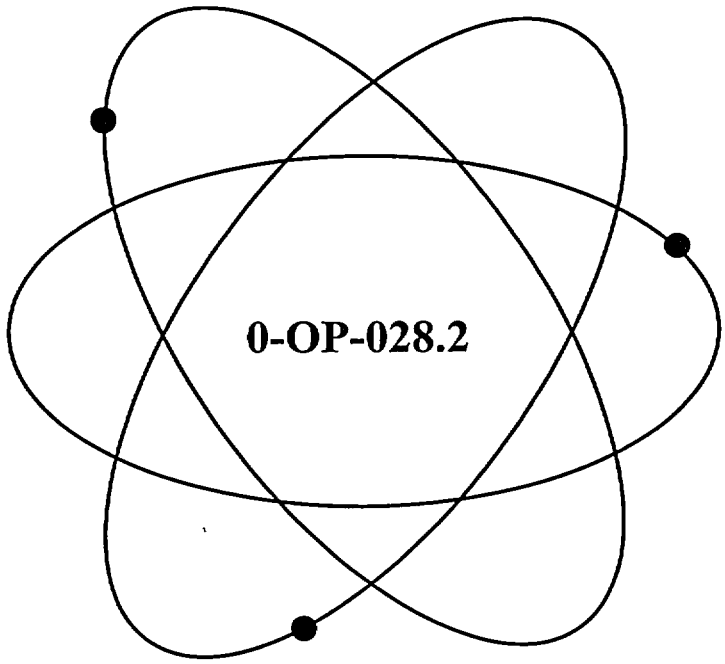
**Attachment 1**

Mark up changes to 0-OP-28.2
Shutdown Margin Calculation Procedure

# Florida Power & Light Company

## Turkey Point Nuclear Plant

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




**Title:**

# Shutdown Margin Calculation

**Safety Related Procedure**

| | |
|---|---|
| *Responsible Department:* | Reactor Engineering |
| *Revision Approval Date:* | ~~8/8/01C1~~ |

***RTSs** 94-0031P, 97-1224, 98-1189P, 00-0624, 01-0314*
***OTSC** 0032-99*

# LIST OF EFFECTIVE PAGES

| Page | Revision Date |
|---|---|
| 1 | ~~08/08/01C1~~ |
| 2 | ~~08/08/01C1~~ |
| 3 | 08/08/01 |
| 4 | 08/08/01 |
| 5 | ~~08/08/01~~ |
| 6 | ~~08/08/01~~ |
| 7 | 08/08/01 |
| 8 | ~~08/08/01~~ |
| 9 | 08/08/01 |
| 10 | 08/08/01 |
| 11 | 08/08/01 |
| 12 | ~~08/08/01C~~ |
| 13 | ~~08/08/01~~ |
| 14 | ~~08/08/01~~ |
| 15 | 08/08/01C |
| 16 | 08/08/01 |

# TABLE OF CONTENTS

## 1.0 PURPOSE

1.1 This procedure provides administrative and technical guidance for:

1.1.1 Verifying Shutdown Margin in accordance with Tech Spec 3.1.1.1 for Modes 1, 2, 3 and 4

1.1.2 Verifying Shutdown Margin in accordance with Tech Spec 3.1.1.2 for Mode 5, and

1.1.3 Calculating the amount of Subcriticality in Modes 3, 4 and 5.

## 2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References

2.1.1 Technical Specifications

1. 3/4.1.1.1
2. 3/4.1.1.2
3. 3/4.1.3.1
4. 3/4.1.3.6
5. 3/4.10.1
6. 1.26

2.1.2 Plant Procedures

1. 0-ADM-554, Plant Curve Book
2. 3/4-EOP-ES-0.1, Reactor Trip Response
3. 3/4-EOP-ES-1.1, SI Termination
4. 3/4-ONOP-028.1, RCC Misalignment
5. 3/4-ONOP-028.2, RCC Position Indication Malfunction
6. 3/4-ONOP-028.3, Dropped RCC
7. 3/4-ONOP-046.1, Emergency Boration
8. 0-OSP-040.4, Estimated Critical Conditions
9. 0-OSP-040.16, Initial Criticality after Refueling and Nuclear Design Verification
10. 3/4-OP-046, CVCS-Boron Concentration Control

## INSERT A

2.3.1 FPL Calculation No. PTN-4FJF-02-074 Rev 0, "Turkey Point 4 Cycle 20 Shutdown Margin and Minimum Shutdown Boron Concentration Analysis to Support Inoperable Rod Position Indication, PLA # L-2002-152," Aug 1, 2002.

2.3.2 Turkey Point Unit 4 "Proposed License Amendment Docket No. 50-251 Inoperable Rod Position Indication," L-2002-152, July 29, 2002.

## INSERT B

### NOTE

During Unit 4 Cycle 20 power operation, the position of Rod C-9 in Shutdown Bank A will be determined by an alternate method other than the Analog Rod Position Indication System, until the repair of the indication system for this rod is completed. The alternate method to verify Rod C-9's position is the recorder installed to track parameters of the stationary gripper coil of Rod C-9's Control Rod Drive Mechanism. Rod C-9 is verified to be fully withdrawn when the stationary gripper coil does not change state.

4.4.3 When in Mode 3 or 4 at least once per 24 hours by consideration of the following factors:

1. RCS Boron Concentration
2. Control Rod Position
3. RCS Average Temperature
4. Fuel Burnup based on Gross Thermal Energy Generation
5. Xenon Concentration, and
6. Samarium Concentration

4.4.4 The required shutdown margin shall be determined with an increased allowance for the worth of ALL immovable or untrippable control rods.

4.5 Attachment 2 is applicable for typical shutdown conditions, that is, all rods expected to be fully inserted.

4.5.1 **IF** a Shutdown Margin Calculation/Verification is required for initial startup following refueling, or for Low Power Physics Testing, **THEN** refer to 0-OSP-040.16, INITIAL CRITICALITY AFTER REFUELING AND NUCLEAR DESIGN VERIFICATION.

4.5.2 **IF** a Shutdown Margin Calculation/Verification is required for non-initial cycle startup, **THEN** refer to 0-OSP-040.4, ESTIMATED CRITICAL CONDITIONS.

4.6 **IF** a Shutdown Margin Calculation/Verification is required for any atypical condition (e.g., one or more rods stuck out or stuck partially inserted), **THEN** consult Reactor Engineering.

INSERT C →

## 5.0 SPECIAL TOOLS/EQUIPMENT

5.1 The Plant Curve Book, and/or other approved analysis for the appropriate unit and cycle.

## 6.0 ACCEPTANCE CRITERIA

6.1 The Shutdown Margin shall be:

6.1.1 Greater than or equal to the value shown in Tech Spec, Figure 3.1-1 for Modes 1, 2, 3 and 4, and

6.1.2 Greater than or equal to 1% $\Delta k/k$ for Mode 5.

## INSERT C

4.7 During Unit 4 Cycle 20, the position of Rod C-9 in Shutdown Bank A will be determined by an alternate method other than the Analog Rod Position Indication System, until the repair of the indication system for this rod is completed. The alternate method cannot determine if Rod C-9 is fully inserted following a reactor trip. The alternate method to verify Rod C-9's withdrawn position is the recorder installed to track parameters of the stationary gripper coil of Rod C-9's Control Rod Drive Mechanism. Rod C-9 is verified to be fully withdrawn when its stationary gripper coil has not changed state since the last time it was verified to be fully withdrawn.

4.7.1 When calculating shutdown margin on Unit 4 for Modes 1 and 2, Rod C-9 is assumed to be fully withdrawn if its stationary gripper coil has not changed state.

4.7.2 When calculating shutdown margin on Unit 4 for Modes 3, 4 and 5, Rod C-9 is assumed to be fully withdrawn following a reactor trip.

## 7.0 PROCEDURE

**CAUTION**

***With the Shutdown Margin less than that required by Technical Specification 3.1.1.1 or 3.1.1.2, as applicable, boration at greater than or equal to 16 gpm of a solution containing greater than or equal to 3.0 wt % (5245 ppm) boron or equivalent shall be immediately initiated and continued until the required shutdown margin is restored.***

**NOTES**

- *Values determined by precise modeling with neutronics codes are more accurate than first principles implementation of generic curves. Therefore, documented values supplied by vendor or staff may be substituted for calculated values.*
- *If the actual worth of the inoperable RCCA is NOT known, then the worth of the most reactive rod should be used.*
- *Obtain as much of the Reference conditions as possible from measurement.*

*Design values for this procedure are required to be taken from either:*

- *Plant Curve Book,* ***OR***
- *Approved analysis*

7.1 Modes 1 and 2

7.1.1 **IF** the unit is in Mode 1 or 2, **THEN** complete Attachment 1.

7.2 Modes 3, 4 and 5

**NOTE**

*If the Xenon Worth (Step 4 of Attachment 2) can NOT be easily determined, it may be set equal to zero.*

7.2.1 **IF** the unit is in Mode 3, 4, or 5, **THEN** complete Attachment 2.

**END OF TEXT**

## ATTACHMENT 1
(Page 1 of 5)

## SHUTDOWN MARGIN CALCULATION FOR MODES 1 AND 2

1. **IF** one or more Rod Control Cluster Assembly is dropped partially or fully into the core, **THEN IMMEDIATELY** go to 3/4-ONOP-028.3, DROPPED RCC, and continue with this procedure.

2. **IF** one or more Rod Control Cluster Assembly is misaligned with its associated bank, **THEN IMMEDIATELY** go to 3/4-ONOP-028.1, RCC MISALIGNMENT, and continue with this procedure.

3. Unit ..... [ ]

4. Date ..... [ ]

5. Time ..... [ ]

6. Record the number of Control Rods that are dropped ..... [ ]
INSERT D

7. Record the number of Control Rods that are known to be UNTRIPPABLE..... [ ]
INSERT E

8. **IF** Step 7 is greater than one (1), **THEN** contact Reactor Engineering and/or Nuclear Fuels for assistance in completing the Shutdown Margin Calculation.

9. Record the following current critical conditions:

   9.1 Fractional Reactor Power ..... [ ]

   9.2 Tavg ..... [ ] °F

   9.3 Tref ..... [ ] °F

   9.4 Measured Boron Concentration ..... [ ] ppm

   9.5 Burnup (PCB Section 5, figure 4) [ ] MWD/MTU

**NOTES**

- *BOC is defined as 150 MWD/MTU. EOC is the projected cycle burnup and can be found in the Plant Curve Book (PCB), Section 3, Figure 7, Summary of Reactivity Requirements and Shutdown Margin.*
- *In Steps 9.6 and 9.7 a linear interpolation between BOC and EOC is appropriate.*

   9.6 Using the Burnup from Step 9.5 and the PCB, Section 3, Figure 7 (Summary of Reactivity Requirements and Shutdown Margin), record the "(1) Total Control Bank Requirement". [ ] pcm

   9.7 Using the Burnup from Step 9.5 and the PCB, Section 3, Figure 7 (Summary of Reactivity Requirements and Shutdown Margin), record the "(2) Less Uncertainty" [ ] pcm

## INSERT D

### NOTE

During Unit 4 Cycle 20, Rod C-9 in Shutdown Bank A is verified to be fully withdrawn when its stationary gripper coil has not changed state since the last time it was verified to be fully withdrawn.

## INSERT E

### NOTE

During Unit 4 Cycle 20, Rod C-9 in Shutdown Bank A is experiencing a problem with the Analog Rod Position Indication System, which does not affect its ability to trip.

## ATTACHMENT 1
(Page 2 of 5)
## SHUTDOWN MARGIN CALCULATION FOR MODES 1 AND 2

**NOTE**

*In Steps 9.8 through 9.13, it is not necessary to record the RPI for rods greater than or equal to 228 steps.*

9.8 RPI for CBA

| G5 | E9 | J11 | L7 | J5 | E7 | G11 | L9 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

9.9 RPI for CBB

| F2 | B10 | K14 | P6 | K2 | B6 | F14 | P10 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

9.10 RPI for CBC

| F4 | D10 | K12 | M6 | K4 | D6 | F12 | M10 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

9.11 RPI for CBD

| D8 | M8 | H4 | H8 | H12 |
|---|---|---|---|---|
| | | | | |

9.12 RPI for SBA

| G3 | C9 | J13 | N7 | J3 | C7 | G13 | N9 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

9.13 RPI for SBB

| E5 | L11 | L5 | E11 | H6 | H10 | F8 | K8 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

**NOTE**

*Step 10 calculates the worth of inserted rods by comparing each to the worth of CBD. Dropped rods **ARE NOT** considered in the determination of most deeply inserted.*

10. EXCLUDING DROPPED RODS, calculate the inserted rod worth as follows:

10.1 CBA

The most deeply Inserted RCCA from Step 9 8 ____ X HFP integral rod worth of CBD at this insertion (PCB Section 2, Figure 5) ____ pcm X CBA conversion factor (PCB Section 3, Figure 7) ____ = ____ pcm

10.2 CBB

The most deeply Inserted RCCA from Step 9.9 ____ X HFP integral rod worth of CBD at this insertion (PCB Section 2, Figure 5) ____ pcm X CBB conversion factor (PCB Section 3, Figure 7) ____ = ____ pcm

## ATTACHMENT 1
(Page 3 of 5)

## SHUTDOWN MARGIN CALCULATION FOR MODES 1 AND 2

### 10.3 CBC

| The most deeply Inserted RCCA from Step 9.10 | HFP integral rod worth of CBD at this insertion (PCB Section 2, Figure 5) | | CBC conversion factor (PCB Section 3, Figure 7) | | |
|---|---|---|---|---|---|
| | pcm | X | | = | pcm |

### 10.4 CBD

| The most deeply Inserted RCCA from Step 9 11 | HFP integral rod worth of CBD at this insertion (PCB Section 2, Figure 5) | | CBD conversion factor (PCB Section 3, Figure 7) | | |
|---|---|---|---|---|---|
| | pcm | X | 1.00 | = | pcm |

### 10.5 SBA

| The most deeply Inserted RCCA from Step 9 12 | HFP integral rod worth of CBD at this insertion (PCB Section 2, Figure 5) | | SBA conversion factor (PCB Section 3, Figure 7) | | |
|---|---|---|---|---|---|
| | pcm | X | | = | pcm |

### 10.6 SBB

| The most deeply Inserted RCCA from Step 9 13 | HFP integral rod worth of CBD at this insertion (PCB Section 2, Figure 5) | | SBB conversion factor (PCB Section 3, Figure 7) | | |
|---|---|---|---|---|---|
| | pcm | X | | = | pcm |

10.7 Record the total inserted rod worth (the sum of Steps 10.1 through 10.6) pcm

## ATTACHMENT 1
(Page 4 of 5)

## SHUTDOWN MARGIN CALCULATION FOR MODES 1 AND 2

11. Record the worth of those rods known to be UNTRIPPABLE as follows:

11.1 **IF** Step 7 equals one (1), **THEN** using the burnup from Step 9.5 and the PCB Section 3, Figure 7 (Summary of Reactivity Requirements and Shutdown Margin), record the interpolated worth of the Most Reactive PAIR of Stuck Rods

| Worth of most reactive Pair of rods stuck out (from notes) | | Most reactive stuck rod worth | | |
|---|---|---|---|---|
| _____ pcm | - | _____ | = | _____ pcm |

11.2 **IF** Step 7 is greater than one (1), **THEN** contact Reactor Engineering for untrippable rod worth and record that value here, otherwise N/A this step. _____ pcm

12. Record the rod worth reactivity balance as follows:

Inserted Rod Worth (Step 10.7) → _____ pcm

Untrippable Rod Worth (Step 11.1, 11.2 or N/A) → + _____ pcm

Step 6

_____ X 200 pcm/rod → + _____ pcm

= _____ pcm

13. Determine the Calculated Shutdown Margin as follows:

Step 9.7 → _____ pcm

Step 9.1 _____ X Step 9.6 _____ pcm → - _____ pcm

Reactivity Balance (Step 12) → - _____ pcm

→ = _____ pcm

## ATTACHMENT 1
(Page 5 of 5)

## SHUTDOWN MARGIN CALCULATION FOR MODES 1 AND 2

14. Using the RCS Boron Concentration from Step 9.4, determine the required Shutdown Margin as follows:

14.1 **IF** Step 9.4 is greater than or equal to 750 ppm, **THEN** the Required Shutdown Margin is..... 1000 pcm

14.2 **IF** Step 9.4 is less than 750 ppm, **THEN** the Required Shutdown Margin is:

Step 9.4

$1770 - 1.02 \times$ [ ppm ] = [ pcm ]

15. Is Step 13 greater than or equal to Step 14.1 or Step 14.2, as applicable? Yes ☐ No ☐

16. **IF** Step 15 is NO, **THEN THE UNIT DOES NOT HAVE ADEQUATE SHUTDOWN MARGIN. IMMEDIATELY INITIATE AND CONTINUE BORATION** using 3/4-ONOP-046.1, Emergency Boration, and perform the following: BOLD

16.1 Calculate the Required Boron Concentration as follows:

[ Step 14.1 or 14.2 [ pcm ] - Step 13 [ pcm ] ] $\times 0.143 \frac{ppm}{pcm}$ + Step 9.4 [ ppm ] = [ ppm ]

16.2 Calculate the gallons of Acid required to increase the RCS Boron Concentration

$$50{,}790 \text{ gal} \times \ln \left[ \frac{5245 \text{ ppm} - \text{Step 9.4 [ ppm ]}}{5245 \text{ ppm} - \text{Step 16.1 [ ppm ]}} \right] = [\ \text{gal}\ ]$$

16.3 Add the volume of Acid from Step 16.2 using 3/4-ONOP-046.1, Emergency Boration

REMARKS: _____

| Completed by: | Date. | Reviewed by: | Date |
|---|---|---|---|
| | | | |

## ATTACHMENT 2
(Page 1 of 4)

## SHUTDOWN MARGIN CALCULATION FOR MODES 3, 4 AND 5

1. Record the following reference conditions:

   1.1 Unit ..... [ ]

   1.2 Cycle ..... [ ]

   1.3 Shutdown ..... Date [ ] Time [ ]

   1.4 Cycle burnup (Plant Curve Book (PCB), Section 5, Figure 4) [ ] MWD/MTU

**NOTE**

*The CALCULATION POINT is the point in time post shutdown at which the Shutdown Margin is to be calculated. It is not necessarily the present time.*

2. Record the following calculation point conditions:

   2.1 Calculation Point ..... Date [ ] Time [ ]

   2.2 Time since Shutdown ..... [ ] hrs

   2.3 Most Recent RCS Boron Concentration ..... [ ] ppm

   2.4 Average RCS Temperature ..... [ ] °F

   2.5 The Mode:
   - Mode 3: Hot Standby RCS temperature at 350 - 547°F [ ]
   - Mode 4: Hot Shutdown RCS temperature at 200 - 350°F [ ]
   - Mode 5: Cold Shutdown RCS temperature below 200°F [ ]

INSERT F →

   2.6 Record the number of Control Rods that are NOT fully inserted ..... [ ]

**NOTE**

- *In Step 3 below, Plant Curve Book Section 3, Figure 5A already includes the reactivity effects of the minimum, Hot Full Power, steady state Samarium concentration. Figure 5A conservatively does NOT take credit for the additional build-up of Samarium that occurs after Unit shutdown.*

→ INSERT G

3. Using the burnup from Step 1.4, the temperature from Step 2.4, **AND** the applicable PCB Section 3, Figure 5A (Minimum Shutdown Boron vs RCS Temperature as a function of Burnup ~~(ARI-1, NO Xe)~~), record the Minimum Shutdown Boron Concentration ..... [ ] ppm

## INSERT F

### NOTE

During Unit 4 Cycle 20, the position of Rod C-9 in Shutdown Bank A will be determined by an alternate method, which cannot determine if Rod C-9 is fully inserted following a reactor trip. Therefore, for the purposes of calculating shutdown margin on Unit 4 for Modes 3, 4 and 5, Rod C-9 is assumed to be fully withdrawn following a reactor trip. The number of rods not fully inserted is determined as follows:

- **IF** all rods except Rod C-9 are fully inserted following a reactor trip, **THEN** the number of rods not fully inserted equals 1.

- **IF** another control rod(s) other than Rod C-9 does not fully insert following a reactor trip, **THEN** Rod C-9 is not counted when determining the number of rods not fully inserted. Rod C-9 is not counted in this case because this rod is specifically accounted for as being fully withdrawn in the reactivity values used to calculate subsequent steps.

## INSERT G

### NOTE

- During Unit 4 Cycle 20, for the purposes of calculating shutdown margin in Modes 3, 4 and 5, Rod C-9 in Shutdown Bank A is assumed to be fully withdrawn following a reactor trip.

  - If all rods except Rod C-9 are fully inserted following a reactor trip, then use PCB Section 3, Figure 5A (Minimum Shutdown Boron vs RCS Temperature as a Function of Burnup **(ARI-1, No Xe)**).

  - If another control rod other than C-9 does not fully insert following a reactor trip, then use PCB Section 3, Figure 5A (Minimum Shutdown Boron vs RCS Temperature as a Function of Burnup **(ARI-1-C9, No Xe)**).

## ATTACHMENT 2
(Page 2 of 4)

## SHUTDOWN MARGIN CALCULATION FOR MODES 3, 4 AND 5

**NOTE**

*If the Xenon Worth can NOT be easily determined, it may be set equal to zero.*

4. Using the Time Since Shutdown from Step 2.2, **AND** the PCB, Section 2, Figure 2A (Xenon Worth vs Time After Shutdown), or the ERDADS Poison Program, record the Boron Equivalent of the Xenon Worth as follows:

Xenon Worth _____ pcm ÷ 15.5 pcm/ppm = _____ ppm

**NOTE**

*In Step 5, a linear interpolation for Most Reactive Stuck Rod Worth between BOC and EOC using the Burnup in Step 1.4 is appropriate.*

5. Calculate the RCCA correction as follows:

5.1 **IF** Step 2.6 equals zero or one, **THEN** the RCCA correction equals zero ppm. 0 ppm

5.2 **IF** Step 2.6 is greater than one, **THEN** using the PCB, Section 3, Figure 7, Summary of Reactivity Requirements and Shutdown Margin, record the Boron equivalent of those rods not fully inserted as follows:

Space

[1 - Step 2.6 _____ ] X Most Reactive Stuck Rod Worth _____ pcm ÷ 7.0 pcm/ppm = _____ ppm

6. Record the Corrected Minimum Shutdown Boron Concentration as follows:

Step 3 _____ ppm − Step 4 _____ ppm − Step 5.1 or 5.2 _____ ppm = _____ ppm

**NOTE**

*Step 7 determines whether or not the minimum required SHUTDOWN MARGIN per Technical Specifications is being met.*

7. Is Step 6 less than or equal to Step 2.3? ..... ☐ YES ☐ NO

## ATTACHMENT 2
(Page 3 of 4)

## SHUTDOWN MARGIN CALCULATION FOR MODES 3, 4 AND 5

8. **IF** Step 7 is NO, **THEN** IMMEDIATELY perform the following:

   8.1 Calculate the gallons of Acid required to increase the RCS Boron Concentration to greater than or equal to that of Step 5 as follows:

$$50{,}790 \text{ gal} \times \ln \left[ \frac{(5245 \text{ ppm} - \text{Step 2.3 } \_\_\_\_ \text{ ppm})}{(5245 \text{ ppm} - \text{Step 6 } \_\_\_\_ \text{ ppm})} \right] = \_\_\_\_ \text{ gal}$$

   8.2 Add the volume of Acid from Step 8.1, using 3/4-ONOP-046.1, EMERGENCY BORATION.

9. **IF** Step 7 is YES, **THEN** record the Excess SHUTDOWN MARGIN as follows:

$$[\text{Step 2.3 } \_\_\_\_ \text{ ppm} - \text{Step 6 } \_\_\_\_ \text{ ppm}] \times 7.0 \text{ pcm/ppm} = \_\_\_\_ \text{ pcm}$$

**CAUTION**

***Steps 10 and 11 are not Tech Spec related. They provide additional information for determining the subcriticality by taking credit for ALL fully inserted control rods.***

**NOTE**

*In Step 10, a linear interpolation for Most Reactive Stuck Rod Worth between BOC and EOC using the Burnup in Step 1.4 is appropriate.*

10. Calculate the RCCA correction as follows:

   10.1 **IF** Step 2.6 equals zero, **THEN** using the PCB, Section 3, Figure 7, "Summary of Reactivity Requirements and Shutdown Margin", record the Boron equivalent of the Most Reactive Stuck Rod as follows:

Most Reactive Stuck Rod Worth _____ pcm ÷ 15.5 pcm/ppm = _____ ppm

## ATTACHMENT 2
(Page 4 of 4)

## SHUTDOWN MARGIN CALCULATION FOR MODES 3, 4 AND 5

10.2 IF Step 2.6 is greater than one, THEN using the PCB, Section 3, Figure 7, "Summary of Reactivity Requirements and Shutdown Margin", record the Boron equivalent of those rods not fully inserted as follows:

| Step 2.6 | | Most Reactive Stuck Rod Worth | | |
|---|---|---|---|---|
| [1- ____ ] | X | ____ pcm | ÷ 15.5 pcm/ppm = | ____ ppm |

11. Determine subcriticality as follows:

11.1 Result in ppm:

| Step 3 | | Step 4 | | Step 10.1 or 10.2 | | |
|---|---|---|---|---|---|---|
| ____ ppm | - | ____ ppm | - | ____ ppm | = | ____ ppm |

11.2 Result in pcm:

| Step 11.1 | | |
|---|---|---|
| ____ ppm | X 7.0 pcm/ppm = | ____ pcm |

| Completed by. | Date: | Reviewed by: | Date: |
|---|---|---|---|
| | | | |

FINAL PAGE

**Attachment 2**

Operation's Training Activities Plan for
Technical Specification proposed changes related to
Inoperable Rod Position Indication for Shutdown Bank A, Rod C-9

Prior to implementation, Turkey Point will ensure the following items have been completed:

1. Issue a Night Order to all Operation's personnel informing them of the changes.

2. Issue a Training Brief to Operations personnel detailing the changes. The Training Brief will be presented by a member of Operation's management to each Operating crew's Licensed personnel upon their return to shift.

3. Issue a Problem Status Summary to give guidance on operation of the installed recorder connected to monitor rod C-9 stationary gripper coil.

4. Issue a Special Instruction, detailing the specific procedures that were affected.

5. Training on the installed alternate instrumentation will be scheduled into the Licensed Operator Continuing Training Program.

## Attachment 3

## Shutdown Mode Required for RPI Repair

In response to NRC questions regarding repair of the Unit 4 Analog Rod Position Indication (RPI) for Shutdown Bank A, rod C-9, at the earliest Mode 3 outage versus the earliest Mode 5 outage, the following description of plant maneuvers, surveillance requirements and challenges to plant systems is provided.

To repair the Unit 4 Analog Rod Position Indication (RPI) for Shutdown Bank A, rod C-9 requires the plant to be in cold shutdown Mode 5. Should Unit 4 experience a plant condition that requires shutdown to Mode 5 prior to the next scheduled Unit 4 refueling outage in October 2003, such a shutdown should be of sufficient duration to effect repairs to the RPI for rod C-9.

In the event of an unplanned shutdown requiring shutdown of Unit 4 to only Mode 3, the plant maneuvers required to then proceed to cold shutdown (Mode 5), solely for the purpose of making repairs to the C-9 RPI, with a subsequent plant startup from cold shutdown, would impose unnecessary thermal cycles and shutdown/startup related challenges to primary and secondary plant systems.

The standard Turkey Point forced outage schedule duration for a "hot" Short Notice Outage (SNO) is 35 hours, while the standard for a "cold " SNO is 104 hours. The significant differences are summarized below.

Plant Maneuvers:

RCS cool-down from 547 to 350 degrees in order to place RHR in-service
RCS cool-down on RHR to <200 degrees (Mode 5)
Collapse the pressurizer bubble and cool-down the pressurizer – solid plant operations

Surveillance Requirements:

| | |
|---|---|
| OSP-206.1 | Cold Shutdown IST Valve Exercising |
| OSP-74.5 | FW Reg. Valve IST Valve Exercising |
| OSP-41.17 | RCS Boundary Valve Leakage Testing |
| OSP-41.18 | RCS Boundary Valve Leakage Testing |
| OSP-41.19 | RCS Boundary Valve Leakage Testing |
| OSP-41.4 | OMS Testing |
| OSP-50.2 | RHR Pump IST During CSD |
| OSP-53.4 | Containment Integrity (Inside Containment) |
| OSP-205 | Locked Valve List (Inside Containment) |
| OSP-72 | MSIV Valve Exercising |
| OSP-41.23 | Pressurizer Heater Output Check (Required For Solid Operations) |

Challenges to Plant Systems:

Thermal cycling of all Primary and Secondary Systems
Operation of cold shutdown cooling systems with solid plant operations- PORV challenge
Unnecessary Surveillance Testing, Valve Cycling and System/Component Alignments