

July 12, 1996

DISTRIBUTION

See attached sheet

Mr. T. F. Plunkett
President - Nuclear Division
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

SUBJECT: TURKEY POINT UNITS 3 AND 4 - ISSUANCE OF AMENDMENTS RE: ROD
MISALIGNMENT REQUIREMENTS FOR MOVABLE CONTROL ROD ASSEMBLIES
(TAC NOS. M93060 AND M93061)

Dear Mr. Plunkett:

The Commission has issued the enclosed Amendment No. 186 to Facility Operating License No. DPR-31 and Amendment No. 180 to Facility Operating License No. DPR-41 for the Turkey Point Plant, Unit Nos. 3 and 4, respectively. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated July 26, 1995. The amendments allow operation with up to ± 18 steps of rod misalignment at or below 90 percent power.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:

Richard P. Croteau, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-250
and 50-251

Enclosures:

1. Amendment No.186 to DPR-31
2. Amendment No.180 to DPR-41
3. Safety Evaluation

cc w/enclosures: See next page

Document Name: G:TURKEY\TP93060.AMD

OFFICE	LA:PDII-3	PM:PDII-3	OGG	D:PDII-3	
NAME	BClayton	RCroteau		FHebdon	
DATE	6/12/96	6/12/96	6/17/96	6/19/96	1/96
COPY	(Yes/No)	(Yes/No)	(Yes/No)	(Yes/No)	

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Mr. T. F. Plunkett
Florida Power and Light Company

Turkey Point Plant

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DATED: July 12, 1996

AMENDMENT NO. 186 TO FACILITY OPERATING LICENSE NO. DPR-31-TURKEY POINT UNIT 3
AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. DPR-41-TURKEY POINT UNIT 4

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Docket File

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Turkey Point Rdg.

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180012



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-250

TURKEY POINT PLANT UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 186
License No. DPR-31

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Florida Power and Light Company (the licensee) dated July 26, 1995, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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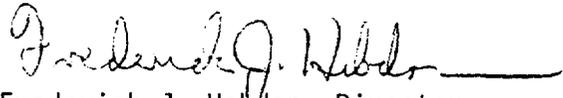
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-31 is hereby amended to read as follows:

(B) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 186, are hereby incorporated in the license. The Environmental Protection Plan contained in Appendix B is hereby incorporated into the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Frederick J. Heddon, Director
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 12, 1996



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-251

TURKEY POINT PLANT UNIT NO. 4

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 180
License No. DPR-41

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Florida Power and Light Company (the licensee) dated July 26, 1995, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

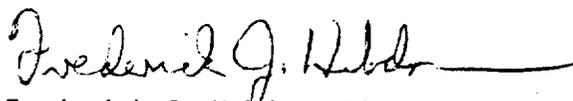
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-41 is hereby amended to read as follows:

(B) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 180, are hereby incorporated in the license. The Environmental Protection Plan contained in Appendix B is hereby incorporated into the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Frederick J. Heddon, Director
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 12, 1996

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 186 FACILITY OPERATING LICENSE NO. DPR-31

AMENDMENT NO. 180 FACILITY OPERATING LICENSE NO. DPR-41

DOCKET NOS. 50-250 AND 50-251

Revise Appendix A as follows:

Remove pages

3/4 1-17
3/4 1-18
3/4 1-20
3/4 1-21
B 3/4 1-4
B 3/4 1-5
6-20

Insert pages

3/4 1-17
3/4 1-18
3/4 1-20
3/4 1-21
B 3/4 1-4
B 3/4 1-5
6-20

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full length (shutdown and control) rods shall be OPERABLE and positioned within the Allowed Rod Misalignment between the Analog Rod Position Indication and the group step counter demand position within one hour after rod motion. The Allowed Rod Misalignment shall be defined as:

- a. for THERMAL POWER less than or equal to 90% of RATED THERMAL POWER, the Allowed Rod Misalignment is ± 18 steps, and
- b. for THERMAL POWER greater than 90% of RATED THERMAL POWER, the Allowed Rod Misalignment is ± 12 steps.

APPLICABILITY: MODES 1* and 2*

ACTION:

- a. With one or more full length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full length rod inoperable or misaligned from the group step counter demand position by more than ± 12 steps and THERMAL POWER greater than 90% of RATED THERMAL POWER, within 1 hour either:
 1. Restore all indicated rod positions to within the Allowed Rod Misalignment, or
 2. Reduce THERMAL POWER to less than 90% of RATED THERMAL POWER and confirm that all indicated rod positions are within the Allowed Rod Misalignment, or
 3. Be in HOT STANDBY within the following 6 hours.
- c. With more than one full length rod inoperable or misaligned from the group step counter demand position by more than ± 18 steps and THERMAL POWER less than or equal to 90% of RATED THERMAL POWER, within 1 hour either:
 1. Restore all indicated rod positions to within the Allowed Rod Misalignment, or
 2. Be in HOT STANDBY within the following 6 hours.

*See Special Test Exceptions 3.10.2 and 3.10.3.

REACTIVITY CONTROL SYSTEMS
LIMITING CONDITION FOR OPERATION (Continued)

- d. With one full length rod inoperable due to causes other than addressed by ACTION a, above, or misaligned from its group step counter demand position by more than the Allowed Rod Misalignment of Specification 3.1.3.1, POWER OPERATION may continue provided that within one hour either:
1. The rod is restored to OPERABLE status within the Allowed Rod Misalignment of Specification 3.1.3.1, or
 2. The remainder of the rods in the bank with the inoperable rod are aligned to within the Allowed Rod Misalignment of Specification 3.1.3.1 of the inoperable rod while maintaining the rod sequence and insertion limits of Specification 3.1.3.6; the THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or
 3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within one hour and within the next 4 hours the power range neutron flux high trip setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER. THERMAL POWER shall be maintained less than or equal to 75% of RATED THERMAL POWER until compliance with ACTIONS 3.1.3.1.d.3.c and 3.1.3.1.d.3.d below are demonstrated, and
 - b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours, and
 - c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F_{\Delta H}^N$ are verified to be within their limits within 72 hours, and
 - d) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full length rod shall be determined to be within the Allowed Rod Misalignment of the group step counter demand position at least once per 12 hours (allowing for one hour thermal soak after rod motion) except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 92 days.

REACTIVITY CONTROL SYSTEMS

POSITION INDICATION SYSTEMS - OPERATING

LIMITING CONDITION FOR OPERATION (Continued)

3.1.3.2 The Analog Rod Position Indication System and the Demand Position Indication System shall be OPERABLE and capable of determining the respective actual and demanded shutdown and control rod positions as follows:

- a. Analog rod position indicators, within one hour after rod motion (allowance for thermal soak);

All Shutdown Banks: within the Allowed Rod Misalignment of Specification 3.1.3.1 of the group demand counters for withdrawal ranges of 0-30 steps and 200-All Rods Out as defined in the Core Operating Limits Report.

Control Bank A and B: within the Allowed Rod Misalignment of Specification 3.1.3.1 of the group demand counters for withdrawal ranges of 0-30 steps and 200-All Rods Out as defined in the Core Operating Limits Report.

Control Banks C and D: within the Allowed Rod Misalignment of Specification 3.1.3.1 of the group demand counters for withdrawal range of 0-All Rods Out as defined in the Core Operating Limits Report.

- b. Group demand counters; ± 2 steps.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With a maximum of one analog rod position indicator per bank inoperable either:
1. Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and within one hour after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or
 2. Reduce THERMAL POWER to less than 75% of RATED THERMAL POWER within 8 hours.
- b. With a maximum of one demand position indicator per bank inoperable either:
1. Verify that all analog rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within the Allowed Rod Misalignment of Specification 3.1.3.1 at least once per 8 hours, or
 2. Reduce THERMAL POWER to less than 75% of RATED THERMAL POWER within 8 hours.

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS

4.1.3.2.1 Each analog rod position indicator shall be determined to be OPERABLE by verifying that the Demand Position Indication System and the Analog Rod Position Indication System agree within the Allowed Rod Misalignment of Specification 3.1.3.1 (allowing for one hour thermal soak after rod motion) at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then compare the Demand Position Indication System and the Analog Rod Position Indication System at least once per 4 hours.

4.1.3.2.2 Each of the above required analog rod position indicator(s) shall be determined to be OPERABLE by performance of a CHANNEL CHECK, CHANNEL CALIBRATION and ANALOG CHANNEL OPERATIONAL TEST performed in accordance with Table 4.1-1.

REACTIVITY CONTROL SYSTEMS

BASES

BORATION SYSTEMS (Continued)

The charging pumps are demonstrated to be OPERABLE by testing as required by Section XI of the ASME code or by specific surveillance requirements in the specification. These requirements are adequate to determine OPERABILITY because no safety analysis assumption relating to the charging pump performance is more restrictive than these acceptance criteria for the pumps.

The boron concentration of the RWST in conjunction with manual addition of borax ensures that the solution recirculated within containment after a LOCA will be basic. The basic solution minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. The temperature requirements for the RWST are based on the containment integrity and large break LOCA analysis assumptions.

The OPERABILITY of one Boron Injection System during REFUELING ensures that this system is available for reactivity control while in MODE 6.

The OPERABILITY requirement of 55°F and corresponding surveillance intervals associated with the boric acid tank system ensures that the solubility of the boron solution will be maintained. The temperature limit of 55°F includes a 5°F margin over the 50°F solubility limit of 3.5 wt.% boric acid. Portable instrumentation may be used to measure the temperature of the rooms containing boric acid sources and flow paths.

(*)One channel of heat tracing is sufficient to maintain the specified temperature limit. Since one channel of heat tracing is sufficient to maintain the specified temperature, operation with one channel out-of-service is permitted for a period of 30 days provided additional temperature surveillance is performed.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that: (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of rod misalignment on associated accident analyses are limited. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits continue. OPERABLE condition for the analog rod position indicators is defined as being capable of indicating rod position to within the Allowed Rod Misalignment of Specification 3.1.3.1 of the demand counter position. For the Shutdown Banks and Control Banks A and B, the Position Indication requirement is defined as the group demand counter indicated position between 0 and 30 steps withdrawn inclusive, and between 200 steps withdrawn and All Rods Out (ARO) inclusive. This permits the operator to verify that the control rods in these banks are either fully withdrawn or fully inserted, the normal operating modes for these banks. Knowledge of these bank positions in these two areas satisfies all accident analysis assumptions concerning their position. For Control Banks C and D, the Position Indication requirement is defined as the group demand counter indicated position between 0 steps withdrawn and All Rods Out (ARO) inclusive.

(*)This is no longer applicable once boric acid tanks inventory and boric acid source and flow path inventories have been diluted to less than or equal to 3.5 weight percent (wt%).

REACTIVITY CONTROL SYSTEMS

BASES

MOVABLE CONTROL ASSEMBLIES (Continued)

The increase in the Allowable Rod Misalignment below 90% of Rated Thermal Power is as a result of the increase in the peaking factor limits as reactor power is reduced.

Comparison of the group demand counters to the bank insertion limits with verification of rod position with the analog rod position indicators (after thermal soak after rod motion) is sufficient verification that the control rods are above the insertion limits.

Rod position indication is provided by two methods: a digital count of actuating pulses which shows demand position of the banks and a linear position indicator Linear Variable Differential Transformer which indicates the actual rod position. The relative accuracy of the linear position indicator Linear Variable Differential Transformer is such that, with the most adverse error, an alarm will be actuated if any two rods within a bank deviate by more than 24 steps for rods in motion and 12 steps for rods at rest. Complete rod misalignment (12 feet out of alignment with its bank) does not result in exceeding core limits in steady-state operation at RATED THERMAL POWER. If the condition cannot be readily corrected, the specified reduction in power to 75% will insure that design margins to core limits will be maintained under both steady-state and anticipated transient conditions. The 8-hour permissible limit on rod misalignment is short with respect to the probability of an independent accident.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with T_{avg} greater than or equal to 541°F and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a Reactor trip at operating conditions.

Control rod positions and OPERABILITY of the rod position indicators are required to be verified on a nominal basis of once per 12 hours with more frequent verifications required if an automatic monitoring channel is inoperable. These verification frequencies are adequate for assuring that the applicable LCOs are satisfied.

PEAKING FACTOR LIMIT REPORT (Continued)

Factor Limit Report, the Peaking Factor Limit Report shall be provided to the NRC Document Control desk with copies to the Regional Administrator and the Resident Inspector within 30 days of their implementation, unless otherwise approved by the Commission.

The analytical methods used to generate the Peaking Factor limits shall be those previously reviewed and approved by the NRC. If changes to these methods are deemed necessary they will be evaluated in accordance with 10 CFR 50.59 and submitted to the NRC for review and approval prior to their use if the change is determined to involve an unreviewed safety question or if such a change would require amendment of previously submitted documentation.

CORE OPERATING LIMITS REPORT

6.9.1.7 Core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT (COLR) before each reload cycle or any remaining part of a reload cycle for the following:

1. Axial Flux Difference for Specifications 3.2.1.
2. Control Rod Insertion Limits for Specification 3.1.3.6.
3. Heat Flux Hot Channel Factor - $F_Q(Z)$ for Specification 3/4.2.2.
4. All Rods Out position for Specification 3.1.3.2.

The analytical methods used to determine the AFD limits shall be those previously reviewed and approved by the NRC in:

1. WCAP-10216-P-A, "RELAXATION OF CONSTANT AXIAL OFFSET CONTROL F_Q SURVEILLANCE TECHNICAL SPECIFICATION," June 1983.
2. WCAP-8385, "POWER DISTRIBUTION CONTROL AND LOAD FOLLOWING PROCEDURES - TOPICAL REPORT," September 1974.

The analytical methods used to determine the K(Z) curve shall be those previously reviewed and approved by the NRC in:

1. WCAP-9220-P-A, Rev. 1, "Westinghouse ECCS Evaluation Model - 1981 Version," February 1982.
2. WCAP-9561-P-A, ADD. 3, Rev. 1, "BART A-1: A Computer Code for the Best Estimate Analysis of Reflood Transients - Special Report: Thimble Modeling W ECCS Evaluation Model."

The analytical methods used to determine the Rod Bank Insertion Limits and the All Rods Out position shall be those previously reviewed and approved by the NRC in:

1. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

The ability to calculate the COLR nuclear design parameters are demonstrated in:

1. Florida Power & Light Company Topical Report NF-TR-95-01, "Nuclear Physics Methodology for Reload Design of Turkey Point & St. Lucie Nuclear Plants".



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 186 TO FACILITY OPERATING LICENSE NO. DPR-31
AND AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. DPR-41

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT UNIT NOS. 3 AND 4

DOCKET NOS. 50-250 AND 50-251

1.0 INTRODUCTION

By letter dated March 21, 1996, Florida Power and Light (FPL or the licensee) proposed a change to the Technical Specifications (TS) for Turkey Point Units 3 and 4. The proposed TS amendments involve TS 3/4.1.3.1, "Movable Control Assemblies - Group Height" and 3/4.1.3.2 "Position Indication Systems - Operating" and their associated BASES. The proposed amendments would allow ± 18 steps misalignment at or below 90% of Rated Thermal Power (RTP) and maintain the ± 12 steps requirement above 90% RTP.

The licensee's experience with the Analog Rod Position Indication (ARPI) System shows that indicated misalignment is often greater than ± 12 steps. The root cause of this phenomenon is the analog rod position indication variation with temperature, most often after a recent power level change. This temperature variation was first observed at Turkey Point in 1972. While no cost-effective modification has been identified to completely eliminate the problem, two contributing factors (contaminated connectors and coil polarity) have been corrected. In addition, procedures have been developed to aid in diagnosing and correcting ARPI troubles. Generally the temperature dependent variation is corrected within the 1 hour thermal soak time allowed by Technical Specification 3.1.3.1.

Technical Specification 3.1.3.2, Action Statement a. requires that an incore flux map be taken every 8 hours to verify the actual location of the rods when the indicated rod misalignment is greater than ± 12 steps. The flux maps have shown that there was no actual rod misalignment for all cases of indicated rod misalignment in the past 5 years (the length of time that the records were examined). Changing the Technical Specifications to allow ± 18 steps misalignment will reduce the use of the flux mapping system. Frequent use of the flux mapping system may lead to more maintenance work required on the system, and an As Low as is Reasonably Achievable (ALARA) concern since the maintenance on this system is in a radiation area.

2.0 EVALUATION

The ARPI system is designed to an accuracy of 12 steps. Therefore, in order to guarantee a rod misalignment of less than 24 steps (12 steps misalignment + 12 steps ARPI uncertainty), the individual ARPI readings must be no larger than 12 steps. In order to justify changing the misalignment limit to ± 18 steps, the licensee did evaluations for misalignments of up to 30 steps (18 steps indicated + 12 steps uncertainty). The Technical Specification limits on peaking factors F_q and $F_{\Delta H}$ increase as the power level lowers. The increase in the limit for F_q and $F_{\Delta H}$ was used to accommodate the larger than ± 12 steps misalignment at the reduced power levels. To justify the increase in allowable rod misalignment at a reduced power level, the following parameters were evaluated:

- 1) Reactivity Control
- 2) Control Rod Misoperation (dropped rods and static rod misalignments)
- 3) Rod Ejection
- 4) Power Operation with Misaligned Rods

The principal tool used in the analysis was the Westinghouse Advanced Nodal Computer (ANC) code (WCAP-10965-P-A, September 1986) in the three dimensional mode. Full core and quarter core models were used in the analyses. The calculations were performed by Florida Power and Light, using NRC approved methods per Amendments 174 and 168, issued June 9, 1995. For this analysis the changes in peaking factors rather than the absolute values of the peaking factors were of interest.

The Unit 3 Cycle 14 model was used in the analysis since this cycle is representative of expected future core designs.

2.1 Reactivity Control

To demonstrate that reactivity control was acceptable with the additional allowed misalignment, the licensee calculated the reactivity of a misaligned bank by 30 steps past the insertion limit and then showed that the calculated reactivity was substantially less than the excess shutdown margin available. The calculation was performed for EOC since it represents the point in cycle with the least available shutdown margin.

2.2 RCCA Misoperation Events

The RCCA misoperation events (dropped RCCAs and statically misaligned RCCAs) are events initiated by the movement or displacement of one RCCA rod or bank from its normal position. These events result in reactivity and power distribution anomalies. Each reload is analyzed for these events to ensure that the Departure for Nucleate Boiling (DNB) acceptance criteria are met.

2.3 Rod Ejection

The rod ejection analysis is performed at Hot Zero Power (HZZP) and Hot Full Power (HFP), Beginning of Cycle (BOC) and End of Cycle (EOC) conditions. The physics parameters of interest are the ejected rod worth and the post-ejection F_q . A misaligned control rod can increase the available ejected rod worth. Calculations showed that the ejected F_q was below that assumed in the Safety Analysis and thus the average fuel pellet enthalpy and centerline temperature remained below their limits.

2.4 Power Operation with Misaligned Rod

Power distributions with control rod misalignment of 30 steps (18 steps misalignment + 12 steps for ARPI uncertainty) were evaluated. Neutronic analysis were performed to evaluate the impact of RCCA misalignment on steady state power distribution and normal operational transients such as load follow operations. Calculations were performed for both inward and outward misalignments from the demand counter position. Multiple misalignments as well as single misalignments were analyzed.

Comparisons were made between the peaking factors assuming the 18 step misalignment, the 12 step misalignment and the base case (control bank D at rod insertion limit (RIL)). The results indicate that the incremental increase in F_q and $F_{\Delta H}$ due to additional misalignment of six steps is 0.78% and 0.53%, while the available margin from 100% of rated thermal power (RTP) to 90% of RTP is 11.1% and 3.0% for F_q and $F_{\Delta H}$ respectively. Sensitivity studies were also performed for 18 and 12 step misalignments from initial conditions of control bank D at 200 steps rather than at the RIL. The results show that the incremental increase for the additional six steps misalignment is 1.08% and 0.27% for F_q and $F_{\Delta H}$, respectively.

The effect of load following and misalignment on peaking factors was investigated using a variety of axial power distributions obtained by skewing the EOL xenon distribution to the bottom and top of the core. The incremental increases in F_q and $F_{\Delta H}$ due to the additional six steps is 2.05% and 0.65% respectively.

3.0 SUMMARY

RCCA misalignments up to 30 steps (18 steps indicated + 12 steps ARPI uncertainty) have been evaluated for impact on peaking factors and reactivity worth. The results of the analysis showed that the incremental increases in the peaking factors were only a small fraction of the increase in the peaking factor limits for powers less than 90%. The change in reactivity worth was also shown to be well within the excess margin available. Thus it has been shown that the increase in peaking factors will be accommodated at or below 90% of RTP and the change to the technical specification to allow misalignment of up to 18 steps is acceptable.

4.0 STATE CONSULTATION

Based upon the written notice of the proposed amendments, the Florida State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration and there has been no public comment on such finding (60 FR 47616). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: M. Chatterton

Date: July 12, 1996

DATED: July 12, 1996

AMENDMENT NO. 186 TO FACILITY OPERATING LICENSE NO. DPR-31-TURKEY POINT UNIT 3
AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. DPR-41-TURKEY POINT UNIT 4

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