

September 10, 1991

Docket No. 50-335

DISTRIBUTION
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Mr. J. H. Goldberg
President-Nuclear Division
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

Dear Mr. Goldberg:

SUBJECT: ST. LUCIE UNIT 1 - ISSUANCE OF AMENDMENT RE: DELETION OF TOTAL
PLANAR RADIAL PEAKING FACTOR

The Commission has issued the enclosed Amendment No. 109 to Facility Operating License No. DPR-67 for the St. Lucie Plant, Unit No. 1. This amendment consists of changes to the Technical Specifications in response to your application dated April 17, 1991.

This amendment deletes the St. Lucie Unit 1 Technical Specification 3/4.2.2, "Total Planar Radial Peaking Factor - F_{xy} " and all of its references.

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)

Jan A. Norris, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 109 to DPR-67
2. Safety Evaluation

cc w/enclosures:
See next page

OFC	:LA:PDII-2	:PM:PDII-2	:D:PDII-2	:OGC	:	:	:
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St. Lucie Plant

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DATED: September 10, 1991

AMENDMENT NO. 109 TO FACILITY OPERATING LICENSE NO. DPR-67 - ST. LUCIE, UNIT 1

Docket File

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

FLORIDA POWER & LIGHT COMPANY

DOCKET NO. 50-335

ST. LUCIE PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 109
License No. DPR-67

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Florida Power & Light Company, (the licensee) dated April 17, 1991, 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.

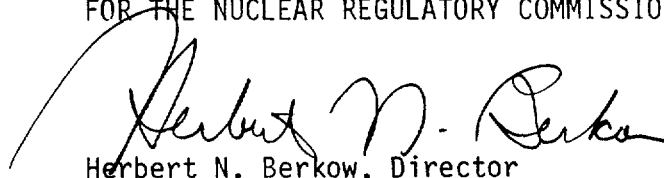
2. Accordingly, Facility Operating License No. DPR-67 is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and by amending paragraph 2.C.(2) to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 109, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance:

ATTACHMENT TO LICENSE AMENDMENT NO. 109
TO FACILITY OPERATING LICENSE NO. DPR-67
DOCKET NO. 50-335

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

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3/4 10-2
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Insert Pages

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DEFINITIONS

STAGGERED TEST BASIS

- 1.32 A STAGGERED TEST BASIS shall consist of:
- a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subintervals, and
 - b. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval.

THERMAL POWER

1.33 THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

UNIDENTIFIED LEAKAGE

1.34 UNIDENTIFIED LEAKAGE shall be all leakage which is not IDENTIFIED LEAKAGE or CONTROLLED LEAKAGE.

UNRESTRICTED AREA

1.35 An UNRESTRICTED AREA shall be any area at or beyond the SITE BOUNDARY access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials, or any area within the SITE BOUNDARY used for residential quarters or for industrial, commercial, institutional, and/or recreational purposes.

UNRODDED INTEGRATED RADIAL PEAKING FACTOR - F_r

1.36 The UNRODDED INTEGRATED RADIAL PEAKING FACTOR is the ratio of the peak pin power to the average pin power in an unrodded core, excluding tilt.

TABLE 1.1
FREQUENCY NOTATION

<u>NOTATION</u>	<u>FREQUENCY</u>
S	At least once per 12 hours
D	At least once per 24 hours
W	At least once per 7 days
4/M*	At least 4 per month at intervals of no greater than 9 days and a minimum of 48 per year
M	At least once per 31 days
Q	At least once per 92 days
SA	At least once per 184 days
R	At least once per 18 months
S/U	Prior to each reactor startup
P**	Completed prior to each release
N.A.	Not applicable

* For Radioactive Effluent Sampling
** For Radioactive Batch Releases Only

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

- c. Verifying that the AXIAL SHAPE INDEX is maintained within the allowable limits of Figure 3.2-2, where 100 percent of maximum allowable power represents the maximum THERMAL POWER allowed by the following expression:

$$M \times N$$

where:

1. M is the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination.
2. N is the maximum allowable fraction of RATED THERMAL POWER as determined by the F_r^T curve of Figure 3.2-3.

4.2.1.4 Incore Detector Monitoring System[#] - The incore detector monitoring system may be used for monitoring the core power distribution by verifying that the incore detector Local Power Density alarms:

- a. Are adjusted to satisfy the requirements of the core power distribution map which shall be updated at least once per 31 days of accumulated operation in MODE 1.
- b. Have their alarm setpoint adjusted to less than or equal to the limits shown on Figure 3.2-1 when the following factors are appropriately included in the setting of these alarms:
 1. A measurement-calculational uncertainty factor of 1.07,
 2. An engineering uncertainty factor of 1.03,
 3. A THERMAL POWER measurement uncertainty factor of 1.02.

[#]If the core system becomes inoperable, reduce power to M x N within 4 hours and monitor linear heat rate in accordance with Specification 4.2.1.

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POWER DISTRIBUTION LIMITS

DELETED

ST. LUCIE - UNIT 1

3/4 2-6

Amendment No. 27, 32, 48, 63,
109,

POWER DISTRIBUTION LIMITS

DELETED

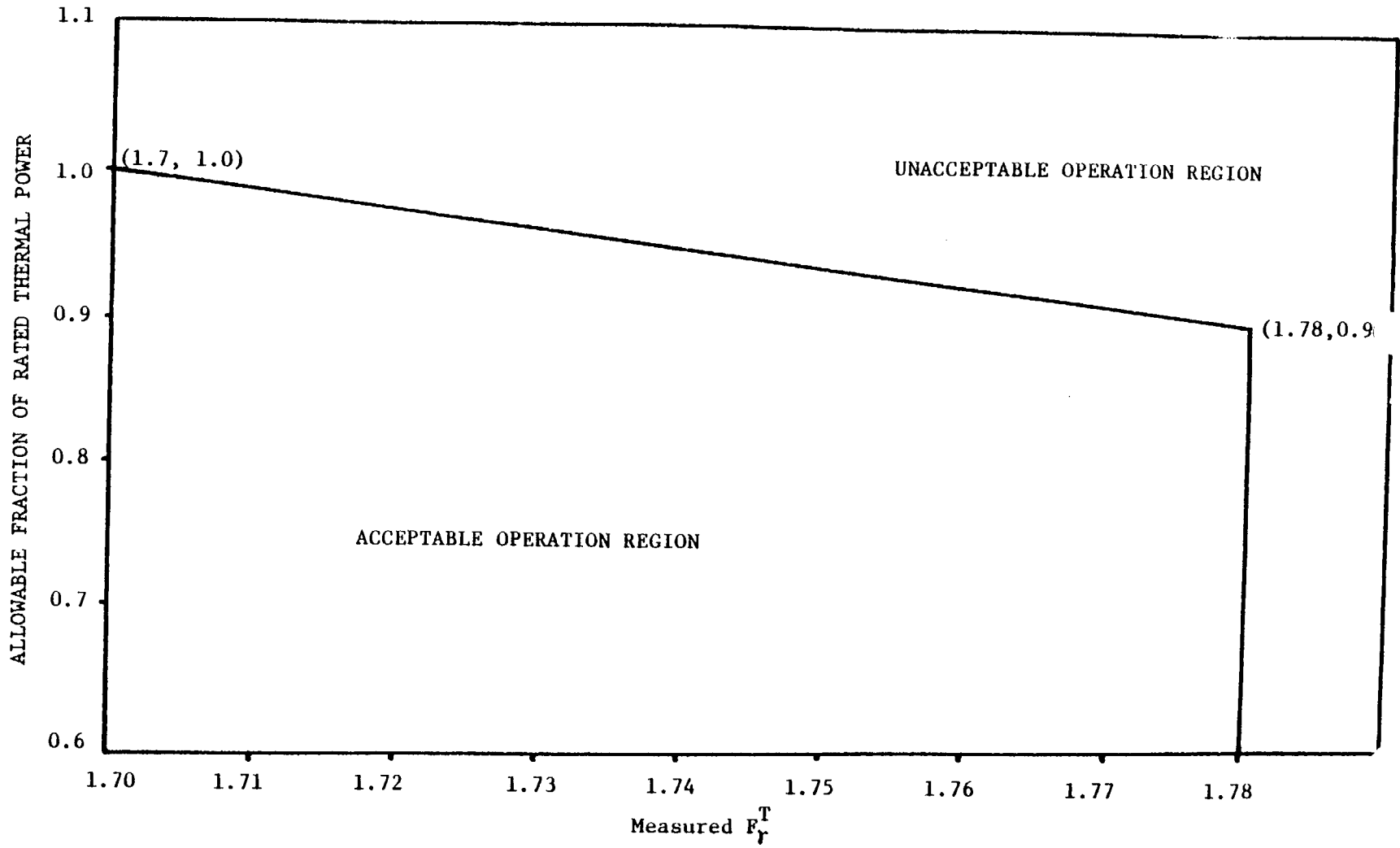


FIGURE 3.2-3
Allowable Combinations Of Thermal Power And F_r^T

POWER DISTRIBUTION LIMITS

AZIMUTHAL POWER TILT - T_q

LIMITING CONDITION FOR OPERATION

3.2.4 The AZIMUTHAL POWER TILT (T_q) shall not exceed 0.03.

APPLICABILITY: MODE 1*

ACTION:

- a. With the indicated AZIMUTHAL POWER TILT determined to be $> .030$ but ≤ 0.10 , either correct the power tilt within two hours or determine within the next 2 hours and at least once per subsequent 8 hours, that the TOTAL INTEGRATED RADIAL PEAKING FACTOR (F_r^T) is within the limits of Specification 3.2.3.
- b. With the indicated AZIMUTHAL POWER TILT determined to be > 0.10 , operation may proceed for up to 2 hours provided that the TOTAL INTEGRATED RADIAL PEAKING FACTOR (F_r^T) is within the limits of Specification 3.2.3. Subsequent operation for the purpose of measurement and to identify the cause of the tilt is allowable provided the THERMAL POWER level is restricted to $\leq 20\%$ of the maximum allowable THERMAL POWER level for the existing Reactor Coolant Pump combination.

SURVEILLANCE REQUIREMENT

4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

4.2.4.2 The AZIMUTHAL POWER TILT shall be determined to be within the limit by:

- a. Calculating the tilt at least once per 7 days when the Subchannel Deviation Alarm is OPERABLE,

* See Special Test Exception 3.10.2.

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

- b. Calculating the tilt at least once per 12 hours when the Subchannel Deviation Alarm is inoperable, and
- c. Using the incore detectors to determine the AZIMUTHAL POWER TILT at least once per 12 hours when one excore channel is inoperable and THERMAL POWER is $> 75\%$ of RATED THERMAL POWER.

SPECIAL TEST EXCEPTIONS

GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

3.10.2 The group height, insertion and power distribution limits of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.2, 3.1.3.5, 3.1.3.6, 3.2.3, and 3.2.4 may be suspended during the performance of PHYSICS TESTS provided:

- a. The THERMAL POWER is restricted to the test power plateau which shall not exceed 85% of RATED THERMAL POWER, and
- b. The limits of Specification 3.2.1 are maintained and determined as specified in Specification 4.10.2.2 below.

APPLICABILITY: MODES 1 and 2.

ACTION:

With any of the limits of Specification 3.2.1 being exceeded while the requirements of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.2, 3.1.3.5, 3.1.3.6, 3.2.3 and 3.2.4 are suspended, either:

- a. Reduce THERMAL POWER sufficiently to satisfy the requirements of Specification 3.2.1, or
- b. Be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.10.2.1 The THERMAL POWER shall be determined at least once per hour during PHYSICS TESTS in which the requirements of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.2, 3.1.3.5, 3.1.3.6, 3.2.3 or 3.2.4 are suspended and shall be verified to be within the test power plateau.

4.10.2.2 The linear heat rate shall be determined to be within the limits of Specification 3.2.1 by monitoring it continuously with the Incore Detector Monitoring System pursuant to the requirements of Specifications 4.2.1.3 and 3.3.3.2 during PHYSICS TESTS above 5% of RATED THERMAL POWER in which the requirements of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.2, 3.1.3.5, 3.1.3.6, 3.2.3 or 3.2.4 are suspended.

3/4.2 POWER DISTRIBUTION LIMITS

BASES

3/4.2.1 LINEAR HEAT RATE

The limitation on linear heat rate ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F.

Either of the two core power distribution monitoring systems, the Excore Detector Monitoring System and the Incore Detector Monitoring System, provides adequate monitoring of the core power distribution and is capable of verifying that the linear heat rate does not exceed its limits. The Excore Detector Monitoring System performs this function by continuously monitoring the AXIAL SHAPE INDEX with the OPERABLE quadrant symmetric excore neutron flux detectors and verifying that the AXIAL SHAPE INDEX is maintained within the allowable limits of Figure 3.2-2. In conjunction with the use of the excore monitoring system and in establishing the AXIAL SHAPE INDEX limits, the following assumptions are made: 1) the CEA insertion limits of Specifications 3.1.3.5 and 3.1.3.6 are satisfied, 2) the AZIMUTHAL POWER TILT restrictions of Specification 3.2.4 are satisfied, and 3) the TOTAL INTEGRATED RADIAL PEAKING FACTOR does not exceed the limits of Specification 3.2.3.

The Incore Detector Monitoring System continuously provides a direct measure of the peaking factors and the alarms which have been established for the individual incore detector segments ensure that the peak linear heat rates will be maintained within the allowable limits of Figure 3.2-1. The setpoints for these alarms include allowances, set in the conservative directions, for 1) a measurement-calculational uncertainty factor of 1.07, 2) an engineering uncertainty factor of 1.03, 3) a THERMAL POWER measurement uncertainty factor of 1.02.

3/4.2.3 and 3/4.2.4 TOTAL INTEGRATED RADIAL PEAKING FACTOR - F_r^T AND AZIMUTHAL POWER TILT - T_q

The limitations on F_r^T and T_q are provided to ensure that the assumptions used in the analysis for establishing the Linear Heat Rate and Local Power Density-High LCOs and LSSS setpoints and

POWER DISTRIBUTION LIMITS

BASES

the DNB Margin LCO, and Thermal Margin/Low Pressure LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. If F_r or T_q exceed their basic limitations, operation may continue under the additional restrictions imposed by the ACTION statements since these additional restrictions provide adequate provisions to assure that the assumptions used in establishing the Linear Heat Rate, Thermal Margin/Low Pressure and Local Power Density - High LCOs and LSSS setpoints remain valid. An AZIMUTHAL POWER TILT > 0.10 is not expected and if it should occur, subsequent operation would be restricted to only those operations required to identify the cause of this unexpected tilt.

The requirement that the measured value of $(1+T_q)$ be multiplied by the calculated value of F_r to determine F_r^T is applicable only when F_r is calculated with a non-full core power distribution analysis. With a full core power distribution analysis code the azimuthal tilt is explicitly accounted for as part of the radial power distribution used to calculate F_r .

The surveillance requirements for verifying that F_r^T and T_q are within their limits provide assurance that the actual values of F_r^T and T_q do not exceed the assumed values. Verifying F_r^T after each fuel loading prior to exceeding 75% of RATED THERMAL POWER provides additional assurance that the core was properly loaded.

3/4.2.5 DNB PARAMETERS

The limits on the DNB related parameters assure that each of the parameters are maintained within the normal steady state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the safety analyses assumptions and have been analytically demonstrated adequate to maintain a minimum DNBR of ≥ 1.22 throughout each analyzed transient.

The 12 hour periodic surveillance of these parameters through instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation. The 18 month periodic measurement of the RCS total flow rate is adequate to detect flow degradation and ensure correlation of the flow indication channels with measured flow such that the indicated percent flow will provide sufficient verification of flow rate on a 12 hour basis.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 109

TO FACILITY OPERATING LICENSE NO. DPR-67

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE PLANT, UNIT NO. 1

DOCKET NO. 50-335

1.0 INTRODUCTION

By letter dated April 17, 1991, Florida Power and Light Company (FPL) requested an amendment to Facility Operating License No. DPR-67 for St. Lucie Unit 1. The amendment would delete the St. Lucie Unit 1 Technical Specification 3/4.2.2, "Total Planar Radial Peaking Factor - F_{xy} " and all of its references.

2.0 EVALUATION

For future reloads of the St. Lucie Unit 1 core, the axial power distributions (APDs) will be generated by Advanced Nuclear Fuels (ANF) Corporation using a three-dimensional core model (XTGPWR), rather than the synthesized one-dimensional axial and two-dimensional radial power distribution model previously used. In this synthesis technique, the total peaking factor, F_0 , was determined by multiplying the core average axial power distribution, F_z , by F_{xy} , the maximum ratio of the peak-to-average power density of the individual fuel rods in any of the unrodded horizontal planes (planar radial peaking factor), excluding any azimuthal tilt effects. Assurance that the resultant F_0 is not exceeded was obtained by limiting the maximum value of F_{xy} at which the core can operate. In the new three-dimensional model, the need for an F_{xy} limit is eliminated, since F_0 is calculated directly and is limited by adherence to the F_0 Technical Specification limit. The integrated radial peaking factor, F_r , is defined as the ratio of the peak pin power to the average pin power in the core, excluding tilt.

The ANF three-dimensional APD model has been previously reviewed and approved by the staff. In a letter from M. W. Hodges to R. A. Copeland (ANF) dated July 8, 1988, the staff stated that the ANF three-dimensional methodology given in ANF-507(P), Addendum 1, may be referenced for licensing applications. However, to justify removal of the Technical Specification F_{xy} limit, each application must provide assurance that the three-dimensional based setpoints remain bounding. The setpoint analysis for the local power density (LPD) limiting safety system settings (LSSS) and the LPD limiting conditions for operation (LCO) utilized F_0 and F_r to establish the operational limits that

ensure that the core thermal limits are not exceeded. In addition, the assumptions used in the St. Lucie Unit 1 accident analysis bound the changes caused by the proposed Technical Specification modifications and the accident consequences remain acceptable.

3.0 TECHNICAL FINDING

To delete the F_{xy}^T limit and replace it with the integrated radial peaking factor F_r , the licensee proposed the following specific changes:

<u>Page</u>	<u>Change</u>
Ia	The reference to the "Unrodded Planar Radial Peaking Factor - F_{xy} " is deleted from the Index of Definitions.
IV	The reference to Technical Specification 3/4.2.2 is deleted from the Index of Limiting Conditions for Operation and Surveillance Requirements.
1-7	The definition 1.37 "Unrodded Planar Radial Peaking Factor - F_{xy} " is deleted.
3/4 2-2	The term " F_{xy}^T " in Surveillance Requirement 4.2.1.3 Item c. is replaced with the term " F_r ".
3/4 2-6, 3/4 2-7	The "TOTAL PLANAR RADIAL PEAKING FACTOR - F_{xy}^T " Limiting Condition for Operation 3.2.2 and Surveillance Requirements 4.2.2.1, 4.2.2.2, 4.2.2.3 and 4.2.2.4 are deleted.
3/4 2-8	The reference to " F_{xy}^T " is deleted from Figure 3.2-3. Additionally, the term " F_1 " is deleted.
3/4 2-11	The references to the "Total Planar Radial Peaking Factor, F_{xy}^T " and to the limits of Specification 3.2.2 are deleted from Technical Specification 3/4.2.4. Revised text accounts for the deletions.
3/4 10-2	The references to Technical Specification 3.2.2 are deleted from Technical Specification 3/4.10.2.

<u>Page</u>	<u>Change</u>
B 3/4 2-1	In the Technical Specification Bases for 3/4.2.1 for Linear Heat Rate, the word "PLANAR" is replaced with the word "INTEGRATED" and the reference to Technical Specification "3.2.2" is replaced with "3.2.3".
B 3/4 2-1, B 3/4 2-2	The Technical Specification Bases for 3/4.2.2 is deleted. The text is corrected to account for the deletion of the F_{xy}^T limit. Additionally, the term " F^T " is being added to the text after the word "determine" in the second line of the second paragraph of Page B 3/4 2-2.

Based on the evaluation contained in Section 2.0 of this Safety Evaluation, the NRC staff finds the above Technical Specifications changes acceptable.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding (56 FR 22466). Accordingly, this amendment meets 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 this amendment.

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.

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