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April 29, 1986

Docket No. 50-389

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Mr. C. O. Woody  
 Group Vice President  
 Nuclear Energy  
 Florida Power & Light Company  
 P. O. Box 14000  
 Juno Beach, Florida 33408

Dear Mr. Williams:

The Commission has issued the enclosed Amendment No.14 to Facility Operating License No. NPF-16 for the St. Lucie Plant, Unit No. 2. This amendment consists of changes to the Technical Specifications in response to your application dated December 30, 1985 and supplemented by letter dated March 17, 1986.

This amendment changes the Moderator Temperature Coefficient to provide more operating flexibility and remove restrictive operational requirements above 70% power.

A copy of the related Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next bi-weekly Federal Register notice.

Sincerely,

/S/

E. G. Tourigny, Project Manager  
 PWR Project Directorate #8  
 Division of PWR Licensing-B

Enclosures:

1. Amendment No.14 to NPF-16
2. Safety Evaluation

cc w/enclosures:  
 See next page

PBD#8 PMKreutzer 4/15/86	<i>Pat. #8</i> SATP PBD#8 ETourigny 4/15/86	<i>AT</i> PBD#8 ATHadani 4/15/86	OELD 4/17/86 <i>Wolcott et al. objection</i> <i>McBurney</i>
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Mr. C. O. Woody  
Florida Power & Light Company

St. Lucie Plant

cc:

Mr. Jack Shreve  
Office of the Public Counsel  
Room 4, Holland Building  
Tallahassee, Florida 32304

Mr. Allan Schubert, Manager  
Public Health Physicist  
Department of Health and  
Rehabilitative Services  
1323 Winewood Blvd.  
Tallahassee, Florida 32301

Resident Inspector  
c/o U.S. NRC  
7585 S. Hwy A1A  
Jensen Beach, Florida 33457

Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
Executive Director for Operations  
101 Marietta Street N.W., Suite 2900  
Atlanta, Georgia 30323

State Planning & Development  
Clearinghouse  
Office of Planning & Budget  
Executive Office of the Governor  
The Capitol Building  
Tallahassee, Florida 32301

Harold F. Reis, Esq.  
Newman & Holtzinger  
1615 L Street, N.W.  
Washington, DC 20036

Norman A. Coll, Esq.  
McCarthy, Steel, Hector and Davis  
14th Floor, First National Bank Building  
Miami, Florida 33131

Administrator  
Department of Environmental Regulation  
Power Plant Siting Section  
State of Florida  
2600 Blair Stone Road  
Tallahassee, Florida 32301

Mr. Weldon B. Lewis, County  
Administrator  
St. Lucie County  
2300 Virginia Avenue, Room 104  
Fort Pierce, Florida 33450

Mr. Charles B. Brinkman, Manager  
Washington - Nuclear Operations  
Combustion Engineering, Inc.  
7910 Woodmont Avenue  
Bethesda, Maryland 20814



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

FLORIDA POWER & LIGHT COMPANY  
ORLANDO UTILITIES COMMISSION OF  
THE CITY OF ORLANDO, FLORIDA  
AND  
FLORIDA MUNICIPAL POWER AGENCY  
DOCKET NO. 50-389  
ST. LUCIE PLANT UNIT NO. 2  
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 14  
License No. NPF-16

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Florida Power & Light Company, et al. (the licensee), dated December 30, 1985 as supplemented March 17, 1986, 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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P PDR

2. Accordingly, Facility Operating License No. NPF-16 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. 14, 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



Ashok C. Thadani, Director  
PWR Project Directorate #8  
Division of PWR Licensing-B

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: April 29, 1986

ATTACHMENT TO LICENSE AMENDMENT NO.14  
TO FACILITY OPERATING LICENSE NO. NPF-16  
DOCKET NO. 50-389

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

Remove Pages

3/4 1-5

Insert Pages

3/4 1-5

## REACTIVITY CONTROL SYSTEMS

### MODERATOR TEMPERATURE COEFFICIENT

#### LIMITING CONDITION FOR OPERATION

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3.1.1.4 The moderator temperature coefficient (MTC) shall be:

- a. Less positive than  $+0.5 \times 10^{-4}$  delta k/k/°F at  $\leq$  70% RATED THERMAL POWER,
- b. Less positive than  $+0.3 \times 10^{-4}$  delta k/k/°F at  $>$  70% RATED THERMAL POWER, and
- c. Less negative than  $-2.7 \times 10^{-4}$  delta k/k/°F at RATED THERMAL POWER.

APPLICABILITY: MODES 1 and 2\*#

#### ACTION:

With the moderator temperature coefficient outside any one of the above limits, be in at least HOT STANDBY within 6 hours.

#### SURVEILLANCE REQUIREMENTS

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4.1.1.4.1 The MTC shall be determined to be within its limits by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits.

4.1.1.4.2 The MTC shall be determined at the following frequencies and THERMAL POWER conditions during each fuel cycle:

- a. Prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.
- b. At any THERMAL POWER, within 7 EFPD after reaching a RATED THERMAL POWER equilibrium boron concentration of 800 ppm.
- c. At any THERMAL POWER, within 7 EFPD after reaching a RATED THERMAL POWER equilibrium boron concentration of 300 ppm.

\*With  $K_{eff}$  greater than or equal to 1.0.

#See Special Test Exceptions 3.10.2 and 3.10.5.

## REACTIVITY CONTROL SYSTEMS

### MINIMUM TEMPERATURE FOR CRITICALITY

#### LIMITING CONDITION FOR OPERATION

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3.1.1.5 The Reactor Coolant System lowest operating loop temperature ( $T_{avg}$ ) shall be greater than or equal to 515°F.

APPLICABILITY: MODES 1 and 2#.

ACTION:

With a Reactor Coolant System operating loop temperature ( $T_{avg}$ ) less than 515°F, restore  $T_{avg}$  to within its limit within 15 minutes of Be in HOT STANDBY within the next 15 minutes.

#### SURVEILLANCE REQUIREMENTS

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4.1.1.5 The Reactor Coolant System temperature ( $T_{avg}$ ) shall be determined to be greater than or equal to 515°F:

- a. Within 15 minutes prior to achieving reactor criticality, and
- b. At least once per 30 minutes when the reactor is critical and the Reactor Coolant System  $T_{avg}$  is less than 525°F.

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#With  $K_{eff}$  greater than or equal to 1.0.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 14

TO FACILITY OPERATING LICENSE NO. NPF-16

FLORIDA POWER & LIGHT COMPANY, ET AL.

ST. LUCIE PLANT, UNIT NO. 2

DOCKET NO. 50-389

INTRODUCTION

By letter from C. O. Woody to F. J. Miraglia, dated December 30, 1985, and supplemented by letter dated March 17, 1986, Florida Power and Light Company (FPL) submitted a request to amend Appendix A of Facility Operating License NPF-16 for St. Lucie Plant, Unit No. 2. The proposed change to the Technical Specification on moderator temperature coefficient (MTC) would permit an MTC less positive than  $+0.3 \times 10^{-4} \Delta k/k/^\circ F$  above 70% of rated thermal power. This change affects Technical Specification 3.1.1.4 and is evaluated herein.

EVALUATION

The MTC indicates the change in reactivity due to a uniform change in the moderator temperature, including the effect of moderator density changes with changes in moderator temperature. Typically, an increase in the moderator temperature causes a decrease in the core moderator density and, therefore, less thermalization, which reduces core reactivity. However, when soluble boron is present in the moderator, a reduction in moderator density causes a reduction in the amount of soluble boron in the core, thus producing a positive contribution to the MTC.

The necessity for the proposed Technical Specification change arises from the high reactor coolant system dissolved boron concentrations required to accommodate the longer 18-month St. Lucie operating cycles. These higher concentrations cause the beginning of cycle MTC to become more positive, at times approaching the Technical Specification limits on MTC. The current Technical Specification limit on MTC requires a value less positive than  $+0.5 \times 10^{-4} \Delta k/k/^\circ F$  at and below 70% power and less positive than 0.0 above 70% power. In order to satisfy the more restrictive limit above 70% power during power ascensions, it has been necessary to hold at the 70% power plateau while xenon builds up. This buildup of xenon adds the negative reactivity necessary to reduce the critical boron concentration that, in turn, reduces the MTC below the Technical Specification positive limit. The requested change to permit an MTC of  $+0.3 \times 10^{-4} \Delta k/k/^\circ F$  above 70% power would avoid this delay during power ascension.



A positive MTC has an adverse effect on those transients and accidents that involve an increase in moderator temperature. These heatup events are caused by a decrease in heat removal by the secondary system, a decrease in reactor coolant flow rate, or reactivity and power distribution anomalies. In addition, it may also affect the reactivity insertion as a function of moderator density input to the LOCA evaluation. The licensee has reevaluated the impact of a  $+0.3 \times 10^{-4} \Delta k/k/^\circ F$  MTC above 70% reactor power on these events. The two non-LOCA transients that were not bounded by previous reference analyses due to the more positive MTC above 70% power were the loss of condenser vacuum and the feedwater line break. These two events were reanalyzed by the licensee assuming an MTC of  $+0.3 \times 10^{-4} \Delta k/k/^\circ F$  and an increase to 1500 plugged tubes per steam generator. The results indicate that fuel will not fail since the minimum transient DNBR remains above the design limit of 1.28, the peak reactor coolant system pressure does not exceed the upset pressure limit of 2750 psia, and doses remain within their allowable 10 CFR Part 100 limits. In addition, the loss of condenser vacuum event will not result in peak steam generator pressure in excess of its upset pressure limit of 1100 psia. The results of a reanalysis of these limiting transients support a  $+0.3 \times 10^{-4} \Delta k/k/^\circ F$  MTC limit at greater than 70% reactor power.

In addition to the non-LOCA transients, a reevaluation was made to assess the impact of the increased positive MTC limit on the LOCA analysis. A reactivity insertion versus moderator density curve was calculated that included the additional reactivity insertion due to the change in moderator temperature. This calculated curve remained bounded by the reactivity versus moderator density curve used in the previous reference cycle LOCA calculation. Therefore, the LOCA results are not adversely affected by an increase in the MTC limit to  $+0.3 \times 10^{-4} \Delta k/k/^\circ F$ .

An assessment of the impact of a more positive MTC on those transients and accidents adversely affected by a positive MTC has indicated that those events continue to meet all the appropriate analyses criteria required by the NRC.

Based upon the above evaluation, the proposed change to Technical Specification 3.1.1.4 of the St. Lucie Unit 2 plant increasing the positive MTC limit to  $+0.3 \times 10^{-4} \Delta k/k/^\circ F$  above 70% reactor power is acceptable.

#### ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or a change in a surveillance requirement. The 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 published a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the 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 the amendment.

CONCLUSION

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: April 29, 1986

Principal Contributor:  
L. Kopp