

August 13, 1987

Docket No. 50-335

Mr. C. O. Woody
Group Vice President
Nuclear Energy
Florida Power & Light Company
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Dear Mr. Woody:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. 64197)

The Commission has issued the enclosed Amendment No. 84 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 December 23, 1986, as supplemented May 29, 1987.

This amendment permits the allowable peak linear heat rate to be 15 kw/ft for all axial fuel elevations for all times in core life.

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

Sincerely,

/s/

E. G. Tourigny, Project Manager
Project Directorate II-2
Division of Reactor Projects-I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 84 to DPR-67
2. Safety Evaluation

cc w/enclosures:
See next page

LA:PDII-2
DM:Mer
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PM:PDII-2
ETourigny:bg
7/13/87

D:PDII-2
LRubenstein
7/13/87

NRR/SRXB
LKopp
7/13/87

Approved
OGC
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7/16/87

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Mr. C. O. Woody
Florida Power & Light Company

St. Lucie Plant

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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. 84
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 December 23, 1986, as supplemented May 29, 1987, 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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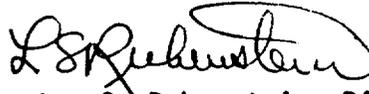
2. Accordingly, Facility Operating License No. DPR-67 is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and by amending paragraph 2.C.(2) to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. ⁸⁴, 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



Lester S. Rubenstein, 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: August 13, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 84
TO FACILITY OPERATING LICENSE NO. DPR-67
DOCKET NO. 50-335

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 2-3 (Figure 3.2-1)

Insert Pages

3/4 2-3 (Figure 3.2-1)

ALLOWABLE PEAK LINEAR HEAT RATE, KW/FT
(FUEL + CLAD + MODERATOR)

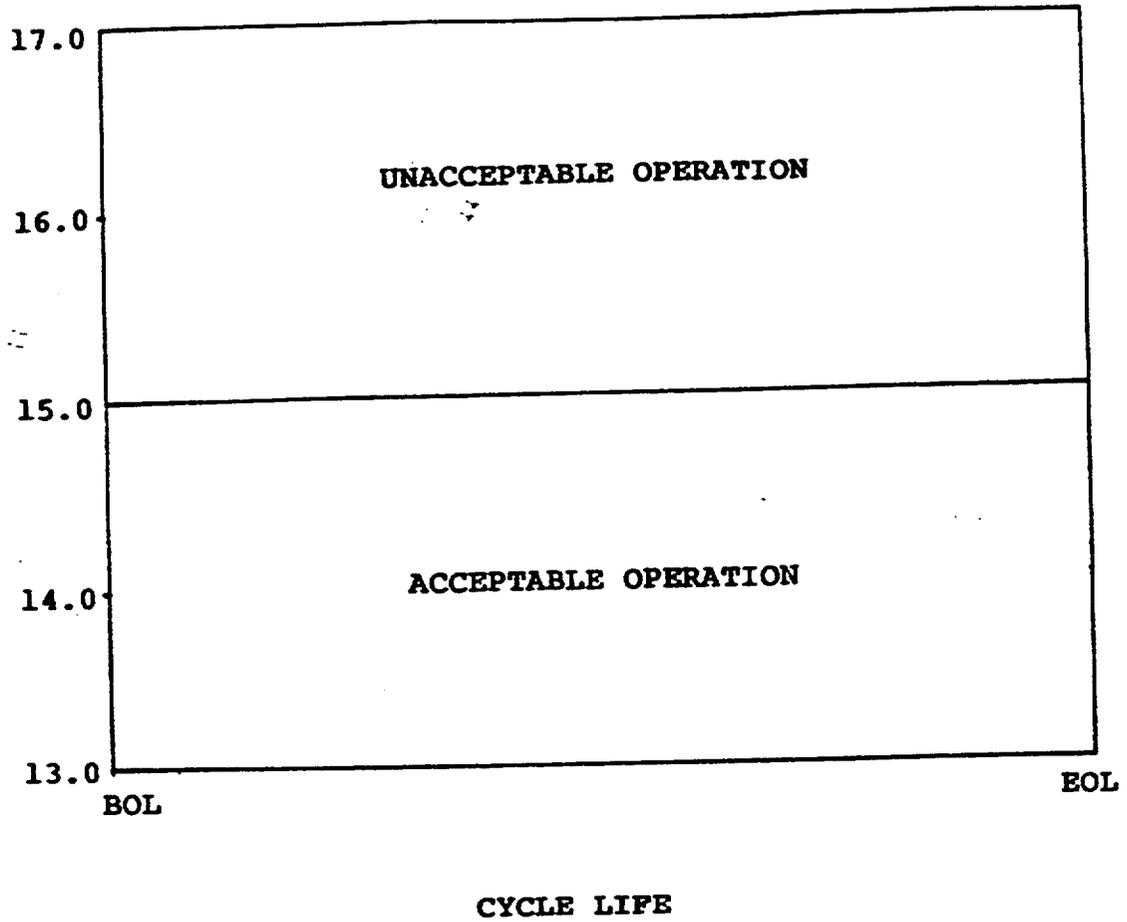


FIGURE 3.2-1
ALLOWABLE PEAK LINEAR HEAT RATE VS. BURNUP

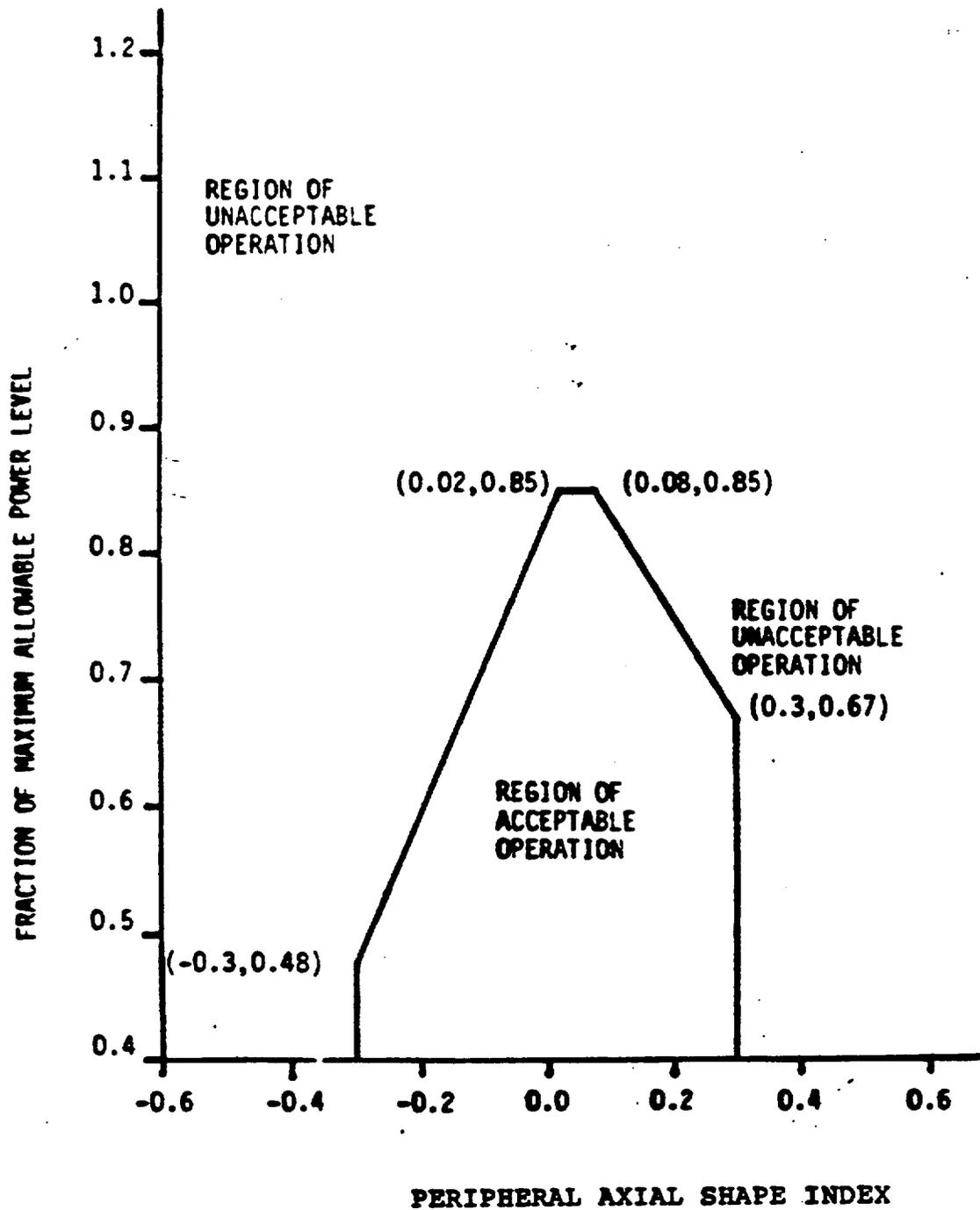


FIGURE 3.2-2

AXIAL SHAPE INDEX VS. MAXIMUM ALLOWABLE POWER
LEVEL PER SPECIFICATION 4.2.1.3



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 84

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 L-86-522 dated December 23, 1986, Florida Power and Light Company (FPL) submitted a request to change the allowable peak linear heat rate (LHR) of St. Lucie Unit 1 Technical Specification 3.2.1, Figure 3.2.1, Allowable Peak Linear Heat Rate vs. Burnup, to 15 kw/ft, independent of core height and exposure and valid up to a steam generator tube plugging level of 15%. The current LHR limits are 15 kw/ft up to a relative core height of 0.6, then decreasing linearly to 14 kw/ft at a relative core height of 0.81 and 10.81 kw/ft at a relative core height of 1.0. These current limits are valid up to a steam generator tube plugging level of 11%. In order to support this change, FPL also submitted a revised LOCA-ECCS analysis, XN-NF-86-137, "St. Lucie Unit 1 LOCA-ECCS Analysis with 15% Steam Generator Tube Plugging" (Ref. 1).

By letter dated April 3, 1987, the staff requested additional information concerning the proposed amendment change in order to continue their review. The licensee responded to the staff's request by letter dated May 29, 1987. The licensee's response to the staff's questions provided supplemental information which did not change the staff's initial determination, or alter the action, published in the Federal Register on January 28, 1987.

2.0 EVALUATION

The major differences between this LOCA-ECCS analysis and the previous analysis (Ref. 2) are: (1) an increase in the steam generator tube plugging limit from 11% to 15%, (2) the use of the recently approved Fuel Cooling Test Facility (FCTF) reflood correlations instead of the FLECHT reflood correlations, and (3) the use of less conservative combinations of stored energy and axial power shapes.

As previously mentioned, the referenced LOCA-ECCS analysis was performed at a peak LHR of 14 kw/ft at 0.81 of core height at the end of bypass and confirmed that the double-ended cold leg guillotine break with a discharge coefficient of 0.8 (0.8 DECLG) was the limiting break. The staff requested justification that this would remain the limiting break in view of the model changes (Ref. 3). In response, the licensee stated that the only change in the present analysis that would affect the blowdown behavior was the increase in average steam generator tube plugging to 15% from 11% (Ref. 4). From past experience, the

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licensee has found that a 4% increase in tube plugging has a small effect on peak clad temperature and on the system response during blowdown such that the limiting break (0.8 DECLG) will not change. The staff finds this acceptable.

The use of the FCTF reflood correlations has been generically approved for the Advanced Nuclear Fuels Corporation (ANF), formerly the Exxon Nuclear Company (Ref. 5). In response to staff questions (Ref. 4), FPL stated that the FCTF correlations are not used until after the beginning of core recovery and do not affect blowdown behavior. Therefore, the use of the FCTF correlations rather than the FLECHT correlations will not change the break spectrum and the 0.8 DECLG remains the limiting break.

In the previous LOCA analyses performed for St. Lucie Unit 1, the combination of fuel rod stored energy and axial power shape was based on the peak stored energy occurring near beginning of cycle and the bounding axial shape found at end of cycle. In the current analysis, two ranges of exposure were analyzed with the worst stored energy and axial shape within each exposure range used. The two ranges of exposure were from 0 to 10 MWD/kg hot rod average burnup and from 10 MWD/kg to end of cycle. Although this results in less conservative combinations of stored energy and axial shapes, the staff concludes that this technique uses a more realistic approach to evaluating burnup effects and retains sufficient conservatism. It is, therefore, acceptable.

The most limiting axial shapes predicted within each exposure range were renormalized to an axial peaking factor of 1.258, representative of 15 kw/ft for Cycle 7, and used in the revised LOCA-ECCS analysis. The first case combined the maximum stored energy, which occurs at a hot rod average burnup of 1.8 MWD/kg, with a bounding axial power shape for a hot rod average burnup of 10 MWD/kg. This resulted in a peak clad temperature of 2092°F, a local maximum metal-water reaction of 5.26%, and a core maximum metal-water reaction of 0.612%. The second case combined the stored energy at a hot rod average burnup of 10 MWD/kg with a bounding axial power shape for end of cycle conditions. This resulted in a peak clad temperature of 1965°F, a local maximum metal-water reaction of 3.7%, and a core maximum metal-water reaction of 0.485%. Therefore, for a 15 kw/ft limiting condition of operation on LHR, the acceptance criteria of 2200°F on peak clad temperature, 1% on total core hydrogen generation, and 17% on local cladding oxidation specified in 10 CFR 50.46 are met for St. Lucie Unit 1.

3.0 SUMMARY

The staff has reviewed the proposed change to St. Lucie Unit 1 Technical Specification 3.2.1 for increasing the allowable peak LHR to 15 kw/ft for all axial elevations for all times in core life and finds it acceptable. Included in the review were changes to the previous LOCA analysis consisting of an increase in the steam generator tube plugging limit to 15%, use of the FCTF reflood correlations, and use of less conservative, though still bounding, combinations of stored energy and axial power shapes. Asymmetric tube plugging was modeled with the broken loop steam generator having 17% of its tubes plugged and the steam generator in the intact loop having 13% of its tubes plugged. The LOCA analysis performed with these changes showed that the acceptance criteria presented in 10 CFR 50.46 are satisfied.

4.0 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. 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.

5.0 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.

6.0 REFERENCES

1. "St. Lucie Unit 1 LOCA-ECCS Analysis with 15% Steam Generator Tube Plugging," XN-NF-86-137, Exxon Nuclear Company, November 1986.
2. "St. Lucie Unit 1 LOCA-ECCS Analysis with 11% Steam Generator Tube Plugging," XN-NF-86-23, Revision 1, Exxon Nuclear Company, March 1986.
3. Letter from E. G. Tourigny (NRC) to C. O. Woody (FPL), dated April 3, 1987.
4. Letter from C. O. Woody (FPL), L-87-222, St. Lucie Unit 1 Linear Heat Rate, dated May 29, 1987.
5. Letter from D. M. Crutchfield (NRC) to G. M. Ward (ANF), "Safety Evaluation of Exxon Nuclear Company's Large Break ECCS Evaluation Model EXEM/PWR and Acceptance for Referencing of Related Licensing Topical Reports," dated July 8, 1986.

Date: August 13, 1987

Principal Contributor:

L. Kopp