

July 14, 1986

Docket Nos. 50-250  
and 50-251

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Mr. C. O. Woody, Group Vice President  
Nuclear Energy Department  
Florida Power and Light Company  
Post Office Box 14000  
Juno Beach, Florida 33408

Dear Mr. Woody:

The Commission has issued the enclosed Amendment No. 117 to Facility Operating License No. DPR-31 and Amendment No. 111 to Facility Operating License No. DPR-41 for the Turkey Point Plant Units Nos. 3 and 4, respectively. The amendments consist of changes to the Technical Specifications in response to your application transmitted by letter dated April 15, 1986.

These amendments revise the design section of the Technical Specifications to allow the use of burnable poisons that are not in the form of discrete rod clusters but are integral to the fuel rods. This feature is known as the Integral Fuel Burnable Absorber (IFBA). The IFBA design has been demonstrated through test assemblies to perform as predicted.

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

Sincerely,

Daniel G. McDonald, Jr., Project Manager  
PWR Project Directorate #2  
Division of PWR Licensing-A  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 117 to DPR-31
2. Amendment No. 111 to DPR-41
3. Safety Evaluation

cc: w/enclosures  
See next page

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DMiller  
7/2/86

*cc for*  
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DMcDonald:hc  
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Mr. C. O. Woody  
Florida Power and Light Company

Turkey Point Plant

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

FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-250

TURKEY POINT PLANT UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 117  
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 April 15, 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.
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:

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(B) Technical Specifications

The Technical Specifications contained in Appendix A and B, as revised through Amendment No. 117, 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 issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Lester S. Rubenstein, Director  
PWR Project Directorate #2  
Division of PWR Licensing-A  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: July 14, 1986



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

FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-251

TURKEY POINT PLANT UNIT NO. 4

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 111  
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 April 15, 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.
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

The Technical Specifications contained in Appendix A and B, as revised through Amendment No. 111, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective immediately and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Lester S. Rubenstein, Director  
PWR Project Directorate #2  
Division of PWR Licensing-A  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: July 14, 1986

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 117 FACILITY OPERATING LICENSE NO. DPR-31

AMENDMENT NO. 111 FACILITY OPERATING LICENSE NO. DPR-41

DOCKET NO. 50-250 AND 50-251

Revise Appendix A as follows:

Remove Pages

5.2-1

Insert Pages

5.2-1

## 5.2 REACTOR

### REACTOR CORE

1. The reactor core contains approximately 71 metric tons of uranium in the form slightly enriched uranium dioxide pellets. The pellets are encapsulated in Zircaloy - 4 tubing to form fuel rods. The reactor core is made up of 157 fuel assemblies. Each fuel assembly contains 204 fuel rods.
2. The average enrichment of the initial core is a nominal 2.50 weight percent of U-235. Three fuel enrichments are used in the initial core. The highest enrichment is a nominal 3.10 weight percent of U-235.
3. Reload fuel will be similar in design to the initial core.
4. Burnable poisons are in the form of rod clusters which are located in vacant rod cluster control guide tubes, or integral to the fuel design and are used for reactivity and/or power distribution control.
5. There are 45 full-length RCC assemblies and 8 partial-length\* RCC assemblies in the reactor core. The full-length RCC assemblies contain a 144 inch length of silver-indium-cadmium alloy clad with the stainless steel. The partial-length\* RCC assemblies contain a 36 inch length of silver-indium-cadmium alloy with the remainder of the stainless steel sheath filled with Al<sub>2</sub>O<sub>3</sub>.

### REACTOR COOLANT SYSTEM

1. The design of the Reactor Coolant System complies with the code requirements.
2. All piping, components and supporting structures of the Reactor Coolant System are designed to Class I requirements and have been designed to withstand:
  - a. The design seismic ground acceleration, 0.05g acting in the horizontal and 0.033g acting in the vertical planes simultaneously, with stress maintained within code allowable working stresses.
  - b. The maximum potential seismic ground acceleration, 0.15g, acting in the horizontal and 0.10g acting in the vertical directions simultaneously with no loss of function.
3. The nominal liquid volume of the Reactor Coolant System, at rated operating conditions, is 9088 cubic feet.

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\* Any reference to part-length rods no longer applies after the part-length rods are removed from the reactor.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 117 TO FACILITY OPERATING LICENSE NO. DPR-31  
AND AMENDMENT NO. 111 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

I. Introduction

By letter dated April 15, 1986, from C. O. Woody (FPL) to H. L. Thompson, Jr., (NRC), the licensee, Florida Power and Light Company, submitted a proposed Technical Specification change that will allow the use of Integral Fuel Burnable Absorbers (IFBAs) in fuel assemblies for Turkey Point Units 3 and 4.

II. Evaluation

The IFBA design was originally introduced in the approved VANTAGE 5 fuel design in a Westinghouse Topical Report (WCAP-10444-P-A). Westinghouse applied this IFBA design feature to other fuel designs such as 14x14 and 15x15 fuel assemblies in Addendum 1 to WCAP-10444-P-A. We approved this Addendum 1 in a safety evaluation dated March 13, 1986. There are no design feature changes at Turkey Point Units 3 and 4 which would make the generic review invalid. Our Safety Evaluation of WCAP-10444-P-A, Addendum 1, is attached to this Safety Evaluation to support our finding and conclusion. In addition, the IFBA design has been demonstrated to perform as predicted by using test assemblies in Turkey Point Units 3 and 4.

III. Finding

Based on the above evaluation, supporting Safety Evaluation of WCAP-10444-P-A, Addendum 1 and the results of the test assemblies, we conclude that the IFBA design can be applied to Turkey Point Units 3 and 4, and the proposed change to Technical Specification Section 5.2 is acceptable.

IV. Environmental Consideration

These amendments involve changes in the installation or use of the facilities components located within the restricted areas as defined in 10 CFR 20. The staff has determined that these 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these amendments meet

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the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 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 these amendments.

V. 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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: July 14, 1986

Principal Contributors:

S. L. Wu

MAR 3 1986

## 1. INTRODUCTION

By letter dated December 23, 1985 from E. P. Rahe, Jr. (Westinghouse) to H. Berkow (NRC), Westinghouse submitted a topical report entitled, "Reference Core Report Vantage 5 Fuel Assembly", WCAP-10444, Addendum 1 for NRC review and approval. This document extends the applicability of the Integral Fuel Burnable Absorber (IFBA) design features of 17x17 VANTAGE 5 fuel assemblies to other Westinghouse fuel assembly designs, i.e., Westinghouse 14x14 and 15x15 fuel arrays. The VANTAGE 5 fuel design including IFBA features received an NRC approval in July 1985 (letter from C. O. Thomas to E. P. Rahe, Jr. dated July 1985).

The IFBA design is a thin boride coating on the fuel pellet surface. The stack length of coated pellets varies depending on the specific fuel rod design. IFBAs provide power peaking and moderator temperature coefficient control. Additional helium release to the void volume of the fuel rod due to the boride coating interaction with neutrons must be accounted for in the analysis.

## 2. EVALUATION

Westinghouse has analyzed the impact of IFBA on fuel mechanical, nuclear, and thermal and hydraulic designs for various fuel rod designs according to the SRP criteria of fuel system damage mechanisms, fuel rod failure mechanisms, and fuel coolability. The findings are similar to the conclusions in the approved VANTAGE 5 fuel design (WCAP-10444-P-A). Our evaluation (provided below) focuses on the more significant characteristics of 14x14 and 15x15 fuel designs.

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## 2.1 Fuel Rod Internal Pressure

Because of boride coating on the pellet surface, additional helium will be generated and released to the plenum space. Westinghouse modified the fission gas release model in the approved PAD 3.3 code to include this effect. The result showed that the rod internal pressure met the design criteria described in the approved report WCAP-8964. We thus conclude that the rod pressure analyses for the 14x14 and 15x15 IFBA designs are acceptable.

## 2.2 Cladding Stress and Strain

Due to a larger pellet outer diameter, the pellet-clad gap is smaller. It is expected that IFBA fuel rods have higher stress and strain than uncoated fuel rods. However, Westinghouse used the approved PAD 3.3 code to verify that the clad stress and strain of IFBA fuel rods meet the criteria in the approved report WCAP-10444-P-A. We, therefore, conclude that the cladding stress and strain analyses for 14x14 and 15x15 IFBA designs are acceptable.

## 2.3 Fuel Centerline Temperature

The IFBA fuel centerline temperature during operation may be different from non-IFBA fuel due to a smaller pellet-clad gap affecting gap conductance. Westinghouse used the approved PAD 3.3 code and confirmed that the maximum fuel temperatures for IFBA fuel were bounded by those generated for non-IFBA fuel. We, therefore, conclude that this fuel temperature analysis is acceptable.

## 2.4 Nuclear Design

The nuclear design methods and models (WCAP-9272-P-A) have been approved for use in IFBA fuel as indicated in WCAP-10444-P-A. These methods and models were consistently used for 14x14 and 15x15 IFBA fuel. We thus consider the nuclear design of 14x14 and 15x15 IFBA fuel rods to be acceptable.

## 2.5 Thermal-Hydraulic Design

The effect of IFBA fuel on thermal-hydraulic design consideration is to flatten the axial power distribution and reduce power peaking. Westinghouse has examined this effect and found that the design axial power distribution used in the determination of the over-temperature  $\Delta T$  setpoint conservatively covered any IFBA fuel related effects on core power distribution. The same conclusion has been approved in our SER on WCAP-10444-P-A. No changes in thermal-hydraulic design methods and models were introduced for 14x14 and 15x15 IFBA fuel. We thus conclude that the thermal-hydraulic design of 14x14 and 15x15 IFBA fuel is acceptable.

## 3. CONCLUSION

Based on the approved 17x17 VANTAGE 5 fuel design (WCAP-10444-P-A) and the acceptable fuel mechanical, nuclear, and thermal-hydraulic design considerations, we conclude that the IFBA feature can be applied to Westinghouse 14x14 and 15x15 fuel designs for licensing applications.