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SUBJECT: Forwards application for amend to Licenses DPR-31 & DPR-41, changing refueling shutdown margin to raise associated effective multiplication factor, Keff, from 0.90-0.95. Approval requested by 870307. Fee paid.

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[illegible] Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Forwards application for amend to Licenses DPR-31 & DPR-41, changing [illegible] shutdown margin to [illegible] effective multiplication factor, Keff, from 0.92-0.95 [illegible] [illegible]

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P. O. BOX 14000, JUNO BEACH, FL 33408-0420

FPL

JANUARY 16 1987
L-87-21

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Proposed License Amendment
Reactor Subcritical Margin

In accordance with 10 CFR 50.90, Florida Power & Light Company (FPL) requests that you amend Appendix A of Facility Operating Licenses DPR-31 and DPR-41 (Turkey Point Units 3 and 4 Technical Specifications) to allow a refueling shutdown margin of 5% Δ K/K. This change will raise the associated effective multiplication factor, Keff, from 0.90 to 0.95. FPL requests your approval by March 7, 1987 in order to utilize the amendment during the upcoming Unit 3 refueling outage.

The proposed changes are described below and shown on the accompanying Technical Specification pages.

Table 1.1

The reactivity condition for Mode 6 (refueling) was revised from a Keff of ≤ 0.90 to ≤ 0.95. The average coolant temperature criteria for Mode 5 (cold shutdown) was revised from $< 200^{\circ}F$ to $\leq 200^{\circ}F$ to be consistent with the Mode 4 requirements and the Standard Technical Specification definition of Modes.

Page 3.10-4

Technical Specification 3.10.8.a is revised to require a Keff of 0.95 or less.

Table 4.18-1

Table 4.18-1 is revised to reflect the change to Table 1.1. In addition, it is also revised to reflect six modes of operation (it currently only addresses the four modes of operation initially defined for Turkey Point).

Page B3.10-2

Bases Section B3.10.8 is revised to reflect the proposed changes discussed above.

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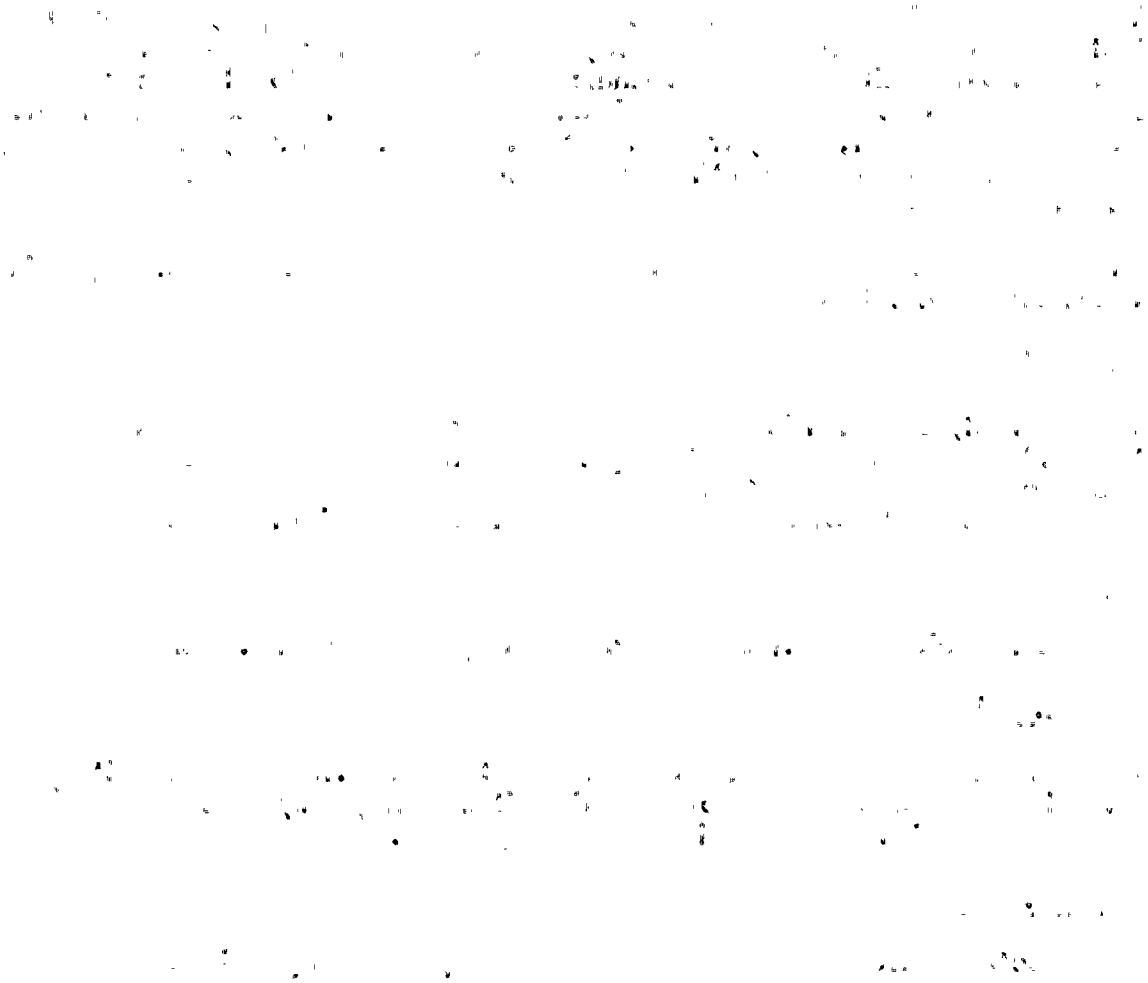

It has been determined that the proposed amendment does not involve a significant hazards consideration pursuant to 10 CFR 50.92. A no significant hazards consideration determination is attached.

In accordance with 10 CFR 50.91(b)(1), a copy of this proposed license amendment is being forwarded to the State Designee for the State of Florida.

In accordance with 10 CFR 170.12(c), FPL Check No. 3656 for $150.00 is attached.

The proposed amendment has been reviewed by the Turkey Point Plant Nuclear Safety Committee and the Florida Power & Light Company Nuclear Review Board.

Your draft of the Turkey Point Plant Upgraded Technical Specification should be revised to reflect these changes.

Very truly yours,

C. O. Woody
Group Vice President
Nuclear Energy

COW/TCG/gp

Attachments

cc: Dr. J. Nelson Grace, NRC Region II
Mr. D. R. Brewer, NRC Senior Resident Inspector, Turkey Point Plant
Mr. D. G. McDonald, NRC Project Manager
Mr. Alan Schubert, Florida Department of Health
and Rehabilitative Services

STATE OF FLORIDA)
) ss.
COUNTY OF PALM BEACH)

C. O. Woody being first duly sworn, deposes and says:

That he is a Group Vice President of Florida Power & Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information, and belief, and that he is authorized to execute the document on behalf of said Licensee.

C. O. Woody

Subscribed and sworn to before me this
16 day of January, 1987.

Bernice M. Palmis
NOTARY PUBLIC, in and for the County
of Palm Beach, State of Florida

My Commission expires: NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP SEPT 18,1989
BONDED THRU GENERAL INS. UND.

TURKEY POINT UNITS 3 and 4

PROPOSED LICENSE AMENDMENT

TITLE: REACTOR SUBCRITICAL MARGIN

DESCRIPTION:

Currently the Turkey Point Technical Specifications require 1950 ppm boron concentration or higher, sufficient to maintain the reactor subcritical by 10 percent Δk/k during refueling. Due to the large amount of excess reactivity installed at beginning of cycle for recent long fuel cycles, the required refueling boron concentration to maintain 10 percent shutdown margin is now well above 1950 ppm.

The proposed amendment modifies the technical specifications to allow a refueling shutdown margin of 5 percent Δ k/k. This change will raise the associated effective multiplication factor, k_{eff}, from 0.90 to 0.95 as it appears in Table 1.1, Specification 3.10.8 and B3.10.8 of Turkey Point Plant Technical Specifications.

Prior to 1973, general practice in the nuclear industry was to design fresh or spent fuel storage facilities for a maximum k_{eff} of about 0.90 (approximately the k_{eff} of a single isolated fuel assembly in water). Calculations of k_{eff} were performed assuming fully flooded unborated conditions using methods then extant, without considering uncertainties in the calculated k_{eff}. At that time, it was believed that the safety margin in k_{eff} of 0.10 was more than sufficient to account for any uncertainties while still preventing criticality.

In August 1973, the American National Standards Institute (ANSI) issued an industry standard designated as ANSI N18.2-1973, which recommended a design basis k_{eff} of 0.95 for storage of fresh or spent fuel assuming fully flooded unborated conditions. The NRC essentially adopted the ANSI N18.2 recommendations when it issued Section 9.1.2 of the Standard Review Plan (SRP) (NUREG-75/087) in 1975. The SRP was reissued in 1980 as NUREG-0800, with little substantive change in the criteria in Section 9.1.2.

Part of the NRC (and industry) rationale for moving from the pre-1973 k_{eff} practice of 0.90 to the higher limits in SRP Section 9.1.2 is the following:

- Significant improvements have been made in calculational methods. Additionally, calculational methods are verified against experimental data that represents, as nearly as possible, the system being evaluated.

- In calculating k_{eff} in accordance with SRP Section 9.1.2, a total uncertainty factor is determined and added to the calculated k_{eff} to define the maximum possible k_{eff}.

SRP Section 9.1.2, entitled "Spent Fuel Storage," currently states that the NRC Staff will accept storage racks for spent fuel assemblies if:

> the center-to-center spacing between fuel assemblies and any strong fixed neutron absorbers in the storage racks is sufficient to maintain the array, when fully loaded and flooded with nonborated water, in a subcritical condition. A k_{eff} not greater than 0.95 for this condition is acceptable.

Further definition and clarification of the NRC position were provided in an April 14, 1978 letter from Brian Grimes, transmitting the NRC "OT Position for Review and Acceptance of Spent Fuel Storage and Handling Applications," setting forth in greater detail the NRC acceptance criteria for spent fuel storage pools. Section III.1.5 of this guidance emphasizes that the "neutron multiplication factor in spent fuel pools shall be less than or equal to 0.95, <u>including all uncertainties</u>, under all conditions" (emphasis in original).

Therefore, industry, ANS and the NRC all recognize the advances in criticality calculational methods and have applied these advances to new and spent fuel pools designs.

Refueling shutdown requirements have also been adjusted to reflect the same advances. The Westinghouse Standard Technical Specification Revision 5 (Draft) also show a shutdown k_{eff} requirement of 0.95. To support this technical specification change, Westinghouse Electric Corporation reanalyzed the "Boron Dilution During Refueling Accident".

The analysis concluded that:

1. A refueling boron concentration of 1950 ppm will provide the 5 percent Δk/k shutdown margin;

2. Operator will have at least 30 minutes to terminate the dilution event before a return to criticality occurs.

An evaluation performed by the Turkey Point Reactor Engineering Department listed the instrumentation, alarms, and annunicators that provide the control room operators indication of a dilution event and allows sufficient time to mitigate the event. These indications are:

NUCLEAR INSTRUMENTATION SYSTEM

Source Range:

1. Countrate meters on drawers and console.
2. Countrate strip chart recorder on console.
3. SUR indication on drawer and console.
4. Audible countrate.
5. High flux at shutdown alarm on drawers.
6. High flux at shutdown annunciator.
7. High countrate Rx trip alarm on drawers.
8. High countrate Rx trip annunciator.

Intermediate Range:

1. Power indication on drawers and console.
2. Power indication on strip chart on console.
3. SUR indication on drawer and console.
4. P6 alarm on drawers.
5. P6 status light VPA.
6. P6 annunciator.

FULL RANGE NUCLEAR INSTRUMENTATION

Gammametrics

1. Countrate meters on console.
2. Power meters on console.
3. High flux at shutdown annunciator.

Two additional changes are being made, first, Table 4.18-1 is being revised in order to bring it into conformance with Table 1.1. The revision constitutes an administrative change bringing the "Applicable Mode" information in line with 6 modes of operation identified in Table 1.1. Table 4.18-1 presently addresses 4 modes of operation. Second, Table 1.1 is being changed in order to correct a typographical error. The "Average Coolant Temperature" for Mode 5 is being revised to read as "less than or equal to", from "less than". The correction of this typographical error will bring Table 1.1 in conformance with the Standard Technical Specifications.

Basis for No Significant Hazards Consideration Determination

The Commission has provided standards for determining whether a significant hazards consideration exists 10 CFR 5092(c). A proposed amendment to an operating license for the facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety.

(1) This amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated. The reanalysis of the Boron Dilution During Refueling Accident concluded that control room operators had more than 30 minutes to terminate the dilution. Both the control room and containment require an audible count rate amplified over speaker systems to be operable for fuel movement. A change in count rate would alert the operators of the dilution. Control room instruments and alarms that monitor the reactor would provide additional indication of a dilution event and allow it's mitigation. Therefore, this amendment does not involve a significant increase in the probability of an accident previously analyzed.

Since no plant modifications are being made by the amendment, the consequences of an accident remain the same as previously analyzed.

(2) This amendment will not create the possibility of a new or different type of accident previously analyzed since this change does not modify the configuration or mode of operation of the plant.

(3) This change will not involve a significant reduction in a margin of safety. The reanalysis of the Boron Dilution Accident showed that more than 30 minutes were available to terminate the dilution by the control room operators.

It is concluded that the amendment would not likely involve a significant hazards consideration. In addition, the Commission has provided guidance for the application of the criteria in 10 CFR 50.92 (as specified above) by providing examples of amendments that are not likely to involve a significant hazards consideration.

This change is similar to example (IV) a relief granted upon demonstration of acceptable operation from a restriction that was imposed because acceptable operation was not yet demonstrated. As discussed the 10 percent $\Delta k/k$ shutdown requirement was the common practice in pre-1973 licensed reactors since acceptable modeling methods were not available before that time.

Therefore, on the basis of the above discussion, operation of Turkey Point Nuclear Units 3 and 4 in accordance with the proposed amendments would pose no threat to the public health and welfare, and would not involve a significant hazards consideration.