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ACCESSION NBR: 9507310192      DOC. DATE: 95/07/26      NOTARIZED: YES      DOCKET #  
FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light C      05000250  
50-251 Turkey Point Plant, Unit 4, Florida Power and Light C      05000251

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SUBJECT: Application for amend to license DPR-31 & DPR-41, re daily calorimetric power comparison w/Nuclear Instrumentation sys at power levels above 15% of RTP.

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JUL 26 1995

L-95-098  
10 CFR §50.36  
10 CFR §50.90

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

Gentlemen:

Re: Turkey Point Units 3 and 4  
Docket Nos. 50-250 and 50-251  
Proposed License Amendments  
Nuclear Instrumentation System (NIS) Adjustments Based on  
Calorimetric Measurements at Reduced Power Levels

In accordance with Title 10 Code of Federal Regulations §50.90 (10 CFR §50.90), Florida Power and Light Company (FPL) requests that Appendix A of Facility Operating Licenses DPR-31 and DPR-41 be amended to modify Turkey Point Units 3 and 4 Technical Specification Table 4.3-1 as discussed below.

Turkey Point Units 3 and 4 Technical Specifications require daily calorimetric power comparisons with the Nuclear Instrumentation System (NIS) at power levels above 15% of RATED THERMAL POWER (RTP). For all power levels above 15% of RTP, the Technical Specifications require that the NIS excore channel gains must be adjusted to within 2% of the measured calorimetric power. At reduced power levels (i.e., less than 70% of RTP), calorimetric power measurement uncertainties are most influenced by the feedwater flow measurements, which have the potential for large flow uncertainties under low flow conditions. These calorimetric uncertainties create the potential for a non-conservative gain adjustment of the NIS when the NIS is adjusted downward to match calorimetric power at reduced power levels, and may result in a non-conservative NIS power level indication when operating at higher power levels. Inappropriate NIS gain adjustments could cause the NIS Power Range High Neutron Flux trip to occur at power levels beyond that assumed in the plant safety analyses. Accordingly, FPL proposes to delete the requirement to adjust NIS downward when operating at less than 70% of RTP.

A description of the amendments request is provided in Attachment 1. FPL has determined that the proposed license amendments do not involve a significant hazard pursuant to 10 CFR §50.92. The no significant hazards determination in support of the proposed Technical Specification changes is provided in Attachment 2. Attachment 3 provides the proposed Technical Specification changes.

In accordance with 10 CFR §50.91(b)(1), a copy of these proposed license amendments are being forwarded to the State Designee for the State of Florida.

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The proposed amendments have been reviewed by the Turkey Point Plant Nuclear Safety Committee and the FPL Company Nuclear Review Board.

Should there be any questions on this request, please contact us.

Very truly yours,



T. F. Plunkett  
Vice President  
Turkey Point Plant

Attachments

EJW/OIH

cc: S. D. Ebnetter, Regional Administrator, Region II, USNRC  
T. P. Johnson, Senior Resident Inspector, USNRC, Turkey Point  
W. A. Passetti, Florida Department of Health and Rehabilitative  
Services



The diagram illustrates the experimental setup. A participant is seated at a table, looking at a video screen. A video camera is positioned above the screen. A light source is positioned to the left of the screen. A target is positioned on the screen. A ruler is placed on the table. A scale bar is shown at the bottom right of the diagram.

STATE OF FLORIDA       )  
                              ) ss.  
COUNTY OF DADE       )

T. F. Plunkett being first duly sworn,, deposes and says:

That he is Vice President, Turkey Point Nuclear Plant, of Florida Power and 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.

T. F. Plunkett  
T. F. Plunkett

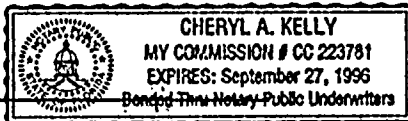
Subscribed and sworn to before me this

26 day of July, 1995.

Cheryl A. Kelly  
Name of Notary Public (Type or Print)

NOTARY PUBLIC, in and for the County of  
Dade, State of Florida

My Commission expires  
Commission No. \_\_\_\_\_



T. F. Plunkett is personally known to me.

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ATTACHMENT 1

DESCRIPTION OF AMENDMENTS REQUEST



## DESCRIPTION OF AMENDMENTS REQUEST

### Introduction

Turkey Point Units 3 and 4 Technical Specifications require daily calorimetric power comparisons with the Nuclear Instrumentation System (NIS) at power levels above 15% of RATED THERMAL POWER (RTP). For all power levels above 15% of RTP, the Technical Specifications require that the NIS excore channel gains must be adjusted to within 2% of the measured calorimetric power. The current design basis calorimetric analysis evaluated power calorimetric uncertainties and concluded that power calorimetric measurements at Turkey Point are accurate to within 2.0% of RTP.

At reduced power levels, feedwater flow uncertainty is the largest constituent element of calorimetric power measurement uncertainties since feedwater flow measurement has large flow uncertainties under low flow conditions. The large feedwater flow uncertainties create the potential for a non-conservative gain adjustment of the NIS. The potential for non-conservative NIS adjustments exists when the NIS is adjusted downward to match calorimetric power based on feedwater flow measurements at reduced power levels. This may result in a non-conservative NIS power level indication when operating at higher power levels. In a design basis event, non-conservative NIS gain adjustments could cause the NIS Power Range High Neutron Flux trip to occur at power levels beyond that assumed in the plant safety analyses.

### Discussion

The potential for non-conservative NIS adjustments was identified by Turkey Point's Nuclear Steam Supply System (NSSS) vendor, Westinghouse. Westinghouse addressed calibration adjustments of the NIS based on reactor power level at the time the calorimetric is performed and recommended:

1. Reactor power <50% of RTP - If the NIS power level is indicating low, then adjust it upward to match the calorimetric. If the NIS power level is indicating high, then adjust it only if the adjustment is required for power ascension. (Typically, this will only occur when the NIS over-power trip setpoint is reduced for a post refueling startup.)
2. Reactor power >50% of RTP - The NIS indicated power level shall be adjusted to within 2% of the calorimetric power.
3. If, within the previous 24 hours a calorimetric/NIS power level comparison has been performed at or near full power (i.e., reactor power  $\geq$  90% of RTP), then no comparison at reduced power levels (i.e., reactor power  $\leq$  90% of RTP) should be performed. The

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Technical Specifications require daily comparisons; therefore, no surveillance is required at the reduced power level condition. Only when the surveillance is required should a reduced power level comparison be made.

As a result of Westinghouse's recommendations, Turkey Point plant procedures 3/4-OSP-059.5 were revised to include precautions alerting the operator to the potential for non-conservative adjustments when performing NIS calorimetric comparisons below 50% of RTP. Controls have been established and implemented to ensure that design basis limits would not be exceeded during a design basis event.

#### **Design and Technical Specification Requirements**

Turkey Point Technical Specification Table 4.3-1, Table Notation (2), requires daily calorimetric power level comparisons with the NIS at power levels above 15% of RTP. If NIS indicated power level deviates by more than 2% from the power level determined from calorimetric measurements, then Table 4.3-1, Table Notation (2), requires that the excore channel gain be adjusted consistent with measured calorimetric power level.

Power level calorimetrics performed at Turkey Point are based on secondary side measurements of feedwater temperature, pressure, flow and steam pressure. Of these secondary parameters, feedwater flow is the only parameter for which uncertainties increase at reduced power levels. Feedwater flow is determined by measuring the differential pressure across the feedwater venturi. The feedwater venturi is factory calibrated to 0.25% accuracy over the feedwater flow range of interest. Transmitters which measure the venturi differential pressure have typical accuracy, drift, temperature, and pressure performance specifications.

The inherent transmitter errors and calibration errors are assumed to be constant over the entire pressure span. However, the relationship of differential pressure to flow is not a constant relationship for varying feedwater flow rates. The relationship between measured pressure differential and flow is a square root function. When the relatively constant differential pressure measurement uncertainties (discussed above) are considered in relationship to the associated flows, the flow uncertainties become significantly larger at low flow conditions.

The Technical Specifications include NIS reactor trip setpoint and Total Allowance (TA) parameters. The Total Allowance represents the difference between the setpoint and the analyzed Safety Analysis Limit (SAL). The basis of the Technical Specifications is to assure that there is sufficient margin between the setpoint and the SAL to account for instrument uncertainties. The inherent calorimetric uncertainties at low power levels appear to represent uncertainties which may not have been accounted for in the documented setpoint analyses.

The Technical Specification required adjustment of NIS for consistency with measured secondary calorimetric power is an instrument gain adjustment. The gain adjustment changes the slope of the NIS response to neutron flux leakage (which is a linear relationship). Consequently, a relatively small adjustment at low power levels could have a large effect on the trip setpoint for higher power levels if the calculated calorimetric power deviates from actual power level, and the NIS is adjusted to meet calorimetric power levels with large uncertainties. An NIS adjustment reducing NIS power to match a calorimetric power level with large uncertainties is non-conservative and could result in a reactor trip occurring at a reactor power level above the currently analyzed SAL.

#### **Interim Measures**

As discussed above, the Turkey Point feedwater flow measurement uncertainty was incorporated into the overall power calorimetric uncertainty determination, and it has been determined that flow uncertainties may have a significant effect on low power calorimetric. However, sufficient margin exists between the reactor trip setpoint and the SAL to account for NIS reactor trip uncertainties, including power calorimetric uncertainties, down to 70% of RTP. This conclusion is consistent with the guidance provided by Westinghouse, and the use of a 70% of RTP threshold is conservative with respect to the 50% of RTP threshold recommended by Westinghouse.

In order to ensure that safety analysis limits are not exceeded during a design basis event, non-conservative adjustments of NIS excore channel gains (i.e., by decreasing the gain adjustments) have been precluded during normal power operation when performing NIS to calorimetric comparisons below 70% of RTP. Increasing gain adjustments during normal power operation, which could result in reactor trip occurring at a reactor power level below the current NIS Power Range High Neutron Flux setpoint, is conservative and, therefore, acceptable. Similarly, a higher power level indication during power ascension would be conservative. During power ascension following refueling outages, additional margin is obtained by reducing the NIS Power Range High Neutron Flux setpoint. As a result of the above, the existing SAL and margins are preserved.

#### **Proposed Technical Specification Revisions**

The proposed changes to the Technical Specifications are intended to remove the requirement which could result in non-conservative gain adjustments of the NIS at reduced power levels (below 70% of RTP). The proposed change is consistent with the guidance provided by Westinghouse.

Turkey Point Technical Specification Table 4.3-1, Table Notation (2), is proposed to be revised as follows:

- (2) "Comparison of calorimetric to excore power level indication above 15% of RATED THERMAL POWER (RTP). Adjust excore channel gains consistent with calorimetric power level, if the absolute difference is greater than 2%. Below 70% of RTP, downward adjustments of NIS excore channel gains to match a lower calorimetric power level are not required. The provisions of Specification 4.0.4 are not applicable for entry into MODE 2 or 1."

Attachment 3 contains a mark-up of the proposed changes to Technical Specification Table 4.3-1, Table Notation (2).

#### Justification For Technical Specification Revisions

- 1) T.S. Table 4.3-1, Table Notation (2) - The word "level" has been added after "power" to ensure the clarity and meaning of the existing text of Notation (2), however this does not change the technical content of Notation (2). An abbreviation "RTP" has been added for use in the newly added third sentence of Notation (2).
- 2) T.S. Table 4.3-1, Table Notation (2) - A third sentence has been added to Notation (2), which further limits the conditions under which downward adjustments of NIS excore channel gains to match a lower calorimetric power level can be performed. The full justification for this change has been addressed earlier.
- 3) T.S. Table 4.3-1, Table Notation (2) - The word "to" has been replaced by "for" to make it consistent with the other Table 4.3-1 notations.

#### Summary

In order to ensure that the SAL are not exceeded during a design basis event, non-conservative gain adjustments of NIS excore channel gains (i.e., by decreasing the gain adjustments) have been precluded when performing NIS to calorimetric comparisons below 70% of RTP. Increasing gain adjustments, which could result in reactor trip occurring at a reactor power level below the current NIS Power Range High Neutron Flux setpoint, is conservative and, therefore, acceptable. Similarly, a higher power level indication during power ascension would be conservative. During power ascension following refueling outages, additional margin is obtained by reducing the NIS Power Range High Neutron Flux setpoint. The proposed change to the Technical Specifications will ensure that the Turkey Point Units 3 and 4 SAL are preserved.

ATTACHMENT 2

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION



DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

**Description of Proposed License Amendments**

**Introduction**

The Nuclear Regulatory Commission has provided standards for determining whether a significant hazards consideration exists (10 CFR 50.92(c)). A proposed amendment to an operating license for a 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. Each standard is discussed below for the proposed license amendments.

**Proposed Change**

Turkey Point Units 3 and 4 Technical Specifications require daily calorimetric power comparisons with the Nuclear Instrumentation System (NIS) at power levels above 15% of RATED THERMAL POWER (RTP). For all power levels above 15% of RTP, the Technical Specifications require that the NIS excore channel gains must be adjusted to within 2% of the measured calorimetric power. At reduced power levels (i.e., less than 70% of RTP), calorimetric power measurement uncertainties are most influenced by the feedwater flow measurements, which have the potential for large flow uncertainties under low flow conditions. These calorimetric uncertainties create the potential for a non-conservative gain adjustment of the NIS when the NIS is adjusted downward to match calorimetric power at reduced power levels, and may result in a non-conservative NIS power level indication when operating at higher power levels. Inappropriate gain adjustments could cause the NIS Power Range High Neutron Flux trip to occur at power levels beyond that assumed in the plant safety analyses. Accordingly, FPL proposes to delete the requirement to adjust NIS downward when operating at less than 70% of RTP.

**Discussion**

- (1) Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed change does not involve any physical changes to the NIS. Implementation of the proposed change does not affect the probability of failure of the NIS and does not alter the method in which protection is afforded by the NIS for the reactor and primary system. Therefore, the proposed change does not result in an increase in the severity or consequences of any accident previously evaluated.

The proposed change in Technical Specifications to remove the requirement which could result in non-conservative gain adjustments of the NIS at reduced power levels (below 70% of RTP), will have no significant effect on the probability or consequences of licensing basis events; and the probability or consequences of an accident previously evaluated for Turkey Point has not been significantly increased. Therefore, operation of the facility in accordance with the proposed amendments would not involve a significant increase in the probability or consequences of an accident previously evaluated.

- (2) Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed change does not result in a change in the method in which the NIS provides plant protection. No change is being made which alters the function of the NIS. Therefore, the proposed change does not create the possibility of a new or different kind of accident nor involve a reduction in a margin of safety as defined in the Safety Analysis Report.

The change in Technical Specifications associated with the removal of the requirement which could result in non-conservative gain adjustments of the NIS at reduced power levels (below 70% of RTP) will not create the possibility of a new or different kind of accident from any accident previously evaluated.

- (3) Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in the margin of safety.

This change in Technical Specifications only affects the removal of the requirement which has the potential for non-conservative gain adjustments of the NIS at reduced power levels (below 70% of RTP); these changes do not alter the manner in which protection is afforded for the reactor and primary system. In addition, the fundamental process for implementation of the calorimetric power/NIS comparison remains the same.

The changes in Technical Specifications associated with the removal of the requirement, which could lead to non-conservative gain adjustments of the NIS at reduced power levels (below 70% of RTP), will not involve a significant reduction in the margin of safety.

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Attachment 2  
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#### Summary

Based on the above discussion, FPL has determined that the proposed amendments do not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (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; and therefore the proposed changes do not involve a significant hazards consideration as defined in 10 CFR 50.92.

**ATTACHMENT 3**

**PROPOSED TECHNICAL SPECIFICATIONS**

**Marked-up Technical Specifications Pages,**

**3/4 3-8 (Provided for information only)**

**3/4 3-11**

