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PROPOSED AMENDMENT TO FACILITY OPERATING LICENSES DPR-31 AND DPR-41, ΔT VERSUS REACTOR POWER SHIFT CHECK, TURKEY POINT, UNIT NOS. 3 AND 4, DOCKET NOS. 50-250 AND 50-251, TAC NO. 6541

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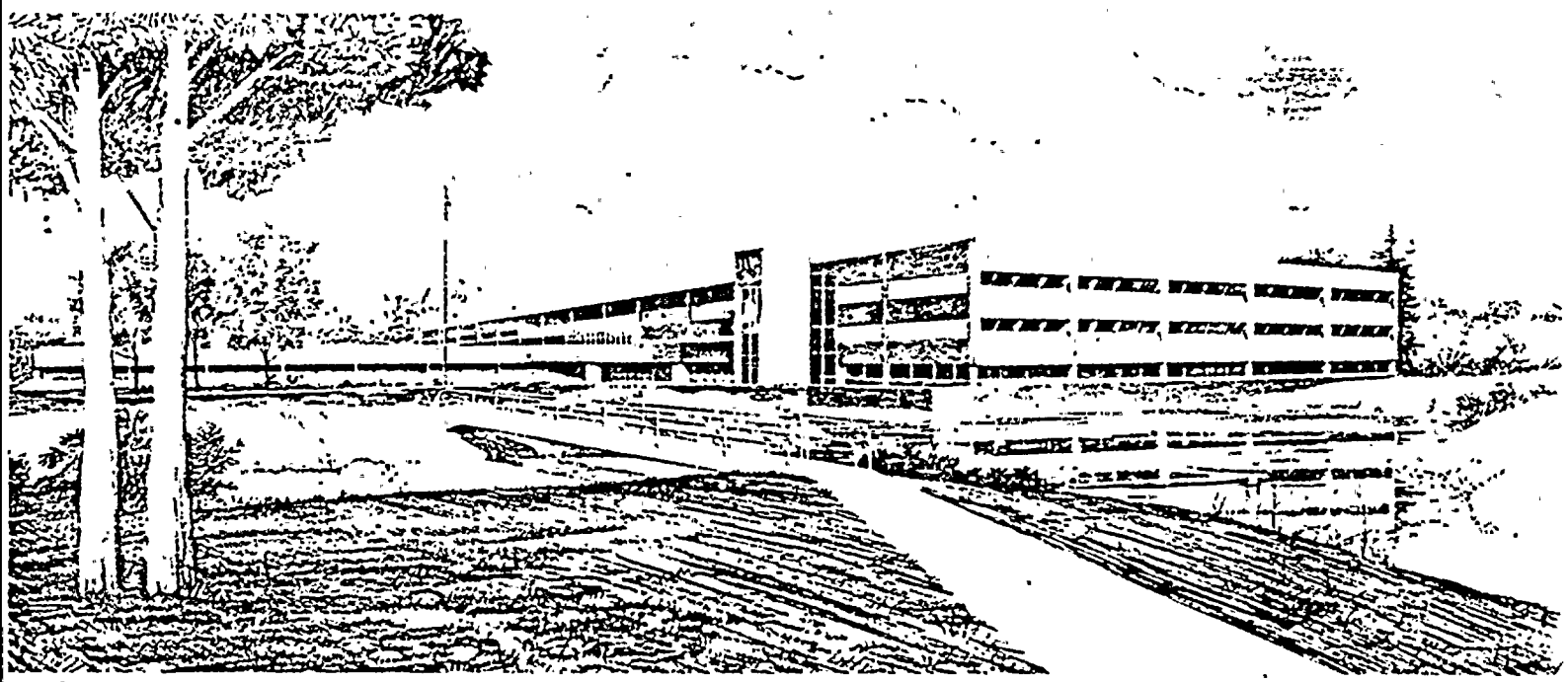

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TECHNICAL EVALUATION REPORT

PROPOSED AMENDMENT TO FACILITY OPERATING LICENSES DPR-31 AND DPR-41
ΔT VERSUS REACTOR POWER SHIFT CHECK

TURKEY POINT, UNIT NOS. 3 AND 4

Docket Nos. 50-250 and 50-251
TAC No. 6541

May 1980

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ABSTRACT

Florida Power & Light Company has requested approval of an alternate method for the shift check of the Nuclear Power Range Instrument channels. This report examines the currently approved method and the proposed method of performing this shift check. Either method is satisfactory for providing the shift check.

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1.0 INTRODUCTION

On January 25, 1977[1], Florida Power & Light Co. (FPL) requested to amend Appendix A of their Facility Operating Licenses DPR-31 and DPR-41. These licenses are for the Turkey Point Station, Units 3 and 4, respectively. The change is to allow a "ΔT versus reactor power curve" or optionally, for convenience, the already approved method, "load versus flux curve."

FPL letters of March 20, 1980[2], and May 1, 1980[3], provided additional information for this review. Additional information is from the Unit Final Safety Analysis Report (FSAR).

2.0 EVALUATION OF THE TURKEY POINT STATION, UNITS 3 AND 4

2.1 Review Guidelines. The intent of this evaluation is to determine if the following guidelines are satisfied by either the original method or the proposed method of performing the shift check, in keeping with the basis and testing requirements of IEEE Standard 338[4]:

1. Guideline No. 1 - The method should minimize the effort and time required to perform checks, functional tests, and calibration verification.

2. Guideline No. 2 - The testing should provide trend data and the capability to observe degradation and the onset of incipient failures.

3. Guideline No. 3 - Testing should be conducted per written test procedures.

4. Guideline No. 4 - The instrument check can be conducted by comparing readings with different variables that bear a known relationship to one another.

Additionally, the unit FSAR requires, in Section 7.4.4C:

5. Guideline No. 5 - The total error from drift in the power range channels should be less than ±1.0% of full power.

2.2 Shift Check Procedures. Table 4.1-1 of the unit Technical Specification requires, at a minimum, the power range channels be checked by the Load Versus Flux curve once per eight-hour shift. This check compares the generator load and back pressure to reactor power.[1] This comparison is done by reading the variables on a graph,[2] as part of Operating Procedure 12304.3. This provides a shift correction factor to be used when the power range channels are read. No calibration adjustments are made as a result of this check. Secondary inefficiencies (that is, opening heater bypasses, temperature change in cooling water, inaccuracies in backpressure readings, etc.) may require large correction factors[1] "to derive the correct power level" using this method.

As ammended, Operating Procedure 12304.3 would allow use of either a ΔT versus power shift check or the load versus flux curve shift check.[3] The ΔT versus power method derives a shift correction factor for the power range channels from a graph, and is dependent on the difference between the hot leg and cold leg temperatures. FPL has determined that the ΔT versus power method is accurate to within ±0.7%, while the original flux versus load method is accurate to within ±1.0%.[3]

Either method of the channel check is only to detect gross failures[1] (that is, blown fuses, defective instruments, etc.). The requirement for daily calibration of the power range channels is not changed by the proposed change in shift check procedures. FPL is committed to perform both the flux versus load and the ΔT versus reactor power methods initially[3], to

acquaint plant personnel with the new method before it is used independently.

2.3 Shift Check Evaluation. Guideline 1 would minimize the effort and time required to perform this channel check. Since secondary inefficiencies are not involved, the ΔT versus reactor power method is viewed as meeting this guideline. Allowing the use of either method allows for possible failure of the instrumentation needed for one method of the channel check, and using the other method while repairs are made.

Guideline 2 requires that the testing provide trend data to observe degradation or onset of incipient failure. Either method of channel check satisfies this guideline.

Guideline 3 requires written test procedures. FPL has provided a marked-up copy of Operating Procedure 12304.3 which allows either method of shift check. This is adequate, as precedures are normally changed after approval to change the method is received.

Guideline 4 allows an instrument check by comparing readings of different variables as long as a known relationship exists. This guideline is satisfied for either method of the power range channel check.

Guideline 5 requires that the total drift in the power range channels be less than ±1.0% of full power. FPL has shown that the proposed ΔT versus reactor power range channel check is conducive to meeting this requirement, and is more accurate than the original flux versus load method.

3.0 SUMMARY

FPL requested approval of an alternate method to provide the shift check of the nuclear power range instrument channels.

The material submitted by FPL identifies Operating Procedure 12304.3 for both methods of the shift check of the power range channels. FPL has shown that the accumulative errors induced by either method will result in

the total drift of the power range channels of less than ±1.0% of full scale. The NRC should allow the use of either method.

4.0 REFERENCES

1. FPL letter, Robert E. Uhrig, to Director of Nuclear Reactor Regulation, "Proposed Amendment to Facility Operating Licenses DPR-31 and DPR-41," January 25, 1977, L-77-32.

2. FPL letter, Robert E. Uhrig, to Office of Nuclear Reactor Regulation, "'ΔT Versus Reactor Power' Curve," March 20, 1980, L-80-93.

3. FPL letter, Robert E. Uhrig, to Office of Nuclear Reactor Regulation, "'ΔT Versus Reactor Power' Curve," May 1, 1980, L-80-134.

4. IEEE Standard 338-1975, "IEEE Standard Criteria for the Periodic Testing of Nuclear Power Generating Station Class 1E Power and Protection Systems," Nuclear Power Engineering Committee of the IEEE Power Engineering Society, Institute of Electrical and Electronic Engineers, 1975.