

REGULATORY INFORMATION DISTRIBUTION SYSTEM (DS)

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 50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251
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 GAMMILL,W. Assistant Director for Operating Reactor Projects (Pre 791

SUBJECT: Forwards response to NRC 790726 & 0808 ltrs re offsite power
 & onsite electrical distribution sys. Distribution sys test
 deferred pending NRC review of encl info.

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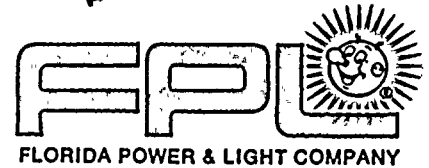
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November 9, 1979
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Office of Nuclear Reactor Regulation
Attn: Mr. William Gammill
Acting Assistant Director
for Operating Reactors Projects
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Gammill:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 & 50-251
Station Electric
Distribution Systems

As a result of NRC letters dated July 26 and August 8, 1979, we have performed evaluations (attached) related to offsite power and the onsite distribution system at Turkey Point Units 3 and 4. Our operating department is now reviewing the evaluations to determine the need for additional Technical Specifications. If such Specifications are needed, we will provide a schedule for their submittal by December 15, 1979.

Based on the results of the evaluations and proposed plant modifications, we have deferred scheduling a distribution system test pending NRC review of this submittal.

Please call if you have additional questions on this subject.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/ld

cc: A. Schwencer, Operating Reactors Branch #1
Harold Reis, Esquire

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In response to NRC letter dated July 26, 1979
Request for Additional Information, Turkey Point 3 and 4

The following response addresses the Request for Additional Information, Turkey Point 3 & 4 enclosed in the NRC letter to FPL dated July 26, 1979. Clarification is provided regarding undervoltage protection. Undervoltage coincidence logic is also described.

The undervoltage protection for Turkey Point is not presently as stated in the Request for Additional Information attached to the letter of July 26, 1979. The undervoltage relays are General Electric 12HGA11J70 models. These relays respond at 40%-50% of 4160V and are used as loss of voltage protection relays.

The loss-of-voltage relaying for Turkey Point is presently provided via two relays per 4160 volt bus; relay A1 and A2 on bus A, relay B1 and B2 on bus B. The A diesel starting sequence and disconnection of offsite power to bus A is initiated by actuation of relay A1 and B1 or by actuation of relay A1 and initiation of the B diesel starting sequence. Similarly, the B diesel starting sequence and disconnection of offsite power to Bus B is initiated by actuation of relay B2 and A2 or by actuation of relay B2 and initiation of the A diesel starting sequence. Thus, a spurious actuation of one undervoltage relay cannot initiate the spurious trip of the offsite power source and a single failure of one undervoltage relay to actuate will not prevent the remaining relays from initiating at least one diesel sequence.

However, as stated in our letter of July 21, 1977, our operating practices provide reasonable assurance that voltage on the auxiliary power system (via the auxiliary transformer or start-up transformer) is maintained above the minimum voltage required for the proper operation of safety and non-safety related equipment.

In order to further ensure that sufficient voltage is present for the auxiliary busses a design modification is in progress to add an undervoltage relay protection system to the present loss of voltage protection scheme.

In response to NRC letter to FPL dated August 8, 1979
Re: Adequacy of Station Electric Distribution Systems Voltages

The following response addresses the NRC concern that the offsite power system (grid) and on-site electrical distribution system is of sufficient capacity and capability to automatically start and operate all required safety loads. Specifically, the NRC required confirmation that potential overloading due to transfer of either safety or non-safety loads and potential starting transient problems do not result in unacceptably degraded voltage to safety loads or spurious shedding of safety loads from the offsite electrical grid.

During 1978 and 1979, the steady state voltage experienced on the transmission system at Turkey Point Plant varied between 235kV and 244kV. The lowest voltage on record at Turkey Point, 228kV, occurred for approximately 10 minutes prior to collapse of the grid on May 16, 1977. From experience, therefore, voltages less than 235kV at Turkey Point are considered transient in nature, with recovery or collapse of the system expected to occur in a short period of time.

Florida Power & Light has no contingency plans to lower transmission voltages to reduce loads. A program is in progress to lower distribution voltages for load reduction, but this would have no effect on the switchyard voltages at Turkey Point.

Voltage calculations were performed based on the Guidelines for Voltage Drop Calculations enclosed in the letter of August 8, 1979. The analyses were performed for an accident condition (which presents the largest load demand) with the unit electrical system connected to the start-up transformer (upon a safety injection signal, transfer to start-up transformer is automatic). Although Turkey Point is a multi-unit station, off-site power is supplied to each unit separately and independently of the other. All automatic actions were assumed to occur as designed and no credit taken for manual load shedding.

A number of loading configurations were analyzed, assuming different combinations of condensate pumps, intake cooling water pumps, and component cooling water pumps were running. For all cases, the following assumptions were made for the calculations:

- 1) Running loads prior to safety injection signal are based on measured loads at the plant with both units at full power. Highest recorded loads on busses were used in calculations.
- 2) The power factor of running loads was assumed as .85.
- 3) Power factor of starting loads assumed to be .20 for 4kV motors, .42 for emergency containment coolers, .35 for emergency containment filters, and .60 for valve motor operators.
- 4) Starting current assumed to be 6 times FLA for motors and 2.1 times FLA for valve motor operators (based on start-up data for St. Lucie Unit 1).
- 5) All running loads were assumed as constant KVA.

A minimum voltage was determined for each bus based on the worst case starting voltage drop to safety equipment. A calculation was then performed for each case to determine the switchyard voltage required to maintain the minimum voltage on all the busses.

On the first round of calculations, several loading configurations resulted in minimum switchyard voltages above the lowest steady state voltage on record at Turkey Point of 235KV.

Special instructions for operation have been formulated to ensure that the Plant is not run in any configuration which would produce results with minimum acceptable voltage greater than 235KV. In addition, the switchyard voltage at Turkey Point is at a seasonal high at this period.

In event of equipment malfunctions requiring operation of the Plant in a configuration other than mentioned above, the operators are instructed to ensure the switchyard voltage remains greater than the analysis voltage for that operating condition, or immediately reduce the output on the unit to allow reduction of loading on the critical switchgear. By taking these administrative actions as outlined above, the voltage analyses verify that sufficient switchyard voltage is available under steady state conditions to run all normal loads and simultaneously start all safety loads without damage or spurious separation from the grid.

In order to further assure that degraded grid voltage would not prevent safety equipment from starting, a design modification is in progress to add undervoltage relays to the 4160V busses and the 480V load centers. Until such time that modification can be accomplished, the above administrative actions will be instituted.



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