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PLANT NAME: Turkey Pt. Units 3 & 4

ENCLOSURE: Turkey Pt. Units 3 & 4 Overpressurization Issue....

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FLORIDA POWER & LIGHT COMPANY

Regulatory Docket File

October 15, 1976
L-76-359

Office of Nuclear Reactor Regulation
Attention: Mr. George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Lear:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Reactor Vessel Overpressurization

Florida Power & Light Company was requested by your letter of August 11, 1976 to evaluate system designs for susceptibility to overpressurization events, analyze the possible events, and propose modifications to systems and procedures to reduce the likelihood and consequences of such events. In our letter L-76-325 of September 2, 1976, we stated that a task group of utilities had been formed to evaluate this problem, and that we would review our operating procedures to determine possible revisions to minimize the likelihood of overpressurization events. We also stated that, at the end of the 60-day period addressed in your letter, a progress report would be submitted. Our progress report is attached.

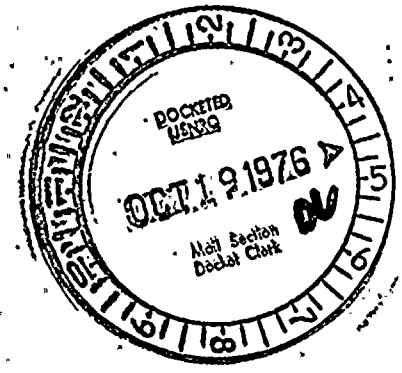
Very truly yours,

Robert E. Uhrig
Vice President

REU/MAS/cpc

Attachment

cc: Mr. Norman C. Moseley
Jack R. Newman, Esquire



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ATTACHMENT

TURKEY POINT UNITS 3 & 4
OVERPRESSURIZATION ISSUE

A meeting was held by a group of utilities with Westinghouse plants on September 23, 1976, to review and discuss actions which had been performed by the utilities and Westinghouse. The major items reviewed and the conclusions reached at that meeting are as follows:

A. The overpressurization events which have occurred on Westinghouse designed plants were discussed and the cause of each of the events was noted. In addition, the effectiveness of assumed mitigating systems, such as relief valves, was considered. The review of these occurrences indicated that a single equipment failure or operator error caused each event, and that some form of pressure relief would reduce the consequences of such events.

B. The sub-grouping of Westinghouse plants was considered as a possible means to reduce the amount of analysis necessary to evaluate the effectiveness of the pressurizer power operated relief valves. The parameters which would affect the analysis were reviewed and the results indicated that plant sub-groups were not necessary. Westinghouse plants are sufficiently similar and can be enveloped by using a bounding analysis.

C. The pressurizer power operated relief valves were found to have significant water relief capability and relatively fast opening times of approximately 2-seconds.

D. The preliminary evaluation of transients induced by mass injection from all possible dynamic sources indicates that the pressurizer power operated relief valves have the proper mass flow characteristics to limit pressure surges caused by such events.

E. The preliminary evaluation of transients induced by component temperature differences occurring after a reactor coolant pump start indicates that the pressurizer power operated relief valves may be able to mitigate the pressure surge following such an event. The equipment temperature differences initiating such a pressure transient will require a detailed transient analysis to determine whether or not system modifications are needed.

ATTACHMENT (Continued)

F. The preliminary evaluations indicate that the pressurizer power operated relief valves may be capable of providing overpressure protection during solid system operation. Therefore, overpressurization transients will be analyzed assuming a mitigating system employing the pressurizer power operated relief valves.

G. A subcommittee was formed to evaluate possible overpressurization events for the purpose of defining the conditions and parameters to be included in the transient analysis. This subcommittee was directed to meet with Westinghouse and reach concurrence as to events and conditions to be analyzed. This subcommittee met on September 26, 1976.

H. A second subcommittee was also formed to review operating parameters, such as chemistry requirements and temperature difference limits, which affect the implementation of procedures intended to minimize solid system operation by maintaining a steam bubble at low reactor coolant system average temperatures. This second subcommittee also was directed to consider an action plan that could be initiated if Appendix G limits were exceeded. This subcommittee met on September 27, 1976.

As a result of the meetings described above, utilities with Westinghouse plants have agreed that the overpressurization issue can be resolved by using transient analysis. The analysis will consider potential overpressurization events induced by either mass-input or heat-input. The range of system and component physical parameters, performance characteristics, and operating limits for Westinghouse plants will be used to bound the analysis. Conservative assumptions will be employed to characterize the relief valve performance.

The single failure criteria presented in your letter of August 11, 1976, will be applied. That is, no single event, whether equipment failure or operator error, will be permitted to result in Appendix G limitations being exceeded. If the overpressurization transient is caused by an equipment failure or operator error, that failure or error will be considered the single failure event and all subsequent actions resulting from the failure or error which could reduce the effectiveness of the mitigating system will be considered and included in the analysis.

ATTACHMENT (Continued)

Preliminary evaluations indicate that it is not practical to use a relief system to protect a solid reactor coolant system from an inadvertently opened safety injection accumulator which is charged to its design pressure. However, administrative controls similar to the controls employed for assuring that the accumulator valves are open during normal operation can be used to provide adequate protection against overpressurization during solid system operation. Our procedures currently incorporate such controls.

It should be noted that with the administrative controls and "single failure" criteria applied, complete assurance of remaining within Appendix G limits cannot be provided. However, with whatever modifications are installed as a result of the analysis addressed above, the consequences of an overpressurization transient will be significantly less severe. Since the remote possibility of exceeding Appendix G limits by a small amount will still exist following installation of any mitigating system, an action plan has been developed for such events. The action would be to perform appropriate analyses to verify the acceptability of continued operation and provide a report of the event and analyses to the NRC.

The analysis of postulated overpressurization transients will be a major activity with an estimated duration of six months. Following completion of the analysis, modification of Turkey Point Units 3 and 4 will be initiated consistent with the analytical results. The schedule for the modification activity will be provided following completion of the analysis and detailed identification of the modification performance requirements.

We have also reviewed the procedures and the administrative controls currently exercised at Turkey Point Units 3 & 4 during periods in which the plant is in a solid water condition. It is felt that the following controls meet the objectives of limiting the time of water solid operation and avoiding plant conditions that have the potential of initiating overpressurization transients:

1. Normal heatup and cooldown procedures act to minimize the time the plant is in a water solid condition. However, these procedures must also be consistent with a technical specification limit of 200°FΔT between the pressurizer and RCS loops and limitations on reactor coolant pressure during operation of the reactor coolant

ATTACHMENT (Continued)

pumps. These requirements limit the times during which a steam bubble may be maintained.

2. Although it is not an explicit requirement, it is standard practice that the plant is not cooled down in excess of that required by the maintenance to be performed.

3. Below 1000 psia the valves at the discharge of the S. I. accumulators are closed and locked. As an additional precaution against inadvertent actuation, the breakers for the valve motor operators are also opened.

4. During plant cooldown the valves at the discharge of the high head safety injection pumps to the RCS cold legs are closed and locked. As an additional precaution against inadvertent actuation, the breakers for the valve motor operators are also opened. The power to the safety injection pumps is not locked out since these pumps are shared between the units.

5. During plant heatup, a steam bubble is drawn in the pressurizer before the Residual Heat Removal System is removed from service.

6. During plant cooldown, the Residual Heat Removal System is placed in service prior to collapse of the pressurizer steam bubble.