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DESCRIPTION:

Ltr re our request....furnishing info with regard to ECCS analysis for two loop operation.....

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ACKNOWLEDGED

PLANT NAME: Turkey Point 3 & 4

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FLORIDA POWER & LIGHT COMPANY

May 19, 1975
L-75-237

REGULATORY DOCKET FILE COPY

Mr. Benard C. Rusche
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Rusche:

Re: Turkey Point Units 3 & 4
Docket Nos. 50-250 & 50-251
ECCS Analysis for Two Loop Operation

This is in response to a request by your Staff that we supply information on the capability of the Turkey Point Emergency Core Cooling System (ECCS) to provide adequate cooling in case of a Loss of Coolant Accident (LOCA) when operating the plant with one idle loop.

On March 11, 1975 we submitted to you the ECCS analysis for 3 loop operation at design power. The consequences of a LOCA when operating this plant, which has no isolation valves, with one idle reactor coolant pump at a maximum of 60% of full power will not be as severe as those of a LOCA occurring with 3 loop operation at full power. Reasons for this become clear by considering the comparison of the various phases of the accident transient for three loop and two loop operating conditions.

1. Blowdown: In comparing three loop and two loop LOCA's the predominant factor influencing the blowdown transient is the effect of reduced core power required during two loop operation. For any given break size, including the "limiting" break, the core mass flow transient will remain essentially the same for the cases because the energy and driving forces in the reactor coolant system, i.e. pressure and temperature, are similar. The idle reactor coolant pump may cause a slight time shift in the core flow characteristics, but the trends will remain the same. Therefore, because of the reduced core power, coolant quality in the core during blowdown will be significantly lower for two loop operation and the clad and pellet temperatures will be lower at the end of blowdown.

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2. Refill: Since the blowdown hydraulic transients are similar and emergency core cooling system performance for the two cases is the same, lower plenum refill and bottom of core recovery will not be altered significantly.

3. Reflood: One important factor that influences the reflood transient is the containment pressure. The conservatively calculated ECCS containment pressure transient will be only slightly affected because the ECCS mass, RCS energy and rate of explusion of the primary coolant to containment will be about the same for the two cases. Another factor in the reflood calculation that must be considered is, again, core power. Sensitivity studies performed with the Westinghouse Appendix K ECCS evaluation model show that decreasing core power and core heat release in the reflood calculation result in a more effective core reflood transient with respect to core cooling. The decrease in core power for two loop operation will, therefore, improve the reflood transient.

In summary, since the core conditions at the end of blowdown will be improved for the two loop operation analysis and the refill/reflood transient is, at worst, the same for three loop and two loop operation, a LOCA postulated to occur during two loop operation will result in lower calculated peak clad temperatures than for 100% power.

For additional conservatism it is proposed that the present Technical Specifications be amended so that for two loop operation the permissible maximum peaking factor, Fq, be reduced to 80% of the value permitted by Section 3.2.6a of the Turkey Point Technical Specifiations. This would lower the peak linear heat rate during two loop operation to 10.9 kw/ft, compared to the 13.62 kw/ft value used in the 3 loop ECCS analysis. According to sensitivity studies described in WCAP-8340, the peak clad temperature following a LOCA would be lowered another 360°F as a result of this reduction in heat rate, bringing the clad temperature well below 1840°F.

Very truly yours,

Robert E. Uhrig

Robert E. Uhrig
Vice President

REU:nch

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