P.O. BOX 3100 MIAMI, FLORIDA 33101

FLORIDA POWER & LIGHT COMPANY

May 16, 1973

Mr. Frank E. Kruesi, Director
Directorate of Regulatory Operations
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Kruesi:

Re: Turkey Point Plant Unit No. 4
Docket No. 50-251

Just prior to issuance of Facility Operating License DPR-41 for Turkey Point Plant Unit No. 4, Reactor Inspector R. C. Lewis of Region II pointed out to us that modifications made to the residual heat removal (RHR), spent fuel pit and the nonregenerative (letdown) heat exchangers (HX) to meet design flow rates without potential vibration problems should be reported in accordance with 10 CFR 50.55(e). This report covers the subject heat exchangers.

Early in 1972 the Nuclear Steam Supply System supplier uncovered a potential vibration problem with similar heat exchangers at other sites. In August of 1972 they recommended the following component cooling water flow limits:

	Design	Pre-Alteration Limit
RHR HX	5.12 x 10 6lb/hr(10,400 gpm)	4.16 x 10 6lb/hr(8400 gpm)
Spent Fuel Pit HX	1.4 x 10 6lb/hr(2,800 gpm)	1.18 x 10 6lb/hr(2380 gpm)
Nonregen (letdown) HX	0.494 x 10 6lb/hr(1000 gpm)	0.417 x 10 6lb/hr(840 gpm)

Further design review by the supplier in April 1973 established new flow limits as follows:

	Design (GPM)	Pre-Alteration Limit (GPM)
RHR HX	10,400	9,700
Spent Fuel Pit HX	2,800	3,100
Nonregen (letdown) HX	987	987

The supplier had concluded that flow induced vibration could occur in the long unsupported tube length between alternate-segmented baffles if flow was greater than that in the right-hand column above. The vibration would result from either vortex shedding excitation or fluidelastic excitation.

The natural frequency of the subject heat exchangers of Unit 4 has been changed by the installation of stabilizing bars between the tube rows and banding of the bundles by the bar locations.

An evaluation of the effect of operating a RHR HX with 8320 gpm component cooling shell side flow was made assuming the core had operated at 2200 MWt for approximately a year. Two cases were considered:

1. Normal plant cooldown
2. Post accident recirculation

The first item, normal cooldown, is only slightly affected by changes in the cooling water flow rate. For example, with the original design flow of 10,400 gpm to each residual heat exchanger, the temperature of the reactor coolant would be decreased from 350°F to 139°F in 13.5 hours of residual loop operation while with the reduced cooling water flow rate of 8320 gpm, the temperature would be decreased from 350°F to 140°F in the same time period.

The second item, post accident recirculation, was evaluated assuming that the residual heat removal system was placed in service at 30 minutes following reactor trip, the earliest time to transfer from the injection to the recirculation mode. Again the cooling water flow to the shell side of the residual heat exchangers was assumed to be decreased, because of the throttling, from 10,400 gpm to 8320 gpm. The effect of the reduced cooling water flow is to increase the differential temperature of the cooling water, between the outlet and inlet to the residual heat exchangers, from 13°F to 18°F. This small increase in component cooling water temperature as it passes through the residual heat exchangers results in about a 1/2°F increase in the temperature of the water in the containment sump in order to transfer the required heat to the cooling water at 30 minutes following reactor trip.

The subject Unit 4 heat exchangers will be operated at the design flow rates given above. The Unit 3 heat exchangers are being operated at the April limits above (except the spent fuel pit HX, which has been altered) and will be modified prior to startup after the first refueling.

The failure to report this work previously was inadvertent and not deliberate.

Yours very truly,

James Coughlin

James Coughlin
Vice President

JC:rp

cc: Mr. Norman C. Moseley
Mr. A. Giambusso
Mr. Jack R. Newman