

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE UNIT NO. 1

REPORTABLE OCCURRENCE NO. 335-B-79-02

TITLE: Zone of Mixing - Surface Temperature Rise

A. Description, Analysis and Evaluation

On March 14, 1979, the Ryan thermographs located in the St. Lucie ocean intake and discharge areas were removed from the ocean for regular chart changes and calibration. When the data from the charts was analyzed it was discovered that on two (2) days during February the zone mixing surface temperature rises were in excess of 5.5°F (3.1°C). On these two days ΔT 's as high as the following were recorded:

<u>Date</u>	<u>Temperature Rise</u>
February 26, 1979	8.5°F (4.7°C)
February 27, 1979	6.7°F (3.7°C)

Two Ryan thermograph instruments, one primary and one replicate, are normally placed in both the intake and discharge areas at the St. Lucie plant.

The four Ryan thermographs which were in the ocean at the time of the events reported herein were placed in the water on January 31, 1979. On February 25, 1979, one of the instruments in the intake area failed. Therefore, the data from it was unavailable for the times of concern. In the discharge, both instruments were operating during the month. Even so, confidence

7904240466

in the data was eroded because the chart advancing mechanism in both instruments operated at a rate faster than the design rate. This resulted in a pen trace which was shorter than the premarked length corresponding to the number of days the chart was in the ocean. This would tend to compress the data and may distort the observed ΔT . Also, the pen trace length differed between the two instruments. These facts made the reading of the charts extremely difficult since it was unclear whether either chart drive mechanism operated at a uniform speed throughout the month. It was assumed that they did, however, and the charts were read accordingly. This probably introduced some inaccuracy into the results.

B. Cause

There appears to be no plant related explanation for the events reported. The maximum temperatures in the discharge canal for February 26 and 27 were 92°F (32°C) and 93°F (34°C) respectively. These are well below the maximum allowable temperature of 111°F (44°C). This magnitude of discharge canal temperature has been effectively dissipated in the past without exceeding the ocean temperature rise limitations. No other plant condition existed which might have adversely affected the ocean temperature rise. Power output was approximately 100% and no circulating water pumps were out of service.

There are however, inherent difficulties in determining real temperature differences in the ocean. These arise from factors such as instrument limitations, the ability to accurately measure the ambient ocean temperature, and the natural temperature fluctuations in the ocean. A combination of these factors most likely is the cause of the reportable events.

C. Corrective Action

The recorders which were installed in the intake and discharge areas are being returned to the vendor for servicing. FPL keeps twelve (12) of these instruments on hand so that adequate replacement instruments are available in case of malfunction.

The Ryan thermographs are the most cost effective means of demonstrating compliance with ETS 2.1.1 which limits the temperature rise in the ocean. FPL believes however that difficulties will continue to exist in the area of data reliability and availability. This is a result of the hostile environment into which the instruments are placed.

