B 05/19/78

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)
DISTRIBUTION FOR INCOMING MATERIAL 50-250/251

REC: SCHWENCER S
NRC

ORG: UHRIG R E
FL PWR & LIGHT

DOCDATE: 05/15/78
DATE RCVD: 05/19/78

DOCTYPE: LETTER NOTARIZED: NO

COPIES RECEIVED
LTR 3 ENCL 3

SUBJECT:
RESPONSE TO NRC LTR DTD 03/02/78...FORWARDING INFO RE APPLICANT"S REQUEST TO USE THE SOUTH DADE METEOROLOGICAL FACILITY FOR SUBJECT FACILITY"S.

PLANT NAME: TURKEY PT #3
TURKEY PT #4

REVIEWER INITIAL: XJM
DISTRIBUTER INITIAL: DL

***************** DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS *****************

GENERAL DISTRIBUTION FOR AFTER ISSUANCE OF OPERATING LICENSE.
(DISTRIBUTION CODE A001)

FOR ACTION: BR CHIEF SCHWENCER**W/7 ENCL

INTERNAL:
REG FILE**W/ENCL
I & E**W/2 ENCL
HANAUER**W/ENCL
EISENHUT**W/ENCL
BAER**W/ENCL
EEB**W/ENCL
J. MCGOUGH**W/ENCL
NRC PDR**W/ENCL
OELD**LTR ONLY
CHECK**W/ENCL
SHAO**W/ENCL
BUTLER**W/ENCL
J COLLINS**W/ENCL

EXTERNAL:
LPDR'S
MIAMI, FL**W/ENCL
TIC**W/ENCL
NSIC**W/ENCL
ACRS CAT B**W/16 ENCL

DISTRIBUTION: LTR 40 ENCL 39
SIZE: 1P+1P+6P

CONTROL NBR: 781390009

*********************************** THE END ***********************************

P. O. BOX 013100, MIAMI, FL 33101
FLORIDA POWER & LIGHT COMPANY

May 15, 1978
L-78-171

Office of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors
U. S. Nuclear Regualtory Commission
Washington, D. C. 20555

Dear Mr. Schwencer:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Meteorological Facility

The attached information is submitted in response to your letter of March 2, 1978 which requested additional information regarding our request to use the South Dade meteorological facility for the Turkey Point Units.

Very truly yours,

Robert E. Uhrig
Vice President

REU/GDW/bb

Attachment

cc: J. P. O'Reilly, Director Region II
Robert Lowenstein, Esq.

7813900009

REQUEST FOR ADDITIONAL INFORMATION

TURKEY POINT UNITS NOS. 3 AND 4

DOCKET NOS. 50-250 AND 50-251

DECOMMISSIONING OF TURKEY POINT METEOROLOGICAL FACILITY

1. Provide a complete description of the information to be transmitted from the meteorological tower at South Dade to the control room for Turkey Point, Units 3 and 4, including the levels of measurement of meteorological parameters (wind speed, wind direction, and vertical temperature gradient), the method of transmission of the information (considering reliability and likelihood of interference or interruption), and the display of the information in the control room.

2. Additional clarification is needed concerning the representativeness of the measurement of vertical temperature gradient from South Dade for use as a real-time indicator of atmospheric stability at Turkey Point. Provide an analysis of the differences between the measurements of vertical temperature gradient made at Turkey Point and South Dade, including a discussion of the effects of type of measurement (temperature subtraction versus direct measurement), the difference in intervals of measurement (5m to 35m at Turkey Point and 11.7m to 58m at South Dade), and the acknowledged influences of nearby structures on the measurement at Turkey Point. Determine if the effects are discernable as function of wind speed, wind direction, or time of day, with particular attention to the periods when large differences in stability conditions appear to exist between Turkey Point and South Dade. Also discuss the relative proximity of each meteorological tower to the Atlantic Ocean and the effects on real-time measurements of vertical temperature measurements representative of Turkey Point.

REQUEST FOR ADDITIONAL INFORMATION

TURKEY POINT UNIT NOS. 3 AND 4

DOCKET NOS. 50-250 AND 50-251

DECOMMISSIONING OF TURKEY POINT METEOROLOGICAL FACILITY

I. TRANSMISSION OF METEOROLOGICAL INFORMATION

a) The high-level (60 meters) wind speed/direction sensors and ΔT (60 meters less 10 meters) recordings on the SOUTH DADE PLANT Meteorological tower will be used to meet these data needs for Turkey Point Plant. The PSD tower is located about 8 miles, SW, of Turkey Point Plant.

In addition, the low-level wind speed/direction sensors will be located on a tower (at a height of 10 meters) near the Land Management Office at Turkey Point Plant. This area is located about 0.5 miles (WSW) from the nuclear reactors.

b) All data will be transmitted to the reactor control room by telephone lines. Interference or interruption of data transmission by this methodology should be minimal.

c) The transmitted signals will be in the analog form and recorded on strip charts in the control room. Individual charts will display the low-level and high-level wind data and the ΔT data.

II. CLARIFICATION - REPRESENTATIVENESS OF SOUTH DADE VERTICAL TEMPERATURE GRADIENT

Currently, there is actually no difference in the methods used to calculate temperature differences between the two sites. At South Dade, ΔT's are not measured "directly". Identical probes measure temperatures at the upper and lower levels, then a Climatronics translator circuit subtracts the lower from the upper temperature (as is done manually for Turkey Point) to calculate the ΔT. These electronic calculations can be expected to be more precise than manual averages of points plotted on an 11" wide chart with a range of 100°F.

The difference in intervals has been discussed in section 4.1.4.1 of the submission to NRC of November 12, 1976 and in Appendix A of our letter to NRC of May 27, 1977. All values have been normalized, so the smaller interval must be extrapolated farther to obtain the normal (°C/100m) values. This makes the readings more sensitive to change at Turkey Point, but there are so many influences on PTP's instruments so that no real correlation of data can be made.

These influences may include heat island effects from the power plant; rapid evening cooling when building shadows reach the instruments; excessive heat load on southwestward facing instruments (a situation which has been corrected); initial heating and subsequent evaporative cooling due to steam plumes seen in the vicinity of the water tower on which the instruments are mounted; abnormal heating or cooling of the upper probe on top of the water tank by the filling of the tank; microscale influences of the shallow water a very short distance away; and rapid low-level changes due to sandy soil in the vicinity of the water tower. The fact that a temperature probe 5 meters above the ground should be subject to more extreme changes than an instrument at 10 meters is acknowledged, but the above mentioned influences obscure verification of this at Turkey Point.

The influences of nearby structures consist mainly of heating from the two fossil-fuel units and afternoon shadows from the same buildings. Additionally, influences from nearby steam lines and from the water tower itself might be expected.

In general, increased wind speeds will tend to neutralize stability in a normal environment due to mixing caused by mechanical turbulence. Onshore wind directions tend to retard morning instability at Turkey Point and to virtually eliminate extreme stability (Categories F and G) at both locations, as can be seen by comparing Table 4.1.4.1-1 of the 11/12/76 submission with Table 3 of the 5/27/77 submission.

South Dade, at just over two miles from Biscayne Bay, must be considered as in a coastal environment. Even when onshore winds do indicate a different environment at Turkey Point, emissions from there will quickly be transported into the regime being measured by South Dade.

Specific discussion of the 43 anomalies considered in the referenced Table 3 follows.

A. AN INVESTIGATIVE OF ANOMALIES IN TEMPERATURE LAPSE RATES MEASURED AT TURKEY POINT AND THE SOUTH DADE SITE DURING ONSHORE WIND CONDITIONS

INTRODUCTION

During the period March 10, 1975 to September 9, 1975 a total of 4117 observations at Turkey Point and South Dade were compared to show that measured conditions at South Dade are representative of the conditions at Turkey Point. Since the wind and temperature measuring instruments at Turkey Point are subject to influences from the power plant structures located in close proximity to the west, an additional comparisón was made solely for the periods when winds at both levels for both sites were blowing "onshore", that is from the north-northeast clockwise through the south-southeast. Studying only these conditions should minimize any wind field disturbances or heat island effects.

PERTINENT CASES

2263 (55%) of the observations met this criteria. Of these, 43 (1.9%) showed sufficient contradiction in measured lapse rates to warrant investigation. The cases considered are those where one station is extremely unstable (Category A; $\Delta T \leq -1.9\ ^{o}C/100\ m$) while the other is stable (Categories E, $\overline{F}$, G; $\Delta T > -0.5^{o}\ C/100\ m$).

Specifically, these were:

South Dade: A,	Turkey Point:	E	30 cases
South Dade: A,	Turkey Point:	F	1 case
South Dade: E,	Turkey Point:	A	12 cases

The date and hour of these cases follow:

SOUTH DADE UNSTABLE - TURKEY POINT STABLE

Case	Date	Hour	Case	Date	Hour
1.	Mar 24	09	17.	Jul 24	13
2.	Mar 28	15	18.	Aug 5	9
3.	Apr 5	16	19.	Aug 7	17
4.		17	20.	Aug 14	9
5.	Apr 6	17	21.	Aug 19	10
6.	Apr 17	17(F)	22.	Aug 20	11
7.	Apr 21	9	23.	Aug 23	12
8.	Apr 23	10	24.	Aug 24	9
9.		11	25.		12
10.	Apr 24	10	26.	Aug 26	14
11.	Apr 25	9	27.		15
12.	May 23	14	28.		17
13.		16	29.	Sep 2	9
14.	May 26	16	30.	Sep 3	11
15.	May 29	15	31.	Sep 4	9
16.	Jul 17	10			

SOUTH DADE STABLE - TURKEY POINT UNSTABLE

Case	Date	Hour	Case	Date	Hour
32.	Mar 10	9	38.	Jul 21	15
33.	Mar 12	10	39.		16
34.		11	40.	Aug 24	16
35.		12	41.	Aug 26	12
36.	Apr 22	19	42.	Aug 29	14
37.	Jul 21	14	43.	Sep 9	13

Of the 43 anomalies:

21 were attributable to equipment failure
21 were attributable to meteorological effects
1 was attributable to analysis error

EQUIPMENT FAILURE

Cases 6-11. The Turkey Point mid-level (35m) probe was noted to be erratic during this period. The instrument was replaced on April 25.

Cases 12-15. Turkey Point mid-level temperature readings consistently high during the afternoon. Probably caused by conductive heating due to probe touching shield.

Case 23. Single abnormally high reading from mid-level temperature probe at Turkey Point. Increased 3.4°F between 1100 and 1200, while the low-level temperature only increased 2.1°F. Then, the 35m temperature dropped 0.4°F the next hour, while the 5m temperature rose 2.4°F, as expected (sky cover 2/10 to 3/10 opaque at Homestead AFB). Turkey Point indicated Category A stability on both sides of the anomalous hour.

Cases 33-35. The upper (60m) probe of the South Dade "B" system consistently reading 2.4°F warmer than the "A" system instrument, which was in phase with Turkey Point. (Note that calculations for South Dade were based on B-system measurements).

Case 36. As in cases 6-11, the Turkey Point 35m probe was behaving erratically.

Cases 37-39. South Dade "B" system malfunction. Identical upper and lower readings for 20 hours, indicating translator card not converting ΔT's. Also 18 of the 20 readings reported temperature to whole degrees; the other two reported temperature to 0.5 degrees, another indication of probable translator malfunction. "A" system was acting normally and in phase with Turkey Point.

Cases 40-42. The South Dade 10m B probe was consistently reading 0.7° to 0.8°F lower than the A probe. Rain showers in the vicinity tended to stabilize conditions, but not to the extreme shown.

METEOROLOGICAL EFFECTS

Retardation of morning low-level heating at Turkey Point due to modification by the Atlantic Ocean was noted in cases 1, 18, 20-22, 30 and 31. Case 32 indicated accelerated warming at Turkey Point at a time when the prevailing temperature was substantially cooler than the water temperature. In all cases, stabilities between Turkey Point and South Dade were in phase within two hours, usually within one hour.

Cases 2-5 appear to have been caused by rapid evening stabilization at Turkey Point due to shadows from the nearby structures falling on the instruments.

Rain showers at Turkey Point caused stabilization in cases 16, 17, 19 and 24-29. On the occasions when showers were falling at South Dade and not at Turkey Point, instability was neutralized, but not to the extremes at Turkey Point. This is attributable to the difference in surfaces at the two sites; marshy at South Dade and sandy at Turkey Point. The sandy soil would tend to reflect more rapid temperature changes.

ANALYSIS ERROR

Case 41. South Dade temperatures for both systems at both levels were missing. The analysis assumed $\Delta T = 0$ and assigned an E stability to this hour. This error was not noted elsewhere in the study. Dames & Moore has been notified and they are taking steps to correct the error.

CONCLUSIONS

None of the 43 cases contradicts the premise that South Dade measurements are representative of Turkey Point conditions. The effects of building shadows and rapid low-level cooling due to showers at Turkey Point can be attributed to less than ideal instrument placement. In the cases where ocean temperatures were modifying Turkey Point stabilities, westward (inland) transport of any emissions from Turkey Point plant would soon place any such materials in a regime with characteristics more closely resembling conditions at South Dade than at Turkey Point. Thus, it can be argued that South Dade measurements more closely represent the true mesoscale conditions at Turkey Point.