Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

July 12, 1994

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. W. Jeffrey Pardue, C.E.P., Manager
Environmental Programs - Energy Supply
Florida Power Corporation
P. O. Box 14042
St. Petersburg, FL 33733

Dear Mr. Pardue:

RE: Florida Power Corporation
Construction Permit Amendments
AC64-191015, PSD-FL-167, DeBary
AC49-203114, PSD-FL-180, Intercession City

The Bureau of Air Regulation received your June 23, 1994, letter concerning the above referenced request, along with a $250 processing fee. Since this request will necessitate two separate department actions, we will need an additional $250 to begin processing the amendments. If you have any questions, please call Patty Adams at (904)488-1344.

Sincerely,

Patty Adams for

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/pa

cc: Charles Logan

Florida Power
CORPORATION

0004895

June 23, 1994

Mr. John C. Brown, P.E.
Administrator of Permitting
Division of Air Resource Management
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Brown:

Re: Request to Amend DeBary Construction Permit AC 64-191015 PSD-FL-167
Request to Amend Intercession City Construction Permit AC 49-203114 PSD-FL-180

Florida Power Corporation (FPC) requests that the permits referenced above be amended to incorporate an ISO corrected NO_x limit of 57 ppm @ 15% 0_2, a fuel bound nitrogen allowance and clarifying language on the application of a heat input vs. ambient temperature curve. Included in this submission are detailed discussions supporting each of these requested changes. The request to amend these permits is consistent with FPC's understanding of the strategy mutually agreed upon by FDEP and FPC at the meeting held in Tallahassee on February 3, 1994 to resolve outstanding permitting issues at these facilities.

Attachment #1 contains the rationale supporting the addition of a new ISO-corrected NO_x limit of 57 ppm @ 15% 0_2 for these facilities. The current limits of 42 ppm @ 15% O_2 and 182 lb./hour @ 59°F would remain unchanged. This limit would result in no increase in emissions from these sources, therefore, this change would not require a modification of the permits. This change would allow the use of the GE NO_x algorithm to continuously adjust water injection based on ambient temperature and humidity. In addition to NO_x control, this algorithm eliminates the current procedure requiring over-injection of water, thus conserving one of Florida's most valuable resources.

Attachment #2 contains the rationale supporting the use of a fuel bound nitrogen (FBN) allowance in determining allowable NO_x emissions. This allowance was requested in the PSD application for these facilities and FPC is requesting the BACT determination be corrected to allow the use of this FBN allowance. As detailed in Attachment #2, FPC is proposing to use the FBN allowance in the determination of allowable excess emissions as provided in 40 CFR 60.334(c)(1).

Attachment #3 explains FPC's proposal for the use of a heat input vs. ambient temperature curve during compliance testing. FPC is requesting clarifying language be added to the construction permits which incorporates current/proposed FDEP guidance on this issue.

It is FPC's desire to meet with you and your staff at your office in the near future to discuss this submittal and respond to any questions resulting from FDEP's initial review. We will be contacting you during the next several days in order to schedule this meeting.

A check in the amount of $250.00 for the processing of this permit amendment request is attached. Please contact Mike Kennedy at (813)866-4344 or Kent Hedrick at (813)866-4281 if you have any questions or comments.

Sincerely,

W. Jeffrey Pardue, C.E.P., Manager
Environmental Programs - Energy Supply

KDH
Attachments
cc: Mr. Mike Harley, FDEP Tallahassee
Mr. Alexander Alexander, FDEP Central District

Attachment 1

NOx ISO-Corrected Limit

Discussion of Separate ISO-Based NOx Limit

New DeBary and Intercession City Combustion Turbines

1.0 Introduction

Florida Power Corporation (FPC) is proposing to add a separate ISO-based NOx concentration limit of 57 ppm for the new combustion turbines at its DeBary (P7 - P10) and Intercession City (P7 - P10) facilities. The current mass emission limits in lbs./hour and tons/year will not change. In addition, the proposed ISO-based limit is equivalent to the limit of 42 ppm at 15% O_2 given in the BACT determination for both facilities.

2.0 Discussion

The construction permit applications for the new GE Frame 7EA combustion turbines at both the DeBary and Intercession City facilities contained a proposed NOx concentration limit of 42 ppm corrected to 15% O_2. This limitation was adopted as part of the BACT determination for both facilities and incorporated into the construction permits. The BACT determination supersedes the emission limitations established in the federal New Source Performance Standards (NSPS), which are codified at 40 CFR Part 60, Subpart GG.

It was subsequently determined that the BACT limit established for the new GE Frame 7EA combustion turbines is to be corrected to ISO conditions, as reflected in the compliance testing portions of the permits. The ISO correction is contained in the NSPS for combustion turbines. Its original purpose was to ensure that each new source could meet the NSPS limit as if it were tested at ISO conditions. Since the BACT determinations are based on manufacturer's data which is corrected to 15% O_2 only, and the determinations have resulted in limits which are well below the NSPS, FPC believes the use of the ISO correction is not necessary or appropriate. However, FPC is aware that an ISO based NOx limit will be required by FDEP for these turbines and establishment of this requirement is a prerequisite in obtaining FDEP approval to use the GE Mark IV ambient temperature/humidity correction algorithm. This strategy was adopted by FPC, FDEP and USEPA as a mutually agreeable solution to this issue during previous meetings attended by these parties.

Under the warm, humid conditions prevalent in central Florida, this additional correction results in a NOx limit which is several parts per million lower than 42 ppm corrected to 15% O_2, causing the injection of additional water in order to control NOx emissions to a lower level. In addition, the use of the GE Mark IV ambient temperature/humidity correction algorithm, which is an integral part of the NOx control system, was not permitted. This system uses the moisture present in the ambient air to contribute to the water injection. As a result of the inability to use the algorithm as it is designed, additional over-injection of water is occurring at both DeBary and Intercession City.

The water/fuel ratios which result from the two factors described above are as high as 1.3/1 on equipment which is designed for ratios of 0.9/1 to 1.0/1. This additional water use is unfortunate from a water conservation standpoint and causes significant unnecessary wear on the combustion turbines. The additional maintenance and major outage costs that FPC will incur are conservatively estimated to be approximately $4.7 million per unit over the lifetime of the units. This estimate does not include an additional $5 million per unit plus replacement energy costs which would occur as the result of a catastrophic failure. The replacement energy costs would be significant since the failure would occur during a peak demand period. FPC is already observing cracks in the combustors at the DeBary facility, which are occurring after less than a year of operation.

The 42 ppm NOx limit corrected to ISO conditions presents a greater problem for the DeBary and Intercession City units than for other GE Frame 7 units in the state of Florida. Other units use natural gas as the primary fuel with No. 2 oil only as a backup in the event gas is not available. The FPC units use only No. 2 oil for fuel. The over-injection of water which occurs continuously in the FPC units occurs infrequently for short periods of time in other units in Florida, in most cases only for compliance testing. Therefore, the excessive wear as a result of additional water injection does not become evident on the other units.

3.0 Proposed ISO-Based NOx Limit

Because of the reasons discussed above, a separate ISO-based NOx concentration limit for the new combustion turbines at DeBary and Intercession City is justified. The units were designed to use the ambient temperature/humidity correction algorithm for a NOx limit of 42 ppm corrected to 15% O_2. FPC proposes an additional NOx limit to be corrected to ISO conditions while retaining the current limits contained in the BACT determination.

In order to develop an ISO-based equivalent to the limit of 42 ppm at 15% O_2, 42 ppm was used as a basis in the ISO correction equation contained in 40 CFR 60 Subpart GG. A worst-case ISO limit was calculated using temperature and humidity conditions which could reasonably be expected to occur.

For representative temperature and humidity conditions, hourly meteorological ISO-Based NOx Limit observations from the National Weather Service office at the Orlando International Airport were obtained. Data for the years 1991 through 1993 were examined for worst-case combinations of temperature and humidity. (Copies of the meteorological data will be forwarded to the DEP upon request, but are not included with this submittal because there are 1096 pages of data.)

The combination of 85 degrees F. and 100% relative humidity is the worst-case set of ambient conditions which can reasonably be expected to occur at the DeBary and Intercession City plant sites. The following shows the derivation of the proposed ISO-based NOx limit using 42 ppm at 15% O_2 and the worst-case meteorology.

$$NOx_{(ISO)} = (NOx_{(obs)})(P_{(ref)}/P_{(obs)})^{0.5}\, e^{19(H(obs) - 0.00633)}\, (288°K/T_{(amb)})^{1.53}$$

Where:

$NOx_{(ISO)}$ = Emissions of NOx at 15% O_2 and ISO standard conditions

$NOx_{(obs)}$ = NOx emissions at 15% O_2 (= 42 ppm)

$(P_{(ref)}/P_{(obs)})$ = Reference combustor inlet pressure/measured combustor inlet pressure (= approximately 1)

$H_{(obs)}$ = Specific humidity (= 0.027 from psychrometric chart)

$T_{(amb)}$ = Ambient temperature (= 85° F. = 302° K.)

$NOx_{(ISO)}$ = 57.7 ppm when solved using the input given above

FPC requests that a separate ISO-based NOx concentration limit of 57 ppm, corrected to 15% O_2 and ISO conditions, be added to the construction permits for the new combustion turbines at DeBary and Intercession City. The current BACT limits for each GE Frame 7EA unit will not be

changed. Compliance will be maintained with these existing limitations. In addition, FPC requests that the ISO-based limit of 57 ppm, corrected to 15% O_2 and ISO conditions, be added to the conditions for the other new units which are contained in the Intercession City construction permit.

Attachment 2

Fuel-Bound Nitrogen Allowance

Discussion of Fuel-Bound Nitrogen Allowance

New DeBary and Intercession City Combustion Turbines

1.0 Introduction

Florida Power Corporation (FPC) is requesting a permit condition allowing for the use of a fuel-bound nitrogen (FBN) allowance for the new combustion turbines at its DeBary and Intercession City peaking facilities. FPC is not requesting a change in the current NO_x emission limits in lb/hr or tons per year. FPC originally requested this provision in the construction permit applications for both facilities. At the time the construction permit was issued, FPC did not have the necessary data to determine the need for this allowance. FPC now has determined, based on test data of FBN concentrations in the fuel being burned at these facilities, this allowance is needed.

2.0 Discussion

The new combustion turbines at these facilities are regulated by the provisions in 40 CFR 60, Subpart GG. This subpart contains language on the use of a fuel-bound nitrogen allowance at 40 CFR 60.332(a) and 60.334(c). FPC referenced this allowance in the construction permit application and indicated it would be needed if the FBN concentration in the fuel being burned at these facilities was higher than the assumed concentration of 0.015 percent.

FPC has collected over 12 months of data on the FBN levels in the fuel at the DeBary facility. These data indicate that the average FBN concentration is 0.023 percent with a range of approximately 0.004 to 0.033 percent. FPC believes this level of FBN is representative of the long term supply of fuel to these facilities.

Discussions were held with the current fuel suppliers for these facilities on the potential to specify an FBN level of 0.015 percent in the fuel contract. Both suppliers indicated that they could not supply a fuel with the current sulfur content and an FBN at or below 0.015 percent. (Please see the attached letters from BP Oil and Coastal Refining and Marketing.) The only supply of fuel that could be guaranteed to this level of FBN would be ultra-low sulfur fuel oil (i.e. 0.05 percent S) and would require special handling in the form of dedicated terminal storage tanks and/or analyzing various terminal bulk supplies of ultra-low sulfur oil to locate acceptable FBN concentrations. FPC has estimated the potential increase in fuel costs above the current cost of fuel for these facilities to be $0.05/gallon. Based on the permitted allowable heat input of the combustion turbines, this represents a potential fuel cost increase of approximately $1,223,000 per year for each combustion turbine. Based on a total of eight combustion turbines, the total potential fuel cost increase is $9,784,000 per year (see attached calculation sheet). FPC's fuel suppliers and contact names are given at the end of this discussion.

3.0 Proposed Fuel-Bound Nitrogen Allowance

Based on the above discussion, the use of an FBN allowance is justified at the DeBary and Intercession City new combustion turbine facilities. FPC requested the FBN allowance in the

original construction permit application pending collection of actual FBN concentrations in the fuel and 40 CFR 60 Subpart GG requires the use of an FBN allowance in determining allowable NOx emissions.

FPC is proposing that language be added to the construction permits for DeBary and Intercession City allowing the use of an FBN allowance up to an FBN concentration of 0.030 percent and not exceeding an allowable NO_x ISO-corrected concentration of 57 ppm. This approach would limit the allowance for NO_x emissions to an additional 6 ppm. Using the estimated cost impact of $9,784,000 per year, the potential cost impact of having to purchase fuel with an FBN concentration of 0.015 percent would be $28,277 per ton NO_x removed (see attached calculation sheet). This is not an economically justified alternative.

The FBN allowance would be used to determine allowable excess emissions from each combustion turbine. Current permit requirements include fuel testing for FBN, which would be used to determine the amount of the FBN allowance and identify periods of excess emissions. During a compliance test, a fuel sample would be taken and analyzed to determine the FBN concentration. The allowance would be determined and used to set the water to fuel ratio during the compliance test for unit operation.

During normal operation, the FBN will be monitored and recorded. Anytime the FBN level exceeds 0.015 percent, the period would be included in the quarterly excess emissions report and noted as an allowable exceedance in accordance with the FBN allowance. These exceedances would be allowable up to a limit of 0.030 percent FBN (i.e. 6 ppm NO_x) and not exceeding an ISO corrected NO_x concentration of 57 ppm.

Using the criteria stated above and the regulatory provisions contained in 40 CFR 60.332 and 40 CFR 60.334, FPC proposes the following language be added as a specific condition in the DeBary and Intercession City construction permits:

> During normal unit operation, periods of excess NO_x emissions caused solely by an increase in fuel-bound nitrogen will be allowed. NO_x emissions shall not exceed 57 ppm @ 15 % O2 corrected to ISO conditions in accordance with the fuel-bound nitrogen allowance provided in the following table.

Fuel Bound Nitrogen (percent by weight)	NO_x Allowance (ppm)
N<=0.015	0
0.015<N<=0.030	200(N)

Fuel Oil Supplier Information

Coastal Refining and Marketing, Inc.

Contact: Mr. J. R. Sauls
Telephone: (305) 551-5239

BP Oil

Contact: Mr. William Smith
Telephone: (404) 641-2501

Calculation Sheet

Data

Maximum permitted CT Heat Input @ 59°F = 1029 mmBtu/Hr

Maximum permitted hours of operation = 3328 Hrs/Year (0.38% capacity factor)

Heat content of No. 2 fuel oil = 140,000 Btu/Gal

Incremental fuel cost increase = $0.05/Gal

Maximum allowable NOx emission rate = 182 lb./hr. @ 59°F

Annual Potential Cost Increase

$$1029\frac{mmBtu}{Hr} \; X \; 3328\frac{Hrs}{Yr} \; X \; \frac{Gal}{140{,}000 \; Btu} \; X \; \frac{\$0.05}{Gal} \approx \$1{,}223{,}000 \; per \; CT$$

$$\frac{\$1{,}223{,}000}{CT} \; X \; 8 \; CTs \approx \$9{,}784{,}000 \; per \; year$$

$$\frac{6ppm}{42ppm} \; X \; 182 \; \frac{lb}{Hr} = 26$$ (Potential NOx emissions controlled by specifying FBN level of 0.015% in fuel contract)

$$26\frac{lb}{Hr} \; X \; 3328\frac{Hr}{Yr} \; X \; \frac{1Ton}{2000lb} = 43 \; \frac{Tons}{Yr} \; X \; 8 \; CTs \approx 346\frac{Tons}{Yr}$$

$$\frac{\$9{,}784{,}000}{YR} \; X \; \frac{YR}{346 \; Tons} \approx \frac{\$28{,}277}{Ton}$$

BP OIL

BP Oil Company
9040 Roswell Road, Suite 520
Atlanta, Georgia 30350 1199
1-800-544-3210
(404) 641-2500

May 10, 1994

Mr. Dan Putnam
Florida Power Corp.
3201 Thirty-Fourth St., S.
St. Petersburg, FL 33733

RE: LOW NITROGEN #2 FUEL

Dear Mr. Putnam:

We have historically been able to produce #2 Fuel Oil with a guaranteed Maximum Nitrogen Content of 150 PPM. We were the only oil company, to my knowledge, able to make this guarantee for two reasons: 1, We processed very sweet crude through our refinery; and, 2. We had the ability to blend to this very tight specification. The costs associated with this blending and separate storage were between four and six cents per gallon.

Recent changes in our refining configuration to allow us to process a wider range of crude oils may have jeopardized our ability to provide low nitrogen at any cost. We are presently testing the refinery output and expect to have a much better indication of our ability by May 20th. Until the 20th, I am unable to commit to our ability to supply on a guaranteed basis at any cost.

Sincerely,

W. F. Smith /pg

W. F. Smith
Manager, Direct Fuels South

WFS:PG

cc: S. F. Johnston

Coastal
The Energy People

April 20, 1994

FAX NO. 813-866-4936

Mr. T. D. Putnam
Buyer, Fuel Supply
FLORIDA POWER CORPORATION
P. O. Box 14042
St. Petersburg, FL 33733

Dear Mr. Putnam:

Confirming our recent conversation, in order to supply Florida Power Corporation with No. 2 Fuel Oil having a maximum of 150 PPM of fuel bound nitrogen, Coastal would supply low sulfur No. 2 Fuel Oil 0.05% maximum which is usually below 150 PPM but can be up to 200 PPM.

The additional cost of low sulfur No. 2 oil has been from zero to 6 cents per gallon. Also there would be additional cost for transporting the oil from a terminal farther away which would be approximately 2 cents per gallon more.

If you have any questions or require additional information, please do not hesitate to contract me at (305) 551-5239.

Sincerely,

COASTAL REFINING & MARKETING, INC.

J. R. Sauls
Director, Utility Sales

Coastal Refining & Marketing, Inc.
A SUBSIDIARY OF THE COASTAL CORPORATION
P O BOX 059400 • MIAMI FL 33102-6550 • 305 551-5200

Attachment 3

Heat Input vs. Ambient Temperature

Discussion of Heat Input vs. Ambient Temperature

New DeBary and Intercession City Combustion Turbines

1.0 Introduction

Florida Power Corporation (FPC) proposes that the Department of Environmental Protection (DEP) incorporate the final guidance on rate of operation during compliance testing for combustion turbines. FPC submits the attached heat input vs. ambient temperature curves, which are based on manufacturer's data of maximum unit performance, for each facility.

2.0 Discussion

The construction permit for the new combustion turbines at Intercession City contains the manufacturer's design heat input for three ambient temperatures, which provides the relationship of ambient temperature vs. heat input. Specific Condition 14 of the permit requires that compliance testing be performed while the units are operating at between 90 and 100% of heat input capacity as adjusted for ambient temperature.

The construction permit for the new combustion turbines at the DeBary facility was issued at an earlier date than that for Intercession City and does not contain the heat input vs. ambient temperature curve. Therefore, compliance testing must be performed while the units are operating at between 90 and 100% of the maximum permitted heat input, regardless of ambient temperature. Initial compliance testing was performed in July, 1993, and the ambient temperature was too high for the units to achieve the required heat input. Therefore, the units have been limited to less than full capacity since that time. Incorporation of the heat input vs. ambient temperature relationship into both the construction and operation permits for the DeBary combustion turbines is extremely important for the economical operation of the units at any ambient temperature in order to provide the electricity FPC customers need at reasonable cost.

3.0 Heat Input vs. Ambient Temperature Curves

FPC submits the attached heat input vs. ambient temperature curve for application to both the DeBary and Intercession City new combustion turbines. For DeBary, FPC requests that the curve be incorporated into the construction permit. FPC will then request that the Central District amend the operating permit accordingly.

For the new GE Frame 7EA combustion turbines at Intercession City, FPC requests that the DEP remove the current specific ambient temperature and heat input references contained in Specific Condition 4.D. The attached curve would then be incorporated into the construction permit, replacing the specific references.

4.0 Heat Input During Compliance Testing

DEP is in the process of developing guidance on the rate of operation during compliance testing for combustion turbines. FPC requests that the final guidance be incorporated into the construction permits for both the DeBary and Intercession City new combustion turbines. In addition, FPC requests that the following language be incorporated into both permits in order to address the potential situation of one or more of the units being unable to achieve the required Heat Input vs. Ambient Temperature percentage of maximum rated heat input as adjusted for ambient temperature during a compliance test. This suggested language is based on the DEP

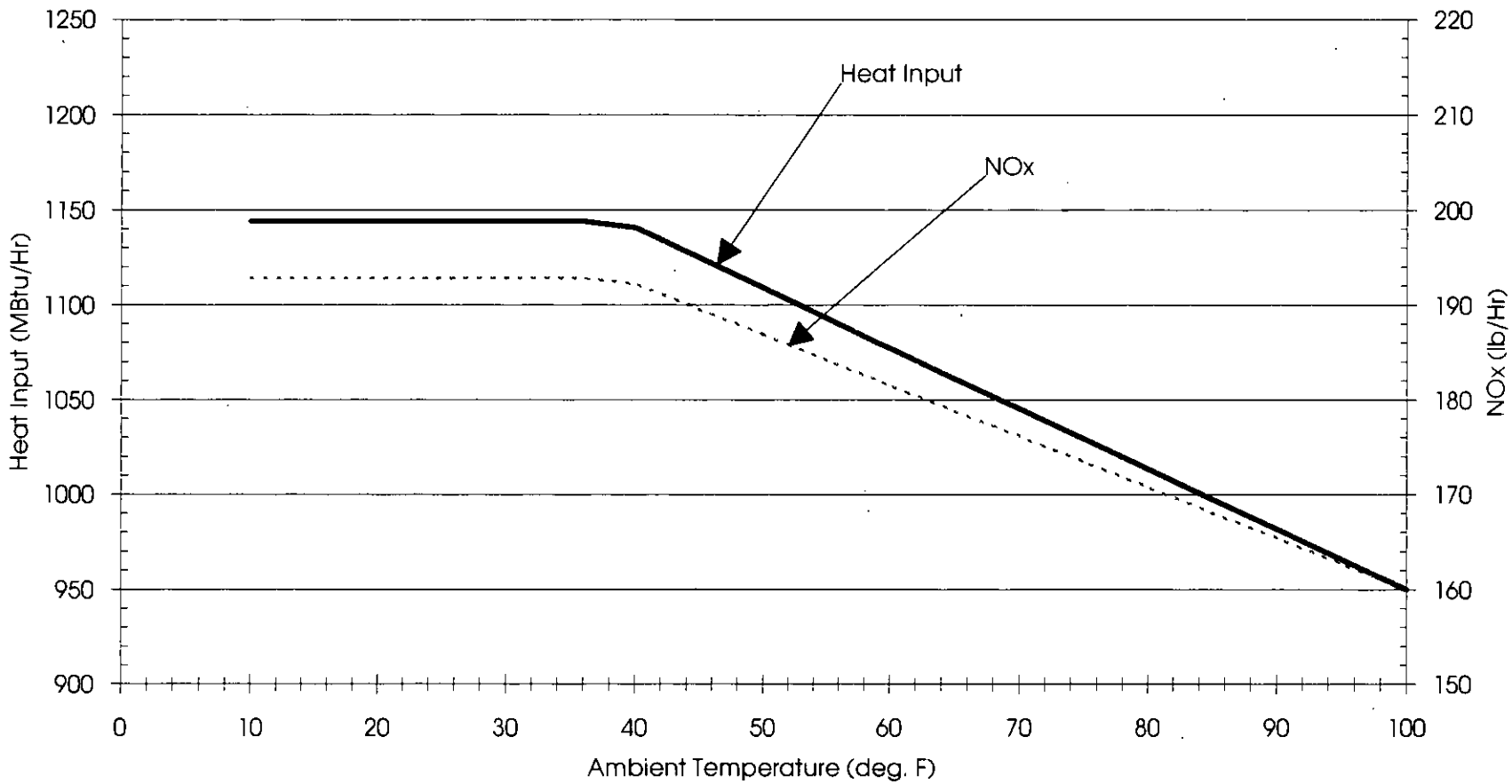
draft guidance dated May 4, 1994, which uses 95% as the required percentage of maximum rated capacity.

> *In the event that a combustion turbine does not achieve 95% of the design heat input capacity as adjusted for average ambient temperature during a compliance test, the entire heat input vs. ambient temperature curve will be adjusted downward by the increment equal to the difference between the design heat input value and 105% of the value reached during the test. The curve will be automatically adjusted upward upon demonstration of compliance at a higher heat input during a subsequent compliance test.*

This language accounts for the possible degradation of the units over a period of time while allowing for the continued use of the ambient temperature vs. heat input relationship unique to combustion turbines.

Florida Power Corporation

GE Frame 7EA Combustion Turbines



Note: Curves based on General Electric's (GE's) expected performance data.

6/10/94

Florida Power
CORPORATION

ACCOUNTS PAYABLE DEPT. B3F
P. O. BOX 14042
ST. PETERSBURG, FL 33733-4042
(813) 866-5257

REMITTANCE ADVICE

89

CHECK DATE 06/20/94 VENDOR FLA DEPT OF ENVIRONMENTAL VENDOR NO. 278473 CHECK NO. 1646777

INVOICE NO.	DATE	OUR ORDER NO.	VOUCHER	GROSS AMOUNT	DISCOUNT	NET AMOUNT
CK097447	06/13/94		9406176213	250.00	.00	250.00
					TOTAL	250.00

THE ATTACHED REMITTANCE IS IN FULL SETTLEMENT OF ACCOUNT AS STATED. IF NOT CORRECT PLEASE RETURN TO ABOVE ADDRESS.

Accounts Payable Department B3F
P.O. Box 14042
St. Petersburg, Fl 33733-4042

Florida Power
CORPORATION

0004895 63-115/631

DATE 06/20/94 CHECK NO. 1646777

PAY: $250*DOLLARS AND 00 CENTS $*******250.00

SunBank / Mid-Florida

TO THE ORDER OF

FLA DEPT OF ENVIRONMENTAL
PROTECTION
2600 BLAIR STONE RD
TALLAHASSEE FL 32399-2400

Void after 60 days

Treasurer

⑈001646777⑈ ⑆063101153⑆699003205273 6⑈

0004826

Florida Power
CORPORATION

June 21, 1994

RECEIVED
1994 JUN 23 PM 1:02

Mr. John Brown, P.E.
Administrator of Permitting
Division of Air Resources Management
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Brown:

Re: Processing Fee for Construction Permit Amendment - Intercession City
(Permit Number AC 49-203114 ; PSD-FL-180)

As requested by Ms. Teresa Heron of your staff, Florida Power Corporation submits the enclosed fee payment of $50.00 for the processing of the permit amendment application referenced above, which was dated April 8, 1994.

Please contact me at (813) 866-4344 if you have any questions.

Sincerely,

J. Michael Kennedy
Senior Environmental Specialist

Enclosure

cc: Ms. Teresa Heron, DEP - Tallahassee (w/o enclosure)

Florida Power
CORPORATION

April 8, 1994

Mr. John Brown, P.E.
Administrator, Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

4/29/94
T.H.

Dear Mr. Brown:

Re: Request for Construction Permit Amendment
DEP Permit Number AC49-203114 ; PSD-FL-180

As provided by the construction permit referenced above, Florida Power Corporation (FPC) is permitted to construct four GE Frame 7EA and two GE Frame 7FA combustion turbines at its Intercession City electric generating station. Initial compliance testing was recently completed on the Frame 7EA units. Construction of the two Frame 7FA combustion turbines has not yet commenced.

FPC requests an amendment to the Intercession City construction permit. FPC has negotiated with a different manufacturer to provide the additional capacity needed at the Intercession City site. FPC proposes to remove the two GE Frame 7FA units (rated at 185.5 MW each at 59°F) from the construction permit and replace them with a single Siemens V84.3 combustion turbine (rated at 171 MW at 59°F). The Siemens unit is quite similar to the GE units in that it is a simple-cycle combustion turbine which uses water injection to control NOx emissions. Based on load rating, it is slightly smaller than each of the GE units, however, and emits lesser amounts of air pollutants.

Attachment 1 contains air pollutant emissions and related data which were provided by the manufacturer for the proposed Siemens unit. Emissions data are given for 25%, 50%, 75%, and 100% of full load at 20, 59, and 90 degrees F. SO_2 emissions are based on the current permitted fuel sulfur limit of 0.2%. Attachments 2 and 3 contain the discussion and results of an air quality modeling analysis which was performed to demonstrate that a substantial net air quality benefit will result from the change from two GE Frame 7FA units to the Siemens combustion turbine.

GENERAL OFFICE: 3201 Thirty-fourth Street South P.O. Box 14042 St. Petersburg, Florida 33733 (813) 866-5151
A Florida Progress Company

FPC also requests a twelve month extension to the permit expiration date of December 31, 1994. Construction of the Siemens unit is proposed to commence on August 15, 1994. A twelve month extension will allow sufficient time to complete construction and initial compliance testing prior to the expiration date. It is FPC's position that the BACT determination will be valid for an additional twelve months for this combustion turbine technology.

Since the amendment will result in the permitting and construction of five combustion turbines instead of six, FPC requests a change in the allowed average annual hours of operation per unit contained in Specific Condition 4(A). The total of 20,340 hours of operation results in a new average of 4,068 hours per unit per year for five units. The Siemens unit will comply with all other provisions of the construction permit and its amendments, such as the NOx limit of 42 ppm corrected to 15% O_2 and submittal of heat input vs. ambient temperature and water vs. fuel curves.

Thank you for your consideration of this request. Please contact Mr. Mike Kennedy at (813) 866-4344 if you have any questions or if you need additional information.

Sincerely,

W. Jeffrey Pardue, C.E.P., Manager
Environmental Programs

Attachments

cc: Mr. Alexander Alexander, DEP Central District

Attachment 1

Air Pollutant Emissions

Siemens Model V84.3 Combustion Turbine

Maximum Air Pollutant Emissions (Lbs./Hour)

100% Load, 20 Degrees F, 0.2% S No. 2 Fuel Oil

Pollutant	Emission Rate
Nitrogen Oxides	305.0
Sulfur Dioxide	382.8
Particulate Matter	17.0
VOC	7.6
Carbon Monoxide	22.1

Additional Data Contained on Following Pages

Manufacturer: Siemens

Model No./Combustor: V84.3

TABLE: B.2- 6

Combustion system type: Dual Fuel Low NOx

AMBIENT TEMPERATURE/
RELATIVE HUMIDITY: 20 F/ 60%

BAROMETRIC PRESSURE: ~~14.61 psia~~

FUEL: Natural Gas LHV = ~~20,700 Btu/lb~~, Temperature = 60 F
No. 2 Fuel Oil LHV = ~~18,550 Btu/lb~~, Temperature = 60 F

NO_x CONTROL LEVEL: 42ppm

POWER FACTOR: 0.85 pf

	Full Speed No Load	Minimum Load	25% of Base Load	50% of Base Load	75% of Base Load	Base Load Rating	Peak Load Rating
Gross output, kW			43,996	87,998	132,003	176,001	
Auxiliary power, kW			2,495	2,495	2,495	2,495	
Gross heat rate, Btu/kWh (LHV)			14,196	11,147	10,509	9,976	
Exhaust flow, lb/h			2,781,648	2,830,356	2,906,496	3,562,560	
Exhaust temp, F			623	835	1,038	1,022	
Inlet guide vane position, ~~degrees~~			75%	75%	75%	92.1%	
Fuel flow, lb/h			33,998	53,399	75,510	95,583	
Nitrogen oxides, ppmdv @ 15% O_2			42	42	42	42	
Nitrogen oxides, lb/h as NO_2			110	171	241	305	
Carbon monoxide, ppmdv			254	5.0	5.0	5.0	
Carbon monoxide, lb/h			403.6	12.4	17.5	22.1	
Sulfur dioxide, ppmwv			21.9	22.0	22.1	22.1	

FPC 17506 COMB TURB GEN 62.1003
061193
PD-54

FOR INFORMATION ONLY

Manufacturer: Siemens

Model No./Combustor: V84.3

TABLE: B.2- 6

Combustion system type: ~~Dry NO$_x$~~ Dual Fuel Low NOx

AMBIENT TEMPERATURE/
RELATIVE HUMIDITY: 20 F/60 %

BAROMETRIC PRESSURE: ~~14.61 psia~~

FUEL: Natural Gas LHV = ~~21,740 Btu/lb~~, Temperature = 60 F
No. 2 Fuel Oil LHV = ~~18,550 Btu/lb~~, Temperature = 60 F

NO$_x$ CONTROL LEVEL: 42ppm

POWER FACTOR: 0.85 pf

	Full Speed No Load	Minimum Load	25% of Base Load	50% of Base Load	75% of Base Load	Base Load Rating	Peak Load Rating
Sulfur dioxide, lb/h			136.1	213.8	302.3	382.8	
TSP, lb/h + PM10, lb/h			17.0	17.0	17.0	17.0	
~~PM10, lb/h~~							
Unburned hydrocarbon, ppmwv			6.0	5.0	5.0	5.0	
Unburned hydrocarbon, lb/h			5.5	7.1	10.0	12.7	
Volatile organic compounds, ppmwv			3.2	3.0	3.0	3.0	
Volatile organic compounds, lb/h			2.9	4.3	6.0	7.6	
Oxygen, ~~lb/h~~			18.5	15.8	12.8	12.3	
Nitrogen, ~~lb/h~~ %Wt.			73.7	72.4	70.5	70.2	
Carbon dioxide, ~~lb/h~~			3.9	6.0	8.2	8.5	
Argon, ~~lb/h~~			1.2	1.2	1.1	1.1	
Water, ~~lb/h~~			2.6	4.4	7.1	7.6	
Opacity, %			2.0	0.6	0	0	

FOR INFORMATION ONLY

Manufacturer: Siemens

Model No./Combustor: V84.3

TABLE: B.2- 8

Combustion system type: Dual Fuel Low NOx

AMBIENT TEMPERATURE/
RELATIVE HUMIDITY: 59 F/ 60%

BAROMETRIC PRESSURE: ~~14.61 psia~~

FUEL: Natural Gas LHV = ~~20,700 Btu/lb~~, Temperature = 60 F
No. 2 Fuel Oil LHV = ~~18,550 Btu/lb~~, Temperature = 60 F

NO_x CONTROL LEVEL: 42ppm

POWER FACTOR: 0.85 pf

	Full Speed No Load	Minimum Load	25% of Base Load	50% of Base Load	75% of Base Load	Base Load Rating	Peak Load Rating
Gross output, kW			42,760	85,522	128,287	171,049	
Auxiliary power, kW			2,495	2,495	2,495	2,495	
Gross heat rate, Btu/kWh (LHV)			14,579	11,514	10,606	10,127	
Exhaust flow, lb/h			2,578,716	2,627,892	2,945,736	3,583,224	
Exhaust temp, F			702	934	1,034	1,034	
Inlet guide vane position, ~~degrees~~			75%	75%	82.4%	100%	
Fuel flow, lb/h			33,934	53,604	74,063	94,298	
Nitrogen oxides, ppmdv @ 15% O_2			42	42	42	42	
Nitrogen oxides, lb/h as NO_2			109.2	171.5	236.5	301	
Carbon monoxide, ppmdv			254	5.0	5.0	5.0	
Carbon monoxide, lb/h			402	12.4	17.1	21.8	
Sulfur dioxide, ppmwv			21.9	22.1	22.1	22.1	

FPC 17506 COMB TURB GEN 62.1003
061193
FD-54

FOR INFORMATION ONLY

Manufacturer: Siemens

Model No./Combustor: V84.3

Combustion system type: ~~Dry NO$_x$~~ Dual Fuel Low NOx

TABLE: B.2-8

AMBIENT TEMPERATURE/
RELATIVE HUMIDITY: 59F/60%

BAROMETRIC PRESSURE: ~~14.61 psia~~

FUEL: Natural Gas LHV = ~~21,140 Btu/lb~~, Temperature = 60 F
No. 2 Fuel Oil LHV = ~~18,550 Btu/lb~~, Temperature = 60 F

NO$_x$ CONTROL LEVEL: 42ppm

POWER FACTOR: 0.85 pf

	Full Speed No Load	Minimum Load	25% of Base Load	50% of Base Load	75% of Base Load	Base Load Rating	Peak Load Rating
Sulfur dioxide, lb/h			135.7	214.2	296.6	376.8	
TSP, lb/h + PM10, lb/h			17.0	17.0	17.0	17.0	
~~PM10, lb/h~~							
Unburned hydrocarbon, ppmwv			6.0	5.0	5.0	5.0	
Unburned hydrocarbon, lb/h			5.4	7.1	9.8	12.5	
Volatile organic compounds, ppmwv			3.2	3.0	3.0	3.0	
Volatile organic compounds, lb/h			2.9	4.3	5.9	7.5	
Oxygen, ~~lb/h~~			18.0	15.1	13.1	12.5	
Nitrogen, ~~lb/h~~ %Wt.			73.2	71.9	70.4	69.9	
Carbon dioxide, ~~lb/h~~			4.2	6.5	8.0	8.4	
Argon, ~~lb/h~~			1.2	1.2	1.2	1.2	
Water, ~~lb/h~~			3.3	5.3	7.4	7.9	
Opacity, %			2.0	0.6	0	0	

FOR INFORMATION ONLY

Manufacturer: Siemens

Model No./Combustor: V84.3

TABLE: B.2-10

Combustion system type: Dual Fuel Low NOx

AMBIENT TEMPERATURE/
RELATIVE HUMIDITY: 90° F/ 60%

BAROMETRIC PRESSURE: ~~14.81 psia~~

FUEL: Natural Gas LHV = ~~20,788 Btu/lb~~, Temperature = 60 F
No. 2 Fuel Oil LHV = ~~18,580 Btu/lb~~, Temperature = 60 F

NO_x CONTROL LEVEL: 42ppm

POWER FACTOR: 0.85 pf

	Full Speed No Load	Minimum Load	25% of Base Load	50% of Base Load	75% of Base Load	Base Load Rating	Peak Load Rating
Gross output, kW			37,729	75,460	113,195	153,861	
Auxiliary power, kW			2,495	2,495	2,495	2,495	
Gross heat rate, Btu/kWh (LHV)			15,749	12,184	11,077	10,445	
Exhaust flow, lb/h			2,414,844	2,459,412	2,756,052	3,368,556	
Exhaust temp, F			746	968	1,055	1,051	
Inlet guide vane position, degrees			75%	75%	82.36%	100%	
Fuel flow, lb/h			32,346	50,051	68,256	87,487	
Nitrogen oxides, ppmdv @ 15% O_2			42	42	42	42	
Nitrogen oxides, lb/h as NO_2			104.0	160.1	218.0	279.2	
Carbon monoxide, ppmdv			254.0	5.0	5.0	5.0	
Carbon monoxide, lb/h			383.0	11.6	15.8	20.2	
Sulfur dioxide, ppmdv			21.9	22.1	22.1	22.1	

FPC 17506 COMB TURB GEN 62.1003
061193
PD-54

FOR INFORMATION ONLY

Manufacturer: Siemens

Model No./Combustor: V84.3

Combustion system type: ~~Dry NO$_x$~~ Dual Fuel Low NOx

TABLE: B.2-10

AMBIENT TEMPERATURE/
RELATIVE HUMIDITY: 90 F/ 60 %

BAROMETRIC PRESSURE: ~~14.64 psia~~

FUEL: Natural Gas LHV = ~~21,140 Btu/lb~~, Temperature = 60 F
No. 2 Fuel Oil LHV = ~~18,550 Btu/lb~~, Temperature = 60 F

NO$_x$ CONTROL LEVEL: 42ppm

POWER FACTOR: 0.85 pf

	Full Speed No Load	Minimum Load	25% of Base Load	50% of Base Load	75% of Base Load	Base Load Rating	Peak Load Rating
Sulfur dioxide, lb/h			129.6	200.4	273.4	350.4	
TSP, lb/h + PM10, lb/h			17.0	17.0	17.0	17.0	
~~PM10, lb/h~~							
Unburned hydrocarbon, ppmwv			6.0	5.0	5.0	5.0	
Unburned hydrocarbon, lb/h			5.2	6.7	9.1	11.6	
Volatile organic compounds, ppmwv			3.2	3.0	3.0	3.0	
Volatile organic compounds, lb/h			2.8	4.0	5.4	7.0	
Oxygen, ~~lb/h~~			17.6	14.9	13.0	17.6	
Nitrogen, ~~lb/h~~			72.3	71.0	69.6	72.3	
Carbon dioxide, ~~lb/h~~			4.3	6.5	7.9	4.3	
Argon, ~~lb/h~~			1.2	1.2	1.2	1.2	
Water, ~~lb/h~~			4.5	6.4	8.4	4.6	
Opacity, %			2.0	0.6	0	0	

FOR INFORMATION ONLY

Attachment 2

Air Quality Modeling Analysis

Air Quality Modeling Comparison

Two GE Frame 7FA Units vs. Proposed Siemens Unit

1.0 Introduction

Florida Power Corporation (FPC) is proposing to construct a single Siemens V84.3 combustion turbine in place of two GE Frame 7FA units at its Intercession City site. In order to assess the impact that the proposed change will have on air quality, a modeling analysis which compared the maximum ambient concentrations resulting from each of the two scenarios was performed.

2.0 Summary

The two GE Frame 7FA units would have emitted more than twice the amount of air pollutants than the proposed Siemens combustion turbine will emit. In addition, the Siemens unit will have a somewhat taller and narrower stack, so it is intuitive that the proposed unit will have a lesser impact on air quality. A modeling analysis using the latest version of EPA's SCREEN model was performed in order to confirm this conclusion.

SO_2 is the pollutant which is emitted in the greatest quantities from the Siemens unit as well as the two GE units. Worst-case SO_2 emissions reflecting maximum load conditions at 20 deg. F were input to the SCREEN2 model. Building dimensions were also input in order to assess the potential for building downwash of the plume.

The resulting maximum predicted concentrations were a total of approximately 23 ug/m^3 from the two GE units and 12 ug/m^3 from the Siemens unit. Therefore, the installation of the Siemens combustion turbine will result in a net air quality benefit when compared to the installation of the two GE units.

3.0 Methodology

In order to compare the maximum ambient air impacts from the proposed Siemens unit with those from the two GE units, the most recent version of EPA's SCREEN model was used. The SCREEN2 model was run using the full range of worst-case meteorology contained in the model. In addition, the following options were input:

- Flat terrain
- Ground-level concentrations (receptor height = 0)
- Rural dispersion coefficients
- Building wake effects

The total emissions from the two GE units were input as a single source in order to more easily determine their aggregate impact. The proposed Siemens unit was run separately, and the resulting predicted concentrations compared.

If the predicted maximum impacts from the Siemens combustion turbine are less than those from the two GE units which it is replacing, then a net benefit will result from the installation of the Siemens unit and no further analysis is necessary.

4.0 Air Pollutant Emissions, Stack Parameters, and Building Dimensions

Because both the GE units and the Siemens combustion turbine will use only No. 2 oil as fuel, SO_2 is the pollutant which will be emitted in the greatest quantities. Although this analysis is a relative impact comparison which would be valid using emissions of any stable air pollutant as input, SO_2 was chosen because those emissions will have the highest impact.

Worst-case SO_2 emissions occur at a temperature of 20 degrees F. Emissions from the GE units were obtained from the Intercession City construction permit application documentation which was submitted to the DEP on October 1, 1991. SO_2 emissions from the proposed Siemens unit are given in Attachment 1 and were obtained from the manufacturer. These emissions represent a maximum fuel sulfur content of 0.2% as required in the current construction permit. Emissions data input to the model are given in Table 1.

Stack and effluent data (stack dimensions, exit temperature, exit velocity) for the GE units were obtained from the construction permit application and were provided by the manufacturer for the Siemens combustion turbine. The stack parameters used in the modeling analysis are shown in Table 1.

To assess the potential for aerodynamic plume downwash due to building wake effects, the building downwash option contained in the model was used. The building dimensions input represent the building containing the combustion turbine and are given in Table 1.

Table 1
SCREEN2 Model Input

	GE Frame 7FA	Siemens
SO_2 Emissions (g/s)	110.6*	48.3
Stack Height (m)	15.2	22.9
Stack Diameter (m)	7.0	5.8
Exit Velocity (m/s)	32.1	41.0
Exit Temp. (K)	881	823
Building Height (m)	11.8	11.8
Building Width (m)	7.1	7.1
Building Length (m)	18.0	18.0

* Represents maximum SO_2 emissions from two GE units.

5.0 Modeling Results

The SCREEN2 model output for each of the two analyses is provided in Attachment 3. The maximum predicted concentrations and their distances downwind are as follows:

GE Units	Max. = 23.18 ug/m^3	Distance = 1.577 km
Siemens Unit	Max. = 12.04 ug/m^3	Distance = 1.488 km

In addition, no building downwash effects were predicted to occur. As expected, the construction of the Siemens combustion turbine in place of the two GE Frame 7FA units will result in a lower impact on the surrounding air quality.

Attachment 3

SCREEN2 Model Output

03/21/94
09:28:45

*** SCREEN2 MODEL RUN ***
*** VERSION DATED 92245 ***

GE Frame 7FA Units With Building Dimensions - 20 deg. F Emissions

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	110.600
STACK HEIGHT (M)	=	15.2000
STK INSIDE DIAM (M)	=	7.0000
STK EXIT VELOCITY (M/S)	=	32.1000
STK GAS EXIT TEMP (K)	=	881.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	11.8000
MIN HORIZ BLDG DIM (M)	=	7.1000
MAX HORIZ BLDG DIM (M)	=	18.0000

BUOY. FLUX = 2573.603 M**4/S**3; MOM. FLUX = 4197.956 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	1	1.0	1.0	4198.5	4197.54	12.76	12.76	NO
100.	4.171	6	1.0	1.3	10000.0	328.23	89.53	89.47	NO
200.	4.197	6	1.0	1.3	10000.0	328.23	89.77	89.53	NO
300.	4.228	6	1.0	1.3	10000.0	328.23	90.14	89.61	NO
400.	4.265	6	1.0	1.3	10000.0	328.23	90.63	89.71	NO
500.	4.305	6	1.0	1.3	10000.0	328.23	91.22	89.83	NO
600.	4.349	6	1.0	1.3	10000.0	328.23	91.92	89.96	NO
700.	4.396	6	1.0	1.3	10000.0	328.23	92.72	90.10	NO
800.	4.434	6	1.0	1.3	10000.0	328.23	93.61	90.23	NO
900.	4.471	6	1.0	1.3	10000.0	328.23	94.58	90.37	NO
1000.	4.509	6	1.0	1.3	10000.0	328.23	95.64	90.52	NO
1100.	7.415	1	3.0	3.1	1410.3	1409.31	313.40	595.86	NO
1200.	13.08	1	3.0	3.1	1410.3	1409.31	335.40	705.77	NO
1300.	18.03	1	3.0	3.1	1410.3	1409.31	357.05	826.90	NO
1400.	21.31	1	3.0	3.1	1410.3	1409.31	378.36	959.32	NO
1500.	22.88	1	3.0	3.1	1410.3	1409.31	399.38	1103.08	NO
1600.	23.16	1	3.0	3.1	1410.3	1409.31	420.13	1258.27	NO
1700.	22.69	1	3.0	3.1	1410.3	1409.31	440.63	1424.93	NO
1800.	21.90	1	3.0	3.1	1410.3	1409.31	460.89	1603.12	NO
1900.	21.04	1	3.0	3.1	1410.3	1409.31	480.94	1792.92	NO
2000.	20.22	1	3.0	3.1	1410.3	1409.31	500.79	1994.37	NO
2100.	19.46	1	3.0	3.1	1410.3	1409.31	520.44	2207.53	NO
2200.	18.76	1	3.0	3.1	1410.3	1409.31	539.91	2432.46	NO
2300.	18.11	1	3.0	3.1	1410.3	1409.31	559.22	2669.22	NO

2400.	17.51	1	3.0	3.1	1410.3	1409.31	578.36	2917.86	NO
2500.	16.95	1	3.0	3.1	1410.3	1409.31	597.35	3178.43	NO
2600.	16.44	1	3.0	3.1	1410.3	1409.31	616.20	3450.98	NO
2700.	15.95	1	3.0	3.1	1410.3	1409.31	634.90	3735.56	NO
2800.	15.56	1	3.0	3.1	1410.3	1409.31	650.69	4031.78	NO
2900.	15.27	1	3.0	3.1	1410.3	1409.31	663.38	4339.71	NO
3000.	14.98	1	3.0	3.1	1410.3	1409.31	676.15	4659.93	NO
3500.	13.67	1	3.0	3.1	1410.3	1409.31	740.85	5000.00	NO
4000.	12.56	1	3.0	3.1	1410.3	1409.31	806.55	5000.00	NO
4500.	11.60	1	3.0	3.1	1410.3	1409.31	872.77	5000.00	NO
5000.	10.78	1	3.0	3.1	1410.3	1409.31	939.20	5000.00	NO
5500.	10.07	1	3.0	3.1	1410.3	1409.31	1005.65	5000.00	NO
6000.	10.10	2	3.5	3.6	1211.2	1210.15	826.33	851.84	NO
6500.	10.18	2	3.5	3.6	1211.2	1210.15	876.26	917.91	NO
7000.	10.08	2	3.5	3.6	1211.2	1210.15	926.16	985.27	NO
7500.	9.863	2	3.5	3.6	1211.2	1210.15	975.97	1053.74	NO
8000.	9.572	2	3.5	3.6	1211.2	1210.15	1025.65	1123.19	NO
8500.	9.245	2	3.5	3.6	1211.2	1210.15	1075.17	1193.51	NO
9000.	8.906	2	3.5	3.6	1211.2	1210.15	1124.52	1264.60	NO
9500.	8.570	2	3.5	3.6	1211.2	1210.15	1173.68	1336.40	NO
10000.	8.758	5	5.0	5.8	10000.0	242.04	412.05	102.24	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

1577.	23.18	1	3.0	3.1	1410.3	1409.31	415.18	1219.98	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	.0000	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	99.99	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	99.99	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	99.99	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	20.44	CAVITY HT (M)	=	14.40
CAVITY LENGTH (M)	=	32.44	CAVITY LENGTH (M)	=	8.06
ALONGWIND DIM (M)	=	7.10	ALONGWIND DIM (M)	=	18.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	23.18	1577.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

03/21/94
09:34:15

*** SCREEN2 MODEL RUN ***
*** VERSION DATED 92245 ***

Siemens Unit With Building Dimensions - 20 deg. F Emissions

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	48.3000
STACK HEIGHT (M)	=	22.9000
STK INSIDE DIAM (M)	=	5.8000
STK EXIT VELOCITY (M/S)	=	41.0000
STK GAS EXIT TEMP (K)	=	823.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	11.8000
MIN HORIZ BLDG DIM (M)	=	7.1000
MAX HORIZ BLDG DIM (M)	=	18.0000

BUOY. FLUX = 2177.484 M**4/S**3; MOM. FLUX = 5033.053 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	1	1.0	1.1	3700.2	3699.17	13.45	13.45	NO
100.	1.200	6	1.0	1.6	10000.0	297.53	78.57	78.50	NO
200.	1.211	6	1.0	1.6	10000.0	297.53	78.85	78.57	NO
300.	1.224	6	1.0	1.6	10000.0	297.53	79.27	78.67	NO
400.	1.239	6	1.0	1.6	10000.0	297.53	79.82	78.78	NO
500.	1.256	6	1.0	1.6	10000.0	297.53	80.50	78.91	NO
600.	1.275	6	1.0	1.6	10000.0	297.53	81.29	79.06	NO
700.	1.296	6	1.0	1.6	10000.0	297.53	82.19	79.22	NO
800.	1.312	6	1.0	1.6	10000.0	297.53	83.19	79.38	NO
900.	1.329	6	1.0	1.6	10000.0	297.53	84.29	79.53	NO
1000.	2.754	1	3.0	3.2	1249.3	1248.32	279.81	490.63	NO
1100.	5.767	1	3.0	3.2	1249.3	1248.32	301.61	589.74	NO
1200.	8.699	1	3.0	3.2	1249.3	1248.32	323.03	699.98	NO
1300.	10.76	1	3.0	3.2	1249.3	1248.32	344.12	821.40	NO
1400.	11.80	1	3.0	3.2	1249.3	1248.32	364.90	954.09	NO
1500.	12.03	1	3.0	3.2	1249.3	1248.32	385.41	1098.10	NO
1600.	11.79	1	3.0	3.2	1249.3	1248.32	405.66	1253.51	NO
1700.	11.36	1	3.0	3.2	1249.3	1248.32	425.67	1420.37	NO
1800.	10.88	1	3.0	3.2	1249.3	1248.32	445.46	1598.75	NO
1900.	10.43	1	3.0	3.2	1249.3	1248.32	465.05	1788.72	NO
2000.	10.01	1	3.0	3.2	1249.3	1248.32	484.45	1990.33	NO
2100.	9.632	1	3.0	3.2	1249.3	1248.32	503.67	2203.64	NO
2200.	9.281	1	3.0	3.2	1249.3	1248.32	522.71	2428.70	NO
2300.	8.958	1	3.0	3.2	1249.3	1248.32	541.60	2665.59	NO

2400.	8.658	1	3.0	3.2	1249.3	1248.32	560.34	2914.34	NO
2500.	8.380	1	3.0	3.2	1249.3	1248.32	578.93	3175.02	NO
2600.	8.140	1	3.0	3.2	1249.3	1248.32	596.04	3447.44	NO
2700.	7.964	1	3.0	3.2	1249.3	1248.32	609.16	3731.28	NO
2800.	7.795	1	3.0	3.2	1249.3	1248.32	622.36	4027.31	NO
2900.	7.633	1	3.0	3.2	1249.3	1248.32	635.61	4335.56	NO
3000.	7.476	1	3.0	3.2	1249.3	1248.32	648.92	4656.06	NO
3500.	6.775	1	3.0	3.2	1249.3	1248.32	716.09	5000.00	NO
4000.	6.189	1	3.0	3.2	1249.3	1248.32	783.87	5000.00	NO
4500.	5.695	1	3.0	3.2	1249.3	1248.32	851.85	5000.00	NO
5000.	5.274	1	3.0	3.2	1249.3	1248.32	919.80	5000.00	NO
5500.	4.937	2	3.5	3.7	1120.0	1073.26	759.17	770.24	NO
6000.	5.000	2	3.5	3.7	1120.0	1073.26	810.13	836.14	NO
6500.	4.956	2	3.5	3.7	1120.0	1073.26	861.01	903.36	NO
7000.	4.842	2	3.5	3.7	1120.0	1073.26	911.74	971.73	NO
7500.	4.686	2	3.5	3.7	1120.0	1073.26	962.29	1041.09	NO
8000.	4.545	2	3.0	3.2	1249.3	1248.32	1028.58	1125.86	NO
8500.	4.403	2	3.0	3.2	1249.3	1248.32	1077.97	1196.02	NO
9000.	4.250	2	3.0	3.2	1249.3	1248.32	1127.19	1266.98	NO
9500.	4.096	2	3.0	3.2	1249.3	1248.32	1176.24	1338.65	NO
10000.	3.945	2	3.0	3.2	1249.3	1248.32	1225.11	1410.98	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

1488.	12.04	1	3.0	3.2	1249.3	1248.32	382.76	1078.74	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	.0000	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	99.99	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	99.99	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	99.99	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	20.44	CAVITY HT (M)	=	14.40
CAVITY LENGTH (M)	=	32.44	CAVITY LENGTH (M)	=	8.06
ALONGWIND DIM (M)	=	7.10	ALONGWIND DIM (M)	=	18.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	12.04	1488.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

Florida Department of
Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

December 14, 1993

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. W. Jeffrey Pardue
C.E.P. Manager
Florida Power Corporation
P.O. Box 14042
St. Petersburg, Florida 33733

Dear Mr. Pardue:

RE: Intercession City - DEP Permit No. AC 49-203114, PSD-FL-180

The Department is in receipt of your letter requesting an interpretation of Specific Condition No. 14 of the above mentioned permit. Specific Condition No. 14 reads: "The sources shall operate between 90% and 100% of permitted capacity during the compliance test(s) **as adjusted for ambient temperature.**" This request is made due to the fact that that DEP's Central District personnel has indicated that ambient temperature during compliance tests will not be considered.

The Bureau of Air Permitting and Standard agreed with your interpretation that the units will be considered to be in compliance with permitted maximum emission limits if peak load testing is performed while the units are operating between 90% and 100% of permitted capacity as determined by the ambient temperature occurring at the time of testing. Thus, Specific Condition No. 14 will remain as stated in the permit.

If you have any questions, please feel free to call Preston Lewis at (904)488-1344 or write to me at the above address.

Sincerely,

For John C. Brown, Jr., P.E.
Administrator
Air Permitting and Standards

JB/TH/bjb

cc: Alexander Alexander, DEP Central District
Charles Collins, DEP Central District
Jewell Harper, EPA
John Bunyak, NPS
Mike Kennedy, FPC

P 872 562 507

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to: Mr. W. Jeffrey Pardue	
Street and No.: P. O. Box 14042	
P.O., State and ZIP Code: St. Petersburg, FL 33733	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: Mailed: 12/14/93 AC 49-203114, PSD-FL-180	

PS Form **3800**, JUNE 1991

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. W. Jeffrey Pardue
C.E.P. Manager
Florida Power Corporation
P. O. Box 14042
St. Petersburg, Florida 33733

4a. Article Number: P 872 562 507

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery: DEC 16 1993

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form **3811**, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Mike Harley

Florida Power
CORPORATION

file

Certified Mail P 627 945 413

December 7, 1993

Mr. Alexander Alexander, P.E.
Director, Central District
Florida Department of Environmental Protection
3319 Maguire Boulevard, Suite 232
Orlando, FL 32803-3767

Dear Mr. Alexander:

Re: Compliance Test Notification for New Combustion Turbines at Intercession City
DEP Permit Number AC49-203114

As required by 40 CFR 60.8 and Specific Condition 14. of the permit referenced above, Florida Power Corporation (FPC) is providing the Department of Environmental Protection (DEP) notification of the commencement of compliance testing of the new combustion turbines at FPC's Intercession City electric generating station which have not yet been tested. Testing of Units P7 and P9 will begin on January 10, 1994.

FPC will perform the tests in accordance with the test protocol which was agreed upon during the pre-test meeting between the Central District and FPC on October 19, 1993. The visible emissions test requirements, which were revised after this meeting, will be followed consistent with the tests performed on Units P8 and P10 in November 1993.

Please feel free to contact me at (813) 866-4344 if you have any questions.

Sincerely,

J. Michael Kennedy

J. Michael Kennedy
Senior Environmental Specialist

cc: Mr. Charles Collins, DEP Central District
Mr. Garry Kuberski, DEP Central District
Mr. John Brown, DEP Tallahassee

RECEIVED
DEC 13 1993
Division of Air
Resources Management