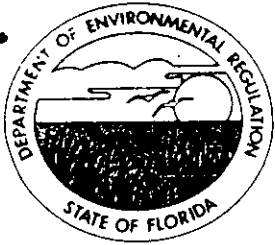


Rtle Cqj



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

May 22, 1992

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. W. W. Vierday
Legal and Governmental Affairs
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

Dear Mr. Vierday:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit to construct four 92.9 MW and two 185.5 simple cycle combustion turbines.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Preston Lewis of the Bureau of Air Regulation.

Sincerely,

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

CHF/TH/plm

Attachments

- c: Kennard Kosky, P.E.
- Chuck Collins, CD - DER mail
- Jewell Harper, EPA
- Chris Shaver, NPS
- Julia Thomas, Fish & Wildlife

Readily
Tenesa Heron }
Cleve Holladay } 5-22-92
Took the Main Post Office RRM

P 710 058 536



Certified Mail Receipt

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Mr. W. W. Vierday	
Legal & Governmental Affairs	
FL Power Corp.	
3201 34th Street South	
St. Petersburg, FL 33733	
Postage	\$
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Special Delivery Fee	
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TOTAL Postage & Fees	\$
Postmark or Date mailed: 5/22/92	
AC 49-203114 & PSD-FL-180	

PS Form 3800, June 1990

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 next to the article number.

I also wish to receive the following services (for an extra fee):

- Addressee's Address
- Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. W. W. Vierday
Legal & Governmental Affairs
Florida Power Corp.
3201 34th Street South
St. Petersburg, FL 33733

5. Signature (Addressee)

6. Signature (Agent)

4a. Article Number
P 710 058 536

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

7. Date of Delivery
5/27/92

8. Addressee's Address (Only if requested and fee is paid)
3201 34th St. S.
St. Pete 33711

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CERTIFIED MAIL

In the Matter of an
Application for Permit by:

DER File No. AC 49-203114
PSD-FL-180
Osceola County

Mr. W. W. Vierday
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

INTENT TO ISSUE

The Department of Environmental Regulation gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above, for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Florida Power Corporation, applied on October 3, 1991, to the Department of Environmental Regulation for a permit to construct four 92.9 MW and two 185.5 simple cycle combustion turbines. The facility is located in Intercession City, Osceola County, Florida.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes and Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that a construction permit is required for the proposed work.

Pursuant to Section 403.815, Florida Statutes and Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this intent in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the

approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION



C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed by certified mail before the close of business on May 22, 1992 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Martha Jane Wise 5/22/92
Clerk Date

Copies furnished to:

Kennard Kosky, P.E.
Chuck Collins, CD
Jewell Harper, EPA
Chris Shaver, NPS
Julia Thomas, Fish & Wildlife

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue a PSD permit to Florida Power Corporation, 3201 34th Street South, St. Petersburg, Florida 33733, to construct four 92.9 MW and two 185.5 simple cycle combustion turbines. A determination of Best Available Control Technology (BACT) was required. The nearest Class I area is the Chassahowitzka National Wilderness Area which is located approximately 110 km away. The Class I sulfur dioxide PSD increment consumed is 19.3 vs. 25 allowable 3-hour average, 4.92 vs. 5 allowable 24-hour average and 0.45 vs. 2 allowable annual average, in micrograms per cubic meter. The Class II sulfur dioxide PSD increment consumed is 63.8 vs. 512 allowable 3-hour average, 17.1 vs. 91 allowable 24-hour average and 1.8 vs. 20 allowable annual average, in micrograms per cubic meter. The Class I particulate matter PSD increment consumed is less than 0.34 vs. 10 allowable 24-hour average and less than 0.02 vs. 5 allowable annual average, in micrograms per cubic meter. The Class I nitrogen dioxide increment consumed is less than 0.34 vs. 2.5 allowable annual average, in micrograms per cubic meter. The maximum predicted increases in ambient concentrations for both particulate matter and nitrogen dioxide are less than significant in the Class II area surrounding the plant, thus no Class II increment consumption was calculated for these pollutants. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner

contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Central District
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803-3767

Any person may send written comments on the proposed action to Mr. Preston Lewis at the Department's Tallahassee address. All comments received within 14 days of the publication of this notice will be considered in the Department's final determination.

ATTACHMENTS AVAILABLE UPON REQUEST

Technical Evaluation
and
Preliminary Determination

Florida Power Corporation
Intercession City Facility
Intercession City, Osceola County, Florida

Six Simple Cycle Combustion Turbines
(Four 92.9 MW & Two 185.5 MW)

Permit Number: AC 49-203114
PSD-FL-180

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

May 22, 1992

SYNOPSIS OF APPLICATION

I. NAME AND ADDRESS OF APPLICANT

Florida Power Corporation
Intercession City Facility
3201 34th Street South
St. Petersburg, Florida 33733

II. REVIEWING AND PROCESS SCHEDULE

Date of Receipt of Application: October 3, 1991

Completeness Review: Department letters dated October 31, 1991, February 21, 1992, and March 9, 1992.

Response to Incompleteness Letters: Company letter received on December 16, 1991, January 23, 1992, February 10, 1992, March 6, 1992, and March 26, 1992.

Application Completeness Date: March 26, 1992.

III. FACILITY INFORMATION

III.1 Facility Location

This facility is located at State Road 532, 3.5 miles west of Intercession City in Osceola County, Florida. The UTM coordinates are Zone 17, 446.3 km East and 3126 km North.

III.2 Facility Identification Code (SIC)

Major Group No. 49 - Electric, Gas and Sanitary Services.

Industry Group No. 491 - Combination Electric, Gas and Other Utility Services.

Industry Group No. 4911 - Electric and Other Services Combined.

III.3 Facility Category

The Florida Power Corporation in Intercession City is classified as a major emitting facility. The proposed project, combustion turbines (CT) peaking units, will increase this facility's emissions by approximately 2,369 tons per year (TPY) of nitrogen oxides (NO_x); 2,459 TPY of sulfur dioxide (SO₂); 159 TPY of particulate matter (PM); 65 TPY of volatile organic compounds (VOC); 0.034 TPY of beryllium; 0.12 TPY of lead; 0.04 TPY of mercury; and 187 TPY of sulfuric acid mist if operated at 3,390 hours per year and using a maximum of 0.2 percent sulfur by weight (33% capacity factor).

IV. PROJECT DESCRIPTION

The Florida Power Corporation proposes to operate four simple cycle CTs (GE Model PG7111EA) rated at 92.9 MW each for a total of 371.6 MW and two simple cycle CTs (GE Model PG7221FA) rated at 185.5 MW each for a total of 371 MW. The six CTs will be located along side six existing CTs generating 306 MW. The proposed CTs are designed to burn No. 2 fuel oil and are equipped with water injection for NOx control.

V. RULE APPLICABILITY

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, Chapters 17-2 and 17-4, Florida Administrative Code (F.A.C.), and 40 CFR (July, 1990 version).

The plant is located in an area designated attainment for all criteria pollutants in accordance with F.A.C. Rule 17-2.420.

The proposed project will be reviewed under F.A.C. Rule 17-2.500(5), New Source Review (NSR) for Prevention of Significant Deterioration (PSD), because it will be a major modification to a major facility. This review consists of a determination of Best Available Control Technology (BACT) and unless otherwise exempted, an analysis of the air quality impact of the increased emissions. The review also includes an analysis of the project's impacts on soils, vegetation and visibility; along with air quality impacts resulting from associated commercial, residential and industrial growth.

The sources shall be in compliance with the New Source Performance Standards for Gas Turbines, Subpart GG, Appendix A, which is contained in 40 CFR 60, and is adopted by reference in F.A.C. Rule 17-2.660. The proposed sources shall also comply with applicable provisions of F.A.C. Rule 17-2.700, Stack Test Procedures, and F.A.C. Rule 17-2.630, Best Available Control Technology.

VI. SOURCE IMPACT ANALYSIS

VI.1 Emission Limitations

The operation of the simple cycle combustion plant burning No. 2 fuel oil will produce emissions of NO_x, SO₂, CO, sulfuric acid mist, PM, Be, Pb and Hg. The impact of these pollutant emissions are below the Florida ambient air quality standards (AAQS) and/or the acceptable ambient concentration levels (AAC). Table 1 and 2 lists each contaminant and its maximum expected emission rate.

VI.2 Air Toxics Evaluation

The operation of the sources will produce emissions of chemical compounds that may be toxic in high concentrations. The emission rates of these chemicals shall not create ambient concentrations greater than the acceptable ambient concentrations (AAC) as shown below. Determination of the AAC for these organic compounds shall be determined by Department approved dispersion modeling or ambient monitoring.

$$\text{AAC} = \frac{\text{OEL}}{\text{Safety Factor}}$$

Where,

AAC = acceptable ambient concentration

Safety Factor = 50 for category B substances and 8 hrs/day
100 for category A substances and 8 hrs/day
210 for category B substances and 24 hrs/day
420 for category A substances and 24 hrs/day

OEL = Occupational exposure level such as ACGIH, ASHA and NIOSH published standards for toxic materials.

MSDS = Material Safety Data Sheets

VI.3 Air Quality Analysis

a. Introduction

The operation of the proposed six combustion peaking turbines will result in emissions increases which are projected to be greater than the PSD significant emission rates for the following pollutants: NO_x, SO₂, PM, PM₁₀, Be, CO, inorganic arsenic, and H₂SO₄ mist. Therefore, the project is subject to the PSD NSR requirements contained in F.A.C. Rule 17-2.500(5) for these pollutants. Part of these requirements is an air quality impact analysis for these pollutants, which includes:

- An analysis of existing air quality;
- A PSD increment analysis (for SO₂, PM, PM₁₀, and NO_x);
- An ambient Air Quality Standards analysis (AAQS);
- An analysis of impacts on soils, vegetation, visibility and growth-related air quality impacts; and,
- A Good Engineering Practice (GEP) stack height determination

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analyses are based on air quality dispersion modeling completed in accordance with EPA guidelines.

Based on these required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard. A brief description of the modeling methods used and results of the required analyses follow. A more complete description is contained in the permit application on file.

b. Analysis of the Existing Air Quality

Preconstruction ambient air quality monitoring may be required for pollutants subject to PSD review. However, an exemption to the monitoring requirement can be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined through air quality modeling, is less than a pollutant-specific de minimus concentration. The predicted maximum concentration increase for each pollutant subject to PSD (NSR) is given below:

	SO ₂	TSP & PM ₁₀	NO _x	CO	Be
PSD de minimus Concentra. (ug/m ³)	13	10	14	575	.001
Averaging Time	24-hr	24-hr	Annual	8-hr	24-hr
Maximum Predicted Impact (ug/m ³)	16.1	0.34	0.34	4.2	.000075

There are no monitoring de minimus concentrations for H₂SO₄ mist and inorganic arsenic. As shown above, the predicted impacts for TSP/PM₁₀, NO_x, CO, and Be are all less than the corresponding de minimus concentrations; therefore, no preconstruction monitoring is required for these pollutants. However, since the predicted SO₂ impact is greater than the de minimus concentration, a pre-construction ambient monitoring analysis is required for SO₂. The Department determined that the use of existing FDER air quality monitoring data collected in 1990 from the Winter Park SO₂ monitoring site in Orange County would be appropriate to satisfy the ambient monitoring analysis requirement. Background SO₂ values of 53 ug/m³, 3-hr average; 28 ug/m³, 24-hr average; and 4 ug/m³, annual average, were based on these data. This site is located 4.1 km away from the project.

c. Modeling Method

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used by the applicant to predict the impact of the proposed project on the surrounding ambient air. All recommended EPA default options were used. Direction-specific downwash parameters were used because the stacks were less than the good engineering practice (GEP) stack height. Five years of sequential hourly surface and mixing depth data from the

Orlando/Tampa Florida National Weather Service (NWS) station collected during 1982 through 1986 were used in the model. Since five years of data were used, the highest-second-high (HSH) short-term predicted concentrations are compared with the appropriate ambient air quality standards or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards.

d. Modeling Results

The applicant first evaluated the potential increase in ambient ground-level concentrations associated with the project to determine if these predicted ambient concentration increases would be greater than specified PSD significant impact levels for SO₂, CO, NO_x, PM and PM₁₀. This evaluation was based on the proposed CT units operating at load conditions of 100, 75, 50 and 25 percent. The modeling was performed using the highest emissions at 20°F design condition coupled with the lowest exit gas flow rates at 90°F design condition to maximize predicted impacts. The applicant modeled emissions based on the use of fuel oil with a maximum sulfur content of 0.5%. The BACT determination specifies the use of fuel oil with a maximum sulfur content of 0.2%, thus the modeled results are conservative. The maximum predicted concentrations generally occur for the maximum capacity at 100% operating load. Dispersion modeling was performed with receptors placed along the 36 standard radial directions (10 degrees apart) surrounding the proposed units at the following downwind distances: (1) the first 36 receptors were located at the plant property boundaries with an additional near-field grid of 54 receptors located 400m and 700m from the proposed units off of plant property; (2) subsequent receptors were located at distances of 1.0, 1.3, 1.6, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 7.5, 10.0, 12.5, 15.0, 20.0, 25.0, 30.0, 40.0, and 50.0 km from the facility, all of which are off plant property. The results of this modeling presented below show that the increases in ambient ground-level concentrations for all averaging times are less than the PSD significant impact levels for CO, NO_x, PM and PM₁₀.

Avg. Time	SO ₂		NO ₂		CO		PM and PM ₁₀	
	Annual	3-hr	24-hr	Annual	1-hr	8-hr	Ann.	24-hr
PSD Signifi. Level (ug/m ³)	1.0	25.0	5.0	1.0	2000	800	1.0	5.0
Ambient Concen. Increase (ug/m ³)	0.62	71.4	16.1	0.34	11.2	4.2	0.02	0.34

Therefore, further dispersion modeling for comparison with AAQS and PSD increment consumption were not required for CO, NO_x, PM and PM₁₀. However, the results also show that the increases in maximum ambient groundlevel concentrations for the 3-hr and 24-hr averaging times for SO₂ were greater than the PSD significant impact levels, thus requiring the applicant to do a full impact analysis for SO₂. The significant impact area for the facility was determined to be greater than 50 km; therefore, all sources within

50 km of the facility were evaluated by the applicant. Screening analyses were performed for predicting maximum SO₂ concentrations for comparison to the PSD Class II increments and the AAQS using the same receptor grid described above. Refined AAQS and PSD Class II analyses were based on modeling the years during which the overall HSH 3-hour, HSH 24-hour, and highest annual concentrations were predicted in the screening analyses. The refined 3-hr and 24-hr modeling was conducted using a receptor grid centered on the receptor which had the HSH 3-hr or 24-hr concentration determined from the screening analysis. These receptors were located at intervals of 100m between the distances considered in the screening phase, along 19 radials spaced at 1-degree increments centered on the radial along which the maximum concentration was predicted. The results of these analyses for SO₂ and comparison with the appropriate standards and increments are summarized in the following tables. The maximum predicted SO₂ concentrations are all less than the appropriate AAQS and PSD increments.

AAQS Analysis (all values in ug/m³)

<u>Avg. Time</u>	<u>Annual</u>	<u>3-hr</u>	<u>24-hr</u>
Maximum Predicted Concentration	37.7	792	215
Includes Background Value	4	53	28
AAQS	60	1300	260

Cumulative PSD Class II
Increment Analysis (all values in ug/m³)

<u>Avg. Time</u>	<u>Annual</u>	<u>3-hr</u>	<u>24-hr</u>
Max. Predicted Consumption Concen.	1.80	63.8	17.1
Increment	20	512	91

The impact of this project on the Class I increments for SO₂ in the closest Class I area, the Chassahowitzka National Wilderness Area, which is located approximately 110 km away is shown below:

Cumulative PSD Class I
Increment Analysis (all values in ug/m³)

<u>Avg. Time</u>	<u>Annual</u>	<u>3-hr</u>	<u>24-hr</u>
Max. Predicted Consumption Concen.	.45	19.3	4.92
Increment	2	25	5

The maximum predicted increment consumptions are all less than the appropriate PSD increments.

Sulfuric acid mist, beryllium, mercury and arsenic are noncriteria pollutants, which means that neither national AAQS nor PSD Significant Impacts have been defined for these pollutants. However, the Department does have a draft Air Toxics Permitting Strategy, which defines no threat levels for these pollutants. The Department and the applicant have used the same modeling procedure described above for the screening analysis to evaluate the maximum increase in ground level concentration of these pollutants for comparison with the no-threat levels. The results of this analysis are shown on the following page:

<u>Avg. Time</u>	<u>H₂SO₄ mist 24-hr</u>	<u>Be Annual</u>	<u>Hg 24-hr</u>	<u>As Annual</u>
No Threat-Level (ug/m ³)	2.4	.0004	.024	.00023
<u>Max. Concen. Increase</u>	<u>2.0</u>	<u>.000005</u>	<u>.00009</u>	<u>.000008</u>

All of these values are less than their respective no-threat levels.

e. Additional Impacts Analysis

A Level-1 screening analysis using the EPA model, VISCREEN was used to determine any potential adverse visibility impacts on the Class I Chassahowitzka National Wilderness Area located about 110 km away. Based on this analysis, the maximum predicted visual impacts due to the proposed project are less than the screening criteria both inside and outside the Class I area. A comprehensive air quality related values (AQRV) analysis for this Class I area was performed by the applicant for not only SO₂ and other criteria pollutants but for numerous non-criteria pollutants that could potentially be emitted by the proposed project. No significant impacts on the Class I area are expected.

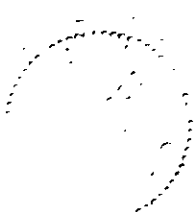
In addition, the maximum predicted concentrations from NO_x, CO, SO₂, PM and PM₁₀ are predicted to be less than the AAQS, including the national secondary standards designed to protect public welfare-related values. As such, no harmful effects on soil and vegetation are expected in the area of the project. Also, the proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

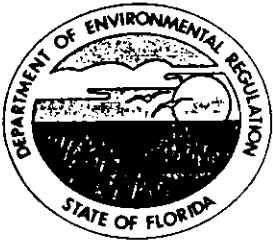
VII. CONCLUSION

Based on the information provided by Florida Power Corporation, the Department has reasonable assurance that the proposed installation of the 742.6 MW simple cycle gas turbine

system, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

J. [Signature]
PE # 41755





Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Florida Power Corporation
Intercession City Facility
3201 34th Street South
St. Petersburg, Florida 33733

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: Mar. 31, 1994
County: Osceola
Latitude/Longitude: 28°15'37"N
81°32'47.6"W
Project: Four 92.9 MW and Two
185.5 MW Simple Cycle Gas
Turbines

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For four 92.9 MW and two 185.5 MW simple cycle combustion turbines (CTs) with maximum heat input of 1,029 MMBtu/hr/unit and 1,886.3 MMBtu/hr/unit at 59°F (oil) to be located at the Intercession facility in Intercession City, Florida. The turbines are to be GE PG7111FA and GE PG7111EA equipped with wet injection. The UTM coordinates are Zone 17, 446.3 km East and 3126 km North.

The sources shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Florida Power Corporation (FPC) application received October 3, 1992.
2. Department's letter dated October 31, 1991.
3. FPC's letter received December 16, 1991.
4. FPC's letter received January 23, 1992.
5. FPC's letter received February 10, 1992.
6. Department's letter dated February 21, 1992.
7. FPC's letter dated March 5, 1992.
8. Department's letter dated March 9, 1992.
9. FPC's letter dated March 25, 1992.

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

GENERAL CONDITIONS:

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

- a. Have access to and copy any records that must be kept under the conditions of the permit;
- b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

GENERAL CONDITIONS:

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
- b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
 - the date, exact place, and time of sampling or measurements;

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

GENERAL CONDITIONS:

- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

Emission Limits

1. The maximum allowable emissions from these sources shall not exceed the emission rates listed in Table 1 (92.9 MW combustion turbines) and Table 2 (185.5 MW combustion turbines).
2. Visible emissions shall not exceed 20% opacity except at full load in which case visible emissions shall not exceed 10% opacity.

Operating Rates

3. These sources are allowed to use only No. 2 fuel oil with a 0.2% sulfur content maximum, by weight.
4. The permitted materials and utilization rates for the simple cycle gas turbines shall not exceed:
 - (A) The average maximum capacity factor shall be limited to 38.7% (3,390 hours per year operating time).
 - (B) Total hours of operation for the six turbines shall not exceed 20,340 unit hours per year. Unit hour per year shall be determined by adding the hrs/yr operation of each of the six units.
 - (C) GE FRAME 7FA
 - a) The maximum heat input of 2,032 MMBtu/hr/unit at 20°F (peak load).

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

SPECIFIC CONDITIONS:

- b) The maximum heat input of 1,886 MMBtu/hr/unit at 59°F (peak load).
- c) The maximum heat input of 1,708 MMBtu/hr/unit at 90°F (peak load).
- d) Maximum No. 2 fuel oil consumption shall not exceed 14,342 gal/hr/unit (at 59°F) or 97,238,760 gal/yr based on 59°F or the prorated consumption based on the tables in the application to construct these units.

(D) GE FRAME 7EA

- a) The maximum heat input of 1,144 MMBtu/hr/unit at 20°F (peak load).
- b) The maximum heat input of 1,029 MMBtu/hr/unit at 59°F (peak load).
- c) The maximum heat input of 932 MMBtu/hr/unit at 90°F (peak load).
- d) Maximum No. 2 fuel oil consumption shall not exceed 7,826 gal/hr/unit or 106,120,560 gal/yr based on 59°F or the prorated consumption based on the tables in the application to construct these units.

5. The capacity factor for these turbines shall be limited to 33% based on a weighted 12 month rolling maximum sulfur content of 0.2%. However, if the weighted rolling average sulfur content of the fuel oil is less than 0.2%, the capacity factor may be adjusted using the following table:

<u>Percent Average Sulfur Content</u>	<u>% Capacity Factor</u>
0.2 - 0.195	33.0
0.19 - 0.185	34.4
0.18 - 0.175	35.8
0.17 - 0.165	37.2
0.16 - or less	38.7

6. Any change in the method of operation, equipment or operating hours shall be submitted to DER's Bureau of Air Regulation.

7. Any other operating parameters established during compliance testing and/or inspection that will ensure the proper operation of this facility may be included in the operating permit.

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

SPECIFIC CONDITIONS:

Compliance Determination

8. Compliance with the NO_x, SO₂, CO, PM, PM₁₀, and VOC standards shall be determined (on each unit while operating within 10% of the permitted maximum heat rate input) within 180 days of initial operation and annually thereafter, by the following reference methods as described in 40 CFR 60, Appendix A (July, 1991 version) and adopted by reference in F.A.C. Rule 17-2.700.

- Method 1. Sample and Velocity Traverses
- Method 2. Volumetric Flow Rate
- Method 3. Gas Analysis
- Method 5. Determination of Particulate Matter Emissions from Stationary Sources
- Method 9. Determination of the Opacity of the Emissions from Stationary Sources
- Method 8. Determination of the Sulfuric Acid of the Emissions from Stationary Sources
- Method 10. Determination of the Carbon Monoxide Emission from Stationary Sources
- Method 20. Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines
- Method 25A. Determination of the Volatile Organic Compounds Emissions from Stationary Sources

Other DER approved methods may be used for compliance testing after prior Departmental approval.

9. Method 5 must be performed on one combustion turbine (each type) to determine the initial compliance status of the unit. Thereafter, the opacity emissions test may be used unless 10% opacity is exceeded at peak load.

10. Compliance with the SO₂ emission limit can also be determined by calculations based on fuel analysis using ASTM D4292 for the sulfur content of liquid fuels.

11. Trace elements of Beryllium (Be) shall be tested during initial compliance test using EMTIC Interim Test Method. As an alternative, Method 104 may be used; or Be may be determined from fuel sample analysis using either Method 7090 or 7091, and sample extraction using Method 3040 as described in the EPA solid waste regulations SW 846.

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

SPECIFIC CONDITIONS:

12. Mercury (Hg) shall be tested during initial compliance test using EPA Method 101 (40 CFR 61, Appendix B) or fuel sampling analysis using methods acceptable to the Department.

13. During performance tests, to determine compliance with the proposed NO_x standard, measured NO_x emissions at 15 percent oxygen will be adjusted to ISO ambient atmospheric conditions by the following correction factor:

$$\text{NO}_x = (\text{NO}_x \text{ obs}) \left(\frac{P_{\text{ref}}}{P_{\text{obs}}} \right)^{0.5} e^{19 (H_{\text{obs}} - 0.00633)} \left(\frac{288^\circ\text{K}}{T_{\text{AMB}}} \right)^{1.53}$$

where:

NO_x = Emissions of NO_x at 15 percent oxygen and ISO standard ambient conditions.

NO_x obs = Measured NO_x emission at 15 percent oxygen, ppmv.

P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.

P_{obs} = Measured combustor inlet absolute pressure at test ambient pressure.

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718).

T_{AMB} = Temperature of ambient air at test.

14. Test results will be the average of 3 valid runs. The Central District office will be notified at least 15 days in writing in advance of the compliance test(s). The sources shall operate between 90% and 100% of permitted capacity during the compliance test(s) as adjusted for ambient temperature. Compliance test results shall be submitted to the Central District office no later than 45 days after completion.

15. A continuous monitoring system shall be installed to monitor and record the fuel consumption on each unit. Water injection shall be utilized for NO_x control. The water to fuel ratio at which compliance is achieved shall be incorporated into the permit and shall be continuously monitored. The system shall meet the requirements of 40 CFR Part 60, Subpart GG.

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

SPECIFIC CONDITIONS:

16. Sulfur, nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be based on a weighted 12 month rolling average from fuel delivery receipts. The records of fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.2 percent.

Rule Requirements

17. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-2 and 17-4, Florida Administrative Code and 40 CFR (July, 1990 version).

18. The sources shall comply with all requirements of 40 CFR 60, Subpart GG, and F.A.C. Rule 17-2.660(2)(a), Standards of Performance for Stationary Gas Turbines.

19. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-2.210(1)).

20. The sources shall comply with F.A.C. Rule 17-2.700, Stationary Point Source Emission Test Procedures.

21. If construction does not commence within 18 months of issuance of this permit, then the permittee shall obtain from DER a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)).

22. Quarterly excess emission reports, in accordance with the July 1, 1991 version of 40 CFR 60.7 and 60.334 shall be submitted to DER's Central District office.

23. Literature on equipment selected shall be submitted as it becomes available. A CT-specific graph of the relationship between NOx emissions and steam injection and also another of ambient temperature and heat inputs to the CT shall be submitted to DER's Central District office and the Bureau of Air Regulation.

24. Stack sampling facilities shall be provided for each of the stacks.

25. Construction period fugitive dust emissions shall be minimized by covering or watering dust generation areas.

PERMITTEE:
Florida Power Corporation
Intercession City Facility

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: March 31, 1994

SPECIFIC CONDITIONS:

26. Pursuant to F.A.C. Rule 17-2.210(2), Air Operating Permits, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur, nitrogen contents and the lower heating value of the fuel being fired, fuel usage, hours of operation, air emissions limits, etc. Annual reports shall be sent to the Department's Central District office by March 1 of each calendar year.

27. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

28. An application for an operation permit must be submitted to the Central District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this _____ day
of _____, 1992

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner
Secretary

TABLE 1
ALLOWABLE EMISSION LIMITS
92.9 MW Simple Cycle GE Frame EA Combustion Turbine

Pollutant	Standard Oil Firing	Each Unit lb/hr ^(a)	Total 4 Units T/yr	Basis
NO _x	42 ppmv at 15% oxygen-dry basis	182	1232 ^(a)	BACT
SO ₂	No. 2 fuel oil with 0.2% max. sulfur	222	1283 ^(c)	BACT
PM/PM ₁₀	0.01 lb/MMBtu	15	102 ^(b)	BACT
VOC	-	5	34 ^(b)	BACT
CO	25 ppm	54	366 ^(b)	BACT
Sulfuric Acid Mist	No. 2 fuel oil with 0.2% max. sulfur	18	106 ^(c)	BACT
Fluorines (FR)	-	3.34×10^{-2}	0.23 ^(b)	Application
Mercury (Hg)	3.0×10^{-6} lbs/MMBtu	3.09×10^{-3}	0.02 ^(b)	Application
Lead (Pb)	8.9×10^{-6} lbs/MMBtu	9.16×10^{-3}	0.06 ^(b)	Application
Inorganic Arsenic	4.2×10^{-6} lbs/MMBtu	4.32×10^{-3}	0.03 ^(b)	BACT
Beryllium (Be)	2.5×10^{-6} lbs/MMBtu	2.57×10^{-3}	0.02 ^(b)	BACT

(a) Emission rates based on 59°F and 15% O₂ at peak load.

(b) Equivalent to 3,390 hours per year at peak load (38.7% capacity factor) and 59°F.

(c) Total TPY for SO₂ assumes 33% capacity factor and fuel with a maximum sulfur content of 0.2%. Refer to Specific Condition No. 5 for listed capacity factors vs. sulfur content in oil.

TABLE 2
ALLOWABLE EMISSION LIMITS
185.5 MW Simple Cycle GE Frame FA Combustion Turbine

Pollutant	Standard Oil Firing	Each Unit lb/hr ^(a)	Total 2 Units T/yr	Basis
NO _x	42 ppmv at 15% oxygen-dry basis	334	1132 ^(a)	BACT
SO ₂	No. 2 fuel oil with 0.2% max. sulfur	407	1176 ^(c)	BACT
PM/PM ₁₀	0.01 lb/MMBtu	17	58 ^(b)	BACT
VOC	-	9	31 ^(b)	BACT
CO	25 ppm	79	268 ^(b)	BACT
Sulfuric Acid Mist	No. 2 fuel oil with 0.2% max. sulfur	28	81 ^(c)	BACT
Fluorines (FR)	-	6.13×10^{-2}	0.20 ^(b)	Application
Mercury (Hg)	3.0×10^{-6} lbs/MMBtu	5.66×10^{-3}	0.02 ^(b)	Application
Lead (Pb)	8.9×10^{-6} lbs/MMBtu	1.68×10^{-2}	0.06 ^(b)	Application
Inorganic Arsenic	4.20×10^{-6} lbs/MMBtu	7.9×10^{-3}	0.02 ^(b)	BACT
Beryllium (Be)	2.5×10^{-6} lbs/MMBtu	4.72×10^{-3}	0.02 ^(b)	BACT

(a) Emission rates based on 59°F and 15% O₂ at peak load.

(b) Equivalent to 3,390 hours per year at peak load (38.7% capacity factor) and 59°F.

(c) Total TPY for SO₂ assumes 33% capacity factor and fuel with a maximum sulfur content of 0.2%. Refer to Specific Condition No. 5 for listed capacity factors vs. sulfur content in oil.

Best Available Control Technology (BACT) Determination
 Florida Power Corporation
 Intercession City Facility
 Osceola County

The applicant proposes to operate six No. 2 fuel oil fired simple cycle combustion turbines with an output power of 92.9 MW (4 turbines) and 185.5 MW (2 turbines) to be used for peaking power at their facility in Osceola County, Florida.

The applicant states that the maximum heat input will be 1,029 MMBtu/hr and 1,886 MMBtu/hr for each turbine type (Frame EA and Frame FA, respectively). The applicant has indicated the maximum annual tonnage of regulated pollutants based on sea level conditions at 59°F and 38.7% capacity (3,390 hours/year) to be as follows:

<u>Pollutant</u>	<u>Potential Emissions (tons/yr)</u>	<u>PSD Significant Emission Rate (tons/yr)</u>
NO _x	2369	40
SO ₂	4326	40
H ₂ SO ₄ Mist	626	7
PM	159	25
PM ₁₀	159	15
CO	633	100
VOC	65	40
Be	0.034	0.0004
Hg	0.04	0.1
Pb	0.12	0.6
As	0.054	0

Florida Administrative Code Rule 17-2.500(2)(f)(3) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

Date of Receipt of a BACT Application

October 3, 1991

BACT Determination Requested by the Applicant

<u>Pollutant</u>	<u>Determination</u>
NO _x	42 ppmvd @ 15% O ₂
SO ₂ and H ₂ SO ₄	Max 0.5% Sulfur No. 2 fuel oil
PM/PM ₁₀	Combustion Controls
CO	Combustion Controls
VOC	Combustion Controls
As, Be	Fuel Quality

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account: energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

- (a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).
- (b) All scientific, engineering, and technical material and other information available to the Department.
- (c) The emission limiting standards or BACT determinations of any other state.
- (d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT Pollutants Analysis

Nitrogen Oxides (NO_x)

The applicant has stated that BACT for nitrogen oxides will be met by using wet injection necessary to limit emissions to 42 ppmvd corrected to 15% oxygen for No. 2 fuel oil firing.

A review of the EPA's BACT/LAER Clearinghouse indicates that the lowest NO_x emission limit established to date for a combustion turbine is 4.5 ppmvd at 15% percent oxygen. This level of control was accomplished through the use of water injection and a selective catalytic reduction (SCR) system.

Selective catalytic reduction is a post-combustion method for

control of NO_x emissions. The SCR process combines vaporized ammonia with NO_x in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90% reduction of NO_x with a new catalyst. As the catalyst ages, the maximum NO_x reduction will decrease to approximately 86 percent.

The effect of exhaust gas temperature on NO_x reduction depends on the specific catalyst formulation and reactor design. Generally, SCR units can be designed to achieve effective NO_x control over a 100-300°F operating window within the bounds of 450-800°F, although recently developed zeolite-based catalysts are claimed to be capable of operating at temperatures as high as 950°.

Most commercial SCR systems operate over a temperature range of about 600-750°F. At levels above and below this window, the specific catalyst formulation will not be effective and NO_x reduction will decrease. Operating at high temperatures can permanently damage the catalyst through sintering of surfaces.

Increased water vapor content in the exhaust gas (as would result from water or steam injection in the gas turbine combustor) can shift the operating temperature window of the SCR reactor to slightly higher levels.

The exhaust temperatures of the proposed CTs for the Intercession City site are expected to be in excess of 1,000°F. At temperatures of 1,000°F and above, the zeolite catalyst (reported to operate within 600°F to 950°F) will be irreparably damaged. Therefore, application of an SCR system using a zeolite catalyst on a simple-cycle operation is technically infeasible without exhaust gas cooling. Attemperation systems are neither commercially available nor have they been applied, even at a pilot stage, to SCR systems associated with simple-cycle CTs.

Consequently, the applicant has rejected using SCR because of technical infeasibility, economic and environmental impact. In addition, controlling NO_x emissions with SCR, the applicant has identified the following limitations: (a) reduced power output, (b) ammonia slip, and (c) disposal of hazardous waste generated (spent catalyst). The applicant was unable to find similar combustion turbines firing fuel oil and equipped with SCR, and states several supporting reasons for their decision in Table 4-3 of the application.

Economic analysis review of an application for a similar combustion turbine, included levelized cost for SCR of \$2,190,000. Assuming that the lowered ammonia injection ratio strategy was used to control NO_x emissions by 65%, the SCR would control 201 tons (.65 x 308 tons/year) for the 92.9 MW turbine and 367 tons (.65 x 566 tons/year). This reduction (201 and 367 tons/year) assumes an operating rate of 3,390 hours/year/unit. When this

reduction of NO_x is taken into consideration with the total annual cost of \$2,190,000, the cost per ton of controlling NO_x is \$10,890 and \$5,967 for the 92.9 MW and 185.5 MW units, respectively.

Several BACT determinations have established a 25% capacity factor as an operating limit due to the increase in nitrogen oxides emissions that results from the burning of oil as compared to natural gas. In some cases, turbines (using natural gas as a primary fuel) have been allowed to operate above the 25% capacity factor limitation on oil (generally 33%) provided that they use low NO_x combustors (42 ppmv on oil firing). Since the Intercession City facility is capable of limiting NO_x emissions to 42ppmv using wet injection and can only use oil, it is reasonable to allow the capacity factor to range from 33 to 38.7%. Hence, the technology proposed, wet injection, with a maximum capacity factor of 38.7% is accepted by the Department as BACT for NO_x .

Sulfur Dioxide(SO_2) and Sulfuric Acid Mist (H_2SO_4)

The applicant has stated that sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4) emissions when firing fuel oil will be controlled by lowering the operating time to 3390 hour/year per unit and the fuel oil sulfur content to a maximum of 0.5 % by weight, and an average of 0.3%. This will result in an annual emission rate of 4,326 tons SO_2 /year and 626 tons H_2SO_4 mist per year.

In accordance with the "top down" BACT review approach, only two alternatives exist that would result in more stringent SO_2 emissions. These include the use of a lower sulfur content fuel oil or the use of wet lime or limestone-based scrubbers, otherwise known as flue gas desulfurization (FGD).

In developing the NSPS for stationary gas turbines, EPA recognized that FGD technology was inappropriate to apply to these combustion units. EPA acknowledged in the preamble of the proposed NSPS that "Due to the high volumes of exhaust gases, the cost of flue gas desulfurization (FGD) to control SO_2 emissions from stationary gas turbines is considered unreasonable."(23). EPA reinforced this point when, later on in the preamble, ~~they stated that~~ "FGD... would cost about two to three times as much as the gas turbine."(23). The economic impact of applying FGD today would be no different.

Furthermore, the application of FGD would have negative environmental and energy impacts. Sludge would be generated that would have to be disposed of properly, and there would be increased utility (electricity and water) costs associated with the operation of a FGD system. The capital cost alone of a system designed for 90% removal would require debt services cost of \$30,000+/tons SO_2 removed. Finally, there is no information in the open literature to indicate that FGD has ever been applied to stationary gas turbines burning distillate oil.

The elimination of flue gas controls as a BACT option then leaves the use of low sulfur fuel oils as the next option to be investigated. Area available distillate fuel oil has a sulfur content in the range of 0.1% - 0.5% by weight. As already mentioned, several BACT determinations nationwide have established a 25% capacity factor as an operating time limit for turbines using gas as a primary fuel and oil as a supplemental fuel. Those facilities that have been permitted to operate above the 25% capacity factor limitation had a maximum sulfur content ranging from 0.20 to 0.25 percent.

The Intercession City facility's proposed simple cycle turbines will be allowed to operate from 33 to 37.8% capacity factor provided that the maximum sulfur content will not exceed 0.2%. This would result in a SO₂ and H₂SO₄ mist reduction of 1867 tons/year [4326 (proposed) - 2459 (allowable)] and 439 tons/yr [626 (proposed) - 187 (allowable)] while operating at a 33% capacity factor.

The applicant's cost analysis presented showed that the cost effectiveness of using 0.2% sulfur maximum in the oil instead of 0.5% sulfur maximum is \$1,995/ton SO₂ removed. The Department believes that this cost of \$1,995/ton removed is reasonable as BACT for this proposed project.

Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

Combustion design is proposed as BACT as a result of the technical infeasibility and economic impact of using catalytic oxidation on fuel-oil fired CTs. Catalytic oxidation has not been demonstrated on a continuous basis when using fuel oil and a cost effectiveness of \$7,099/ton removed will have an economic impact on this facility. The Department is in agreement with the applicant's proposal, therefore, BACT for this facility's gas turbines is combustion design as proposed.

Particulate Matter (PM/PM₁₀)

The design of the CTs ensures that particulate emissions will be minimized by combustion control and the use of clean fuels. The maximum particulate emissions from the CTs when burning fuel oil will be lower concentration than that normally specified for fabric filter designs (0.01 grains/scf). The Department accepts the applicant's proposed control for particulate matter.

Toxic Pollutants (As, Be)

The Department agrees with the applicant's rationale that there are no feasible methods to control beryllium and arsenic except by limiting the inherent quality of the fuel.

Although the emissions of these toxic pollutants could be controlled by particulate control devices, such as a baghouse or

scrubber, the amount of emission reductions would not warrant the added expense. As this is the case, the Department does not believe that the BACT determination would be affected by the emissions of these pollutants.

BACT Determination by DER

Based on the information presented by the applicant and the studies conducted, the Department believes that the use of SCR for NO_x control is not justifiable as BACT. Since these units are intended for peaking service and have operating hours limited to 3,390 hrs/yr/unit, wet injection for NO_x emission control is justifiable as BACT for this facility. BACT for SO₂ and sulfuric acid mist is the burning of fuel oil with a maximum sulfur content of 0.2%.

As this is the case, the BACT emission limitations are established as follows for the 92.9 MW combustion turbines.

<u>Pollutant</u>	<u>Emission Limit</u>	<u>Method of Control</u>
NO _x	42 ppmvd @ 15% O ₂	Wet Injection
SO ₂	222 lbs/hr/unit	Max. 0.2% sulfur content, by weight, No. 2 fuel oil
PM and PM ₁₀	15 lbs/hr/unit	Combustion
CO	54 lbs/hr/unit	Combustion
VOC	5 lbs/hr/unit	Combustion
Arsenic	4.32 x 10 ⁻³ lbs/hr/unit	Fuel Quality
Beryllium	2.57 x 10 ⁻³ lbs/hr/unit	Fuel Quality
H ₂ SO ₄	18 lbs/hr/unit	Max. 0.2% sulfur content, by weight, No. 2 fuel oil

and as follows for the 185.5 MW combustion turbines:

<u>Pollutant</u>	<u>Emission Limit</u>	<u>Method of Control</u>
NO _x	42 ppmvd @ 15% O ₂	Wet Injection
SO ₂	407 lbs/hr/unit	Max. 0.2% sulfur content, by weight, No. 2 fuel oil
PM and PM ₁₀	17 lbs/hr/unit	Combustion
CO	79 lbs/hr/unit	Combustion

VOC	9 lbs/hr/unit	Combustion
Arsenic	7.9×10^{-3} lbs/hr/unit	Fuel Quality
Beryllium	4.7×10^{-3} lbs/hr/unit	Fuel Quality
H ₂ SO ₄	28 lbs/hr/unit	Max 0.2% sulfur content, by weight, No. 2 fuel oil

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
 Department of Environmental Regulation
 Bureau of Air Regulation
 Twin Towers Office Building
 2600 Blair Stone Road
 Tallahassee, Florida 32399-2400

Recommended by:

Approved by:

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

 Carol M. Browner, Secretary
 Dept. of Environmental Regulation

 Date 1992

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