



Florida Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

December 16, 1993

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Jewell A. Harper
Air Enforcement Branch
U.S. EPA, Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365

Dear Ms. Harper:

Re: Florida Power Corporation, Polk County Project
470 MW - Stationary Gas Turbines
Site Certification Number: PA-92-33
Federal Number: PSD-FL-195

Enclosed for your review and comment is a copy of the Technical Evaluation and Preliminary Determination for the above referenced project. Please submit any comments or questions within 30 days to Preston Lewis at the above address or call (904) 488-1344 at your earliest convenience.

Sincerely,

for John C. Brown Jr.
C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/SA/bjb

Enclosure

cc: Bill Thomas, Southwest District
Chris Shaver, NPS
Scott Osbourne, FPC

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 Ms. Jewell A. Harper
 Air Enforcement Branch
 U.S. EPA, Region IV
 345 Courtland Street, NE
 Atlanta, Georgia 30365

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 P 872 562 511

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PS Form 3800, JUNE 1991

Technical Evaluation
and
Preliminary Determination

Florida Power Corporation
Polk County, Florida

TWO COMBINED CYCLE COMBUSTION TURBINES
(Phase IA - 2X235 MW)

File No.: (PSD-FL-195)
(PA-92-33)

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

December 16, 1993

SYNOPSIS OF APPLICATION

I. GENERAL INFORMATION

A. Name and address of applicant

Florida Power Corporation
3201 34th Street South
St. Petersburg, FL 33733

B. Reviewing and Process Schedule

Date of Receipt of Application: August 4, 1992

Completeness Review: Department letters dated August 31, 1992 and November 13, 1992.

Response to Incompleteness Letters: Company letters received on October 13, 1992 and November 30, 1992.

Application Completeness Date: November 30, 1992.

Application Waiver Date: September 10, 1993.

C. Facility Location

This facility is located at 7700 County Road 555, 3.5 miles northwest of Ft. Meade in Polk County, Florida. The UTM coordinates are Zone 17, 414.4 km east and 3073.9 km north.

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.

D. Project Description

The Florida Power Corporation (FPC) facility in Polk County is classified as a major emitting facility. The proposed project consists of the construction of multiple generating units and directly associated facilities at the Polk County site in multiple phases with an ultimate capacity of 3,000 megawatts (MW). The initial phase (Phase IA) consists of two combustion turbines (CTs), each equipped with one heat recovery steam generator (HRSG) and exhausting to a separate stack, a 99 MMBTU/hr auxiliary boiler, a 1,300 kilowatt (KW) diesel generator and a 97,570 barrel fuel oil storage tank. Phase IA is targeted for a maximum combined

generating capacity (CT generators and steam turbine generators) of 470 MW, with the CTs fired primarily on natural gas, with low sulfur fuel oil as backup.

E. Project Emissions

The proposed project, combined cycle combustion turbines, will produce emissions of 792 tons per year (TPY) of nitrogen oxides (NO_x); 56 TPY of sulfur dioxide (SO₂); 722 TPY of carbon monoxide (CO); 88 TPY of particulate matter (PM/PM₁₀); 97 TPY of volatile organic compounds (VOC); 0.0023 TPY of beryllium; 0.008 TPY of lead; 0.0027 TPY of mercury and 5.9 TPY of sulfuric acid mist if operated at 8760 hours per year (8,260 hours per year on natural gas and a maximum of 500 hours per year per CT on fuel oil) using a maximum of 0.05 percent sulfur and a maximum of 0.03 percent fuel bound nitrogen by weight in the No. 2 fuel oil.

II. RULE APPLICABILITY

The proposed project, construction of 470 MW of combined cycle units (SIC 4911) in Polk County, is subject to the State Power Plant Siting Act (PPSA) and preconstruction review under the provisions of Chapter 403, Florida Statutes, Chapters 17-212 and 17-4, Florida Administrative Code (F.A.C.), and 40 CFR 60 (July, 1993 version).

This facility is located in an area designated attainment for all criteria pollutants in accordance with F.A.C. Rule 17-275.400.

The proposed project will be reviewed under F.A.C. Rule 17-212.400(5), New Source Review (NSR) for Prevention of Significant Deterioration (PSD), because it will be a major new stationary source. 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 proposed facility shall be in compliance with all applicable provisions of F.A.C. Chapters 17-212 and 17-4 and the 40 CFR 60 (July, 1993 version). The proposed source shall be in compliance with all applicable provisions of F.A.C. Rules 17-210.650: Circumvention; 17-210.700: Excess Emissions; 17-296.800: Standards of Performance for New Stationary Sources (NSPS); 17-296: Stationary Point Source Emission Test Procedures; and, 17-4.130: Plant Operation-Problems.

The proposed facility shall be in compliance with the New Source Performance Standards (NSPS) for Gas Turbines, Subpart GG and NSPS for Industrial Steam Generating Units, Subpart Dc, which are contained in 40 CFR 60, Appendix A, and are adopted by reference in F.A.C. Rule 17-296.800.

III. TECHNICAL EVALUATION

The applicant proposes to install four combined cycle combustion turbine generators at their facility in southwest Polk County. These generator systems will consist of: 1) four nominal 235 megawatt (MW) General Electric PG 7221 (FA) (or equivalent) combined cycle combustion turbines (CCCTs), with exhaust through a heat recovery steam generator (HRSG), which will be used to power a steam turbine. The initial phase (Phase IA) consists of two CTs, each equipped with one HRSG and exhausting to a separate stack, a 99 MMBtu/hr auxiliary boiler, a 1,300 kilowatt diesel generator and a 97,570 barrel fuel oil storage tank. Phase IA is targeted for a maximum combined generating capacity of 470 MW. The next phase (Phase IB) consists of two CTs, each equipped with one HRSG and exhausting to a separate stack, for a maximum combined generating capacity of an additional 470 MW.

On February 25, 1992, the Public Service Commission (PSC) determined the need for the first 470 MW of combined cycle power plants, fueled primarily with natural gas. This Order represents approval for the initial 470 MW of generation at the Polk County Site. Therefore, this PSD permit will approve only Phase IA for a total of 470 MW generating capacity. The applicant will have to submit supplemental applications for the next phase (IB) PSD permit once the PSC has granted an order approving Phase IB.

The primary fuel to the two CTs for Phase IA will be natural gas. No. 2 fuel oil with a maximum sulfur content of 0.05%, by weight, will be used as a backup fuel for a maximum of 500 hours per year per CT. The remainder 8,260 hours will be fueled by natural gas. The emissions of nitrogen oxides (NO_x) represent a significant proportion of the total emissions generated by this project. The BACT for NO_x as determined by the Department will be met by using low-NO_x combustors to limit emissions to 12 ppmvd (corrected to 15% O₂) when burning natural gas and water injection to limit emissions to 42 ppmvd (corrected to 15% O₂) when burning fuel oil. The facility is subject to PSD and BACT for NO_x emissions because the proposed increase in annual NO_x emissions exceeds the significant emission rate. Compliance with the emission standards will be determined by stack tests and the NO_x emissions will be monitored continuously.

Particulate matter (PM/PM₁₀) emissions from the combined cycle combustion turbines will be minimized by combustion control and the use of clean fuels. The Department agrees with the applicant's rationale that there are no feasible methods to control lead, mercury, beryllium and other trace pollutants, except by limiting the inherent quality of the fuel. The facility is subject to PSD and BACT for PM/PM₁₀ emissions because the proposed increase in annual PM/PM₁₀ emissions exceeds the significant emission rate. Compliance will be determined by periodic stack tests and the visible emissions will be continuously monitored.

SO₂ emissions will be controlled by the use of low sulfur fuel. The No. 2 fuel oil, which will be used as a back-up fuel, for up to 500 hours per year, will have a maximum sulfur content of 0.05 percent, and will produce 9 ppmvd (98 lbs/hr) SO₂ emissions per combined cycle unit corrected to 15% O₂. The use of natural gas as the primary fuel, and limited use of fuel oil represents BACT for this facility. The facility is subject to PSD and BACT for SO₂ emissions because the proposed increase in annual SO₂ emissions exceeds the significant emission rate. Compliance with the SO₂ emission standards will be demonstrated by fuel analysis, stack testing, and/or continuous emission monitoring.

CO and VOC emissions will be minimized by combustion control to assure proper fuel mixing and complete fuel combustion. The CO emissions from the proposed combined cycle turbines with dry low-NO_x combustors are 25 ppmvd @ 15% O₂ for natural gas firing and 30 ppmvd @ 15% O₂ for fuel oil firing with water injection. VOC emissions have been based on exhaust concentrations of 7 ppmvd for natural gas and fuel oil firing. The facility is subject to PSD and BACT for CO and VOC emissions because the proposed increase in annual CO and VOC emissions exceeds the significant emission rate. Compliance with the emission standards will be determined by stack tests.

The facility is subject to the PSD regulations for beryllium, benzene and inorganic arsenic. These pollutants are caused primarily by the contaminants in the fossil fuels. Emissions will be controlled by limiting the quantity of fossil fuel that can be burned. Compliance for the pollutants shall be determined by stack tests.

The following table summarizes the emissions of air pollutants subject to PSD review.

<u>Pollutant</u>	<u>Emissions (TPY)</u>			<u>PSD Significant Emission Rate (TPY)</u>
	<u>Gas</u>	<u>Oil</u>	<u>Total</u>	
NO _x	639	153	792	40
SO ₂	9	47	56	40
CO	675	47	722	100
PM/PM ₁₀	79	8.5	87.5	15
VOC	91	6	97	40
Be	Neg.	0.0022	0.0022	0.0004
Benzene	0.93	Neg.	0.93	Any
Arsenic	Neg.	0.0038	0.0038	Any

IV. SOURCE IMPACT ANALYSIS

A. Introduction

On August 4, 1992, Florida Power Corporation (applicant) filed an air pollution permit application for the construction of a power generating station (Polk County Site) in the southwest portion of Polk County. The Polk County Site is approximately seven miles south-southwest of Bartow and five miles west-northwest of Fort Meade. The initial phase of the project (phase IA) will consist of two combustion turbines (CT's), each equipped with one heat recovery steam generator (HRSG), creating a total capacity of 470 MW, with a future ultimate site capacity of up to 3,000 MW. The applicant originally submitted their site certification application requesting an initial phase capacity of 940 MW (i.e., four CT's and HRSG's). Since the time of that submittal, the application was only approved by the PSC for 470 MW. This air impact analysis specifically addresses an initial 940 MW of generating capacity as was originally planned by the applicant. Thus, the analysis presented here conservatively estimates the air quality impacts associated with the lesser 470 MW facility. For future increases in the generating capacity, the applicant must reevaluate all air quality impacts associated with the generating capacity above 470 MW.

The proposed project as reviewed consists of four combustion turbines with associated heat recovery steam generators (CT/HRSG), an auxiliary boiler, and an emergency diesel generator. For purposes of this air quality impact analysis only emissions associated with the normal operation of the project (CT/HRSGs) were evaluated.

The applicant's proposed maximum annual emissions associated with the initial phase of the project, along with the prevention of significant deterioration (PSD) significant emission rates are presented in Table 1. As presented in Table 1, PSD review was required for the pollutants carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), particulate matter (PM₁₀), total suspended particulates (TSP), volatile organic compounds (VOC), beryllium (Be), benzene (C₆H₆) and inorganic arsenic (As). In addition to the PSD pollutants, the project will also emit several air contaminants considered to be air toxics by the Department, which are presented in Table 2.

As part of the PSD review process, the Department reviewed analyses on existing air quality, PSD increment consumption (Class I and II areas), ambient air quality standards (AAQS), soils, vegetation and wildlife impacts, visibility, growth-related air quality impacts, and proposed stack heights. In addition, an air toxics analysis was conducted in accordance with the Department's draft "Air Toxics Guidelines".

B. Modeling Methodology

In support of the PSD permit application, the applicant was required to demonstrate to the Department that the proposed project would not cause or contribute to an exceedance of any federal or state AAQS, PSD increment, visibility limit or no-threat levels (Department's draft "Air Toxics Guidelines"). These demonstrations were conducted by dispersion modeling techniques pre-approved by the Department.

For modeling purposes, the applicant examined emissions from only the CTs and HRSGs under full load conditions associated with ambient air temperatures of 40°F, 72°F, and 95°F, while firing either natural gas or fuel oil. Under these operating scenarios, worst-case short-term emission rates will occur while firing fuel oil at an ambient air temperature of 40°F. Worst-case annual emissions were based on the firing of fuel oil for no more than 500 hours per year and natural gas for the remaining 8,260 hours per year at an ambient temperature of 40°F.

For estimating ambient impacts on air quality from the proposed project, the applicant used the refined Industrial Source Complex Short-Term (ISCST) dispersion model (Version 90346) and VISCREEN Version 1.01 (88341) model. The applicant's choice of models for compliance demonstration purposes was acceptable to the Department. In conducting the ISCST modeling, the applicant collocated the CTs/HRSGs, applied the model's building downwash option, and chose the regulatory default option, which are all acceptable to the Department.

The applicant modeled the proposed project's ambient impacts at the nearest PSD Class I area (Chassahowitzka National Wilderness Area) as well as the area surrounding the Polk County Site. The individual receptor locations used by the applicant and approved by the Department for the PSD Class I area and PSD Class II/AAQS analyses are presented in Tables 3 and 4, respectively. Meteorological data used by the applicant was supplied by the Department in the form of hourly preprocessed National Weather Service (NWS) data from Tampa, Florida and twice-daily upper air soundings from Ruskin, Florida, for the five years 1982 through 1986.

The applicant's proposed maximum annual emissions have been summarized in Tables 1 and 2. Stack parameters and emission rates for the CTs/HRSGs used by the applicant in the modeling are contained in Table 5. All sources associated with the Polk County Site are considered "increment consuming" in relation to the PSD Class I and II areas.

C. Analysis of Existing Air Quality

The proposed project will be located in a PSD Class II area currently classified as attainment for all criteria pollutants by both the U.S. Environmental Protection Agency (EPA) and the Department.

For each pollutant identified in Table 1 as having a significant emission rate, the applicant determined the highest and second-highest predicted ambient impacts using the ISCST dispersion model. The results of the applicant's modeling exercise, as well as the Department's significant impact levels and de minimis levels are presented in Table 6. The applicant's modeling revealed SO₂ as the only pollutant for which a predicted off-site impact was greater than the significant impact level. (It should be noted that at the lower generating capacity that the facility will actually be operating (470 MW), there is no significant impact for SO₂.) The significant impact area for SO₂ was set within a circle with a 1.0 km radius and centered on the four CT/HRSGs (UTM Coordinates 414.300 km east and 3073.88 km north). For the initial phase, the applicant was required to establish an ambient air monitoring program for SO₂ and ozone (O₃) based on a comparison with the de minimis levels established by the Department. In addition, the applicant monitored for PM₁₀ based on potential fugitive dust emissions associated with the ultimate site capacity.

D. PSD Increment Analyses (NO₂, TSP and SO₂)

The Polk County Site is approximately 118 km from the nearest PSD Class I area. Prior to receiving a PSD permit the applicant must demonstrate to the Department that the proposed project will not "cause or contribute" to an exceedance of a PSD Class I increment. The applicant's predicted ambient impacts (Table 7) of the proposed project on the PSD Class I area revealed NO₂ and SO₂ as having significant impacts (significant as defined by the values suggested by the National Park Service and the U. S. Fish and Wildlife Service). (It should be noted that if the analysis had been completed for the 470 MW capacity instead of the 940 MW, the proposed facility would not have had a significant NO₂ impact in the Class I area.) Further analysis performed by the applicant, including other increment-consuming sources in the area, revealed that the allowable PSD Class I SO₂ increment was being exceeded on several days at many of the receptor points. Additional analysis by the applicant revealed that the proposed project had insignificant impacts on the PSD Class I area receptors on those days and times with predicted exceedances of the increment. Further analysis, including other increment-consuming sources, revealed that the allowable PSD Class I NO₂ increment was not exceeded.

The applicant's significant impact area analysis for the Class II area (Table 6) identified SO₂ as the only pollutant having an off-site significant impact. (It should be noted that if the

analysis had been completed for the 470 MW capacity instead of the 940 MW, the proposed facility would not have had a significant SO₂ impact.) Further analysis by the applicant revealed predicted ambient impacts from all PSD sources including the Polk County Site to be within the allowable PSD Class II increments for SO₂. The results of analysis are presented in Table 8.

E. AAQS Analysis

The applicant established background air quality concentrations based on information contained in the Department's 1990 air quality data base and information collected from an on-site air monitoring station. In establishing the background concentrations around the Polk County Site, the applicant used on-site air quality data for SO₂, PM₁₀, and O₃, and Tampa data for CO and NO₂. These background concentrations are presented in Table 9.

The applicant's maximum predicted SO₂ concentrations in the vicinity of the Polk County Site are presented in Table 10. The maximum concentrations represent the sum of the applicant's proposed project impacts, the modeled impacts of other nearby sources and the monitored background concentrations. The sum of these concentrations is below both the federal and state AAQS.

The applicant's predicted ambient air quality impact of various trace metals and volatile organic compounds are contained in Table 11. A comparison of the predicted impacts versus the Department's draft "Air Toxics Guidelines" reveals that the project is not expected to pose any long-term health risks.

F. Additional Impact Analysis

Potential impacts of the proposed project on the vegetation, soils, and wildlife of the PSD Class I area were examined by the applicant. In the analysis, the applicant addressed the impacts of the criteria pollutants, synergistic effects of these pollutants, as well as the deposition effects of these pollutants and certain trace metals. In all cases, the predicted impacts were at levels which would not be expected to result in any harm or damage to the vegetation, soils, and/or wildlife of the PSD Class I area.

In addition to the analysis on impacts to vegetation, soils, and wildlife, the applicant also examined the impact of the proposed project on the visibility of the PSD Class I area. In this analysis, the applicant used the VISCREEN computer model which reported that the maximum visual impacts inside the Class I area were not exceeded.

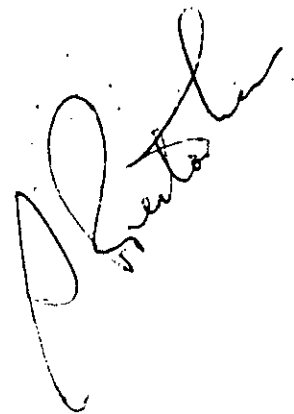
Growth-related air quality impacts associated with the project were examined by the applicant. The analysis addressed impacts resulting from industrial, commercial and residential growth in the vicinity of the Polk County Site potentially associated with the project. The analysis addressed only growth which would be considered permanent. In the analysis, the applicant projected a

population increase of approximately 80 people into the area, which represents less than 1 percent of the projected population increase into Polk County between 1990 and 2000. The applicant has projected that considerable amounts of residential and commercial development in the form of new homes, rental property, and businesses providing goods and services would occur. However, emissions (non-mobile) associated from this development are expected to be relatively small with associated impacts in locations different from that of the proposed project. The applicant projects that other industrial development associated with the proposed project will be negligible, due to the nature of the project.

The applicant addressed the Department's stack height policy (Rule 17-2.270, F.A.C.) by use of the BREEZEWAKE computer modeling program for downwash analysis, developed by Trinity Consultants, Inc. As designed, the applicant's proposed stack heights are within the requirements of the stack height policy (Table 5).

V. CONCLUSION

Based on the information presented by the applicant in the above analysis, the Department has been provided reasonable assurances that the proposed project of 470 MW (phase IA) as described in the application and subject to the conditions of approval proposed herein will not cause or contribute to any violation of any PSD increment, ambient air quality standard, or any other technical provision of Chapter 17-212 of the Florida Administrative Code.

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V. CONCLUSION

Based on the information presented by the applicant in the above analysis, the Department has been provided reasonable assurances that the proposed project of 470 MW (phase IA) as described in the application and subject to the conditions of approval proposed herein will not cause or contribute to any violation of any PSD increment, ambient air quality standard, or any other technical provision of Chapter 17-212 of the Florida Administrative Code.

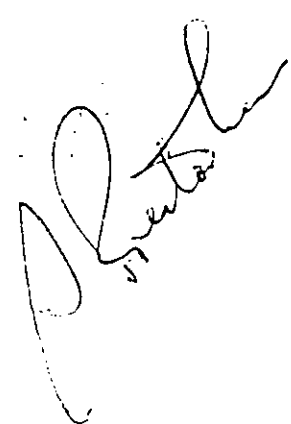
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TABLE 1

FPC POLK PHASE IA - 470 MW
 MAXIMUM POTENTIAL ANNUAL EMISSIONS
 AND PSD SIGNIFICANCE VALUES

Pollutant	Proposed Maximum Emissions (tpy)	PSD Significant Emission Rate (tpy)	PSD Review Required (Yes/No)
Carbon Monoxide	722	100	Yes
Nitrogen Oxides	792	40	Yes
Sulfur Dioxide	56	40	Yes
Particulate Matter (PM ₁₀)	88	15	Yes
Total Suspended Particulates (TSP)	88	25	Yes
Volatile Organic Compounds	97	40	Yes
Lead	0.008	0.6	No
Asbestos	Neg.	0.007	No
Beryllium	0.0023	0.0004	Yes
Mercury	0.0027	0.1	No
Vinyl Chloride	Neg.	1	No
Total Fluorides	Neg.	3	No
Sulfuric Acid Mist	5.9	7	No
Hydrogen Sulfide	Neg.	10	No
Total Reduced Sulfur	Neg.	10	No
Benzene	0.93	Any	Yes
Inorganic Arsenic	0.0038	Any	Yes
Radionuclides	Neg.	Any	No

Note: The air quality analysis was completed considering a 940 MW facility.

tpy = Tons per year

Neg. = Negligible

Any = Any emissions are considered significant.

TABLE 2

**FPC POLK PHASE I - 940 MW
OTHER REGULATED AND HAZARDOUS POLLUTANT EMISSIONS**

Pollutant	Emission Factor ¹ (lb/mmBtu)	Annual Emission ² (tpy)
Trace Metals		
Antimony	0.0000221	0.0398
Arsenic	0.0000042	0.00756
Barium	0.0000195	0.0351
Beryllium	0.0000025	0.00450
Boron	0.0000651	0.117
Cadmium	0.0000105	0.0189
Calcium	0.000747	1.34
Chromium	0.000048	0.0854
Cobalt	0.00000906	0.0163
Copper	0.00028	0.504
Lead	0.0000089	0.0160
Magnesium	0.000232	0.418
Manganese	0.000014	0.0252
Mercury	0.000003	0.00540
Nickel	0.00017	0.306
Selenium	0.00000235	0.00423
Vanadium	0.0000696	0.125
Zinc	0.000683	1.23
Volatile Organic Compounds		
Benzene	0.000065	1.79
Formaldehyde	0.000405 (0.00022) ³	6.44

Notes:

1. Emission factors are for fuel oil only, except for benzene which is for natural gas only.
2. Annual emissions are based on four CC units operating for 500 hours per year firing fuel oil at 40°F and 70 percent relative humidity, except for benzene which is based on 8,760 hours per year of natural gas firing.
3. Formaldehyde is also associated with natural gas combustion. Annual emissions are based on 500 hours per year firing fuel oil and 8,260 hours per year firing natural gas.

Source: EPA, 1988

TABLE 3

**FPC POLK PHASE I -940 MW
RECEPTOR GRID FOR PSD CLASS I AREA**

Point	UTM Coordinates		Distance from Polk County Site*		
	East (km)	North (km)	ΔX (km)	ΔY (km)	Distance (km)
1	340.3	3,165.7	-74.0	91.82	117.9
2	340.3	3,167.7	-74.0	93.82	119.5
3	340.3	3,169.8	-74.0	95.92	121.1
4	340.7	3,171.9	-73.6	98.02	122.6
5	342.0	3,174.0	-72.3	100.12	123.5
6	343.0	3,176.2	-71.3	102.32	124.7
7	343.7	3,178.3	-70.6	104.42	126.0
8	342.4	3,180.6	-71.9	106.72	128.7
9	341.1	3,183.4	-73.2	109.52	131.7
10	339.0	3,183.4	-75.3	109.52	132.9
11	336.5	3,183.4	-77.8	109.52	134.3
12	334.0	3,183.4	-80.3	109.52	135.8
13	331.5	3,183.4	-82.9	109.52	137.3

* Location of "zero point" for Polk County Site is 414.300 km East; 3,073.880 km North

TABLE 4

**FPC POLK PHASE I -940 MW
PSD CLASS II/AAQS RECEPTOR LOCATIONS**

UTM Coordinates		UTM Coordinates		UTM Coordinates	
East (km)	North (km)	East (km)	North (km)	East (km)	North (km)
415.166	3,703.380	414.422	3,073.191	414.989	3,073.301
415.066	3,073.237	414.474	3,072.895	414.814	3,073.267
414.879	3,073.191	414.300	3,073.080	414.600	3,073.360
414.650	3,073.274	414.196	3,073.289	414.750	3,073.101
414.800	3,073.514	414.144	3,072.994	414.539	3,073.224
414.574	3,073.128	414.061	3,073.222	414.642	3,072.940
414.404	3,073.289	413.958	3,072.940	414.439	3,073.092
414.456	3,072.994	413.900	3,073.187	414.300	3,073.280
414.30	3,073.180	413.850	3,073.344	414.300	3,072.980
414.30	3,072.88	414.913	3,073.366	414.178	3,073.191
414.161	3,073.092	414.750	3,073.344	414.126	3,072.895
414.095	3,073.316	414.943	3,073.114	414.026	3,073.182
413.992	3,073.034	414.700	3,073.187	414.000	3,073.360
413.950	3,073.274	414.505	3,073.316	413.850	3,073.101
413.800	3,073.014	414.608	3,073.034	413.786	3,073.263

TABLE 5

**FPC POLK PHASE I - 940 MW
STACK PARAMETERS AND EMISSION RATES FOR MODELED SOURCES Page 1 of 2**

Source Name	4-CCUs (Natural Gas Fired)	4-CCUs (Oil Fired)
UTM-N	414.40	414.40
UTM-E	3,073.91	3,073.91
Modeled location		
x	0	0
y	0	0
PSD Increment Consumer (y/n)	yes	yes
PSD Increment Expander (y/n)	no	no
Nearby Building Height (m)	22.86	22.86
Maximum Projected Width (m)	30.02	30.02
GEP Stack Height (m)	57.15	57.15
Modeled Stack Height (m)	34.4	34.4
Stack Exit Diameter (m)	4.1	4.1
Stack Exit Velocity (m/s)	35.3	40.5
Stack Exit Temperature (°K)	366	400
Emissions (g/s)		
Carbon Monoxide	40.36	48.44
Nitrogen Oxides	38.32	182.40
Sulfur Dioxide	0.52	49.44
Particulate Matter (PM ₁₀ - TSP)	4.56	8.56
Antimony	Negligible	0.02
Arsenic	Negligible	0.0038
Barium	Negligible	0.018
Beryllium	Negligible	0.0023
Boron	Negligible	0.059
Cadmium	Negligible	0.0095
Calcium	Negligible	0.68
Chromium	Negligible	0.043
Cobalt	Negligible	0.0082
Copper	Negligible	0.254
Lead	Negligible	0.0081

TABLE 5 (Continued)

FPC POLK PHASE I - 940 MW
 STACK PARAMETERS AND EMISSION RATES FOR MODELED SOURCES Page 2 of 2

Source Name	4-CCUs (Natural Gas Fired)	4-CCUs (Oil Fired)
Magnesium	Negligible	0.21
Manganese	Negligible	0.13
Mercury	Negligible	0.0027
Nickel	Negligible	0.15
Selenium	Negligible	0.021
Vanadium (as V ₂ O ₃)	Negligible	0.063
Zinc	Negligible	0.62
Volatile Organic Compounds	5.65	6.05
Benzene	0.054	Negligible
Formaldehyde	0.17	0.32
Asbestos	Negligible	Negligible
Vinyl Chloride	Negligible	Negligible
Total Fluorides	Negligible	Negligible
Sulfuric Acid Mist	0.056	5.04
Hydrogen Sulfide	Negligible	Negligible
Total Reduced Sulfur	Negligible	Negligible
Radionuclides	Negligible	Negligible

TABLE 6

**FPC POLK PHASE I - 940 MW
MAXIMUM AIR QUALITY IMPACTS FOR COMPARISON TO THE
SIGNIFICANT IMPACT AND DE MINIMUS AMBIENT LEVELS**

Pollutant	Averaging Time	Highest Predicted Impact ($\mu\text{g}/\text{m}^3$)	Highest, Second-Highest Predicted Impact ($\mu\text{g}/\text{m}^3$)	Sign. Impact Level ($\mu\text{g}/\text{m}^3$)	De Minimus Level ($\mu\text{g}/\text{m}^3$)
Carbon Monoxide	1-hour	47.1	27.3	2000.00	N/A
	8-hour	11.7	7.7	500.00	575.0
Nitrogen Dioxide	Annual	0.39	0.39	1.0	14.0
Sulfur Dioxide	3-hour	17.3	13.45	25.0	N/A
	24-hour	6.25*	3.08	5.0	13.0
	Annual	0.02	0.02	1.0	N/A
PM ₁₀ or TSP	24-hour	1.08	0.53	5	10
	Annual	0.03	0.03	1	N/A
Benzene	24-hour	0.0066	N/A	N/A	N/A
Beryllium	24-hour	0.00025	N/A	N/A	0.0005
Arsenic	24-hour	0.00045	N/A	N/A	N/A
Sulfuric Acid Mist	24-hour	0.61	N/A	N/A	N/A
Volatile Organic Compounds	Annual	197 TPY	197 TPY	N/A	100 TPY

* Significant Impact

Note: The SO₂ 24-hour value is not significant for the 470 MW facility.

TABLE 7

**FPC POLK PHASE I - 940 MW
PSD CLASS I AREA INCREMENT ANALYSIS - SIGNIFICANT IMPACTS**

Pollutant	Averaging Period	Maximum Predicted Concn. ⁽¹⁾ ($\mu\text{g}/\text{m}^3$)	PSD Class I Significance Value ⁽²⁾ ($\mu\text{g}/\text{m}^3$)	Significant Impact (Yes/No)
Nitrogen Dioxide	Annual	0.032	0.025	Yes
Particulate Matter (PM ₁₀ or TSP)	24-hour	0.090	0.33	No
	Annual	0.003	0.08	No
Sulfur Dioxide	3-hour	3.45	0.48	Yes
	24-hour	0.53	0.07	Yes
	Annual	0.002	0.0025	No

Notes:

- (1) Maximum short-term values less than annual concentrations are highest, second-highest values.
- (2) U. S. Fish and Wildlife Service suggested values.
- (3) Proposed project had insignificant impacts on those days and times with predicted exceedances of the SO₂ increment.
- (4) NO₂ is not significant considering the 470 MW facility.

TABLE 8

FPC POLK PHASE I - 940 MW
 MAXIMUM PREDICTED SO₂ IMPACTS⁽¹⁾ VERSUS
 CLASS II PSD INCREMENTS

Averaging Period	Maximum ⁽²⁾ Concentration ($\mu\text{g}/\text{m}^3$)	PSD Class II Increment ($\mu\text{g}/\text{m}^3$)
3-Hour	106.3	512
24-Hour	27.6	91
Annual	3.4	20

(1) Proposed and existing PSD Sources.

(2) Maximum short-term concentrations are highest,
 second-highest values.

TABLE 9

FPC POLK PHASE I - 940 MW
BACKGROUND AIR QUALITY DATA

Parameter	Averaging Period	Concentration ^[1] ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	FAAQS ($\mu\text{g}/\text{m}^3$)
Carbon Monoxide (CO) [2]	1-Hour	11,450	40,000	40,000
	8-hour	6,870	10,000	10,000
Nitrogen Dioxide (NO ₂) [3]	Annual	25	100	100
Sulfur Dioxide (SO ₂) [4]	3-Hour	78	1,300	1,300
	24-Hour	34	365	260
	Annual	5	80	60
Particulate Matter (PM ₁₀) [4]	24-Hour	24	150	150
	Annual	17	50	50
Ozone (O ₃) [5]	1-Hour	186	235	235

FAAQS - Florida Ambient Air Quality Standards
NAAQS - National Ambient Air Quality Standards

Note: [1]. Second-highest (short-term) and highest annual (long-term) concentrations are presented.

Sources:

[2] FDER Hillsborough Site 060G01 (1990)

[3] FDER Hillsborough Site 002G09 (1990)

[4] FPC Homeland AQ Station (10/15/91 through 2/14/92). Annual value based on 4 month average.

[5] FPC Homeland AQ Station (10/15/91 through 10/14/92). Highest value over the period.

TABLE 10

FPC POLK PHASE I - 940 MW
 MAXIMUM PREDICTED CONCENTRATIONS VERSUS FAAQS

Parameter	Avg. Time	Maximum Concentrations ⁽¹⁾				FAAQS ($\mu\text{g}/\text{m}^3$)
		FPC ($\mu\text{g}/\text{m}^3$)	Existing Sources ($\mu\text{g}/\text{m}^3$)	Monitored Value ($\mu\text{g}/\text{m}^3$)	Total ($\mu\text{g}/\text{m}^3$)	
CO	1-hr	27.3	N/A	11,450	11,477	40,000
	8-hr	7.7	N/A	6,870	6,878	10,000
NO ₂	Ann.	0.4	N/A	25	25.4	100
SO ₂	3-hr	0.0	256.7	78	334.7	1,300
	24-hr	0.1	83.2	34	117.2	260
	Ann.	0.1	18.3	5	23.3	60
PM ₁₀	24-hr	0.5	N/A	24	24.5	150
	Ann.	0.0	N/A	17	17.0	50

FAAQS - Florida Ambient Air Quality Standards

N/A - Not Applicable Since Source had Insignificant Impacts.

(1) Maximum short-term concentrations are highest, second-highest values.

Table 11

FPC POLK PHASE I - 940 MW
AIR TOXICS ANALYSIS⁽¹⁾

Parameter	FDER NTLs ($\mu\text{g}/\text{m}^3$)			Max. Pred. Conc. ($\mu\text{g}/\text{m}^3$)			Acceptable
	8 Hour	24 Hour	Ann.	8 Hour	24 Hour	Ann.	
Trace Metals ⁽²⁾							
Antimony*	5	1.2	0.30	5E-3	3E-3	1E-5	Yes
Arsenic *	2	0.48	2E-4	9E-4	5E-4	2E-6	Yes
Barium	5	1.2	50	4E-3	2E-3	8E-6	Yes
Beryl ⁽⁴⁾ *	0.02	5E-3	4E-4	5E-4	3E-4	1E-6	Yes
Boron	100	24	N/A	0.01	7E-3	3E-5	Yes
Cadmium *	0.5	0.12	6E-4	2E-3	1E-3	5E-6	Yes
Calcium ⁽⁴⁾	100	24	N/A	0.16	0.09	3E-4	Yes
Chrom. *	5	1.2	2E-3	0.01	5E-3	2E-5	Yes
Cobalt *	0.5	0.12	N/A	2E-3	1E-3	4E-6	Yes
Copper	10	2.4	N/A	0.06	0.03	1E-4	Yes
Lead	N/A	N/A	N/A	2E-3	1E-3	4E-6	N/A
Magnes. ⁽⁴⁾	100	24	N/A	0.05	0.03	1E-4	Yes
Mangan. *	50	12	0.40	3E-3	2E-3	6E-6	Yes
Mercury *	0.5	0.12	0.30	7E-4	3E-4	1E-6	Yes
Nickel *	1	0.24	N/A	0.04	0.02	7E-5	Yes
Selen. *	2	0.48	N/A	5E-4	3E-4	1E-6	Yes
Vanadium	0.5	0.12	20	0.02	8E-3	3E-5	Yes
Zinc	50	24	N/A	0.26	0.13	5E-4	Yes
VOCs ⁽³⁾							
Benzene *	30	7.2	0.12	0.01	7E-3	5E-4	Yes
Formaldehyde *	12	2.9	0.08	0.08	0.04	2E-3	Yes

(1) Analysis is for the four 235 MW CC units only.

(2) Trace metal emissions based on four 235 MW CC units fired on fuel oil.

(3) Volatile organic compound emissions based on four 235 MW CC units fired on natural gas.

(4) Based on Natural gas firing for 8,260 hrs/yr and fuel oil firing for 500 hrs/yr.

* Listed pollutant under Title III of CAA Amendments of 1990.

NTL = "No Threat" Level (FDER, 1992, Draft Air Toxics Guidelines)

N/A = Not applicable.



Florida Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

PERMITTEE:
Florida Power Corporation
3201 34th Street South
St. Petersburg, FL 33733

Permit Number: PA-92-33
PSD-FL-195
Expiration Date: November 1, 2000
County: Polk
Latitude/Longitude: 27°47'19"N
81°52'10"W
Project: 470 MW Combined Cycle
Combustion Turbines

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-212 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 specifically described as follows:

For two 235 MW combined cycle combustion turbines (CTs) with maximum heat input at 59°F of 1,510 MMBtu/hr/unit (natural gas) and 1,730 MMBtu/hr/unit (oil) to be located at the Polk County site near Fort Meade, Florida. Phase IA would consist of two combined cycle combustion turbines for a total of 470 MW, a 99 MMBtu/hr auxiliary boiler, a 1,300 KW diesel generator and a 97,570 barrel fuel oil storage tank. The combustion turbines are to be GE PG7111FA or equivalent and equipped with dry low NO_x combustors for natural gas firing and wet injection for fuel oil firing.

The source 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 August 4, 1992.
2. Department's letters dated August 31 and November 13, 1992.
3. FPC's letters dated October 13 and November 30, 1992.

PERMITTEE:
Florida Power Corporation

Permit Number: PA-92-33; PSD-FL-195
Expiration Date: November 1, 2000

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.

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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.

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Florida Power Corporation

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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 17-730.300, 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.

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GENERAL CONDITIONS:

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- 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:

The construction and operation of Polk County Site (Project) shall be in accordance with all applicable provisions of Chapters 17-210 to 297, F.A.C. The following emission limitations and conditions reflect BACT determinations for the Phase IA - 470 MW (two combined cycle combustion turbines and auxiliary equipment) of generating capacity for which the need has been determined. BACT determinations for the remaining phases will be made upon review of supplemental applications. In addition to the foregoing, the Project shall comply with the following conditions of certification as indicated.

A. General Requirements

1. The maximum heat input to each combustion turbine (CT) at an ambient temperature of 59° F shall neither exceed 1,510 MMBtu/hr while firing natural gas, nor 1,730 MMBtu/hr while firing fuel oil. Heat input may vary depending on ambient conditions and the CT characteristics. Manufacturer's curves or equations for correction to other temperatures shall be provided to DEP for review 90 days after selection of the CT. Subject to approval by the Department for technical validity applying sound engineering principles, the manufacturer's curves shall be used to establish heat input rates over a range of temperatures for the purpose of compliance determination.

2. Each of the two CTs in Phase IA may operate continuously, i.e., 8,760 hrs/year.

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Expiration Date: November 1, 2000

SPECIFIC CONDITIONS:

3. Only natural gas (NG) or low sulfur fuel oil shall be fired in each combustion turbine and the auxiliary boiler. Only low sulfur fuel oil shall be fired in the diesel generator. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent, by weight.

4. The maximum heat input to the auxiliary boiler shall not exceed 99 MMBtu/hr when firing NG or No. 2 fuel oil with 0.05 percent maximum sulfur content (by weight). All fuel consumption must be continuously measured and recorded for the auxiliary boiler.

5. The maximum allowable fuel oil consumption for the two turbines is 13,762,806 gallons per year, which is equivalent to an aggregate of 1,000 hours per year of operation at full load.

6. FPC shall have the option of installing duct module(s) suitable for possible future installation of an oxidation catalyst and/or SCR equipment on each combined cycle generating unit. In the event that the module(s) are not installed in the Heat Recovery Steam Generator (HRSG), the retrofit costs associated with not making provisions for such technology (initially) shall not be considered in any future economic evaluation to justify not installing SCR or an oxidation catalyst.

7. Fugitive dust emissions during the construction period shall be minimized by covering or watering dust generation areas.

8. If site construction does not commence on Phase IA (470 MW) within 18 months of issuance of this certification, then FPC may request an extension of the 18-month period, provided that such request is received by the Department's Bureau of Air Regulation at least 90 days prior to the expiration date. Such a request shall identify the progress made toward commencement of the construction of the site and the expected time required to start and complete construction of the initial phase. The Department may grant the extension upon a satisfactory showing that the extension is justified.

Units to be constructed or modified in later phases of the project will be reviewed under the supplementary review process of the Power Plant Siting Act. If site construction has not commenced within 18 months of issuance of this certification, then FPC shall obtain from DEP a review and, if necessary, a modification of the BACT determination and allowable emissions for the unit(s) on which construction has not commenced [40 CFR 52.21(r)(2)].

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Florida Power Corporation

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Expiration Date: November 1, 2000

SPECIFIC CONDITIONS:

B. Emission Limits

1. The maximum allowable emissions from two CTs, when firing natural gas or low sulfur fuel oil, in accordance with the BACT determination, shall not exceed the following, at 59° F (except during periods of start up, shutdown, malfunction and load change):

EMISSIONS LIMITATIONS

<u>POLLUTANT</u>	<u>FUEL</u>	<u>BASIS (g)</u>	<u>LB/HR/CT (a)</u>	<u>TPY (b)</u>
NO _x	Gas	12 ppmvd(h)	73	639
	Oil	42 ppmvd(c)	305	153
VOC (d)	Gas	7 ppmvw	10.4	91
	Oil	7 ppmvw	11.2	5.6
CO	Gas	25 ppmvd	77	675
	Oil	30 ppmvd	93	47
PM/PM ₁₀	Gas		9	79
	Oil(e)		17	8.5
SO ₂	Gas		0.99	8.7
	Oil (f)		94	47

Visible Emissions Gas 10 percent opacity
Oil 20 percent opacity

a. Emission limitations in LB/HR/CT are blocked 24-hour averages (midnight to midnight). Pollutant emission rates may vary depending on ambient conditions and the CT characteristics. Manufacturer's curves for the emission rate correction to other temperatures at different loads shall be provided to DEP for review 90 days after selection of the CT. Subject to approval by the Department for technical validity applying sound engineering principles, the manufacturer's curves shall be used to establish pollutant emission rates over a range of temperatures for the purpose of compliance determination.

b. Annual emission limits (TPY) for natural gas are based on a total of two CTs operating at full load 8,760 hours per year (i.e., NO_x - 73 lbs/hr X 2 CTs X 8,760 hrs/yr X 1 ton/2,000 lbs = 639 TPY). Annual emission limits (TPY) for fuel oil are based on full load operation for a total of 1,000 hours per year for the two CTs (i.e., NO_x - 305 lbs/hr X 1,000 hrs/yr X 1 ton/2,000 lbs = 153 TPY).

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c. Fuel oil NO_x emissions are based on full load operation at ISO conditions and 15 percent oxygen. For fuel oil firing, NO_x levels of 42 ppmvd @ 15 percent O₂ are based on a fuel bound nitrogen content of 0.015 percent or less. The emission limit for NO_x is adjusted as follows for higher fuel nitrogen contents up to a maximum of 0.030 percent by weight:

<u>FUEL BOUND NITROGEN</u> <u>(% BY WEIGHT)</u>	<u>NO_x LEVELS</u> <u>(PPMVD @ 15%O₂)</u>	<u>NO_x EMISSIONS</u> <u>LB/HR/CT</u>	<u>NO_x EMISSIONS</u> <u>TPY</u>
0.015 or less	42	305	153
0.020	44	320	160
0.025	46	334	167
0.030	48	349	175

using the formula $STD = 0.0042 + F$ where:

STD = allowable NO_x emissions (percent by volume at 15 percent O₂ and on a dry basis).

F = NO_x emission allowance for fuel-bound nitrogen defined by the following table:

<u>FUEL-BOUND NITROGEN (% BY WEIGHT)</u>	<u>F (NO_x % BY VOLUME)</u>
0 < N < 0.015	0
0.015 < N < 0.03	0.04(N-0.015)

where: N = the nitrogen content of the fuel (% by weight).

NO_x emissions limits are preliminary for the fuel oil specified in Specific Condition No. A.3. FPC shall submit fuel bound nitrogen content data for the low sulfur fuel oil prior to commercial operation.

d. Exclusive of background concentrations.

e. PM/PM₁₀ emission limitations are exclusive of sulfuric acid mist.

f. SO₂ emissions are based on a maximum of 0.05 percent sulfur in the fuel oil.

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SPECIFIC CONDITIONS:

g. The values are the computational basis for the lb/hr numbers, which are the actual emission limitations. Once a combustion turbine manufacturer has been selected, it may be necessary to modify this basis. If this basis is to be modified, a professional engineer-certified equivalency analysis by the manufacturer must be submitted to the Department. The equivalency analysis will recommend an emissions normalizing basis (i.e., lb/hr, lb/MMBtu, lb/MWh, or ppmvd) and associated emissions appropriate for the specific manufacturer's equipment. If the equivalency analysis demonstrates an impact equal to or less than the current lb/hr limit, the Department shall amend the conditions to reflect the alternate basis. The characteristics and parameters of the CT selected will be reflected in other permit conditions, where appropriate.

h. 12 ppmvd at 15 percent O₂, not ISO corrected. The ISO corrected value is 15 ppmvd at 15 percent O₂. Compliance will be determined through the initial and annual compliance tests required in Condition XIII.C.1.

2. The following CT emissions, determined by BACT, are tabulated for PSD purposes:

ESTIMATED EMISSIONS

<u>POLLUTANT</u>	<u>METHOD OF CONTROL</u>	<u>Basis(b)</u>
Benzene	Natural Gas	BACT
Inorganic Arsenic	No. 2 Fuel Oil(a)	BACT
Beryllium	No. 2 Fuel Oil(a)	BACT
Mercury	No. 2 Fuel Oil(a)	(c)
Pb	No. 2 Fuel Oil(a)	(c)

a. The No. 2 fuel oil shall have a maximum sulfur content of 0.05 percent.

b. Since these pollutants are inherent constituents in the fuel, the basis for control will be by specifying that only natural gas and No. 2 fuel oil can be fired at the facility.

c. Below PSD significant emission levels.

PERMITTEE:
Florida Power Corporation

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Expiration Date: November 1, 2000

SPECIFIC CONDITIONS:

3. FPC will install a dry low NO_x combustion turbine (CT). FPC shall make every practicable effort to achieve with that CT the lowest possible NO_x emission rate but must not exceed 73 lbs/hr (based on 12 ppmvd at 15 percent O₂ and 59° F) per CT (24-hour average, not including down time) on a continuous basis when firing natural gas.

4. After the initial compliance tests on the CTs (estimated to be in January, 1999), FPC shall operate a certified continuous emissions monitor for NO_x emissions, and collect 12 months of monitoring data. The monitor will at a minimum meet the requirements of 40 CFR 60 Appendix F quality assurance procedures. Within 17 months after the initial compliance test FPC shall prepare and submit for the Department's review an engineering report regarding the collection and the analysis of the data gathered from the monitor. In addition, this report shall include a conclusion regarding the lowest NO_x emission rate which can be consistently achieved with a reasonable operating margin taking into account long-term performance expectations and assuming good operating and maintenance practices. The report shall also include results of the testing requirements of Appendix F procedures and the actual CEM data for the period of the study in an acceptable format.

5. One month after submittal of the engineering report (estimated to be by June 2000), the Department will make a determination based on the engineering report submitted by FPC on the revised NO_x emission limits. If the data demonstrate that a NO_x emission rate of less than 73 lb/hr (based on 12 ppmvd at 15 percent O₂ and 59°F) is consistently achievable, the NO_x emission limits may be adjusted accordingly, but not lower than 55 lb/hr (based on 9 ppmvd at 15 percent O₂ and 59°F).

6. Excess emissions from a turbine resulting from start up, shutdown, malfunction, or load change shall be acceptable providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for a longer duration. The permittee shall provide a general description of the procedures to be followed during periods of start up, shutdown, malfunction, or load change to ensure that the best operational practices to minimize emissions will be adhered to and the duration of any excess emissions will be minimized. The description should be submitted to the Department along with the initial compliance test data. The description may be updated as needed by submitting such update to the Department within thirty (30) days of implementation.

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SPECIFIC CONDITIONS:

7. Operation of the auxiliary steam boiler shall be limited to a maximum of 100 hours per year and only during periods of cold CT startup, when no other source of steam is available or during periodic testing. The following emission limitations shall apply:

a. NO_x emissions shall not exceed 0.1 lb/MMBtu for natural gas firing or 0.2 lb/MMBtu for oil firing.

b. Sulfur dioxide emissions shall be limited by firing natural gas or low sulfur fuel oil with a maximum sulfur content of 0.05 percent by weight.

c. Visible emissions shall not exceed 10 percent opacity while burning natural gas, or 20 percent opacity (except for one six-minute period per hour during which opacity shall not exceed 27 percent), while burning low sulfur fuel oil.

8. Operation of the emergency diesel generator shall be limited to a maximum of 100 hours per year and only during periods of on site emergency power needs (when no other power source is available) or during periodic testing. The following emission limitations shall apply:

a. NO_x emissions shall not exceed 9.82 grams/hp-hr.

b. Sulfur dioxide emissions shall be limited by firing only low sulfur fuel oil with maximum sulfur content of 0.05 percent by weight.

c. Visible emissions shall not exceed 20 percent opacity.

C. Performance Testing

1. Initial (I) compliance tests shall be performed on each CT using both fuels. Testing of emissions shall be conducted with the source operating at capacity (maximum heat input rate for the tested operating temperature). Capacity is defined as 90 - 100 percent of rated capacity. If it is impracticable to test at capacity, then sources may be tested at less than capacity; in this case subsequent source operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen days for purposes of additional compliance testing to regain the rated capacity in the permit, with prior notification to the Department. Annual (A) compliance tests shall be performed on each CT with the fuel(s) used for more than 400 hours in the preceding 12-month period. Tests shall be conducted using EPA reference methods in accordance with 40 CFR 60, Appendix A, as adopted by reference in Rule 17-297, F.A.C.:

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SPECIFIC CONDITIONS:

- a. Reference Method 5B for PM (I, A, for oil only).
- b. Reference Method 9 for VE (I, A).
- c. Reference Method 10 for CO (I, A).
- d. Reference Method 20 for NOx (I, A).
- e. Reference Method 18 for VOC (I, A).
- f. Trace elements of Beryllium (Be) and Arsenic (As) shall be tested (I, for oil only) using EMTIC Interim Test Methods. As an alternative, Method 104 for Beryllium (Be) may be used; or Be and Arsenic may be determined from fuel analysis using either Method 7090 or 7091, and sample extraction using Method 3040 as described in the EPA solid waste regulations SW 846.
- g. ASTM D4294 (or equivalent) for sulfur content of distillate oil (I,A), which can be used for determining SO₂ emissions annually.
- h. ASTM D1072-80, D3031-81, D4084-82, or D3246-81 (or equivalent) for sulfur content of natural gas (I, and A if deemed necessary by DEP).

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

2. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent by weight. Compliance shall be demonstrated in accordance with the requirements of 40 CFR 60.334 testing for sulfur content of the fuel oil in the storage tanks on each occasion that fuel is transferred to the storage tanks from any other source. Testing for fuel bound nitrogen content and for fuel oil lower heating value, shall also be conducted on the same schedule.

D. Monitoring Requirements

For each combined cycle unit, the permittee shall install, operate, and maintain a continuous emission monitoring system (CEMS) (in accordance with 40 CFR 60, Appendix F) or use other approved alternate methods to monitor nitrogen oxides and, if necessary, a diluent gas (CO₂ or O₂). The Federal Acid Rain Program requirements of 40 CFR 75 shall apply when those requirements become effective within the state.

1. Each CEMS shall meet performance specifications of 40 CFR 60, Appendix B.

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Expiration Date: November 1, 2000

SPECIFIC CONDITIONS:

2. CEMS data shall be recorded and reported in accordance with Chapter 17-297.500, F.A.C., 40 CFR 60 and 40 CFR 75. The record shall include periods of start up, shutdown, and malfunction. Continuous compliance with condition XIII B.1. for NO_x shall be determined on a mass emission rate basis (LB/HR).

3. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.

4. The procedures under 40 CFR 60.13 and 40 CFR 75 shall be followed for installation, evaluation, and operation of all CEMS.

5. For purposes of the reports required under this permit, excess emissions are defined as any calculated average emission rate, as determined pursuant to Condition XIII.B.6 herein, which exceeds the applicable emission limits in Condition XIII.B.1.

E. Notification, Reporting and Recordkeeping

1. To determine compliance with the natural gas and fuel oil firing heat input limitation, the permittee shall maintain daily records of natural gas and fuel oil consumption for each turbine and the heating value for each fuel. All records shall be maintained for a minimum of two years after the date of each record and shall be made available to representatives of the Department upon request.

2. The project shall comply with all the applicable requirements of Chapter 17, F.A.C., and 40 CFR 60 Subparts A and GG. The requirements shall include:

a. 40 CFR 60.7(a)(1) - By postmarking or delivering notification of the start of construction no more than 30 days after such date.

b. 40 CFR 60.7(a)(2) - By postmarking or delivering notification of the anticipated date of the initial start up of each CT and the auxiliary steam boiler not less than 30 days prior to such date.

c. 40 CFR 60.7(a)(3) - By postmarking or delivering notification of the actual start up of each turbine and the auxiliary steam boiler within 15 days after such date.

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SPECIFIC CONDITIONS:

d. 40 CFR 60.7(a)(5) - By postmarking or delivering notification of the date for demonstrating the CEMS performance, no less than 30 days prior to such date.

e. 40 CFR 60.7(a)(6) - By postmarking or delivering notification of the anticipated date for conducting the opacity observations no less than 30 days prior to such date.

f. 40 CFR 60.7(b) - By initiating a recordkeeping system to record the occurrence and duration of any start up, shutdown or malfunction of a turbine and the auxiliary steam boiler, of any malfunction of the air pollution control equipment, and the periods when the CEMS is inoperable.

g. 40 CFR 60.7(c) - By postmarking or delivering a quarterly excess emissions and monitoring system performance report within 30 days after the end of each calendar quarter. This report shall contain the information specified in 40 CFR 60.7(c) and (d).

h. 40 CFR 60.8(a) - By conducting all performance tests within 60 days after achieving the maximum turbine and boiler firing rates, but not more than 180 days after the initial start up of each CT and the auxiliary boiler.

i. 40 CFR 60.8(d) - By postmarking or delivering notification of the date of each performance test required by this permit at least 30 days prior to the test date; and,

j. 17-297.345 - By providing stack sampling facilities for each turbine and the auxiliary steam boiler.

All notifications and reports required by this specific condition shall be submitted to the Department's Air Program, within the Southwest District office. Performance test results shall be submitted within 45 days of completion of such test.

3. The following information shall be submitted to the Department's Bureau of Air Regulation within 90 days after selection of each, respectively:

a. Description of the final selection of the turbines, the auxiliary steam boiler and diesel generator for installation at the facility. Descriptions shall include the specific make and model numbers, any changes in the proposed method of operation, fuels, emissions or equipment.

b. Description of the CEMS selected. Description shall include the type of sensors, the manufacturer and model number of the equipment.

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Expiration Date: November 1, 2000

SPECIFIC CONDITIONS:

4. The following protocols shall be submitted to the Department's Air Program, within the Southwest District office for approval;

a. CEMS Protocol - Within 60 days after selection of the CEMS, but prior to the initial startup, a CEMS protocol describing the system, its installation, operating and maintenance characteristics and requirements. The protocol shall meet the requirements of 40 CFR 60.13, Appendix B and Appendix F. The Federal Acid Rain Program requirements of 40 CFR 75 shall apply when those requirements become effective within the state.

b. Performance Test Protocol - At least 90 days prior to conducting the initial performance tests required by this permit, the permittee shall submit to the Department's Air Program, within the Southwest District office, a protocol outlining the procedures to be followed, the test methods and any differences between the reference methods and the test methods proposed to be used to verify compliance with the conditions of this permit. The Department shall approve the testing protocol provided that it meets the requirements of this permit.

F. Modifications

The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change.

Issued this _____ day
of _____, 1993

**STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION**

Howard L. Rhodes, Director
Division of Air Resources
Management

Best Available Control Technology (BACT) Determination
 Florida Power Corporation
 Polk County
 PSD-FL-195
 PA-92-33

The applicant proposes to install two combined cycle combustion turbine generators at their facility in southwest Polk County about seven miles south-southwest of Bartow in an initial phase. These generator systems will consist of: 1) two nominal 235 megawatt (MW) General Electric PG7221(FA) (or equivalent) combined cycle combustion turbines (CCCTs), with exhaust through a heat recovery steam generator (HRSG), which will be used to power a steam turbine. The initial phase (Phase IA) consists of two CTs, each equipped with one HRSG and exhausting to a separate stack, a 99 MMBtu/hr auxiliary boiler, a 1,300 kW diesel generator and a 97,570 barrel fuel oil storage tank. Phase IA is targeted for a maximum combined generating capacity of 470 MW. The CTs will be fired with natural gas and low sulfur fuel oil with a sulfur content not to exceed 0.05 percent, by weight, as a backup in Phase IA. Phase IB, which is not covered by this BACT determination, will add 470 MW of additional natural gas fired generating capacity and is to consist of two additional 235 MW CC units. At ultimate site capacity, the project will have a generating capacity of approximately 3,000 MW, consisting of 2,000 MW of coal gasification CC units and 1,000 MW of primarily natural gas fired CC units.

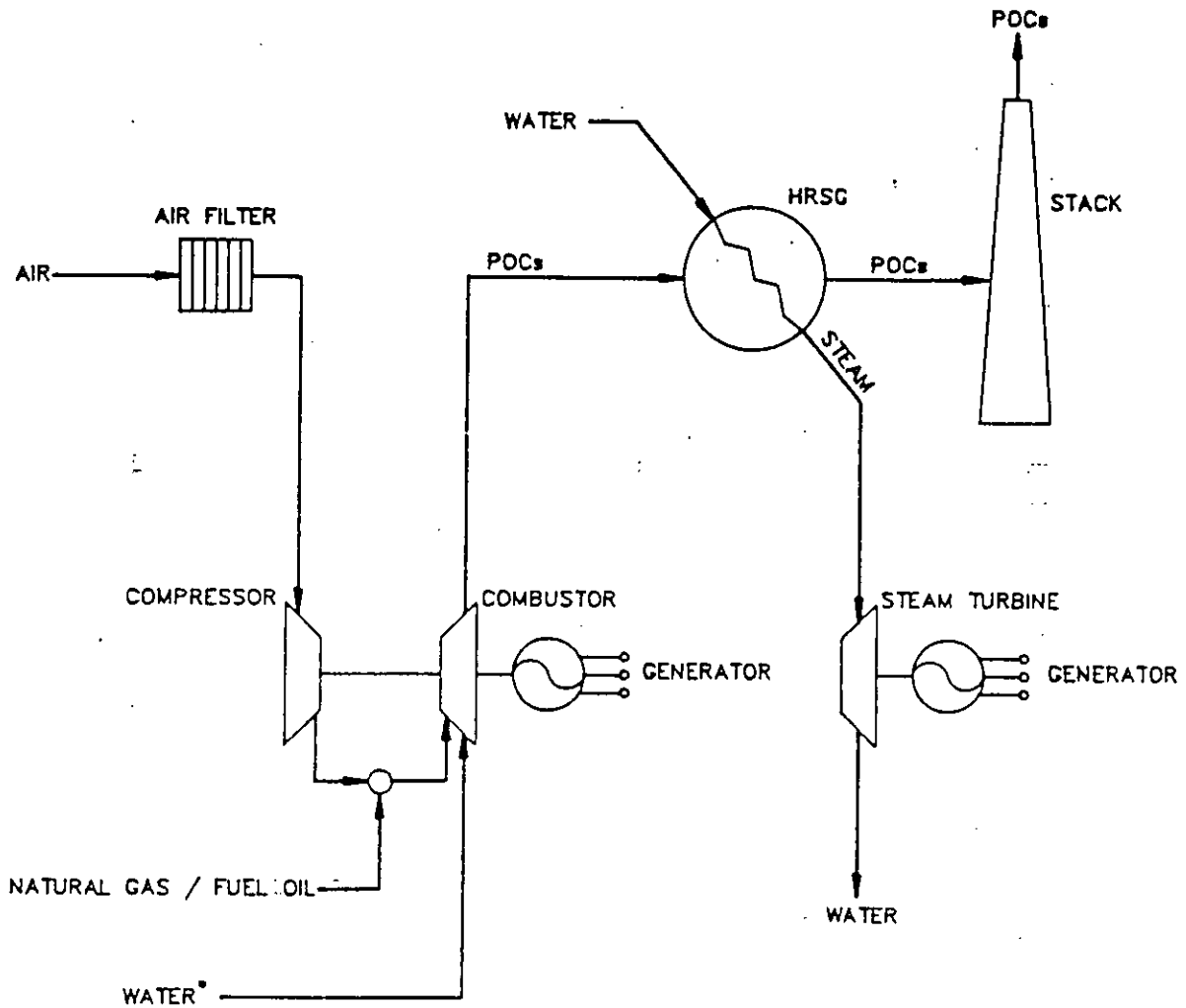
Construction and startup of the proposed 470 MW CC units of Phase IA at the Polk County Site will occur over a four-year period. The first CC unit will begin commercial startup in November 1998 and the second CC unit will begin commercial startup in November 1999. A simplified flow chart for the operation of a 235 MW CC unit is shown in Figure 1.

The applicant has indicated the maximum annual air pollutant emission rates associated with the initial phase (470 MW), based on 100 percent capacity factor and type of fuel fired, to be as follows:

Pollutant	Emissions (TPY)				PSD Diesel Generator ²	PSD Significant Emission Rate (TPY)
	CCCT ¹		Auxiliary Boiler ²			
	Oil	Gas	Oil	Gas		
NO _x	159	628	0.99	0.495	2.65	40
SO ₂	49	8.5	0.264	0.0032	0.044	40
PM/PM ₁₀	8.5	74	0.245	0.025	0.025	25/15
CO	48	661	0.245	0.245	0.60	100
VOC	6	93	0.05	0.025	0.14	40
H ₂ SO ₄	5	0.9	0.0041	4.95E-5	6.5 E-4	7
Arsenic	0.0038	neg.	2.08E-5	neg.	3.7 E-6	---
Beryllium	0.0023	neg.	1.25E-5	neg.	2.2 E-6	0.0004
Mercury	0.0027	neg.	1.50E-5	neg.	2.6 E-6	0.1
Lead	0.008	neg.	4.41E-5	neg.	1.8 E-6	0.6
Benzene	neg.	0.95	neg.	3.3E-4	neg.	Any

1 - 500 hours on fuel oil and 8260 hours on gas

2 - 100 hours operation per year



LEGEND

- POCs PRODUCTS OF COMBUSTION
- HRSG HEAT RECOVERY STEAM GENERATOR
- WATER INJECTION ONLY DURING FUEL OIL FIRING

SOURCE: EBASCO ENVIRONMENTAL, 1992

NOT TO SCALE



**Florida
Power
CORPORATION**

Polk County Site

**FIGURE 1
SIMPLIFIED FLOW CHART
235 MW COMBINED CYCLE UNIT**

Florida Administrative Code (F.A.C.) Rule 17-212.400, Stationary Source Preconstruction Review, 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
 August 4, 1992

BACT Determination Requested by the Applicant

Combined Cycle Combustion Turbines

<u>Pollutant</u>	<u>Fuel</u>	
	<u>Natural Gas</u>	<u>Fuel Oil</u>
NO _x	12 ppmvd @ 15% O ₂ Dry Low NO _x Burners	42 ppmvd @ 15 % O ₂ Water Injection
SO ₂	Firing with Natural Gas	Low Sulfur Fuel Oil (0.05 %, by weight) Limited Annual Operation
CO	25 ppmvd Combustion Control	30 ppmvd Combustion Control
VOC	7 ppmvw Combustion Control	7 ppmvw Combustion Control
PM/PM ₁₀	Combustion Control	Combustion Control
Beryllium	Combustion Control	Combustion Control Limited fuel oil operation
Inorganic Arsenic	Combustion Control	Combustion Control Limited fuel oil operation
Benzene	Combustion Control	N/A

Auxiliary Boiler

<u>Pollutant</u>	<u>Control</u>
NO _x	Low NO _x Burners and Combustion Controls, Limited Operation
SO ₂	Natural Gas Firing, Use of Fuel Oil with a Sulfur Content not to Exceed 0.05 % by Weight, and Limited Operation

H ₂ SO ₄	Natural Gas Firing, Use of Fuel Oil with a Sulfur Content not to Exceed 0.05 % by Weight, and Limited Operation
CO	Combustion Control, limited fuel oil operation
VOC	Combustion Control, limited fuel oil operation
PM/PM ₁₀	Combustion Control, limited fuel oil operation
Beryllium	Combustion Control, limited fuel oil operation
Inorganic Arsenic	Combustion Control, limited fuel oil operation
Benzene	Combustion Control

Diesel Generator

<u>Pollutant</u>	<u>Control</u>
NO _x	Timing retardation & limited annual operation
SO ₂	Low sulfur fuel oil & limited annual operation
CO	Good combustion control & limited annual operation
VOC	Good combustion control & limited annual operation
PM/PM ₁₀	Good combustion control & limited annual operation
Beryllium	Good combustion control & limited annual operation
Inorganic Arsenic	Good combustion control & limited annual operation

Fuel Oil Storage

VOC Emissions Bottom Loading/Submerged Filling

BACT Determination Procedure

In accordance with F.A.C. Chapter 17-212.410, Best Available Control Technology Review, Stationary Source - Preconstruction Review, 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.

The air pollutant emissions from combined cycle power plants can be grouped into categories based upon what control equipment and techniques are available to control emissions from these facilities. Using this approach, the emissions can be classified as follows:

- o Combustion Products (e.g., particulates). Controlled generally by good combustion of clean fuels.
- o Products of Incomplete Combustion (e.g., CO). Control is largely achieved by proper combustion techniques.
- o Acid Gases (e.g., NO_x). Controlled generally by gaseous control devices.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "nonregulated" air

pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., particulates, sulfur dioxide, fluorides, sulfuric acid mist, etc.), if a reduction in "nonregulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

BACT POLLUTANT ANALYSIS

COMBUSTION PRODUCTS

Particulate Matter (PM/PM₁₀)

The design of the CCCT system ensures that particulate emissions will be minimized by combustion control and the use of clean fuels. The particulate emissions from the combustion turbines when burning natural gas and fuel oil will not exceed 9 lbs/hr/CT (gas) and 17 lbs/hr/CT (oil) for the PG7221(FA) (or equivalent).

Particulate/PM₁₀ emissions are controlled for the auxiliary boiler by firing with natural gas or with No. 2 fuel oil with a sulfur concentration not to exceed 0.05%, by weight. Use of the specified fuels is considered BACT for particulate emissions from the auxiliary boiler and will result in opacity within the allowable NSPS limit of 20 percent (40 CFR 60 Subpart Dc).

Beryllium and Arsenic (Be, As)

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

PRODUCTS OF INCOMPLETE COMBUSTION

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

The emissions of carbon monoxide exceed the PSD significant emission rate of 100 TPY. The applicant has indicated that the carbon monoxide emissions from the proposed combined cycle turbines with dry low-NO_x combustors are 25 ppmvd at 15% O₂ for natural gas firing and 30 ppmvd at 15% O₂ for fuel oil firing with water injection. Volatile organic compound emissions have been based on exhaust concentrations of 7 ppmvw for natural gas and fuel oil firing.

The majority of BACT emissions limitations have been based on combustion controls for carbon monoxide and volatile organic compounds minimization. Additional control is achievable through the use of catalytic oxidation. Catalytic oxidation is a

post-combustion control that has been employed in CO nonattainment areas where regulations have required CO emission levels to be less than those associated with wet injection. These installations have been required to use LAER technology and typically have CO limits in the 10-ppm range (corrected to dry conditions).

In an oxidation catalyst control system, CO emissions are reduced by allowing unburned CO to react with oxygen at the surface of a precious metal catalyst such as platinum. Combustion of CO starts at about 300°F, with efficiencies above 90 percent occurring at temperatures above 600°F. Catalytic oxidation occurs at temperatures 50 percent lower than that of thermal oxidation, which reduces the amount of thermal energy required. For CT/HRSG combinations, the oxidation catalyst can be located directly after the CT or in the HRSG. Catalyst size depends upon the exhaust flow, temperature, and desired efficiency.

The application of oxidation catalyst is not technically feasible for gas turbines fired with fuel oil due to the oxidation of sulfur compounds and excessive formation of H₂SO₄ mist emissions. Catalytic oxidation has not been demonstrated on a continuous basis when using fuel oil.

Use of oxidation catalyst technology would be feasible for natural gas-fired unit; however, the cost effectiveness of \$6,384 per ton of CO/VOC removed for the PG7221(FA) (or equivalent) unit will have an economic impact on this project.

The applicant has proposed bottom loading/submerged filling for control of VOC emissions from the fuel oil storage tank. The proposed controls are consistent with other BACT determinations.

ACID GASES:

Nitrogen Oxides (NO_x)

The emissions of nitrogen oxides represent a significant proportion of the total emissions generated by this project, and need to be controlled if deemed appropriate. As such, the applicant presented an extensive analysis of the different available technologies for NO_x control.

The applicant has stated that BACT for nitrogen oxides will be met by using dry low-NO_x combustors to limit emissions to 12 ppmvd (corrected to 15% O₂) when burning natural gas and water injection to limit emissions to 42 ppmvd (corrected to 15% O₂) when burning fuel oil.

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% 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.

As stated by the applicant, the exhaust temperatures of the proposed combined cycle CTs for this site are between 950°F to 1100°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. Either catalyst can be located in the appropriate temperature range in the HRSG but the applicant has stated that effective SCR operation will be difficult to maintain under significant load and ambient temperature variations. In this case, application of an SCR system appears to be technically feasible.

Although technically feasible, the applicant has also rejected using SCR on the combined cycle units because of economic, energy, and environmental impacts. The applicant has identified the following limitations:

- a) Reduced power output.
- b) Emissions of unreacted ammonia (slip).

- c) Disposal of hazardous waste generated (spent catalyst).
- d) Ammonium bisulfate and ammonium sulfate particulate emissions (ammonium salts) due to the reaction of NH_3 with SO_3 present in the exhaust gases.
- e) Cost effectiveness for the application of SCR technology to the Polk County project was considered to be \$10,587 per ton of NO_x removed when compared to use of dry low- NO_x combustors.

Since SCR has been determined to be BACT for several combined cycle facilities, the EPA has clearly stated that there must be unique circumstances to consider the rejection of such control on the basis of economics.

In a recent letter from EPA Region IV to the Department regarding the permitting of a combined cycle facility (Tropicana Products, Inc.), the following statement was made:

"In order to reject a control option on the basis of economic considerations, the applicant must show why the costs associated with the control are significantly higher for this specific project than for other similar projects that have installed this control system or in general for controlling the pollutant."

For fuel oil firing, the cost associated with controlling NO_x emissions must take into account the potential operating problems that can occur with using SCR in the oil firing mode.

A concern associated with the use of SCR on combined cycle projects is the formation of ammonium bisulfate. For the SCR process, ammonium bisulfate can be formed due to the reaction of sulfur in the fuel and the ammonia injected. The ammonium bisulfate formed has a tendency to plug the tubes of the heat recovery steam generator leading to operational problems. As this is the case, SCR has been judged to be technically infeasible for oil firing in some previous BACT determinations.

The latest information available now indicates that SCR can be used for oil firing provided that adjustments are made in the ammonia to NO_x injection ratio. For natural gas firing operation, NO_x emissions can be controlled with up to a 90 percent efficiency using a 1 to 1 or greater ammonia injection ratio. By lowering the injection ratio for oil firing, testing has indicated that NO_x can be controlled with efficiencies ranging from 60 to 80 percent. When the injection ratio is lowered there is not a problem with ammonium bisulfate formation since essentially all of the ammonia is able to react with the nitrogen oxides present in the combustion gases. Based on this strategy SCR has been both proposed and established as BACT for oil fired combined cycle facilities with

NO_x emission limits ranging from 11.7 to 25 ppmvd depending on the efficiency of control established.

The applicant has indicated that the total levelized annual operating cost to install SCR for this project at 100 percent capacity factor and burning natural gas is \$9,825,000. Taking into consideration the total annual cost, a cost/benefit analysis of using SCR can now be developed.

For the PG7221(FA) (or equivalent) combined cycle combustion turbine, based on the information supplied by the applicant, it is estimated that the maximum annual NO_x emissions using dry low NO_x combustors will be 1,446 tons/year (assuming 8,260 and 500 hours of operation per year while firing natural gas and fuel oil, respectively and at 72°F and 80% relative humidity). Assuming that SCR would reduce the NO_x emissions from 25 ppmvd to 6 ppmvd when firing natural gas and from 42 ppmvd to 15 ppmvd when firing fuel oil, 681 tons of NO_x would be emitted annually. When this reduction of 765 TPY in comparison with the application of dry low-NO_x combustors is taken into consideration with the total levelized annual operating cost differential of \$8,099,000; the cost per ton of controlling NO_x is \$10,587. These calculated costs are higher than has previously been approved as BACT.

A review of the latest DEP BACT determinations show limits of 15 ppmvd (natural gas) using low-NO_x combustor technology for combined cycle turbines. General Electric is currently developing programs using both steam/water injection and dry low NO_x combustor to achieve NO_x emission control level of 9 ppm when firing natural gas. This technology will be available at the latest by 1998, according to a GE representative.

Sulfur Dioxide(SO₂)

The applicant has stated that sulfur dioxide (SO₂) emissions when firing fuel oil will be controlled by using fuel oil with a maximum sulfur content of 0.05% by weight. This will result in an annual emission rate of 49 tons SO₂ per year (operating at 500 hours per year) plus 8.5 tons SO₂ per year when firing natural gas.

In accordance with the "top down" BACT review approach, only two alternatives exist that would result in more stringent SO₂ 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 SO₂ emissions from stationary gas turbines is considered unreasonable." 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. 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 control as a BACT option then leaves the use of low sulfur fuel oil as the next option to be investigated. The use of No. 2 fuel oil with a 0.05% sulfur by weight, as proposed by the applicant, is acceptable as BACT for this project.

The auxiliary boiler is expected to operate 100 hours per year or less. The applicant is proposing to control SO₂ and acid gas emissions by firing with natural gas or No. 2 fuel oil with a sulfur content of 0.05% or less, by weight, and by using low NO_x burners and combustion controls.

BACT Determination by DEP

Combined Cycle Combustion Turbines

NO_x Control

The information that the applicant presented and Department calculations indicate that the cost per ton of controlling NO_x for these turbines, \$10,587, is high compared to other BACT determinations which require SCR. Based on the information presented by the applicant, the Department believes that the use of SCR for NO_x control is not justifiable as BACT at this time.

A review of the permitting activities for combined cycle proposals across the nation indicates that SCR has been required and most recently proposed for installations with a variety of operating conditions (i.e., natural gas, fuel oil, and various capacity factors). Although, the cost and other concerns expressed by the applicant are valid, the Department, in this case, is willing to accept water injection and dry low-NO_x burner design as BACT for this project.

The applicant has proposed a NO_x emission limit of 73 lb/hr/CT (12 ppmvd) at 59°F. Combustion turbine manufacturers are currently offering NO_x guarantees of approximately 9 ppmvd. However, these combustion turbine manufacturers have no commercial operating experience to validate this guarantee basis. Considering the uncertainty regarding the basis of CT manufacturer guarantees and the lack of commercial operating experience at this lower emission level, the Department has determined that a NO_x emission limit of 73 lb/hr/CT (12 ppmvd) at 59°F for continuous compliance (on a blocked 24-hour average (midnight to midnight) basis, not corrected to ISO conditions), is required. The ISO corrected value will be based on 15 ppmvd, at 15% O₂ because ISO correction results in higher calculated emissions for the high temperature and humidity conditions typically found in Florida; compliance will be determined through the initial and annual stack tests required in Specific Condition C.1. Based on the first 12 months of actual operating experience, the Department may revise the continuous emission limit from 73 lb/hr/CT (12 ppmvd) to as low as 55 lb/hr/CT (based on 9 ppmvd at 59°F, but not ISO corrected), as described in Specific Condition B.5.

SO₂ Control

BACT for sulfur dioxide is the burning of fuel oil No. 2 with 0.05% sulfur content by weight. The Department accepts their proposal as BACT for this project.

VOC and CO Control

The Department is in agreement with the applicant's proposal of combustor design and good operating practices as BACT for CO and VOCs for this project.

Other Emissions Control

The emission limitations for PM and PM₁₀, Be, and As are based on previous BACT determinations for similar facilities. Although the emissions of these 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. Therefore, the Department does not believe that the BACT determination for Phase IA would be affected by the emissions of these pollutants. The Department accepts the applicant's proposed control of limiting the inherent quality of the fuel for these pollutants as BACT for the combined cycle units, auxiliary boiler and diesel generator.

The emission limits for the Florida Power Corporation Polk County Phase IA project of two combined cycle units for 470 MW are thereby established as follows:

470 MW COMBINED CYCLE COMBUSTION TURBINES

Pollutant	Emission Standards/Limitations		Method of Control
	Oil (a)	Gas (b)	
NO _x	42 ppmvd @ 15% O ₂	12 ppmvd @ 15% O ₂	Water Injection/ Dry Low NO _x Combustor Water Injection/Dry Low NO _x Combustor
CO	30 ppmvd	25 ppmvd	Combustion controls
PM & PM ₁₀	34 lbs/hr	18 lbs/hr	Combustion controls
SO ₂	196 lbs/hr	2.1 lbs/hr	No. 2 Fuel Oil (0.05% S)
VOC	7 ppmvw	7 ppmvw	Combustion controls
Be	2.6 x 10 ⁻⁶ lbs/MMBtu		Fuel Quality
As	4.2 x 10 ⁻⁶ lbs/MMBtu		Fuel Quality
Benzene	6.5 x 10 ⁻⁵ lbs/MMBtu		Fuel Quality

- (a) No. 2 fuel oil with a maximum of 0.05% sulfur by weight.
 (b) Natural gas/fuel oil 8260/500 hours per year.

Auxiliary Steam Boiler

The auxiliary steam boiler will be operated in an infrequent or emergency mode. However BACT for these facilities typically limits NO_x emissions from boilers to 0.1 lb/MMBtu and 0.2 Lb/MMBtu for natural gas and oil firing, respectively. The applicant has proposed to meet these levels.

Sulfur Dioxide emissions limitations for the auxiliary steam boiler are established by firing natural gas or limiting the No. 2 fuel oils sulfur content to 0.05%, by weight. The Department accepts the controls proposed as BACT for the auxiliary boiler.

Fuel Oil Storage Tank

Fuel Oil Storage

Control Technology

VOC

Bottom Loading/Submerged Filling

In accordance with F.A.C. 17-212.410(2), the determination of BACT shall be reviewed and modified as appropriate at the latest reasonable time not later than 18 months prior to commencement of construction, as defined in F.A.C. 17-212.200 of each independent phase of the project. At such time, the owner or operator of the facility is required to demonstrate the adequacy of any previous determination of BACT.

Details of the Analysis May be Obtained by Contacting:

Douglas G. Outlaw, BACT Coordinator
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

Approved by:

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

Virginia B. Wetherell, Secretary
Dept. of Environmental Protection

Date 1993

Date 1993

SPECIFIC CONDITIONS TO BE INSERTED IN APPENDIX A FOLLOWING THE GENERAL CONDITIONS:

II. AIR

The construction and operation of Polk County Site (Project) shall be in accordance with all applicable provisions of Chapters 17-210 to 297, F.A.C. The following emission limitations and conditions reflect BACT determinations for the Phase IA 470 MW (two combined cycle combustion turbines and auxiliary equipment) of generating capacity for which the need has been determined. BACT determinations for the remaining phases will be made upon review of supplemental applications. In addition to the foregoing, the Project shall comply with the following conditions of certification as indicated.

General Requirements

1. The maximum heat input to each combustion turbine (CT) shall neither exceed 1,573 MMBtu/hr while firing natural gas, nor 1,800 MM Btu/hr while firing fuel oil (at an ambient temperature of 40°F or greater).
2. Each of the two CTs in Phase IA may operate continuously, i.e., 8,760 hrs/year.
3. Only natural gas (NG) or low sulfur fuel oil shall be fired in each combustion turbine and the auxiliary boiler. Only low sulfur fuel oil shall be fired in the diesel generator. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05%, by weight.
4. The maximum heat input to the auxiliary boiler shall not exceed 99 MMBtu/hr when firing NG or No. 2 fuel oil with 0.05% maximum sulfur content (by weight). All fuel consumption must be continuously measured and recorded for the auxiliary boiler.
5. The maximum allowable fuel oil consumption for the two turbines is 13,762,806 gallons per year, which is equivalent of an aggregate of 1,000 hours per year of operation at full load.
6. The permittee shall install duct module(s) suitable for possible future installation of an oxidation catalysts and/or SCR equipment on each combined cycle generating unit.
7. Fugitive dust emissions during the construction period shall be minimized by covering or watering dust generation areas.
8. If construction does not commence on Phase IA (470 MW) within 18 months of issuance of this permit, then the permittee may request an extension of the 18- month period, provided that such request is received by the Department's Bureau of Air Regulation at

least 90 days prior to the expiration date. Such a request shall identify the progress made in the construction of the site and the expected time require to complete construction of the initial phase. The Department may grant the extension upon a satisfactory showing that the extension is justified.

Emission Limits

9. The maximum allowable emissions from two CTs, when firing natural gas or low sulfur fuel oil, in accordance with the BACT determination, shall not exceed the following, at an ambient temperature of 40°F (except during periods of start up, shutdown, malfunction and load change):

Emissions Limitations

<u>Pollutant</u>	<u>Fuel</u>	<u>Basis</u>	<u>LB/HR/CT(a)</u>	<u>TPY(b)</u>
NOx	Gas	9 ppmvd	57	499
	Oil	42 ppmvd(c)	318	159
VOC (d)	Gas	7 ppmvw	11.2	98
	Oil	7 ppmvw	12	6
CO	Gas	25 ppmvd	80	701
	Oil	30 ppmvd	96	48.
PM/PM ₁₀	Gas		9	79
	Oil(e)		17	8.5
Pb	Gas		Neg.	Neg.
	Oil		0.016	0.008
SO ₂	Gas		1.03	9
	Oil (f)		98	49

Visible Emissions Gas 10 percent opacity
 Oil 20 percent opacity

- (a) Emission limitations in LB/HR/CT are blocked 24-hour averages (midnight to midnight).
- (b) Annual emission limits (TPY) for natural gas based on a total of two CTs operating at full load 8,760 hours per year (i.e. NOx - 57 lbs/hr X 2 CTs X 8,760 hrs/yr X 1 ton/2,000 lbs =499 TPY). Annual emission limits (TPY) for fuel oil are based on full load operation for a total of 1,000 hours per year for the two CTs (i.e. NOx - 318 lbs/hr X 1,000 hrs/yr X 1 ton/2,000 lbs = 159 TPY).
- (c) Fuel oil NOx emissions are based on full load operation at an ambient temperature of 40°F and 15 percent oxygen. For fuel oil firing, NOx levels of 42 ppmvd @ 15 percent O₂ are based on a fuel bound nitrogen content of 0.015 percent or less.

- (d) Exclusive of background concentrations.
 - (e) PM/PM₁₀ emission limitations are exclusive of sulfuric acid mist.
 - (f) SO₂ emissions based on a maximum of 0.05 percent sulfur in the fuel oil.
10. The following CT emissions, determined by BACT, are tabulated for PSD and inventory purposes:

<u>Pollutant</u>	<u>Allowable Emissions</u>		
	<u>Fuel</u>	<u>lb/hr/CT</u>	<u>TPY (a)</u>
Sulfuric Acid(b) Mist	Gas	0.11	0.96
	Oil	10	5
Benzene	Gas	0.107	0.93
	Oil	Neg.	Neg.
Inorganic Arsenic	Gas	Neg.	Neg.
	Oil	0.0076	0.0038
Beryllium	Gas	Neg.	Neg.
	Oil	0.0045	0.0022
Mercury	Gas	Neg.	Neg.
	Oil	0.055	0.027

(a) Tons per year emission limits listed for natural gas are based on full load operation for 8,760 hours per year for each of the two CTs. TPY limits for fuel oil are based on the equivalent of full load operation for an aggregate of 1,000 hours per year for the 2 CTs.

(b) Sulfuric acid mist emissions assume a maximum of 0.05 percent sulfur in the fuel oil.

11. The maximum NO_x emissions from any combustion turbine is 42 ppmvd @ 15 percent O₂ when burning fuel oil with a fuel bound nitrogen (FBN) content of 0.015 percent or less. The emission limit for NO_x is adjusted as follows for higher fuel bound nitrogen contents up to a maximum of 0.030 percent by weight:

<u>Fuel Bound Nitrogen</u> <u>(% by weight)</u>	<u>NOx Levels</u> <u>(ppmvd @ 15%O₂)</u>	<u>NOx Emissions</u> <u>LB/HR/CT</u>
0.015 or less	42	318
0.020	44	332
0.025	46	347
0.030	48	362

using the formula $STD = 0.0042 + F$ where:

STD= allowable NO_x emissions (percent by volume at 15% O₂ and on a dry basis).

F= NOx emission allowance for fuel-bound nitrogen defined by the following table:

<u>Fuel-bound nitrogen (% by weight)</u>	<u>F (NOx % by volume)</u>
0 < N < 0.015	0
0.015 < N < 0.03	0.04(N-0.015)

where: N = the nitrogen content of the fuel (% by weight)

NOx emissions limits are preliminary for the fuel oil specified in Specific Condition 3. The permittee shall submit fuel bound nitrogen content data for the low sulfur fuel oil prior to commercial operation.

12. Excess emissions from a turbine resulting from start up, shutdown, malfunction, or load change shall be acceptable providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for a longer duration. Best operating practices shall be documented in writing and a copy submitted to the Department along with the initial compliance test data. The document may be updated as needed with all updates submitted to the Department within thirty (30) days of implementation and shall include time limitations on excess emissions caused by turbine start up.

13. Operation of the auxiliary steam boiler shall be limited to a maximum of 100 hours per year and only during periods of cold CT startup, when no other source of steam is available or during periodic testing. The following emission limitations shall apply:

- a. NOx emissions shall not exceed 0.1 lb/MMBtu for natural gas firing or 0.2 lb/MMBtu for oil firing.
- b. Sulfur dioxide emissions shall be limited by firing natural gas or low sulfur fuel oil with a maximum sulfur content of 0.05 percent by weight.
- c. Visible emissions shall not exceed 10 percent opacity while burning natural gas, or 20 percent opacity (except for one six-minute period per hour during which opacity shall not exceed 27 percent), while burning low sulfur fuel oil.

14. Operation of the emergency diesel generator shall be limited to a maximum of 100 hours per year and only during periods of on site emergency power needs (when no other power source is available) or during periodic testing. The following emission limitations shall apply:

- a. NOx emissions shall not exceed 9.82 grams/hp-hr.
- b. Sulfur dioxide emissions shall be limited by firing only low sulfur fuel oil with maximum sulfur content of 0.05 percent by weight.
- c. Visible emissions shall not exceed 20 percent opacity.

Performance Testing

15. Initial (I) compliance tests shall be performed on each CT using both fuels. The stack test for each turbine shall be performed between 90-100 percent of the maximum heat rate input for the tested operating temperature. Annual (A) compliance tests shall be performed on each CT with the fuel(s) used for more than 400 hours in the preceding 12-month period. Tests shall be conducted using EPA reference methods in accordance with 40 CFR 60, Appendix A, as adopted by reference in Rule 17-297, F.A.C. and the requirements of 40 CFR 75:

- a. Reference Method 5B for PM (I, A, for oil only)
- b. Reference Method 8 for sulfuric acid mist (I, for oil only)
- c. Reference Method 9 for VE (I, A)
- d. Reference Method 10 for CO (I, A)
- e. Reference Method 20 for NOx (I, A)
- f. Reference Method 18 for VOC (I, A)
- g. Trace elements of Lead (Pb), Beryllium (Be) and Arsenic (As) shall be tested (I, for oil only) using EMTIC Interim Test Methods. As an alternative, Method 104 for Beryllium (Be) may be used; or Be and Pb may be determined from fuel analysis using either Method 7090 or 7091, and sample extraction using Method 3040 as described in the EPA solid waste regulations SW 846.
- h. ASTM D 2880-71 (or equivalent) for sulfur content of distillate oil (I,A)
- i. ASTM D 1072-80, D 3031-81, D 4084-82, or D 3246-81 for sulfur content of natural gas (I, and A if deemed necessary by DEP)

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

16. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent by weight. Compliance shall be demonstrated in accordance with the requirements of 40 CFR 60.334

by testing for sulfur content of the fuel oil in the storage tanks once per day when firing oil. Testing for fuel bound nitrogen content and for fuel oil heating value, shall also be conducted on the same schedule.

Monitoring Requirements

17. A continuous emission monitoring system (CEMS) shall be installed, operated, and maintained in accordance with 40 CFR 60, Appendix F, for each combined cycle unit to monitor nitrogen oxides and a diluent gas (CO₂ or O₂). The permittee shall request that this condition of certification be amended to reflect the Federal Acid Rain Program requirements of 40 CFR 75 when those requirements become effective within the State.

- a. Each CEMS shall meet performance specifications of 40 CFR 60, Appendix B.
- b. CEMS data shall be recorded and reported in accordance with Chapter 17-297.500, F.A.C., 40 CFR 60 and 40 CFR 75. The record shall include periods of start up, shutdown, and malfunction.
- c. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.
- d. The procedures under 40 CFR 60.13 shall be followed for installation, evaluation, and operation of all CEMS.
- e. For purposes of the reports required under this permit, excess emissions are defined as any calculated average emission concentration, as determined pursuant to Specific Condition No. 12 herein, which exceeds the applicable emission limits in Specific Condition No. 9.

Notification, Reporting and Recordkeeping

18. To determine compliance with the natural gas and fuel oil firing heat input limitation, the permittee shall maintain daily records of natural gas and fuel oil consumption for each turbine and the heating value for each fuel. All records shall be maintained for a minimum of two years after the date of each record and shall be made available to representatives of the Department upon request.

19. The project shall comply with all the applicable requirements of Chapter 17, Florida Administrative Code (F.A.C.) and 40 CFR 60 Subparts A and GG. The requirements shall include:

- a. 40 CFR 60.7(a)(1) - By postmarking or delivering notification of the start of construction no more than 30 days after such date;
- b. 40 CFR 60.7(a)(2) - By postmarking or delivering notification of the anticipated date of the initial start up of each CT and the auxiliary steam boiler not more than 60 days nor less than 30 days prior to such date;
- c. 40 CFR 60.7(a)(3) - By postmarking or delivering notification of the actual start up of each turbine and the auxiliary steam boiler within 15 days of such date;
- d. 40 CFR 60.7(a)(5) - By postmarking or delivering notification of the date for demonstrating the CEMS performance, no less than 30 days prior to such date;
- e. 40 CFR 60.7(a)(6) - By postmarking or delivering notification of the anticipated date for conducting the opacity observations no less than 30 days prior to such date;
- f. 40 CFR 60.7(b) - By initiating a record keeping system to record the occurrence and duration of any start up, shutdown or malfunction of a turbine and the auxiliary steam boiler, of any malfunction of the air pollution control equipment, and the periods when the CEMS is inoperable;
- g. 40 CFR 60.7(c) - By postmarking or delivering a quarterly excess emissions and monitoring system performance report within 30 days of the end of each calendar quarter. This report shall contain the information specified in 40 CFR 60.7(c) and (d);
- h. 40 CFR 60.8(a) - By conducting all performance tests within 60 days after achieving the maximum turbine and boiler firing rates, but not more than 180 days after the initial start up of each CT and the auxiliary boiler;
- i. 40 CFR 60.8(d) - By postmarking or delivering notification of the date of each performance test required by this permit at least 30 days prior to the test date; and
- j. 17-297.345 - By providing stack sampling facilities for each turbine and the auxiliary steam boiler.

All notifications and reports required by this specific condition shall be submitted to the Department's Air Program, within the Southwest District Office. Performance test results shall be submitted within 45 days of completion of such test.

20. The following information shall be submitted to the Department's Bureau of Air Regulation within 18 months of issuance of this permit:

- a. Description of the final selection of the turbines, the auxiliary steam boiler and diesel generator for installation at the facility. Descriptions shall include the specific make and model numbers, any changes in the proposed method of operation, fuels, emissions or equipment.
- b. Description of the CEMS selected. Description shall include the type of sensors, the manufacturer and model number of the equipment.

If construction has not commenced within 18 months of issuance of this permit, then the permittee shall obtain from DEP a review and, if necessary, a modification of the BACT determination and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)). Units to be constructed or modified in later phases of the project will be reviewed and limitations revisited under the supplementary review process of the Power Plant Siting Act.

21. The following protocols shall be submitted to the Department's Air Program, within the Southwest District Office for approval;

- a. CEMS Protocol - Within 60 days of selection of the CEMS, but prior to the initial startup, a CEMS protocol describing the system, its installation, operating and maintenance characteristics and requirements. The Department shall approve the protocol provided that the system and the protocol meet the requirements of 40 CFR 60.13, 60.334, Appendix B and Appendix F. This condition of certification shall be amended to reflect the Federal Acid Rain Program requirements of 40 CFR 75 when those requirements become effective within the State.
- b. Performance Test Protocol - At least 90 days prior to the conducting the initial performance tests required by this permit, The permittee shall submit to the Department's Air Program, within the Southwest District Office, a protocol outlining the procedures to be followed, the test methods and any differences between the reference methods and the test methods proposed to be used to verify compliance with the conditions of this permit. The Department shall approve the testing protocol provided that it meets the requirements of this permit.

Modifications

22. The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change.