



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

June 2, 1992

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. R. W. Neiser
Senior Vice President-Legal and Gov. Affairs
Florida Power Corporation
3201-34th Street South
St. Petersburg, Florida 33733

Dear Mr. Neiser:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Florida Power Corporation to construct a cogeneration facility at the University of Florida in Gainesville.

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

Sincerely,

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

CHF/JR/plm

Attachments

c: A. Kutyna, NED
J. Harper, EPA
C. Shaver, NPS
K. Kosky, KBN

P 710 058 538



Certified Mail Receipt

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

PS Form 3800, June 1990

Sent to Mr. R. W. Neiser, FPC	
Street & No. 3201-34th St. South	
PO., State & ZIP Code St. Petersburg, FL 33733	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	\$
Postmark or Date Mailed: 6-2-92 Permit: AC 01-204652 PSD-FL-181	

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

CERTIFIED MAIL

In the Matter of an
Application for Permit by:

DER File No. AC 01-204652
PSD-FL-181

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

INTENT TO ISSUE

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

The applicant, Florida Power Corporation, applied on March 6, 1992, to the Department of Environmental Regulation for a permit to construct a cogeneration facility at the University of Florida in Gainesville, Alachua County, Florida.

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

Pursuant to Section 403.815, Florida Statutes and Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permits. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed on the fourth page. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

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

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

The Petition shall contain the following information;

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

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

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

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

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

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

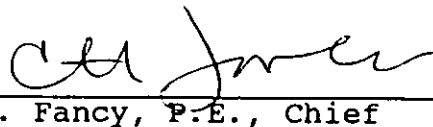
(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this intent in the Office of General Counsel at the above address of the Department.

Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION



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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed by certified mail before the close of business on 6-2-92 to the listed persons.

Clerk Stamp

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

Kuni Ibar 6-2-92
Clerk Date

Copies furnished to:

- A. Kutyna, NED
- J. Harper, EPA
- C. Shaver, NPS
- K. Kosky, KBN

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

The Department of Environmental Regulation gives notice of its intent to issue a permit to Florida Power Corporation, 3201 - 34th Street South, St. Petersburg, Florida 33733, to construct a 43 MW cogeneration facility on Mowry Road at the University of Florida campus in Gainesville, Alachua County, Florida. A determination of Best Available Control Technology (BACT) was required. The proposed project is subject to Prevention of Significant Deterioration (PSD) regulations in regard to carbon monoxide emissions and federal new source performance standards for nitrogen oxides. Modeling results show that increases in ground-level concentrations are less than PSD significant impact levels for carbon monoxide. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's

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

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

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

Department of Environmental Regulation
Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7577

Any person may send written comments on the proposed action to Mr. Preston Lewis at the Department's Tallahassee address. All comments received within 30 days of the publication of this notice will be considered in the Department's final determination.

Further, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Technical Evaluation
and
Preliminary Determination

Florida Power Corporation/University
of Florida Cogeneration Project
Alachua County, Florida

Permit No. AC 01-204652
PSD-FL-181

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

June 2, 1992

I. Application Information

A. Applicant

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

B. Request

The Department received a complete application on March 6, 1992, for a permit to construct a 43 megawatt (MW) cogeneration facility at the existing University of Florida Central Heat Plant in Gainesville.

C. Classification/Location

The subject facility (SIC Code 8221) is located on Mowry Road at the University of Florida Campus in Gainesville. Latitude and longitude are 29°38'23"N and 82°20'55"W, respectively. The UTM coordinates of the site are: 369.4 km E and 3,279.3 km N.

II. Project Description/Emissions

The applicant proposes to construct a 43 MW cogeneration facility to replace existing Boilers 1, 2, and 3 and part of the current capacity of Boilers 4 and 5. The University's power and steam requirements will be provided by a General Electric LM-6000 gas turbine generator exhausting into a heat recovery steam generator producing 112,500 lbs/hr steam for the UF campus. The cogeneration facility will be located next to the existing Heat Plant No. 2. Primary fuel for the cogeneration facility will be natural gas. Distillate fuel oil will be used for up to 219 hours/yr.

The following discussion concerns how emissions offsets were determined. Since fuel use at the subject facility was abnormally low in 1990, the applicant requested that offsets be based on a three year period (1988-1990). EPA regulations require offsets to be based on actual emissions for the two year period immediately preceding the new emissions unless it can be shown that a different two year period is more representative of normal operation. This is summarized in the following excerpt from EPA's 1991 workshop document on creditable emission changes:

"In certain limited situations where the applicant adequately demonstrates that the prior two years is not representative of normal source operation, a different two year time period may be used upon a determination by the reviewing agency that it is more representative of normal source operation."
(emphasis added)

Therefore, since EPA requires that any alternate representative period be no more than two years, 1989 and 1991 would be the proper two years on which to base actual emissions for this project. As it turns out, the applicant's proposed offsets based on 1988 through 1990 are within 1% of the 1989/1991 average, therefore the Department can use the applicant's offset estimates. The increased emissions from this project are:

Allowable Emissions (TPY)

	<u>Gas Turbine</u>		<u>Duct Burner</u>	<u>Total</u>	<u>Offsets</u>	<u>Net Increase</u>
	<u>NG</u>	<u>Oil</u>	<u>NG</u>			
NO _x	142.7	7.3	24.6	174.6	134.9	39.7
SO ₂	4.3	21.6	0.7	26.6	36.1	- 9.5
PM/PM ₁₀	10.2	1.1	2.5	13.8	3.4	10.4
CO	158.0	7.7	24.6	190.3	20.4	169.9
VOC	6.5	0.4	10.6	17.5	1.1	16.4
H ₂ SO ₄	0.3	2.0	0.1	2.4	0.8	1.6

III. Rule Applicability

The construction permit application is subject to review under Chapter 403, Florida Statutes, and Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4. The proposed facility is subject to the provisions of F.A.C. Rule 17-2.500, Prevention of Significant Deterioration (PSD). The facility is located in an area classified as attainment for all regulated air pollutants. The proposed increase in carbon monoxide (CO) emissions exceeds the significant level set forth in Table 500-2 of F.A.C. Rule 17-2.500. Preconstruction review must include a determination of Best Available Control Technology (BACT), good-engineering practice stack height, ambient impact analysis, impact on soils, vegetation and visibility. Applicable emission limit rules are F.A.C. Rules 17-2.660, Table 660-1, Section 60.330, New Source Performance Standards for Stationary Gas Turbines, Subpart GG, and Section 60.40b, Subpart Db, Industrial/Commercial/Institutional Steam Generating Units. Limits for nitrogen oxides (NO_x) and particulate matter (PM) emissions will be based on the turbine manufacturer's performance guarantees since they are more stringent than the NSPS limits. Existing Boilers 4 and 5 will be subject to F.A.C. Rule 17-2.600(6).

IV. Air Quality Analysis

a. Introduction

The operation of the proposed cogeneration facility will result in emissions increases which are projected to be greater than the PSD significant emission rates for the following pollutant: CO. Therefore, the project is subject to the PSD NSR requirements contained in F.A.C. Rule 17-2.500(5) for these

pollutants. Part of these requirements is an air quality impact analysis for these pollutants, which includes:

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

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

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

b. Analysis of the Existing Air Quality

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

	<u>CO</u>
PSD de minimus Concentra. (ug/m ³)	575
Averaging Time	8-hr
Maximum Predicted Impact (ug/m ³)	59

c. Modeling Method

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used by the applicant to predict the impact of the proposed project on the surrounding ambient air. All recommended EPA default options were used. Downwash parameters were used because the stacks were less than the good engineering practice (GEP) stack height. Five years of sequential hourly surface and mixing depth data from the Jacksonville, Florida/Waycross, GA National Weather Service (NWS) stations

collected during 1983 through 1987 were used in the model. Since five years of data were used, the highest-second-high (HSH) short-term predicted concentrations are compared with the appropriate ambient air quality standards or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards.

d. Modeling Results

The applicant first evaluated the potential increase in ambient ground-level concentrations associated with the project to determine if these predicted ambient concentration increases would be greater than specified PSD significant impact levels for CO. This evaluation was based on the proposed CT units operating at load conditions of 100, 75, 50 and 25 percent. The modeling was performed using the highest emissions at 20°F design condition coupled with the lowest exit gas flow rates at 95°F design condition to maximize predicted impacts. The maximum predicted concentrations generally occur for the maximum capacity at 100% operating load. Dispersion modeling was performed with receptors placed along the 36 standard radial directions (10 degrees apart) surrounding the proposed units at the following downwind distances: 53, 70, 100, 400, 700, 1000, 1300, 1600, 2000, and 2500 km. The results of this modeling presented below show that the increases in ambient ground-level concentrations for all averaging times are less than the PSD significant impact levels for CO.

	CO	
	<u>1-hr</u>	<u>8-hr</u>
Avg. Time PSD Signifi. Level (ug/m ³)	2000	800
Ambient Concen. Increase (ug/m ³)	250	59

e. Additional Impacts Analysis

The proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

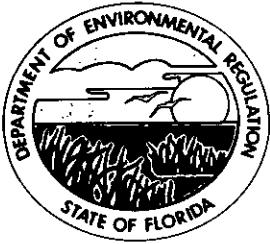
V. Air Toxics Evaluation

Only negligible quantities of toxic pollutants will be emitted from the limited firing of distillate fuel oil. The quantities are very small and are of no environmental concern.

VI. Conclusion

Based on the information provided by Florida Power Corporation, the Department has reasonable assurance that the proposed installation, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

Alvin L. ...
#41755



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

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

Permit Number: AC 01-204652
PSD-FL-181
Expiration Date: December 31, 1994
County: Alachua
Latitude/Longitude: 29°38'23"N
82°20'55"W
Project: UF Cogeneration Facility

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

For the construction of a 43 Megawatt cogeneration facility consisting of replacement of existing boiler Nos. 1, 2, and 3 with a GE LM-6000 combustion turbine in series with a duct burner at a designed flow of 325,200 ACFM, and operating existing boiler Nos. 4 and 5 as auxiliary units.

Particulate emissions shall be controlled by using clean fuels and good combustion practices. CO emissions shall be controlled by proper combustion techniques. NO_x emissions shall be controlled by steam injection.

The facility is located at the existing Central Heat Plant on the campus of the University of Florida in Gainesville, Alachua County, Florida. The UTM coordinates are 369.4 km East and 3,279.3 km North.

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. FPC letter dated 11-13-91.
2. FPC letter dated 11-25-91.
3. KBN letter dated 12-2-91.
4. DER incompleteness letter dated 12-31-91.
5. FPC letter dated 1-2-92.
6. EPA letter dated 1-8-92.
7. DER letter to EPA dated 1-16-92.
8. KBN letter dated 1-30-92.
9. FPC letter to EPA dated 2-6-92.

PERMITTEE:
Florida Power Corporation

Permit Number: AC 01-204652
PSD-FL-181
Expiration Date: December 31, 1994

Attachments Cont'd

10. DER letter to EPA dated 2-12-92.
11. DER letter to EPA dated 2-14-92.
12. FPC response to incompleteness dated 3-5-92.
13. FWS letter to DER dated 4-2-92.
14. EPA letter to DER dated 4-8-92.
15. KBN letter to DER dated 4-8-92.

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.

PERMITTEE:
Florida Power Corporation

Permit Number: AC 01-204652
PSD-FL-181
Expiration Date: December 31, 1994

GENERAL CONDITIONS:

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.

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

PERMITTEE:
Florida Power Corporation

Permit Number: AC 01-204652
PSD-FL-181
Expiration Date: December 31, 1994

GENERAL CONDITIONS:

- 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.

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

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

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

13. This permit also constitutes:

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

PERMITTEE:
Florida Power Corporation

Permit Number: AC 01-204652
PSD-FL-181
Expiration Date: December 31, 1994

GENERAL CONDITIONS:

14. The permittee shall comply with the following:

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

1. Unless otherwise indicated, the construction and operation of the subject cogeneration facility shall be in accordance with the capacities and specifications stated in the application.

PERMITTEE:
Florida Power Corporation

Permit Number: AC 01-204652
PSD-FL-181
Expiration Date: December 31, 1994

SPECIFIC CONDITIONS:

2. Emissions from this facility shall not exceed the limits listed below:

Pollutant	Source	Fuel	Basis of Limit	lbs/hr	tons/yr
NOx	Turbine	Gas	EBM*:25 ppmvd @ 15% O2	35.0	142.7
	Turbine	Oil	EBM*:42 ppmvd @ 15% O2	66.3	7.3
	D.Burner	Gas	EBM*:0.1 lb/MMBTU	18.7	24.6
SO2	Turbine	Oil	BACT:0.1% Sulfur Max.	-	-
	Boiler 4	Oil	BACT:0.1% Sulfur Max.	-	-
	Boiler 5	Oil	BACT:0.1% Sulfur Max.	-	-
VE	Turbine	Gas/Oil	Equivalent of mass EBM*		10% opacity
	D.Burner	Gas	" " "		10% opacity
	Boiler 4	Gas/Oil	" " "		10% opacity
	Boiler 5	Gas/Oil	" " "		10% opacity
CO	Turbine	Gas	BACT:42 ppmvd	38.8	158.0
	Turbine	Oil	EBA*:75 ppmvd	70.5	7.7

* EBM: Established by manufacturer
EBA: Established by applicant

3. Fuel consumption rates and hours of operation shall not exceed those listed below:

	Natural Gas			No. 2 Fuel Oil		
	M ft3/hr*	MM ft3/yr	hrs/yr*	M gal/hr*	M gal/yr	hrs/yr*
Turbine	367.9	2997.2**	8146.8**	2.9	635.1	219.0**
Duct Burner	197.7	519.5	2628.0	0	0	0
Boiler No. 4	67.0	10.1	150.0	0.5	7.6	15.2
Boiler No. 5	160.0	63.4	396.0	1.1	25.3	23.0

*Based on maximum firing rates. Units may run at lower rates for more hours within annual fuel limits.

**An additional 1.9 hours/yr operation on natural gas will be allowed for each 1.0 hour/yr that fuel oil is not burned (up to 219 x 1.9 hours/yr).

4. Before this construction permit expires, the cogeneration facility and Central Heat Plant (Boilers 4 and 5) stacks shall be sampled according to the emission limits in Specific Condition

PERMITTEE:
Florida Power Corporation

Permit Number: AC 01-204652
PSD-FL-181
Expiration Date: December 31, 1994

SPECIFIC CONDITIONS:

No. 2. Annual compliance tests shall be conducted each year thereafter. Compliance tests shall be run at 100% of permitted capacity. Tests shall be conducted using the following reference methods:

NO_x: EPA Method 20
SO₂: Fuel supplier's sulfur analysis
VE: EPA Method 9
CO: EPA Method 10

5. The DER Northeast District office shall be notified at least 30 days prior to the compliance tests. Compliance test results shall be submitted to the DER Northeast District office and the Bureau of Air Regulation office within 45 days after completion of the tests. Sampling facilities, methods, and reporting shall be in accordance with F.A.C. Rule 17-2.700 and 40 CFR 60, Appendix A.

6. Within 60 days of receipt of the compliance test results, the DER Bureau of Air Regulation in Tallahassee will re-evaluate the BACT determination.

7. A continuous operations monitoring system shall be installed, operated, and maintained in accordance with 40 CFR 60.334. The natural gas, fuel oil and steam injection flows to the cogeneration turbine along with the power output of the generator shall be metered and continuously recorded. The data shall be logged daily and maintained so that it can be provided to DER upon request.

8. The permittee shall include in the initial construction adequate modules and other provisions necessary for future installation of state-of-the-art catalytic abatement or equivalent CO and NO_x control systems. Following receipt of the initial compliance test results, the Department may make a revised determination of Best Available Control Technology and may require installation of such technology.

9. Boilers Nos. 1, 2 and 3 shall permanently cease operation prior to the startup of the cogeneration facility.

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

PERMITTEE:
Florida Power Corporation

Permit Number: AC 01-204652
PSD-FL-181
Expiration Date: December 31, 1994

SPECIFIC CONDITIONS:

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

Issued this _____ day
of _____, 1992

**STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION**

Carol M. Browner, Secretary

Best Available Control Technology (BACT) Determination
University of Florida Cogeneration Project
Alachua County

The applicant proposes to install a 43 MW cogeneration facility to replace existing boiler capacity at the University of Florida - Gainesville campus in Alachua County. The facility will consist of a General Electric LM-6000 Gas Turbine Generator exhausting through a duct-fired heat recovery steam generator which will produce steam for the University campus. The turbine and duct burner will be fired by natural gas with No. 2 fuel oil being used only as a backup fuel for the turbine.

A BACT determination is required for all regulated air pollutants emitted in amounts equal to or greater than the significant emission rates listed in Table 500-2 of Florida Administrative Code (F.A.C.) Rule 17-2.500.

Maximum annual emissions from the proposed project are listed below in tons per year:

	<u>Gas Turbine</u>		<u>Duct Burner</u>	<u>Total</u>	<u>Offsets</u>	<u>Increase</u>	<u>PSD</u>
	<u>NG</u>	<u>Oil</u>	<u>NG</u>				
NO _x	142.7	7.3	24.6	174.6	134.9	39.7	40.0
SO ₂	4.3	21.6	0.7	26.6	36.1	-9.5	40.0
PM/PM ₁₀	10.2	1.1	2.5	13.8	3.4	10.4	25/15
CO	158.0	7.7	24.6	190.3	20.4	169.9	100.0
VOC	6.5	0.4	10.6	17.5	1.1	16.4	40.0
H ₂ SO ₄	0.3	2.0	0.1	2.4	0.8	1.6	7.0

Emissions are based on firing natural gas in the turbine for 8,147 hours/yr at 348 MMBTU/hr and natural gas in the duct burner for 2,628 hours/yr at 187 MMBTU/hr. Oil firing in the turbine is based on 219 hours/yr at 382.6 MMBTU/hr.

Turbine performance under natural gas firing is based on NO_x emissions of 25 ppmvd (corrected to 15 percent O₂). Performance on oil firing is based on NO_x emissions of 42 ppmvd (corrected to 15 percent O₂). SO₂ emissions are based on 0.5 percent sulfur.

Date of Receipt of a Complete Application

March 6, 1992

BACT Determination Requested by Applicant

Control Technology: Combustion efficiency for cogeneration CO control.

Emission Limits: 75 ppmvd CO (natural gas or No. 2 oil - 0.5% Sulfur max.)
(No request made for Boilers 4 and 5)

BACT Determined by the Department

Control Technology: Combustion efficiency for cogeneration CO control with provision for future installation of an oxidation catalyst system.

Emission Limits: Turbine - natural gas firing: 42 ppmvd CO
Turbine - No. 2 oil firing: 75 ppmvd CO
Maximum % Sulfur - No. 2 oil: 0.1 % S
Duct Burner - Natural gas: 0.1 lb CO/MMBTU
Boilers 4 & 5: 10% opacity

BACT Determination Procedure

In accordance with F.A.C. Chapter 17-2, 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 control methods, systems and techniques. In addition, the regulations require 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.

A review of EPA's BACT/LAER Clearinghouse indicates that catalytic oxidation is the most stringent control technique. An oxidation catalyst control system allows 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 and reaches near completion (above 90%) at temperatures above 600°F. Catalytic oxidation occurs at temperatures 50 percent lower than for thermal oxidation thus reducing the thermal energy required. The oxidation catalyst is typically located directly after the turbine or as an integral part of the steam generator. Catalyst size depends on the exhaust flow, temperature, and desired efficiency.

Catalytic oxidation for CO control has been employed in nonattainment areas and is considered to be LAER technology capable of reducing CO emissions to the 10 ppm range. Due to economics, applications of catalytic oxidation technology have thus far been limited to small cogeneration facilities burning natural gas. Oxidation catalysts have not been used on base-loaded fuel oil-fired turbines in simple cycle or combined cycle facilities since extended use of sulfur-containing fuel would result in increased corrosion.

Also, trace metals in the fuel could poison catalysts during prolonged fuel oil firing. For these reasons, if catalytic oxidation is required upon re-evaluation of the BACT, the permit will be amended to allow natural gas firing only.

Using the applicant's proposed CO emission level of 75 ppmvd, the total annualized cost of CO catalytic oxidation for this project is \$508,156 with a cost effectiveness of about \$1,970/ton of CO removed. The cost effectiveness is based on 87% efficiency (75 ppmvd to 10 ppmvd) and includes a heat rate penalty of 0.2% based on an energy loss of \$50/MW associated with pressure drop across the catalyst. A review of previous BACT determinations indicates that \$1,970/ton would not be prohibitive. However, the decision to require catalytic oxidation should be based on a cost/benefit analysis once compliance testing has been done, with the provision for future installation being made a condition of the original construction permit. Therefore, the Department will propose initial BACT emission limits for CO consistent with recent BACT determinations for similar sources. These limits are to be revised, if necessary, upon evaluation of the compliance test data. The turbine limit proposed by the applicant for fuel oil operation (75 ppmvd) is more stringent than a recent BACT determination for similar sources (78 ppmvd).

Other Air Pollutants Not Subject to BACT Determination

The application indicates that emissions of other pollutants will not be subject to a BACT determination. Since the applicant narrowly escaped PSD review for NO_x by lowering firing rates, and since increased firing rates may be requested at some future date, the Department will require that the applicant make provisions for future installation of state-of-the-art catalytic abatement technology for control of NO_x emissions, such as would presently be required if the source was subject to a NO_x BACT determination.

Details of the Analysis May be Obtained by Contacting:

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

Recommended by:

Approved by:

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

Carol M. Browner, Secretary
Dept. of Environmental Regulation

Date 1992

Date 1992