



Jeb Bush
Governor

Department of Environmental Protection

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

David B. Struhs
Secretary

June 30, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregory M. Nelson, P.E.
Manager Environmental Planning
Tampa Electric Company
6944 U.S. Highway 41 North
Apollo Beach, Florida 33572-9200

Re: DEP File No. PSD-FL-263
Polk Power Station
Two 165 Megawatt Combustion Turbines


Dear Mr. Nelson:

Enclosed is one copy of the Draft PSD Permit, Technical Evaluation and Preliminary Determination, and Draft BACT Determination, for the referenced project at the Polk Power Station located at 9995 State Route 37 South, Mulberry, Polk County. The Department's Intent to Issue PSD Permit and the "PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT" must be published one time only as soon as possible in a newspaper of general circulation in the area affected, pursuant to Chapter 50, Florida Statutes. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (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.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any questions, please call Ms. Teresa Heron at 850/921-9529.

Sincerely,


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

CHF/th

Enclosures

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. PSD-FL-263

Tampa Electric Company - Polk Power Station
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to Tampa Electric Company (TEC). The permit is to construct two nominal 165 megawatt (MW) natural gas and distillate fuel oil-fired combustion turbine-electrical generators with evaporative inlet coolers and two 114-foot stacks at the Polk Power Station at 9995 State Route 37 South, Mulberry, Polk County. A Best Available Control Technology (BACT) determination was required for particulate matter (PM/PM₁₀), nitrogen oxides (NO_x), sulfur dioxide (SO₂), sulfuric acid mist (SAM), and carbon monoxide (CO) pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21. The applicant's name and address are Tampa Electric Company 6944 U.S. Highway 41 North, Apollo Beach, Florida 34741-6804.

The new units will be General Electric nominal 165 MW PG7241FA combustion turbines-electrical generators. The units will operate in simple cycle mode and intermittent duty. The units will operate primarily on natural gas and will be permitted to operate 4380 hours per year on gas and no more than 750 hours will be on maximum 0.05 percent sulfur distillate fuel oil.

NO_x emissions will be controlled by Dry Low NO_x (DLN) combustors. The units must achieve the manufacturer's initial "new and clean" performance guarantee of 9 parts per million by volume at 15 percent oxygen (ppm) and meet a continuous emission limit of 10.5 ppm. NO_x will be controlled to 42 ppm by wet injection when firing fuel oil. Sulfuric acid mist, SO₂, and PM/PM₁₀ will be limited by use of clean fuels. Emissions of VOC and CO will be controlled by good combustion practices.

The maximum emissions in tons per year based on the original application are summarized below. CO emissions will be lower as a result of the Department's proposed BACT determination.

<u>Pollutant</u>	<u>Maximum Potential Emissions</u>	<u>PSD Significant Emission Rate</u>
PM/PM ₁₀	54	25/15
CO	303	100
NO _x	581	40
VOC	18	40
SO ₂	126	40
Sulfuric Acid Mist	15	7

An air quality impact analysis was conducted. Maximum predicted impacts due to proposed emissions from the project are less than the applicable PSD Class I and Class II significant impact levels.

The Department will accept written comments and requests for a public hearing (meeting) concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

This PSD permitting action is being coordinated with a modification to the Site Certification Application submitted pursuant to the Power Plant Siting Act, Sections 403.501-519, F.S. If a petition for an administrative hearing on the Department's Intent to Issue PSD Permit is filed by a substantially affected person, that hearing shall be consolidated with any certification hearing pursuant to Section 403.507, F.S.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57 of the 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 3900 Commonwealth Boulevard, Mail Station # 35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under Section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that 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 such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file 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 Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Department Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100
Fax: 813/744-6084

Polk County Environmental Services
Natural Resources & Drainage Division
4177 Ben Durrance Road
Bartow, Florida 33830
941/534-7377
941/534-7374

The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the BACT Determination, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

In the Matter of an
Application for Permit by:

Mr. Gregory M. Nelson, P.E.
Manager, Environmental Planning
Tampa Electric Company
6944 U.S. Highway 41 North
Apollo Beach, Florida 33572-9200

Facility I.D. No. 0530233
DEP Permit No. PSD-FL-263
Polk Power Station
Polk County

INTENT TO ISSUE PSD PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit under the requirements for the Prevention of Significant Deterioration of Air Quality (copy of Draft PSD Permit attached) for the proposed project, detailed in the application specified above and the attached Technical Evaluation and Preliminary Determination, for the reasons stated below.

The applicant, Tampa Electric Company, applied on February 8, 1999 to the Department for a PSD permit to construct two nominal 165-megawatt combustion turbines-electrical generators and two 114-foot stacks at the Polk Power Station, located at 9995 State Route 37 South, Mulberry, Polk County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that a permit under the provisions for the Prevention of Significant Deterioration (PSD) of Air Quality is required for the proposed work.

The Department intends to issue this PSD permit based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C. and 40 CFR 52.21.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed "Public Notice of Intent to Issue PSD Permit." The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "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 permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/922-6979). The Department suggests that you publish the notice within thirty days of receipt of this letter. You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit or other authorization. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for a public hearing (meeting) concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit." Written comments and requests for a public meeting should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

This PSD permitting action is being coordinated with a certification under the Power Plant Siting Act (Sections 403.501-519, F.S.). If a petition for an administrative hearing on the Department's Intent to Issue is filed by a substantially affected person, that hearing shall be consolidated with any certification hearing held pursuant to Section 403.507.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the 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 3900 Commonwealth Boulevard, Mail Station # 35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that 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 such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each

rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.



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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE PSD PERMIT (including the PUBLIC NOTICE, Technical Evaluation and Preliminary Determination, Draft BACT Determination, and the DRAFT permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 6-29-99 to the person(s) listed:

Gregory M. Nelson, TEC*
Gregg Worley, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Buck Owen, DEP PPSO
Thomas W. Davis, P.E, ECT

Clerk Stamp

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

Keri Jaber
(Clerk)

6-29-99
(Date)

TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION

Tampa Electric Company

Polk Power Station
Two 165 Megawatt Simple Cycle Combustion Turbines
Mulberry, Polk County

DEP File No. PSD-FL-263 (PA92-32SA)

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

June 30, 1999

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

Tampa Electric Company (TEC)
9995 State Route 37 South
Mulberry, Florida 33860-0775

Authorized Representative: Mr. G. M. Nelson, Manager, Environmental Planning

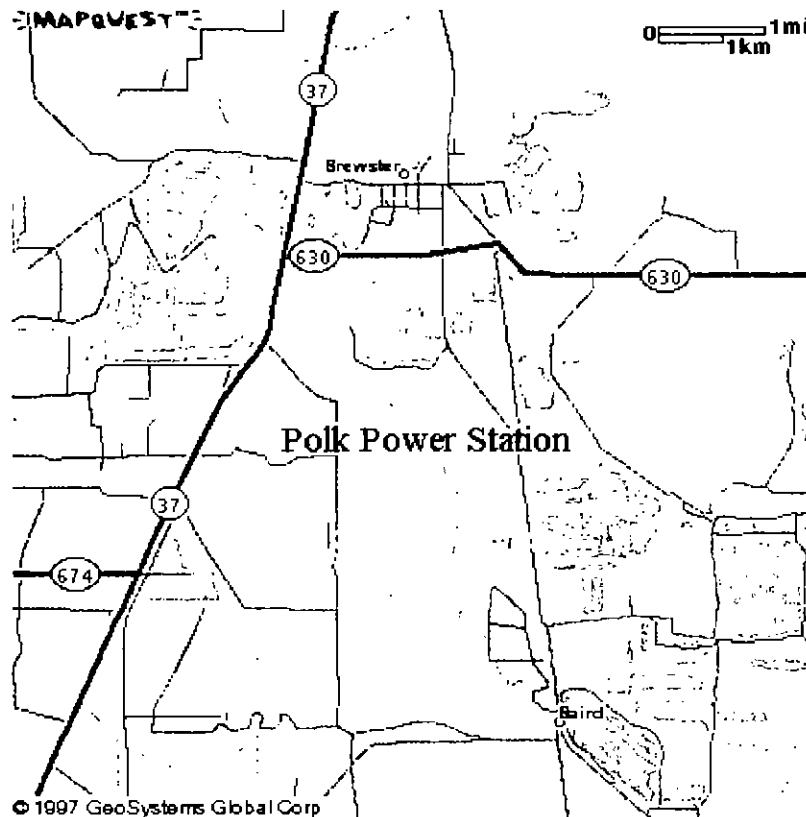
1.2 Reviewing and Processing Schedule

02-08-99: Receipt of PSD Application
02-11-99: DEP/Siting Coordination Office Incompleteness Letter
03-09-99: Preliminary DEP/BAR Incompleteness Letter
05-10-99: Receipt of Site Certification Application and Revised PSD Application
06-30-99: Intent to Issue PSD Permit

2. FACILITY INFORMATION

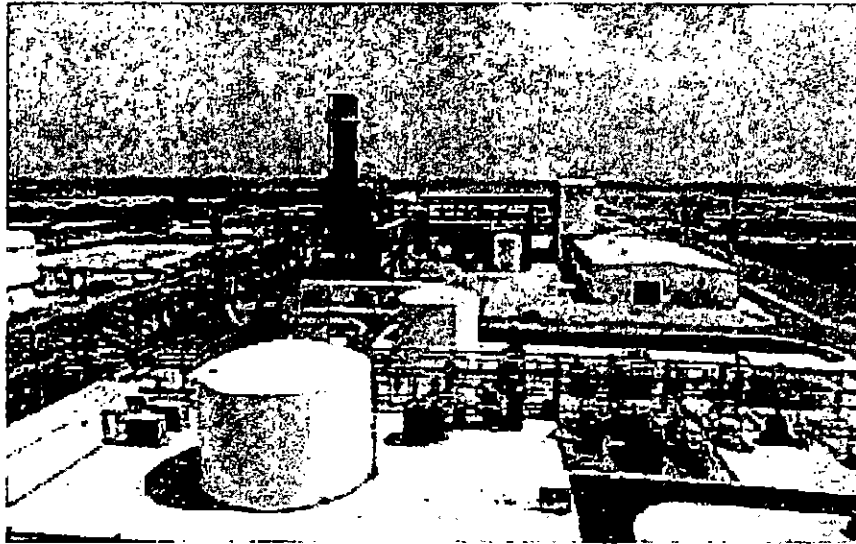
2.1 Facility Location

The Polk Power Station is located at 9995 State Road 37 South, in Mulberry, Polk County (see Figure 1). The general area is characterized primarily by phosphate mining, fertilizer plants, and electrical power plants. This site is approximately 120 kilometers southeast of the Chassahowitzka National Wilderness Area a Class I PSD Area. The UTM coordinates of this facility are Zone 17: 402.45 km E; 3067.35 km N.



TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

The following photograph from TEC's website is a view looking east towards the existing facility.



2.2 Standard Industrial Classification Codes (SIC)

Industry Group No.	49	Electric, Gas, and Sanitary Services
Industry No.	4911	Electric Services

2.3 Facility Category

This facility presently generates electric power from a 260-megawatt (MW) integrated coal gasification and combined cycle turbine unit. The primary mover is a General Electric MS 7001F combustion turbine capable of firing syngas or No. 2 fuel oil. Associated support facilities include: a solid fuel gasification system; a hydrogen sulfide to sulfur dioxide converter; a sulfuric acid plant; solid fuel handling and storage; and fuel oil handling and storage.

The facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM₁₀), sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 TPY. The facility is within an industry included in the list of the 28 Major Facility Categories per Table 212.400-1, F.A.C. Because present emissions are greater than 100 TPY for CO and NO_x, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

As a Major Facility, project emissions greater than: Significant Emission Rates given in Table 212.400-2 (100 TPY of CO; 40 TPY of NO_x, SO₂, or VOC; 7 TPY of sulfuric acid mist (SAM); or 25/15 TPY of PM/PM₁₀) require review per the PSD rules and a determination of Best Available Control Technology (BACT). This facility is also subject to the Title IV Acid Rain Program, 40 CFR 72 and must apply for an Acid Rain Permit at least 24 months prior to start up.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

3. PROJECT DESCRIPTION

This permit addresses the following emissions units:

EMISSION UNIT	SYSTEM	Emission Unit Description
009 (CTG-2)	Power Generation	One nominal 165 Megawatt (nominal) Gas Combustion Turbine-Electrical Generator
010 (CTG-3)	Power Generation	One nominal 165 Megawatt (nominal) Gas Combustion Turbine-Electrical Generator

The Tampa Electric Company (TEC) proposes to construct two nominal 165 MW General Electric PG7241FA simple cycle, intermittent duty combustion turbine-electrical-generators with evaporative inlet coolers and two 114-foot stacks at the existing Polk Power Station. The project will use existing support facilities such as the 3,000,000-gallon fuel oil storage tank.

According to the application, the facility will emit approximately 581 tons per year (TPY) of NO_x, 303 TPY of CO, 54 TPY of PM/PM₁₀, 126 TPY of SO₂, 18 TPY of VOC, and 15 TPY of SAM.

Significant emission rate increases per Table 212.400-2, F.A.C. will occur for carbon monoxide (CO), sulfur dioxide (SO₂), sulfuric acid mist (SAM), particulate matter (PM/PM₁₀), volatile organic compounds (VOC) and nitrogen oxides (NO_x). A BACT determination is required for each of these pollutants. An air quality impact review is also required for CO, PM/PM₁₀, NO_x, and SO₂.

Each turbine will be equipped with Dry Low NO_x (DLN-2.6) combustors for the control of NO_x emissions to 9 - 10.5 ppmvd at 15% O₂ from 50% load up to 100% load conditions during normal operations. Each turbine will have a nominal heat input rating of 1,772 (gas) and 1,947 (oil) mmBtu/hr higher heating value (HHV) at 59 °F while operating at 100% load. The units are rated at 2,066 (oil) and 1,984 (gas) mmBtu/hr (HHV) at 20 °F. The main fuel will be natural gas and the units are proposed by TEC to operate up to 4,380 hours per year on natural gas and 876 hours per year on fuel oil.

Internal and external views of the GE MS7001FA (a predecessor of the PG7241FA) are shown in Figure 3 below. Each unit will be delivered with 14 can-annular design, DLN-2.6 combustors instead of the earlier-generation combustors supplied with the MS7001FA.

4. PROCESS DESCRIPTION

Much of the following discussion is from a 1993 EPA document on Alternative Control Techniques for NO_x Emissions from Stationary Gas turbines. Project specific information is interspersed where appropriate.

A gas turbine is an internal combustion engine that operates with rotary rather than reciprocating motion. Ambient air is drawn into the 18-stage compressor of the GE 7FA where it is compressed by a pressure ratio of about 15 times atmospheric pressure. The compressed air is then directed to the combustor section, where fuel is introduced, ignited, and burned. The combustion section consists of 14 separate can-annular combustors.

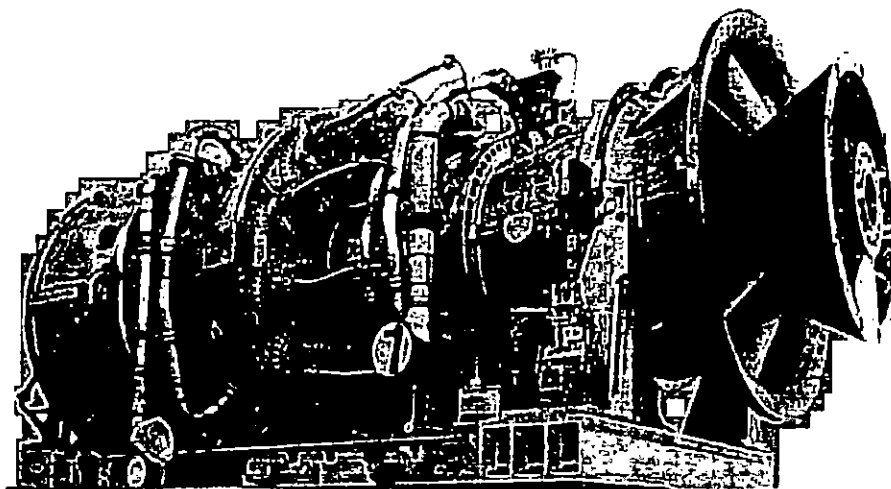
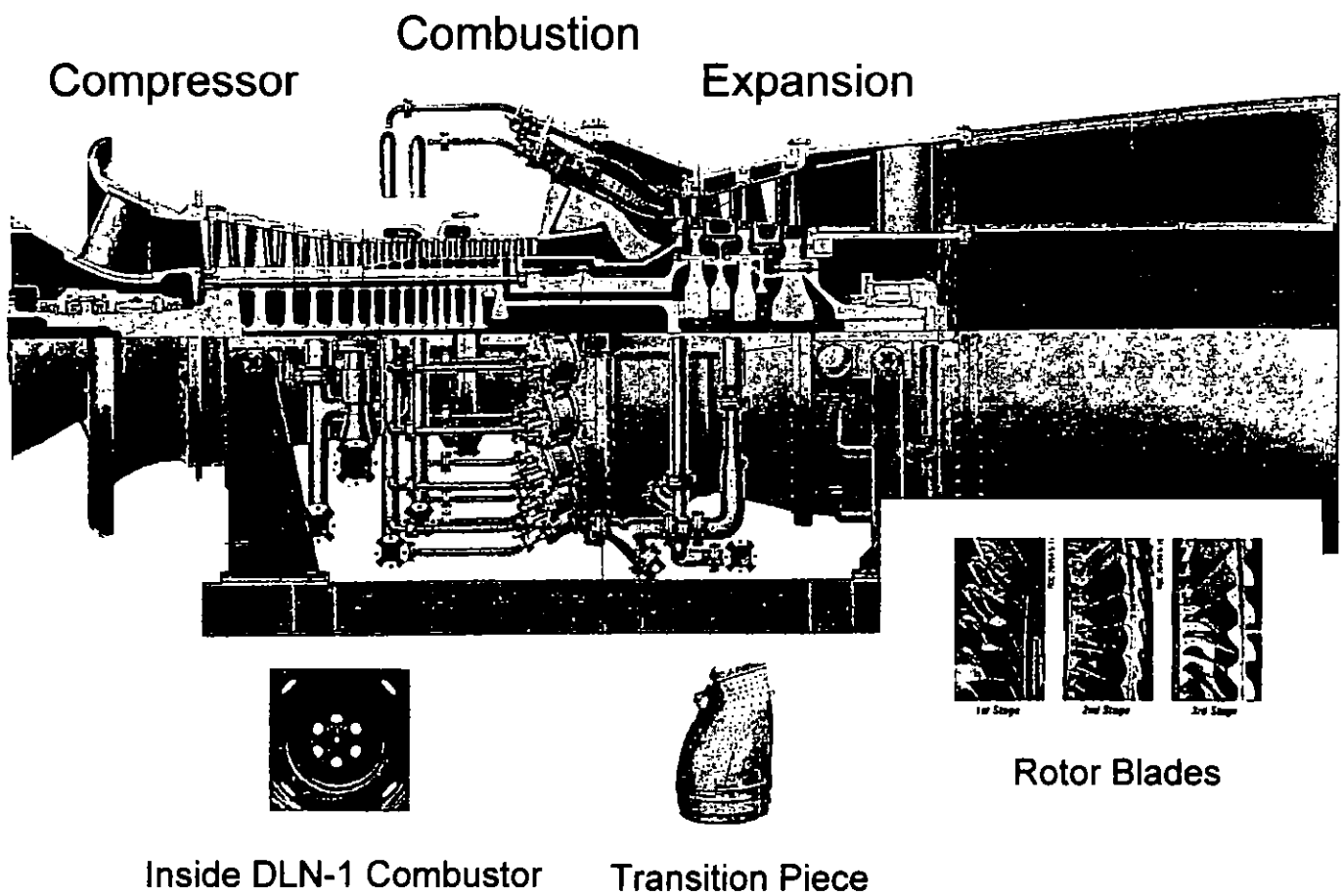


Figure 3 - Internal and External Views of GE MS7001FA

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Flame temperatures in a typical combustor section can reach 3600 degrees Fahrenheit (°F). Units such as the 7FA operate at lower flame temperatures, which minimize NO_x formation. The hot combustion gases are then diluted with additional cool air and directed to the turbine section at temperatures of approximately 2400 °F. Energy is recovered in the turbine section in the form of shaft horsepower, of which typically more than 50 percent is required to drive the internal compressor section. The balance of recovered shaft energy is available to drive the external load unit such as an electrical generator.

In the TEC project, the units will operate as intermittent units in the simple cycle mode (see Figure 4). Cycle efficiency, defined as a percentage of useful shaft energy output to fuel energy input, is approximately 35 percent for F-Class combustion turbines in the simple cycle mode. In addition to shaft energy output, 1 to 2 percent of the heat input can be attributed to mechanical losses. The balance is exhausted from the turbine in the form of heat.

In combined cycle projects, the gas turbine drives an electric generator while the exhausted gases are used to raise additional steam in a heat recovery steam generator. The steam, in-turn, drives another electrical generator producing another 80-90 MW. In combined cycle mode, the thermal efficiency of the 7FA can exceed 56 percent.

At high ambient temperature, the units cannot generate as much power because of lower compressor inlet density. To compensate for the loss of output (which can be on the order of 20 MW compared to referenced temperatures), an evaporative inlet cooler can be installed ahead of the combustion turbine inlet. At an ambient temperature of 95 °F, roughly 7 – 14 MW of power can be regained per unit by using the foggers.

Additional process information related to the combustor design, and control measures to minimize pollutant emissions are given in the draft BACT determination distributed with this evaluation.

5. RULE APPLICABILITY

The proposed project is subject to preconstruction review requirements under the provisions of 40 CFR 52.21, Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-214, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

This facility is located in Polk County, an area designated as attainment for all criteria pollutants in accordance with Rule 62-204.360, F.A.C. The proposed project is subject to review under Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD), for the reasons given in Section 2.3, Facility category, above.

This PSD review consists of an evaluation of resulting ambient air pollutant concentrations, and increases with respect to the National Ambient Air Quality Standards and Increments as well as a determination of Best Available Control Technology (BACT) for PM/PM₁₀, VOC, CO, SAM and NO_x. An analysis of the air quality impact from proposed project upon soils, vegetation, and visibility is required along with air quality impacts resulting from associated commercial, residential, and industrial growth. This project will also be reviewed for Site Certification under the Power Plant Siting Act.

The emission units affected by this PSD permit shall comply with all applicable provisions of the Florida Administrative Code (including applicable portions of the Code of Federal Regulations incorporated therein) and, specifically, the following Chapters and Rules:

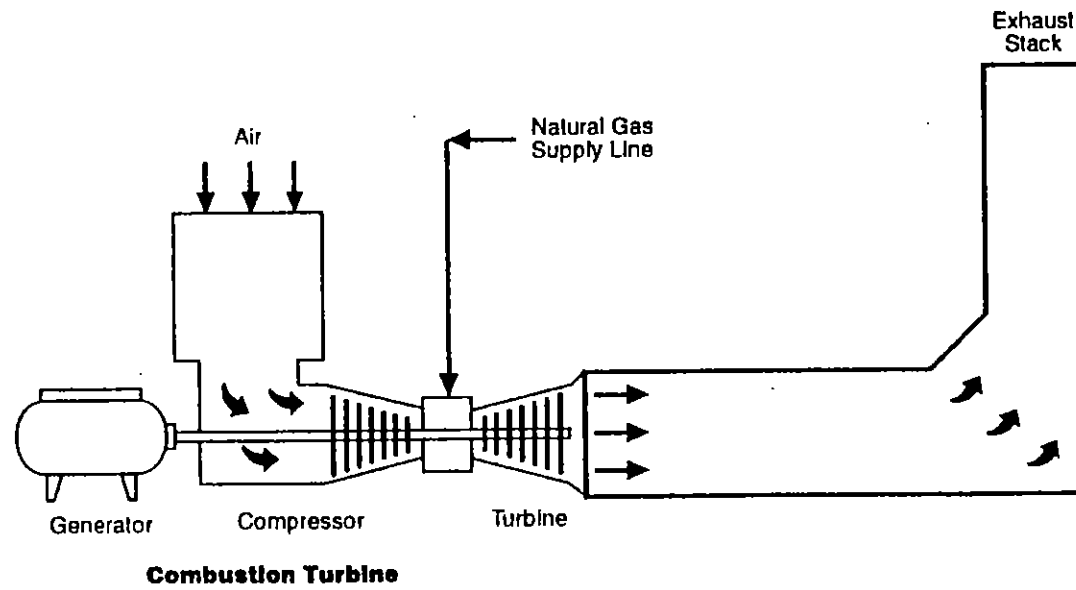


Figure 4 - Simple Cycle Combustion Turbine Process Flow Diagram

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

5.1 State Regulations

Chapter 62-17	Electrical Power Siting
Chapter 62-4	Permits.
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.260	Prevention of Significant Deterioration Increments
Rule 62-204.800	Federal Regulations Adopted by Reference
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Preconstruction Review Requirements
Rule 62-212.400	Prevention of Significant Deterioration
Chapter 62-213	Operation Permits for Major Sources of Air Pollution
Chapter 62-214	Requirements For Sources Subject To The Federal Acid Rain Program
Rule 62-296.320	General Pollutant Emission Limiting Standards
Rule 62-297.310	General Test Requirements
Rule 62-297.401	Compliance Test Methods
Rule 62-297.520	EPA Continuous Monitor Performance Specifications

5.2 Federal Rules

40 CFR 52.21	Prevention of Significant Deterioration
40 CFR 60	NSPS Subpart GG
40 CFR 60	Applicable sections of Subpart A, General Requirements
40 CFR 72	Acid Rain Permits (applicable sections)
40 CFR 73	Allowances (applicable sections)
40 CFR 75	Monitoring (applicable sections including applicable appendices)
40 CFR 77	Acid Rain Program-Excess Emissions (future applicable requirements)

6. SOURCE IMPACT ANALYSIS

6.1 Emission Limitations

The proposed Units 1-3 will emit the following PSD pollutants (Table 212.400-2, F.A.C.): PM/PM₁₀, SO₂, NO_x, VOC, CO, SAM, and negligible quantities of fluorides (F), mercury (Hg) and lead (Pb). The applicant's proposed annual emissions are summarized in the Table below and form the basis of the source impact review. The Department's proposed permitted allowable emissions for these Units are summarized in the Draft BACT document and Specific Conditions Nos. xx through xx of Draft Permit PSD-FL-263.

6.2 Emission Summary

The annual emissions increases for all PSD pollutants as a result of the project are presented below:

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

PROJECT EMISSIONS (TPY) AND PSD APPLICABILITY

Pollutant	Gas Firing ¹	Oil Firing ¹	Total ¹	PSD Significance	PSD REVIEW?
PM/PM ₁₀			54	25	Yes
SO ₂	40	86	126	40	Yes
NO _x	301	280	581	40	Yes
CO	210	93	303	100	Yes
Ozone(VOC)			18	40	Yes
Sulfuric Acid Mist	5	10	15	7	Yes
Total Fluorides	<<3	<<3	<<3	3	No
Mercury	<<0.1	<<0.1	<0.1	0.1	No
Lead	<<0.6	<<0.6	<0.6	0.6	No

1. Based on 4380 hours of gas firing and 876 hours of fuel oil firing. Reference ambient temperature is 59 °F.

6.3 Control Technology

Emissions control will be primarily accomplished by good combustion of clean natural gas and limited use of low sulfur (0.05 percent) fuel oil. The gas turbine combustors will operate in lean pre-mixed mode to minimize the flame temperature and nitrogen oxides formation potential. A full discussion is given in the BACT Determination (see Permit Appendix BD). The Draft BACT is incorporated into this evaluation by reference.

6.4 Air Quality Analysis

6.4.1 Introduction

The proposed project will increase emissions of five pollutants at levels in excess of PSD significant amounts: PM₁₀, CO, NO_x, SO₂, and H₂SO₄ mist. PM₁₀, SO₂, and NO_x are criteria pollutants and have national and state ambient air quality standards (AAQS). PSD increments, and significant impact levels defined for them. CO is a criteria pollutant and has only AAQS and significant impact levels defined for it. There are no applicable PSD increments or AAQS for H₂SO₄ mist.

The applicant's initial PM₁₀, CO, NO_x, and SO₂ air quality impact analyses for this project predicted no significant impacts; therefore, further applicable AAQS and PSD increment impact analyses for these pollutants were not required. Based on the preceding discussion the air quality analyses required by the PSD regulations for this project are the following:

- A significant impact analysis for PM₁₀, CO, SO₂, and NO_x;
- An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts.

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 significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in *NRDC v. Thomas*, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A more detailed discussion of the required analyses follows.

6.4.2 Models and Meteorological Data Used in the Significant Impact Analysis

The EPA-approved SCREEN3 (screening model) and Industrial Source Complex Short-Term (ISCST3) dispersion models were used to evaluate the pollutant emissions from the proposed project. These models determine ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. They incorporate elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfy the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at St. Petersburg/Clearwater, Florida (surface data) and Ruskin, Florida (upper air data). The 5-year period of meteorological data was from 1992 through 1996. These NWS stations were selected for use in the study because they are the closest primary weather stations to the study area and are most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

For determining the project's significant impact area in the vicinity of the facility and if there are significant impacts from the project on any PSD Class I area, the highest predicted short-term concentrations and highest predicted annual averages were compared to their respective significant impact levels.

6.4.3 Significant Impact Analysis

Initially, the applicant conducts modeling using only the proposed project's emissions at worst load conditions. In order to determine worst-case load conditions the SCREEN3 model was used to evaluate dispersion of emissions from the combined cycle facility for three loads (50%, 75%, and 100%) and three seasonal operating conditions (summer, winter, and average). If this modeling at worst-case load conditions shows significant impacts, additional multi-source modeling is required to determine the project's impacts on the existing air quality and any applicable AAQS and PSD increments. Receptors were placed along the fence line of the facility, which is located in a PSD Class II area. They were also placed in the Chassahowitzka National Wilderness Area (CNWA), which is the closest PSD

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Class I area. CNWA is located approximately 120 km northwest of the project. The receptor grid for predicting maximum concentrations in the vicinity of the project was a polar receptor grid that contained 24 rings and 10° spacing radials with dimensions centered on the simple-cycle facility stacks. The inner portion of the grid had rings at 500 m spacing out to 4,000m. A 1,000 m spacing was used out to 10,000 m; and a 2,500 m spacing was used out to 35,000m. From 35,000 m to 50,000 m, a 5,000 m spacing was used. For predicting impacts at the CNWA, thirteen discrete receptors along the border of the PSD Class I area were used. For each pollutant subject to PSD and also subject to PSD increment and/or AAQS analyses, this modeling compares maximum predicted impacts due to the project with PSD significant impact levels to determine whether significant impacts due to the project are predicted in the vicinity of the facility or in the CNWA. The tables below show the results of this modeling.

MAXIMUM PROJECT AIR QUALITY IMPACTS FOR COMPARISON TO THE PSD CLASS II SIGNIFICANT IMPACT LEVELS IN THE VICINITY OF THE FACILITY

Pollutant	Averaging Time	Max Predicted Impact (ug/m ³)	Significant Impact Level (ug/m ³)	Significant Impact?
PM ₁₀	Annual	0.001	1	NO
	24-hour	0.08	5	NO
CO	8-hour	1.17	500	NO
	1-hour	2.78	2000	NO
NO ₂	Annual	0.008	1	NO
SO ₂	Annual	0.002	1	NO
	24-hour	0.31	5	NO
	3-hour	1.62	25	NO

MAXIMUM PROJECT AIR QUALITY IMPACTS FOR COMPARISON TO THE PSD CLASS I SIGNIFICANT IMPACT LEVELS (CNWA)

Pollutant	Averaging Time	Max. Predicted Impact at Class I Area (ug/m ³)	Proposed EPA Significant Impact Level (ug/m ³)	Significant Impact?
PM ₁₀	Annual	0.0004	0.2	NO
	24-hour	0.03	0.3	NO
NO ₂	Annual	0.005	0.1	NO
SO ₂	Annual	0.001	0.1	NO
	24-hour	0.15	0.2	NO
	3-hour	0.89	1	NO

The results of the significant impact modeling show that there are no significant impacts predicted from emissions from this project; therefore, no further modeling was required.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

6.4.4 Impacts Analysis

Impact Analysis Impacts On Soils, Vegetation, And Wildlife

Very low emissions are expected from this natural gas-fired combustion turbine in comparison with conventional power plant generating equal power. Emissions of acid rain and ozone precursors will be very low. The maximum ground-level concentrations predicted to occur for PM₁₀, CO, NO_x, SO₂ and sulfuric acid mist as a result of the proposed project, including background concentrations and all other nearby sources, will be less than the respective ambient air quality standards (AAQS). The project impacts are less than the significant impact levels which in-turn are less than the applicable allowable increments for each pollutant. Because the AAQS are designed to protect both the public health and welfare and the project impacts are less than significant, it is reasonable to assume the impacts on soils, vegetation, and wildlife will be minimal or insignificant.

Impact On Visibility

Natural gas and low ash distillate fuel oil are clean fuels and produce little ash. This will minimize smoke formation. The low NO_x and SO₂ emissions will also minimize plume opacity. Because no add-on control equipment and no reagents are required, there will be no steam plume or tendency to form ammoniated particulate species. A regional haze analysis was performed which shows that the proposed project will not result in adverse impacts on visibility in the nearest PSD Class I area.

Growth-Related Air Quality Impacts

There will be short-term increases in the labor force to construct the project. These temporary increases will not result in significant commercial and residential growth in the vicinity of the project. Operation of the additional unit will require 10 more permanent employees which will cause no significant impact on the local area.

Over the past few years the Public Service Commission has determined that a number of power projects are needed will help meet the low electrical reserve capacity throughout the State of Florida. The project is a response to state-wide and regional growth and also accommodates more growth. There are no adequate procedures under the PSD rules to fully assess these impacts. However, the type of project proposed has a small overall physical "footprint," low water requirements, and the among the lowest air emissions per unit of electric power generating capacity for intermittent duty.

Hazardous Air Pollutants

The project is not a major source of hazardous air pollutants (HAPs) and is not subject to any specific industry or HAP control requirements pursuant to Section 112 of the Clean Air Act.

7. CONCLUSION

Based on the foregoing technical evaluation of the application and additional information submitted by the applicant, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations, provided the Department's BACT determination is implemented.

A. A. Linero, P.E.

Teresa Heron, Engineer

Chris Carlson, Meteorologist

PERMITTEE:

Tampa Electric Company (TEC)
6944 U.S. Highway 41 North
Apollo Beach, Florida 33572-9200

File No.	PSD-FL-263 (PA92-32)
FID No.	1050233
SIC No.	4911
Expires:	December 31, 2002

Authorized Representative:

Gregory M. Nelson, Manager, Environmental Planning

PROJECT AND LOCATION:

Permit pursuant to the requirements for the Prevention of Significant Deterioration of Air Quality (PSD Permit) for the construction of: two dual-fuel nominal 165 megawatt (MW) General Electric PG7241FA combustion turbine-electrical generators and two 114-foot stacks. The units will operate in simple cycle mode and intermittent duty. The units will be equipped with Dry Low NO_x (DLN-2.6) combustors and wet injection capability. They are designated by TEC as CTGs Nos. 2 and 3 and by the Department as ARMS Emissions Units 009 and 010.

The project will be located at the existing Polk Power Station, 9995 State Route 37 South, Mulberry, Polk County. UTM coordinates are: Zone 17; 402.45 km E; 3067.35 km N.

STATEMENT OF BASIS:

This PSD permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.) and 40CFR52.21. The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Attached Appendices and Tables made a part of this permit:

- Appendix BD BACT Determination
- Appendix GC Construction Permit General Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION I - FACILITY INFORMATION

FACILITY DESCRIPTION

This facility presently generates electric power from a 260 megawatt (MW) integrated coal gasification and combined cycle turbine unit. The primary mover is a General Electric MS 7001F combustion turbine capable of firing syngas or No. 2 fuel oil. Associated support facilities include: a solid fuel gasification system; a hydrogen sulfide to sulfur dioxide converter; a sulfuric acid plant; solid fuel handling and storage; and fuel oil handling and storage.

This permitting action is to install two dual-fuel nominal 165 megawatt (MW) General Electric PG7241FA combustion turbine-electrical generators with two 114-foot stacks. The project will utilize existing infrastructure including oil storage and auxiliary equipment.

Emissions from the new units will be controlled by Dry Low NO_x (DLN-2.6) combustors when operating on natural gas and wet injection when firing fuel oil. Inherently clean fuels and good combustion practices will be employed to control all pollutants.

EMISSION UNITS

This permit addresses the following emission units:

ARMS EMISSIONS UNIT	SYSTEM	EMISSION UNIT DESCRIPTION
009 (CTG-2)	Power Generation	One nominal 165 Megawatt Gas Simple Cycle Combustion Turbine-Electrical Generator
010 (CTG-3)	Power Generation	One nominal 165 Megawatt Simple Cycle Gas Combustion Turbine-Electrical Generator

REGULATORY CLASSIFICATION

The facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM₁₀), sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is within an industry included in the list of the 28 Major Facility Categories per Table 212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Pursuant to Table 62-212.400-2, modifications at this facility resulting in emissions increases greater than any of the following values require review per the PSD rules as well as a determination of Best Available Control Technology (BACT): 40 TPY of NO_x, SO₂, or VOC; 25/15 TPY of PM/PM₁₀; 100 TPY of CO; or 7 TPY of sulfuric acid mist (SAM).

This project is subject to certain requirements of Chapter 403, Part II, F.S., Electric Power Plant and Transmission Line Siting, including a modification of the Conditions of Certification (reference Site Certification PA92-32).

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION I - FACILITY INFORMATION

This facility and the project are also subject to applicable provisions of Title IV, Acid Rain, of the Clean Air Act..

PERMIT SCHEDULE

- xx/xx/99 Modification of Conditions of Certification Approved
- xx/xx/99 Notice of Intent to Issue PSD Permit published in _____
- 06/30/99 Distributed Intent to Issue Permit
- 06/10/99 Application deemed complete for PSD review.
- 02/08/99 Received revised PSD Application

RELEVANT DOCUMENTS:

The documents listed below are the basis of the permit. They are specifically related to this permitting action, but not all are incorporated into this permit. These documents are on file with the Department.

- Application received on February 8, 1999
- Department/ Siting Coordination Office incompleteness letter dated February 11, 1999
- Department/BAR memo to Siting Coordination Office dated March 9, 1999
- Comments and letter from the U. S. Fish and Wildlife Service dated March 19, 1999.
- Site Certification and Revised PSD Application received May 10, 1999
- Department/BAR comments on Modeling dated May 20, 1999
- Comments from Hillsborough County EPC dated June 7, 1999
- Response from TEC/ECT received June 10, 1999
- Department's Intent to Issue PSD Permit and Public Notice Package dated June 30, 1999.
- Department's Final Determination and Best Available Control Technology Determination issued concurrently with this Final Permit.

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION II - ADMINISTRATIVE REQUIREMENTS

GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP), at 2600 Blairstone Road, Tallahassee, Florida 32399-2400 and phone number (850)488-0114. All documents related to reports, tests, and notifications should be submitted to the DEP Southwest District, 3804 Coconut Palm Drive, Tampa, Fl 33619-8218 and phone number 813/744-6100.
2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
4. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
5. 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. [Chapters 62-210 and 62-212, F.A.C.]
6. Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)]
7. BACT Determination: In conjunction with extension of the 18 month periods to commence or continue construction, or extension of the December 31, 2002 permit expiration date, the permittee may be required to demonstrate the adequacy of any previous determination of best available control technology for the source. In accordance with paragraph (4) of 40 CFR 52.21(j) the Best Available Control Technology (BACT) determination shall be reviewed and modified as appropriate in the event of a plant conversion. This paragraph states: "For phased construction project, the determination of best available control technology shall be reviewed and modified as appropriate at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the applicable stationary source may be required to demonstrate

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION II - ADMINISTRATIVE REQUIREMENTS

the adequacy of any previous determination of best available control technology for the source." [40 CFR 52.21(j)(4), Rule 62-4.070 F.A.C.]

8. Permit Extension: The permittee, for good cause, may request that this PSD 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 (Rule 62-4.080, F.A.C.).
9. Application for Title IV Permit: An application for a Title IV Acid Rain Permit, must be submitted to the U.S. Environmental Protection Agency Region IV office in Atlanta, Georgia and a copy to the DEP's Bureau of Air Regulation in Tallahassee 24 months before the date on which a new unit begins serving an electrical generator greater than 25 MW. [40 CFR 72]
10. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the DEP's Bureau of Air Regulation, and a copy to the Department's Southwest District. [Chapter 62-213, F.A.C.]
11. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
12. Annual Reports: Pursuant to Rule 62-210.370(2), F.A.C., Annual Operation Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports shall be sent to the DEP's Southwest District by March 1st of each year.
13. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C.
14. Quarterly Reports: Quarterly excess emission reports, in accordance with 40 CFR 60.7 (a)(7) (c) (1998 version), shall be submitted to the DEP's Southwest District.

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-17, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, and 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 52, 60, 72, 73, and 75.
2. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]
3. These emission units shall comply with all applicable requirements of 40CFR60, Subpart A, General Provisions including:
 - 40CFR60.7, Notification and Recordkeeping
 - 40CFR60.8, Performance Tests
 - 40CFR60.11, Compliance with Standards and Maintenance Requirements
 - 40CFR60.12, Circumvention
 - 40CFR60.13, Monitoring Requirements
 - 40CFR60.19, General Notification and Reporting requirements
4. ARMS Emissions Unit 009. Direct Power Generation, consisting of a nominal 165 megawatt simple cycle combustion turbine-electrical generator, shall comply with all applicable provisions of 40CFR60, Subpart GG, Standards of Performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b); F.A.C. The Subpart GG requirement to correct test data to ISO conditions applies. However, such correction is not used for compliance determinations with the BACT standard(s).
5. ARMS Emissions Unit 010. Direct Power Generation, consisting of a nominal 165 megawatt simple cycle combustion turbine-electrical generator, shall comply with all applicable provisions of 40CFR60, Subpart GG, Standards of Performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b), F.A.C. The Subpart GG requirement to correct test data to ISO conditions applies. However, such correction is not used for compliance determinations with the BACT standard(s).
6. All notifications and reports required by the above specific conditions shall be submitted to the DEP's Southwest District.

GENERAL OPERATION REQUIREMENTS

7. Fuels: Only pipeline natural gas or maximum 0.05 percent sulfur fuel oil No. 2 or superior grade of distillate fuel oil shall be fired in this unit. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)] {Note: The limitation of this specific condition is more stringent than the NSPS sulfur dioxide limitation and thus assures compliance with 40 CFR 60.333 and 60.334}

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

8. Combustion Turbine Capacity: The maximum heat input rates, based on the higher heating value (LHV) of each fuel to each unit at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,600 million Btu per hour (mmBtu/hr) when firing natural gas, nor 1,800 mmBtu/hr when firing No. 2 or superior grade of distillate fuel oil. These maximum heat input rates will vary depending upon ambient conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other ambient conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing. [Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
9. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary.
10. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the DEP Southwest District as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]
11. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]
12. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]
13. Maximum allowable hours of operation for each unit are 4,380 hours per year on natural gas and 750 hours on fuel oil. [Applicant Request, Rule 62-210.200, F.A.C.. (Definitions - Potential Emissions), 62-212.400, F.A.C.. (BACT Determination)]

CONTROL TECHNOLOGY

14. Dry Low NO_x (DLN) combustors shall be installed on the stationary combustion turbine to comply with the NO_x emissions limits while firing natural gas. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT Determination)]
15. A water injection system shall be installed for use when firing No. 2 or superior grade distillate fuel oil for control of NO_x emissions. [Design, Rules 62-4.070 and 62-212.400, F.A.C.]

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

16. The permittee shall design these units to accommodate adequate testing and sampling locations for compliance with the applicable emission limits (per each unit) listed in Specific Conditions No. 19 through 24. [Rule 62-4.070 , Rule 62-204.800, F.A.C., and 40 CFR60.40a(b)]
17. The permittee shall provide manufacturer’s emissions performance versus load diagrams for the DLN and wet injection systems prior to their installation. DLN systems shall each be tuned upon initial operation to optimize emissions reductions and shall be maintained to minimize NO_x emissions and CO emissions. Operation of the DLN systems in the diffusion-firing mode shall be minimized when firing natural gas. [Rule 62-4.070, and 62-210.650, F.A.C.]

EMISSION LIMITS AND STANDARDS

18. Following is a summary of the emission limits and required technology. Values for NO_x are corrected to 15 % O₂ on a dry basis. These limits or their equivalent in terms of lb/hr or NSPS units, as well as the applicable averaging times, are followed by the applicable specific conditions [Rules 62-212.400, 62-204.800(7)(b) (Subpart GG), 62-210.200 (Definitions-Potential Emissions) F.A.C.]

POLLUTANT	CONTROL TECHNOLOGY	EMISSION LIMIT
PM/PM ₁₀ , VE	Pipeline Natural Gas Good Combustion	10 Percent Opacity
VOC	As Above	1.4 ppm (Gas) 3.5 ppm (FO)
CO	As Above	12 ppm (Gas) 20 ppm (FO)
SO ₂ and Sulfuric Acid Mist	Pipeline Natural Gas Low Sulfur Oil	2 gr S/100 F ³ 0.05% S Fuel Oil
NO _x	DLN, WI for F.O., limited fuel oil usage	10.5 ppmvd (DLN) 42 ppmvd (FO)

19. Nitrogen Oxides (NO_x) Emissions:

- When NO_x monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate any specified average time.
- While firing Natural Gas: The emission rate of NO_x in the exhaust gas shall not exceed 10.5 ppm @15% O₂ (at ISO conditions) on a 24 hr block average as measured by the continuous emission monitoring system (CEMS). In addition, NO_x emissions calculated as NO₂ (at ISO conditions) shall not exceed 59 pounds per hour and 9 ppm @15% O₂ to be demonstrated by the initial “new and clean” GE performance stack test. [Rule 62-212.400, F.A.C.]

Notwithstanding the applicable NO_x limit during normal operation, reasonable measures shall be implemented to maintain the concentration of NO_x in the exhaust gas at 9 ppmvd at 15% O₂ or lower. Any tuning of the combustors for Dry Low NO_x operation while

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

firing gas shall result in initial subsequent NO_x concentrations of 9 ppmvd @15% O_2 or lower. [Rules 62-212.400 and 62-4.070, F.A.C.]

- While firing Fuel oil: The concentration of NO_x in the exhaust gas shall not exceed 42 ppmvd at 15% O_2 on the basis of a 3 hr average as measured by the continuous emission monitoring system (CEMS). In addition, NO_x emissions calculated as NO_2 (at ISO conditions) shall not exceed 319 lb/hr and 42 ppm @15% O_2 to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]

Within 18 months after the initial compliance test, the permittee shall prepare and submit for the Department's review and acceptance an engineering report regarding the lowest NO_x emission rate that can consistently be achieved when firing distillate oil. This lowest recommended rate shall include a reasonable operating margin, taking into account long-term performance expectations and good operating and maintenance practices. The Department may revise the NO_x emission rate based upon this report. [BACT determination]

20. Carbon Monoxide (CO) Emissions: The concentration of CO in the stack exhaust gas (at ISO conditions) with the combustion turbine operating on natural gas shall exceed neither 12 ppm nor 38 lb/hr and 20 ppmvd nor 65 lb/hr when operating on fuel oil to be demonstrated by stack test using EPA Method 10. [Rule 62-212.400, F.A.C.]
21. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the stack exhaust gas (at ISO conditions) with the combustion turbine operating on natural gas shall exceed neither 1.4 ppm nor 2.8 lb/hr and neither 3.5 ppm nor 7 lb/hr while operating on oil to be demonstrated by initial stack test using EPA Method 18, 25 or 25A. [Applicant Request]
22. Sulfur Dioxide (SO_2) emissions: SO_2 emissions shall be limited by firing pipeline natural gas (sulfur content less than 2 grains per 100 standard cubic foot) or by firing No. 2 or superior grade distillate fuel oil with a maximum 0.05 percent sulfur for 750 hours per year. Emissions of SO_2 shall not exceed 9.2 lb/hr (natural gas) and 98.1 lb/hr (fuel oil) as measured by applicable compliance methods described below. [40CFR60 Subpart GG and Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]
23. Visible emissions (VE): VE emissions shall serve as a surrogate for PM/PM_{10} emissions from the combustion turbine operating with or without the duct burner and shall not exceed 10 percent opacity from the stack in use. [Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]

EXCESS EMISSIONS

24. Excess emissions resulting from startup, shutdown, or malfunction shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period for other reasons unless specifically authorized by DEP for longer duration. Operation below 50% output shall be limited to 2 hours per unit cycle (breaker closed to breaker open).

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

25. Excess emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C. These emissions shall be included in the 24-hr average for NO_x.
26. Excess Emissions Report: If excess emissions occur due to malfunction, the owner or operator shall notify DEP's Southwest District within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Following the NSPS format, 40 CFR 60.7 Subpart A, periods of startup, shutdown, malfunction, shall be monitored, recorded, and reported as excess emissions when emission levels exceed the permitted standards listed in Specific Condition No. 18 and 19. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (1998 version)].

COMPLIANCE DETERMINATION

27. Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate, but not later than 180 days of initial operation of the unit, and annually thereafter as indicated in this permit, by using the following reference methods as described in 40 CFR 60, Appendix A (1997 version), and adopted by reference in Chapter 62-204.800, F.A.C.
28. Initial (I) performance tests (for both fuels) shall be performed on each unit while firing natural gas as well as while firing oil. Initial tests shall also be conducted after any modifications (and shake down period not to exceed 100 days after re-starting the CT) of air pollution control equipment such as change or tuning of combustors. Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.310(7), F.A.C., on each unit as indicated. The following reference methods shall be used. No other test methods may be used for compliance testing unless prior DEP approval is received in writing.
- EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" (I, A).
 - EPA Reference Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources" (I, A).
 - EPA Reference Method 20, "Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines." Initial test only for compliance with 40CFR60 Subpart GG and (I, A) short-term NO_x BACT limits (EPA reference Method 7E, "Determination of Nitrogen Oxides Emissions from Stationary Sources" or RATA test data may be used to demonstrate compliance for annual test requirements).
 - EPA Reference Method 18, 25 and/or 25A, "Determination of Volatile Organic Concentrations." Initial test only.

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

29. Continuous compliance with the NO_x emission limits: Continuous compliance with the NO_x emission limits shall be demonstrated with the CEM system based on the applicable averaging time of 24-hr block average (DLN). Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C. A valid hourly emission rate shall be calculated for each hour in which at least two NO_x concentrations are obtained at least 15 minutes apart. These excess emissions periods shall be reported as required in Conditions 25 and 26. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., 40 CFR 75 and BACT]
30. Compliance with the SO₂ and PM/PM₁₀ emission limits: Notwithstanding the requirements of Rule 62-297.340, F.A.C., the use of pipeline natural gas, is the method for determining compliance for SO₂ and PM₁₀. For the purposes of demonstrating compliance with the 40 CFR 60.333 SO₂ standard, ASTM methods D4084-82 or D3246-81 (or equivalent) for sulfur content of gaseous fuel shall be utilized in accordance with the EPA-approved custom fuel monitoring schedule or natural gas supplier data may be submitted or the natural gas sulfur content referenced in 40 CFR 75 Appendix D may be utilized. However, the applicant is responsible for ensuring that the procedures in 40 CFR 60.335 or 40 CFR 75 are used when determination of fuel sulfur content is made. Analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e) (1998 version).
31. Compliance with CO emission limit: An initial test for CO shall be conducted concurrently with the initial NO_x test, as required. The initial NO_x and CO test results shall be the average of three valid one-hour runs. Annual compliance testing for CO may be conducted at less than capacity when compliance testing is conducted concurrent with the annual RATA testing for the NO_x CEMS required pursuant to 40 CFR 75
32. Compliance with the VOC emission limit: An initial test is required to demonstrate compliance with the VOC emission limit. Thereafter, the CO emission limit and periodic tuning data will be employed as surrogate and no annual testing is required.
33. Testing procedures: Testing of emissions shall be conducted with the combustion turbine operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum heat input rate allowed by the permit, corrected for the average ambient air temperature during the test (with 100 percent represented by a curve depicting heat input vs. ambient temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. In this case, subsequent operation is limited by adjusting the entire heat input vs. ambient temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for ambient temperature) and 110 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Procedures for these tests shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapters 62-204 and 62-297, F.A.C.

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263

SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

34. Test Notification: The DEP's Southwest District shall be notified, in writing, at least 30 days prior to the initial performance tests and at least 15 days before annual compliance test(s).
35. Special Compliance Tests: The DEP may request a special compliance test pursuant to Rule 62-297.310(7), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission standard is being violated.
36. Test Results: Compliance test results shall be submitted to the DEP's Southwest District no later than 45 days after completion of the last test run. [Rule 62-297.310(8), F.A.C.].

NOTIFICATION, REPORTING, AND RECORDKEEPING

37. Records: All measurements, records, and other data required to be maintained by TEC shall be recorded in a permanent form and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These records shall be made available to DEP representatives upon request.
38. Compliance Test Reports: A test report indicating the results of the required compliance tests shall be filed as per Condition No.26 above. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.

MONITORING REQUIREMENTS

39. Continuous Monitoring System: The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from these units. Periods when NO_x emissions (ppmvd @ 15% oxygen) are above the BACT standards, listed in Specific Conditions No 18 and 19, shall be reported to the DEP Southwest District within one working day (verbally) followed up by a written explanation not later than three (3) working days (alternatively by facsimile within one working day). [Rules 62-204.800, 62-210.700, 62-4.130, 62-4.160(8), F.A.C and 40 CFR 60.7 (1998 version)].
40. CEMS for reporting excess emissions: Subject to EPA approval, the NO_x CEMS shall be used in lieu of the requirement for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1997 version). Upon request from DEP, the CEMS emission rates for NO_x on the CT shall be corrected to ISO conditions to demonstrate compliance with the NO_x standard established in 40 CFR 60.332.
41. CEMS in lieu of Water to Fuel Ratio: Subject to EPA approval, the NO_x CEMS shall be used in lieu of the water/fuel monitoring system for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1997 version). The calibration of the water/fuel monitoring device required in 40 CFR 60.335 (c)(2) (1997 version) will be replaced by the 40 CFR 75 certification tests of the NO_x CEMS. Upon request from DEP, the CEMS emission rates for NO_x on this Unit shall be corrected to ISO conditions to demonstrate compliance with the NO_x standard established in 40 CFR 60.332.

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PSD-FL-263
SECTION III - EMISSIONS UNIT(S) SPECIFIC CONDITIONS

42. Continuous Monitoring System Reports: The monitoring devices shall comply with the certification and quality assurance, and any other applicable requirements of Rule 62-297.520, F.A.C., 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) or 40 CFR Part 75. Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F or 40 CFR 75. The monitoring plan, consisting of data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the DEP Emissions Monitoring Section Administrator and EPA for review no later than 45 days prior to the first scheduled certification test pursuant to 40 CFR 75.62.

43. Natural Gas Monitoring Schedule: A custom fuel monitoring schedule pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2) provided the following requirements are met:

- The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.
- The permittee shall submit a monitoring plan, certified by signature of the Designated Representative, that commits to using a primary fuel of pipeline supplied natural gas (sulfur content less than 20 gr/100 scf pursuant to 40 CFR 75.11(d)(2)).
- Each unit shall be monitored for SO₂ emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

This custom fuel monitoring schedule will only be valid when pipeline natural gas is used as a primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO₂ emissions must be accounted for as required pursuant to 40 CFR 75.11(d).

44. Fuel Oil Monitoring Schedule: The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For all bulk shipments of No. 2 fuel oil received at this facility an analysis which reports the sulfur content and nitrogen content of the fuel shall be provided by the fuel vendor. The analysis shall also specify the methods by which the analyses were conducted and shall comply with the requirements of 40 CFR 60.335(d).

45. Determination of Process Variables:

- The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
- Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value [Rule 62-297.310(5), F.A.C]

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

**Polk Power Station Combustion Turbine Project
Tampa Electric Company
PSD-FL-263 and PA92-33
Polk County, Florida**

BACKGROUND

The applicant, Tampa Electric Company (TEC), proposes to install two nominal 165 megawatt (MW) General Electric PG 7241 FA combustion turbine-electrical generators at the existing Polk Power Station, located at 9995 State Road 37 South, Polk County. The proposed project will result in "significant increases" with respect to Table 62-212.400-2, Florida Administrative Code (F.A.C.) of emissions of particulate matter (PM and PM₁₀), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), and sulfuric acid mist (SAM). The project is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rules 62-212.400, F.A.C.

The new units will operate in simple cycle mode and intermittent duty and exhaust through separate 114-foot stacks. TEC proposes to operate these units up to 4380 hours on natural gas and 876 hours on maximum 0.05 percent sulfur distillate fuel oil. Descriptions of the process, project, air quality effects, and rule applicability are given in the Technical Evaluation and Preliminary Determination dated June 30, 1999, accompanying the Department's Intent to Issue.

DATE OF RECEIPT OF A BACT APPLICATION:

The application was received on February 8, 1999 and included a proposed BACT proposal prepared by the applicant's consultant, Environmental Consulting & Technology (ECT). A revised application and BACT proposal were received on May 10, 1999.

REVIEW GROUP MEMBERS:

A. A. Linero, P.E. and Teresa Heron, Permit Engineer

BACT DETERMINATION REQUESTED BY THE APPLICANT

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
Nitrogen Oxides	Dry Low NO _x Combustors Water Injection (Oil)	10.5 ppmvd @ 15% O ₂ (gas) 42 ppmvd @ 15% O ₂ (oil)
Particulate Matter	Pipeline Natural Gas No. 2 Distillate Oil (876 hr/yr) Combustion Controls	10% Opacity
Carbon Monoxide	As Above	15 ppm (gas, baseload) 33 ppm (oil baseload)
Sulfur Dioxide	As Above	2 gr S/100 scf of natural gas 0.05% S in fuel oil
Sulfuric Acid Mist	As Above	2 gr S/100 scf of natural gas 0.05% S in fuel oil

According to the application, the total maximum annualized emissions from the new units will be approximately 581 tons per year (TPY) of NO_x, 303 TPY of CO, 54 TPY of PM/PM₁₀, 126 TPY of SO₂, 18 TPY of VOC, and 15 TPY of SAM.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (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:

- Any Environmental Protection Agency determination of BACT 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.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- 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 unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit 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.

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The minimum basis for a BACT determination is 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). The Department adopted subpart GG by reference in Rule 62-204.800, F.A.C. The key emission limits required by Subpart GG are 75 ppmvd NO_x @ 15% O₂ (assuming 25 percent efficiency) and 150 ppm SO₂ @ 15% O₂ (or <0.8% sulfur in fuel). The BACT proposed by the TEC is within the NSPS limit, which allows NO_x emissions, over 110 ppmvd for the high efficiency unit to be purchased for the Polk Power Station. No National Emission Standard for Hazardous Air Pollutants exists for stationary gas turbines.

DETERMINATIONS BY EPA AND STATES:

The following table is based primarily on "F" Class intermittent-duty simple cycle turbines recently permitted or still under review. One project (PREPA) based on smaller units but permitted to operate continuously is included as an example of a simple cycle unit with add-on control equipment. Another continuous-duty project (Lakeland) based on the larger "G" Class is also included. The proposed TEC project is included to facilitate comparison.

VOC determinations are included. However the TEC project does not trigger PSD and a BACT determination is not required for this pollutant.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Project Location	Power Output and Duty	NO _x Limit ppmvd @ 15% O ₂ and Fuel	Technology	Comments
Lakeland, FL	250 MW SC CON	9/9 - NG (by 2002) 42/15 - No. 2 FO	DLN/HSCR WI/HSCR	250 MW WH 501G CT Initially 25 ppm NO _x limit on gas Issued 7/98. 250 hrs on oil.
Oleander Cocoa, FL	850 MW SC INT	9 - NG 42 - No. 2 FO	DLN WI	5x170 MW GE PG7241FA CTs Draft 4/99. 1000 hrs on oil
JEA Baldwin, FL	510 MW SC INT	12 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE MS7241FA CTs Application 5/99. 800 hrs on oil
JEA Kennedy, FL	170 MW SC INT	15 - NG 42 - No. 2 FO	DLN WI	170 MW GE MS7241FA CT Issued 2/99. Not PSD/BACT
TEC Polk Power, FL	330 MW SC INT	10.5 - NG 42 - F.O.	DLN WI	2x165 MW GE MS7241FA CTs Application 2/99. 876 hrs on oil
Dynergy Heard, GA	510 MW SC INT	15 - NG	DLN	3x170 MW WH 501F CTs Application. Gas only
Tenaska Heard, GA	960 MW SC INT	15 - NG 42 - No. 2 FO	DLN WI	6x170 MW GE PG7241FA CTs Issued 12/98. 720 hrs on oil
Thomaston, GA	680 MW SC INT	15 - NG 42 - No. 2 FO	DLN WI	4x170 MW GE PG7241FA CTs Application. 1687 hrs on oil
Dynergy Reidsville, NC	900 MW SC INT	15 - NG (by 2002) 42 - FO	DLN WI	5x180 MW WH 501F-CTs Initially 25 ppm NO _x limit on gas Draft 5/98. 1000 hrs on oil.
RockGen Cristiana, WI	525 MW SC INT	15/12 - NG 42 - No. 2 FO	DLN WI	3x175 MW GE PG7241FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil
SEI Neenah, WI	330 MW SC INT	15/12 - NG 42 - No. 2 FO	DLN WI	2x165 MW GE PG7241FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 8760/699 hrs gas/oil
PREPA, PR	248 MW SC CON	10 - No. 2 FO	WI & HSCR	3x83 MW ABB GT11N CTs Issued 12/95

CON = Continuous
SC = Simple Cycle
NG = Natural Gas
INT = Intermittent

DLN = Dry Low NO_x Combustion
SCR = Selective Catalytic Reduction
HSCR = Hot SCR
CT = Combustion Turbine

FO = Fuel Oil
ppm = parts per million
WI = Water or Steam Injection
MW = megawatts

GE = General Electric
WH = Westinghouse
ABB = Asea Brown Bovari

Project Location	CO - ppm (or as indicated)	VOC - ppm (or as indicated)	PM - lb/hr (or as indicated)	Technology and Comments
Lakeland, FL	25 - NG or 10 by Ox Cat 75 - FO @ 15% O ₂	4 - NG 10 - FO	10% Opacity	Clean Fuels Good Combustion
Oleander Cocoa, FL	12 - NG 20 - FO	3 - NG 6 - FO	10% Opacity	Clean Fuels Good Combustion
JEA Baldwin, FL	15 - NG 20/26 (part/full load) - FO	2.8 lb/hr - NG 3 lb/hr - FO	9 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
JEA Kennedy, FL	15 - NG 20 - FO	1.4 - NG 3.5 - FO	9 lb/hr - NG 17 lb/hr - FO	Clean Fuels Good Combustion
TEC Polk Power, FL	15 - NG 33 - FO	1.6 - NG 4 - FO	10% Opacity	Clean Fuels Good Combustion
Dynergy Heard Co., GA	25 - NG	? - NG	? - NG	Clean Fuels Good Combustion
Tenaska Heard Co., GA	15 - NG 20 - FO	? - NG ? - FO	? - NG ? lb/hr - FO	Clean Fuels Good Combustion
Dynergy Reidsville, NC	25 - NG 50 - FO	6 lb/hr - NG 8 lb/hr - FO	6 lb/hr - NG 23 lb/hr - FO	Clean Fuels Good Combustion
RockGen Cristiana, WI	12 @ >50% load - NG 15 @ >75% 24 @ <75% - FO	2 - NG 5 - FO	18 lb/hr - NG 44 lb/hr - FO	Clean Fuels Good Combustion
SEI Neenah, WI	12 @ >50% load - NG 15 @ >75% 24 @ <75% - FO	2 - NG 5 - FO	18 lb/hr - NG 41 lb/hr - FO	Clean Fuels Good Combustion
PREPA, PR	9 - FO @ 15% O ₂	11 - FO @ 15% O ₂	0.0171 gr/dscf	Clean Fuels Good Combustion

TEC - Polk Power Station - CTGs 2 and 3
Two 165 MW Simple Cycle Combustion Turbines

Permit No. PSD -FL-263
Facility I.D. No. 1050233 (ARMS 009-010)

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

OTHER INFORMATION AVAILABLE TO THE DEPARTMENT:

Besides the information submitted by the applicant and that mentioned above, other information available to the Department consists of:

- Comments from the Fish and Wildlife Service dated March 19, 1999
- DOE website information on Advanced Turbine Systems Project
- Alternative Control Techniques Document - NO_x Emissions from Stationary Gas Turbines
- General Electric 39th Turbine State-of-the-Art Technology Seminar Proceedings
- GE Guarantee for Jacksonville Electric Authority Kennedy Plant Project
- GE Power Generation - Speedtronic™ Mark V Gas Turbine Control System
- GE Combustion Turbine Startup Curves
- TEC Website – www.teco-energy.com
- Goal Line Environmental Technologies Website – www.glet.com
- Catalytica Website – www.catalytica-inc.com

REVIEW OF NITROGEN OXIDES CONTROL TECHNOLOGIES:

Much of the discussion in this section is based on a 1993 EPA document on Alternative Control Techniques for NO_x Emissions from Stationary Gas Turbines. Project-specific information is included where applicable.

Nitrogen Oxides Formation

Nitrogen oxides form in the gas turbine combustion process as a result of the dissociation of molecular nitrogen and oxygen to their atomic forms and subsequent recombination into seven different oxides of nitrogen. Thermal NO_x forms in the high temperature area of the gas turbine combustor. Thermal NO_x increases exponentially with increases in flame temperature and linearly with increases in residence time. Flame temperature is dependent upon the ratio of fuel burned in a flame to the amount of fuel that consumes all of the available oxygen.

By maintaining a low fuel ratio (lean combustion), the flame temperature will be lower, thus reducing the potential for NO_x formation. Prompt NO_x is formed in the proximity of the flame front as intermediate combustion products. The contribution of prompt to overall NO_x is relatively small in lean, near-stoichiometric combustors and increases for leaner fuel mixtures. This provides a practical limit for NO_x control by lean combustion.

Fuel NO_x is formed when fuels containing bound nitrogen are burned. This phenomenon is not important when combusting natural gas. It is not important for the TEC project because natural gas will be the primary fuel and low sulfur fuel oil will be used only for 876 hours per year.

Uncontrolled emissions range from about 100 to over 600 parts per million by volume, dry, corrected to 15 percent oxygen (ppmvd @15% O₂) for small turbines. For large modern turbines, the Department estimates uncontrolled emissions at approximately 200 ppmvd @15% O₂.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

NO_x Control Techniques

Wet Injection

Injection of either water or steam directly into the combustor lowers the flame temperature and thereby reduces thermal NO_x formation. Typical emissions achieved by wet injection are in the range of 15–25 ppmvd when firing gas and 42 ppmvd when firing fuel oil in large combustion turbines. These values often form the basis, particularly in combined cycle turbines, for further reduction to BACT limits by other techniques. Carbon monoxide (CO) and hydrocarbon (HC) emissions are relatively low for most gas turbines. However steam and (more so) water injection increase emissions of both of these pollutants.

Combustion Controls

The excess air in lean combustion cools the flame and reduces the rate of thermal NO_x formation. Lean premixing of fuel and air prior to combustion can further reduce NO_x emissions. This is accomplished by minimizing localized fuel-rich pockets (and high temperatures) that can occur when trying to achieve lean mixing within the combustion zones.

The above principle is depicted in Figure 1 for a General Electric DLN-1 can-annular combustor operating on gas. For ignition, warm-up, and acceleration to approximately 20 percent load, the first stage serves as the complete combustor. Flame is present only in the first stage, which is operated as lean stable combustion will permit. With increasing load, fuel is introduced into the secondary stage, and combustion takes place in both stages. When the load reaches approximately 40 percent, fuel is cut off to the first stage and the flame in this stage is extinguished. The venturi ensures the flame in the second stage cannot propagate upstream to the first stage. When the fuel in the first-stage flame is extinguished (as verified by internal flame detectors), fuel is again introduced into the first stage, which becomes a premixing zone to deliver a lean, unburned, uniform mixture to the second stage. The second stage acts as the complete combustor in this configuration.

To further reduce NO_x emissions, GE developed the DLN-2.0 (cross section shown in Figure 1) wherein air usage (other than for premixing) was minimized. The venturi and the centerbody assembly were eliminated and each combustor has a single burning zone. So-called "quaternary fuel" is introduced through pegs located on the circumference of the outward combustion casing.

GE has made further improvements in the DLN design. The most recent version is the DLN-2.6 (proposed for the TEC project). The combustor is similar to the DLN-2 with the addition of a sixth (center) fuel nozzle. The emission characteristics of the DLN-2.6 combustor while firing natural gas are given in Figure 2 for a unit tuned to meet a 15 ppmvd NO_x limit (by volume, dry corrected to at 15 percent oxygen) at Jacksonville Electric Authority's Kennedy Station.

NO_x concentrations are higher in the exhaust at lower loads because the combustor does not operate in the lean pre-mix mode. Therefore such a combustor emits NO_x at concentrations of 15 parts per million (ppmvd) at loads between 50 and 100 percent of capacity, but concentrations as high as 100 ppmvd at less than 50 percent of capacity. Note that VOC comprises a very small amount of the "unburned hydrocarbons" which in turn is mostly non-VOC methane.

The combustor can be tuned differently to achieve emissions as low as 9 ppmvd of NO_x and 9 ppm of CO. Emissions characteristics while firing oil are expected to be similar for the DLN-2.6 as they are for those of the DLN-2.0 shown in Figure 3. Simplified cross sectional views of the totally premixed DLN-2.6 combustor to be installed at the TEC project are shown in Figure 4.

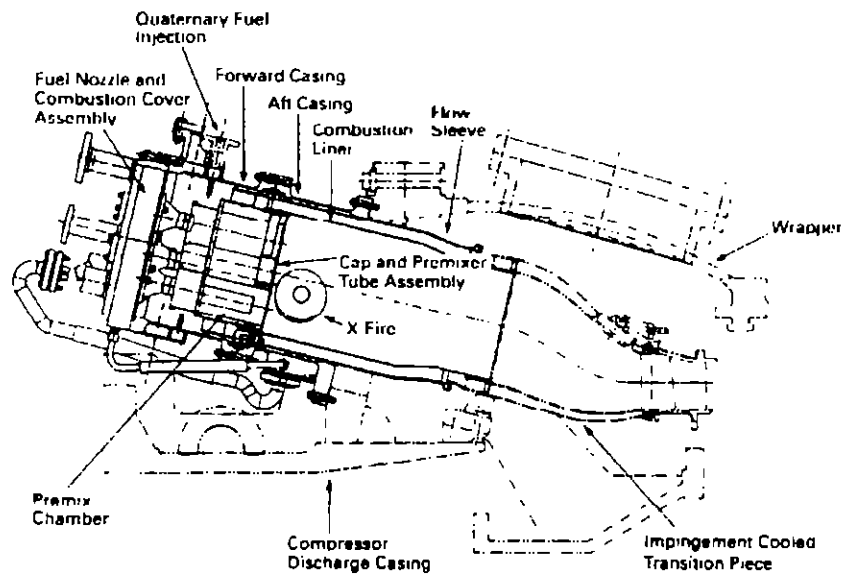
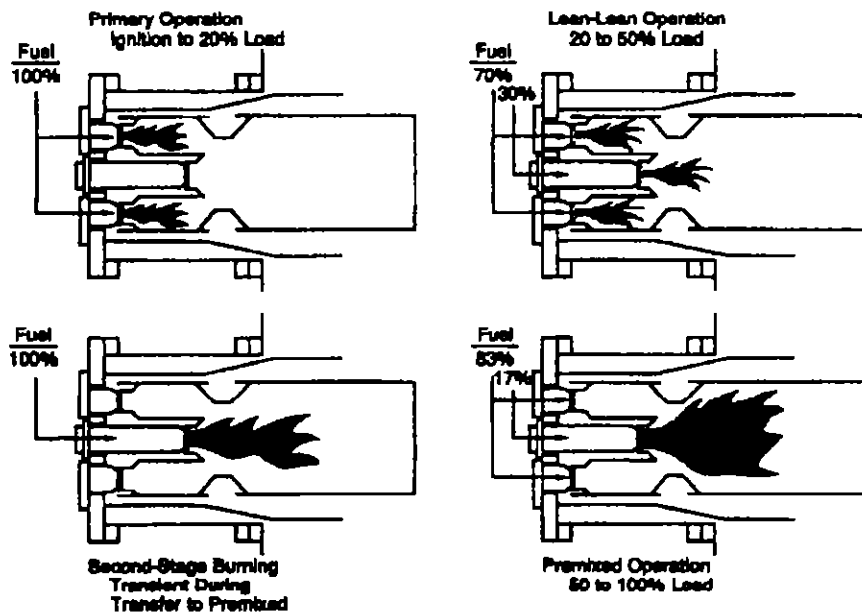


Figure 1 - Dry Low NOx Operating Modes - DLN-1
 Cross Section of GE DLN-2

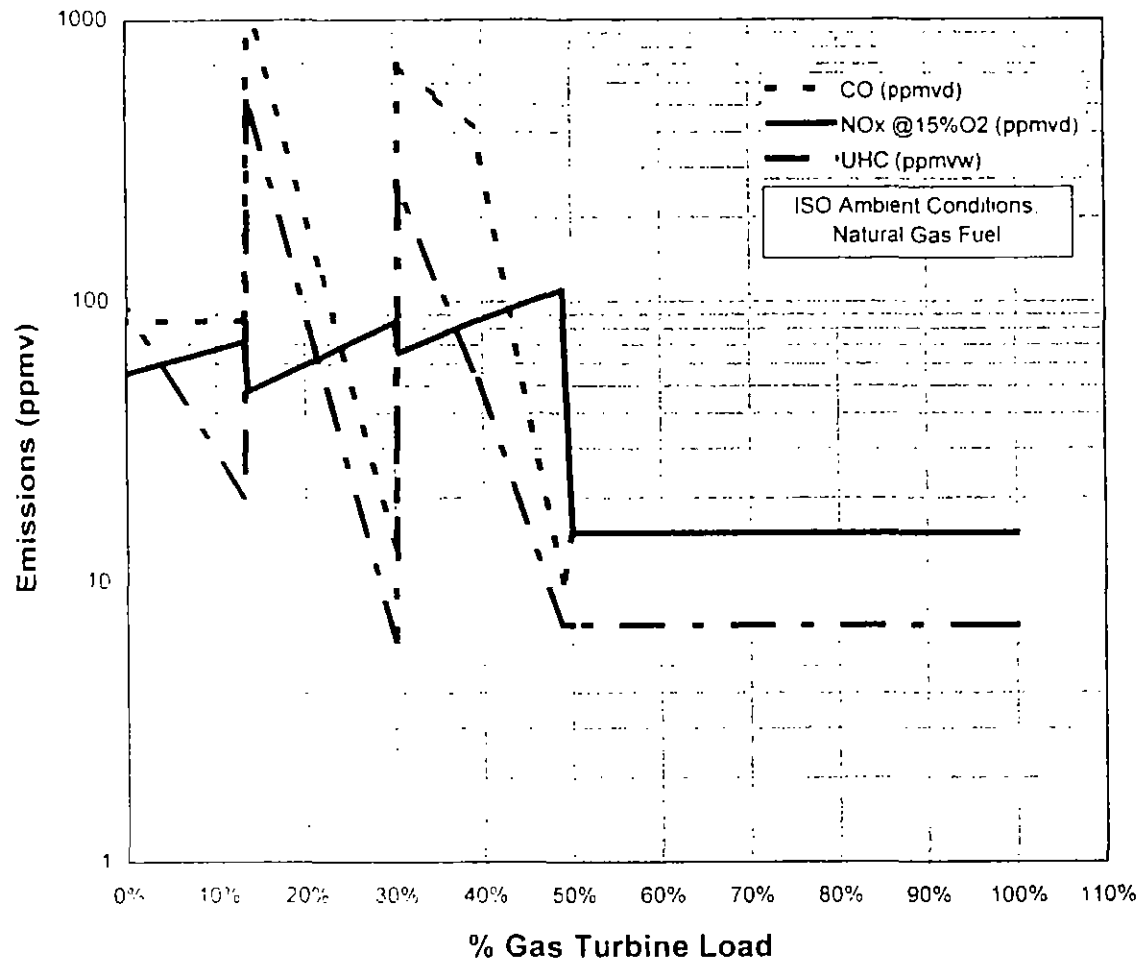


Figure 2 - Emissions Performance Curves for GE DLN-2.6 Combustor
 Firing Natural Gas in a Dual Fuel GE 7FA Combustion Turbine

(Simple Cycle, Intermittent Duty - If Tuned to 15 ppm NOx)

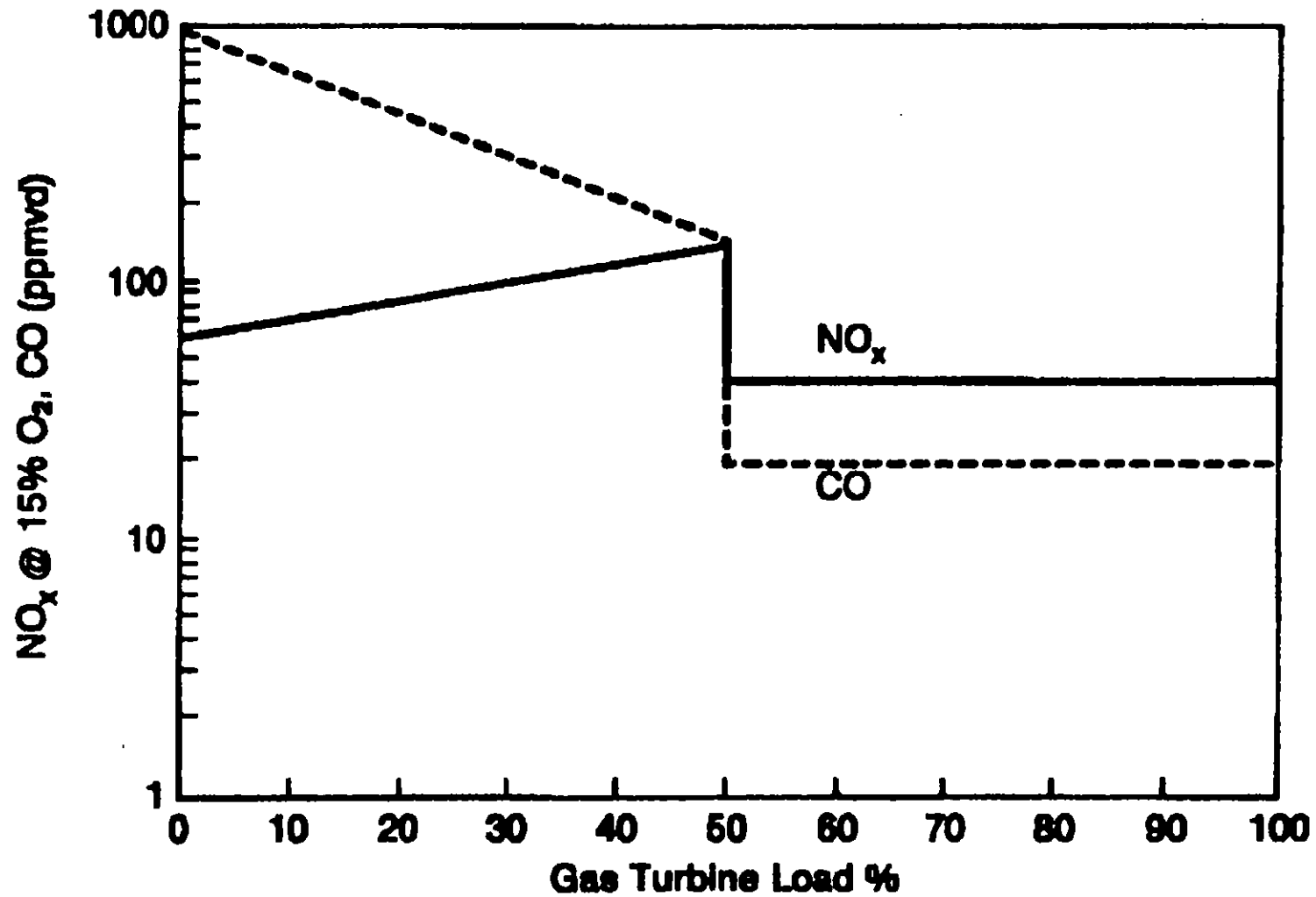


Figure 3 - Emissions Performance for DLN-2 Combustors
 Firing Fuel Oil in Dual Fuel GE 7FA Turbine

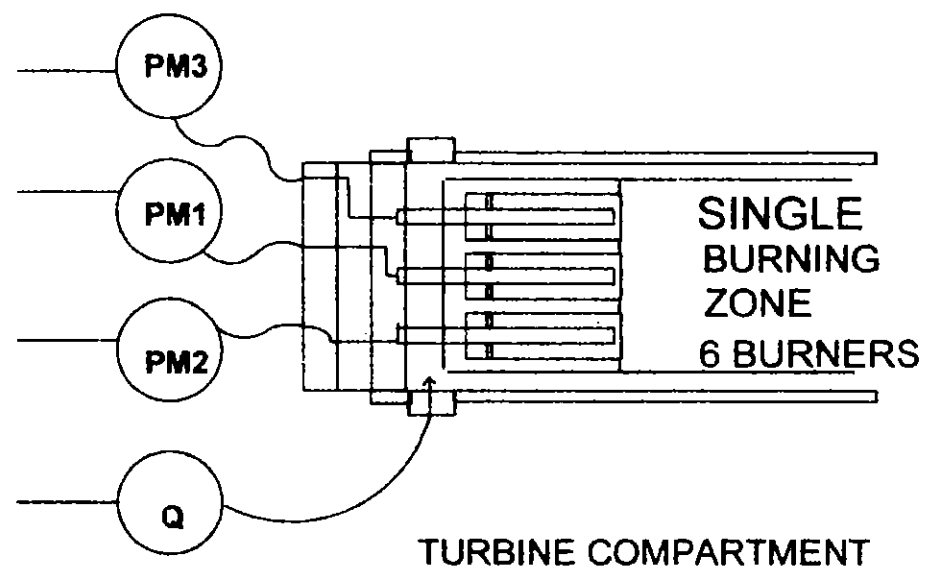
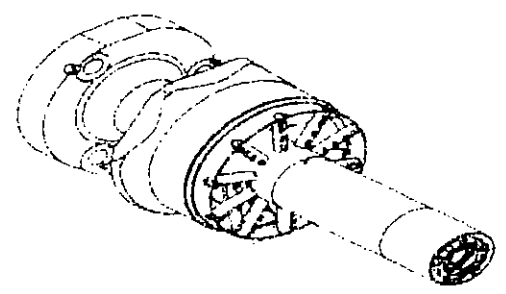
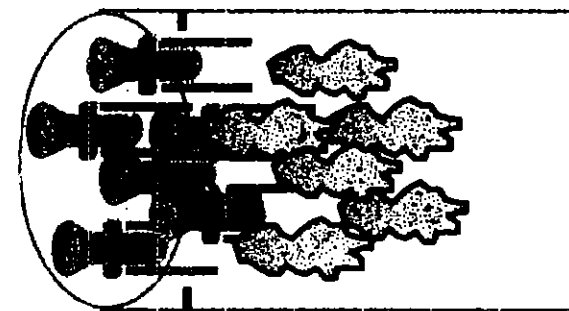
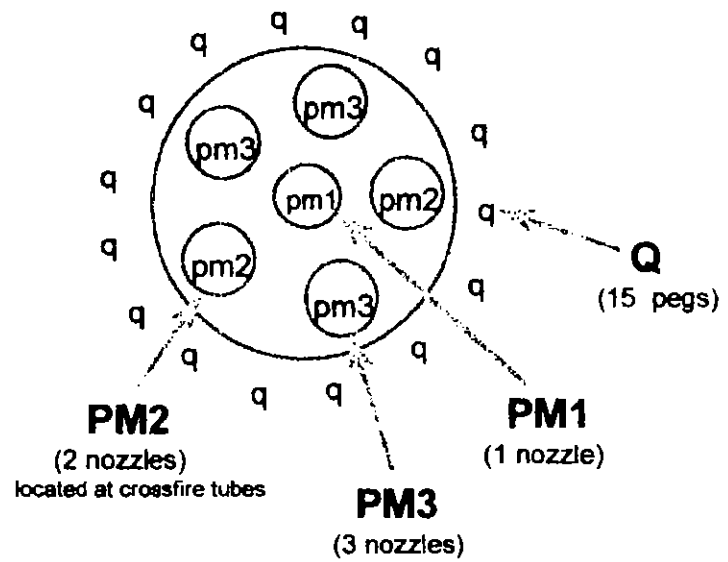


Figure 4 - DLN-2.6 Nozzle and Burner Arrangement

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

In all but the most recent gas turbine combustor designs, the high temperature combustion gases are cooled to an acceptable temperature with dilution air prior to entering the turbine (expansion) section. The sooner this cooling occurs, the lower the thermal NO_x formation. Cooling is also required to protect the first stage nozzle. When this is accomplished by air cooling, the air is injected into the component and is ejected into the combustion gas stream, causing a further drop in combustion gas temperature. This, in turn, lowers achievable thermal efficiency for the unit.

Larger units, such as the Westinghouse 501 G or the planned General Electric 7H, use steam in a closed loop system to provide much of the cooling. The fluid is circulated through the internal portion of the nozzle component or around the transition piece between the combustor and the nozzle and does not enter the exhaust stream. Instead it is normally sent back to a steam generator. The difference between flame temperature and firing temperature into the first stage is minimized and higher efficiency is attained.

Another important result of steam cooling is that a higher firing temperature can be attained with no increase in flame temperature. Flame temperatures and NO_x emissions can therefore be maintained at comparatively low levels even at high firing temperatures. At the same time, thermal efficiency should be greater when employing steam cooling. A similar analysis applies to steam cooling around the transition piece between the combustor and first stage nozzle.

The relationship between flame temperature, firing temperature, unit efficiency, and NO_x formation can be appreciated from Figure 5 which is from a General Electric discussion on these principles. In addition to employing pre-mixing and steam cooling, further reductions are accomplished through design optimization of the burners, testing, further evaluation, etc.

At the present time, emissions achieved by combustion controls are low as 9 ppmvd from gas turbines smaller than 200 MW (simple cycle), such as GE "F Class" units. Even lower NO_x emissions are achieved from certain units smaller than 100 MW, such as the GE 7EA line.

Selective Catalytic Combustion

Selective catalytic reduction (SCR) is an add-on NO_x control technology that is employed in the exhaust stream following the gas turbine. SCR reduces NO_x emissions by injecting ammonia into the flue gas in the presence of a catalyst. Ammonia reacts with NO_x in the presence of a catalyst and excess oxygen yielding molecular nitrogen and water. The catalysts used in combined cycle, low temperature applications (conventional SCR), are usually vanadium or titanium oxide and account for almost all installations. For high temperature applications (Hot SCR up to 1100 °F), such as simple cycle turbines, zeolite catalysts are available but used in few applications to-date. SCR units are typically used in combination with wet injection or DLN combustion controls.

In the past, sulfur was found to poison the catalyst material. Sulfur-resistant catalyst materials are now available, however, and catalyst formulation improvements have proven effective in resisting performance degradation with fuel oil in Europe and Japan, where conventional SCR catalyst life in excess of 4 to 6 years has been achieved, versus 8 to 10 years with natural gas.

Excessive ammonia use tends to increase emissions of CO, ammonia (slip) and particulate matter (when sulfur bearing fuels are used).

As of early 1992, over 100 gas turbine installations already used SCR in the United States. Per the above table, only one combustion turbine project in Florida (FPC Hines Power Block 1) employs SCR (it is currently being started up). The equipment was installed on a temporary basis because Westinghouse had not yet demonstrated emissions as low as 12 ppmvd by DLN technology at the

Gas Turbine - Hot Gas Path Parts

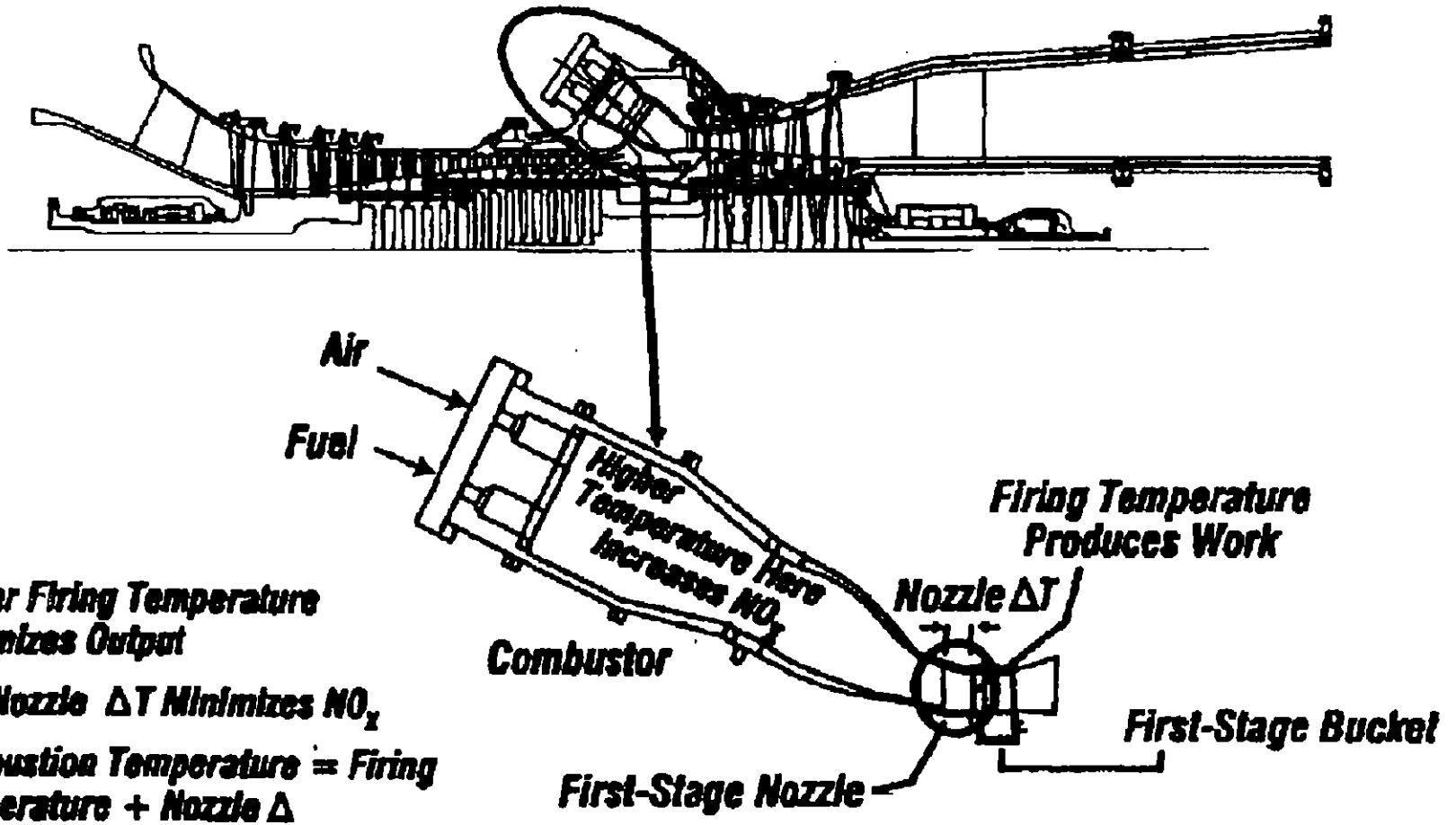


Figure 5 - Relation Between Flame Temperature and Firing Temperature

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

time the units were to start up in 1998. SCR is also proposed on a permanent basis for the expansion of the FPC Hines Facility (Power Block II). Seminole Electric will install SCR on a previously-permitted 501F unit at the Hardee Unit 3 project. The reasons are similar to those for the FPC Hines Power Block I.

Permit limits as low as 2.25 to 3.5 ppmvd NO_x have been specified using SCR on combined cycle F Class projects throughout the country.

Selective Non-Catalytic Combustion

Selective non-catalytic reduction (SNCR) reduction works on the same principle as SCR. The differences are that it is applicable to hotter streams than conventional or hot SCR, no catalyst is required, and urea can be used as a source of ammonia. No applications have been identified wherein SNCR was applied to a gas turbine because the exhaust temperature of 1100 °F is too low to support the NO_x removal mechanism.

The Department did, however, specify SNCR as one of the available options for the combined cycle Santa Rosa Energy Center. The project will incorporate a large 600 MMBtu/hr duct burner in the heat recovery steam generator (HRSG) and can provide the acceptable temperatures (between 1400 and 2000 °F) and residence times to support the reactions.

Emerging Technologies: SCONOX™ and XONON™

There are at least two technologies on the horizon that will influence BACT determinations. These, as usual, are prompted by the needs specific to non-attainment areas such as Southern California.

The first technology is called SCONOX™ and is a catalytic technology that achieves NO_x control by oxidizing and then absorbing the pollutant onto a honeycomb structure coated with potassium carbonate. The pollutant is then released as harmless molecular nitrogen during a regeneration cycle that requires a dilute hydrogen reducing gas. The technology has been demonstrated on small units in California and has been purchased for a small source in Massachusetts.¹ California regulators and industry sources have stated that the first 250 MW block to install SCONOX™ will be at U.S. Generating's La Paloma Plant near Bakersfield.² The overall project includes several more 250 MW blocks with SCR for control.³ USEPA has identified an "achieved in practice" BACT value of 2.0 ppmvd over a three-hour rolling average based upon the recent performance of a Vernon, California natural gas-fired 32 MW combined cycle turbine (without duct burners) equipped with the patented SCONOX™ system

SCONOX™ technology (at 2.0 ppmvd) is considered to represent LAER in non-attainment areas where cost is not a factor in setting an emission limit. It competes with less-expensive SCR in those areas, but has the advantages that it does not cause ammonia emissions in exchange for NO_x reduction. Advantages of the SCONOX™ process include in addition to the reduction of NO_x, the elimination of ammonia and the control of some CO emissions. SCONOX™ has not been applied on any major sources in ozone attainment areas.

In a letter dated March 23, 1998 to Goal Line Environmental Technologies, the SCONOX™ process was deemed as technically feasible for maintaining NO_x emissions at 2 ppmvd on a combined cycle unit. ABB Environmental was announced on September 10, 1998 as the exclusive licensee for SCONOX™ for United States turbine applications larger than 100 MW. ABB Power Generation has stated that scale up and engineering work will be required before SCONOX™ can be offered with commercial guarantees for large turbines (based upon letter from Kreminski/Broemmelsiek of ABB Power Generation to the Massachusetts Department of Environmental Protection dated November 4,

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

1998). SCONOX requires a much lower temperature regime that is not available in simple cycle units and is therefore not feasible for this project. Therefore the SCONOX system cannot be considered as achievable or demonstrated in practice for this application.

The second technology is XONON™, which works by partially burning fuel in a low temperature pre-combustor and completing the combustion in a catalytic combustor. The overall result is low temperature partial combustion (and thus lower NO_x combustion) followed by flameless catalytic combustion to further attenuate NO_x formation. The technology has been demonstrated on combustors on the same order of size as SCONOX™ has. However GE has teamed with Catalytica to develop a combustor for gas turbines in the 80-90 MW range before continuing with development on a combustor for a larger unit.

XONON™ avoids the emissions of ammonia and the need to generate hydrogen. It is also extremely attractive from a mechanical point of view if it works.

Catalytica Combustion Systems, Inc. develops, manufactures and markets the XONON™ Combustion System. In a press release on October 8, 1998 Catalytica announced the first installation of a gas turbine equipped with the XONON™ Combustion System in a municipally owned utility for the production of electricity. The turbine was started up on that day at the Gianera Generating Station of Silicon Valley Power, a municipally owned utility serving the City of Santa Clara, Calif. The XONON™ Combustion System, deployed for the first time in a commercial setting, is designed to enable turbines to produce environmentally sound power without the need for expensive cleanup solutions. Previously, this XONON™ system had successfully completed over 1,200 hours of extensive full-scale tests which documented its ability to limit emissions of nitrogen oxides, a primary air pollutant, to less than 3 parts per million.

Catalytica's XONON™ system is represented as a powerful technology that essentially eliminates the formation of nitrogen oxides air emissions in gas turbines without impacting the turbine's operating performance. In a definitive agreement signed on November 19, 1998, GE Power Systems and Catalytica agreed to cooperate in the design, application, and commercialization of XONON™ systems for both new and installed GE E-class and F-class turbines used in power generation and mechanical drive applications. This appears to be an up-and-coming technology, the development of which will be watched closely by the Department for future applications. It is not yet available for fuel oil and cycling operation.

REVIEW OF SULFUR DIOXIDE (SO₂) AND SULFURIC ACID MIST (SAM)

SO₂ control processes can be classified into five categories: fuel/material sulfur content limitation, absorption by a solution, adsorption on a solid bed, direct conversion to sulfur, or direct conversion to sulfuric acid. A review of the BACT determinations for combustion turbines contained in the BACT Clearinghouse shows that the exclusive use of low sulfur fuels constitutes the top control option for SO₂.

For this project, the applicant has proposed as BACT the use of 0.05% sulfur oil and natural gas containing no more than 2 grains of sulfur per 100 standard cubic foot (gr S/100 ft³). This value is well below the "default" maximum value of 20 gr. S/100 ft³, but high enough to require a BACT determination. The applicant estimated total emissions for the project at 126 TPY of SO₂ and 15 TPY of SAM. However the Department expects the emissions to be lower because of the limited oil consumption and the typical natural gas in Florida which contains less than 1 gr S/100ft³.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

REVIEW OF PARTICULATE MATTER (PM/PM₁₀) CONTROL TECHNOLOGIES:

Particulate matter is generated by various physical and chemical processes during combustion and will be affected by the design and operation of the NO_x controls. The particulate matter emitted from this unit will mainly be less than 10 microns in diameter (PM₁₀).

Natural gas and 0.05 percent sulfur No. 2 (or superior grade) distillate fuel oil will be the only fuels fired and are efficiently combusted in gas turbines. Such fuels are necessary to avoid damaging turbine blades and other components already exposed to very high temperature and pressure. Natural gas is an inherently clean fuel and contains no ash. The fuel oil to be combusted contains a minimal amount of ash and its use is proposed for only 876 hours per year making any conceivable add-on control technique for PM/PM₁₀ either unnecessary or impractical.

A technology review indicated that the top control option for PM/PM₁₀ is a combination of good combustion practices, fuel quality, and filtration of inlet air. Total annual emissions of PM₁₀ for the project are expected to be approximately 54 tons per year.

REVIEW OF CARBON MONOXIDE(CO) CONTROL TECHNOLOGIES

CO is emitted from combustion turbines due to incomplete fuel combustion. Combustion design and catalytic oxidation are the control alternatives that are viable for the project. The most stringent control technology for CO emissions is the use of an oxidation catalyst.

All combustion turbines using catalytic oxidation appear to be combined cycle units. Among the most recently permitted ones are the 500 MW Wyandotte Energy project in Michigan, the El Dorado project in Nevada, Ironwood in Pennsylvania, Millenium in Massachusetts, and Sutter Calpine in California. The permitted CO values of these units are between 3 and 5 ppmvd. Catalytic oxidation was recently installed at a cogeneration plant at Reedy Creek (Walt Disney World), Florida to avoid PSD review which would have been required due to increased operation at low load. Seminole Electric recently proposed catalytic oxidation in order to meet the permitted CO limit at its planned 244 MW Westinghouse 501FD combined cycle unit in Hardee County, Florida.⁴

Most combustion turbines incorporate good combustion to minimize emissions of CO. So far this appears to be the only technology proposed at simple cycle turbine projects. These installations typically achieve emissions between 10 and 25 ppm at full load while firing gas. The values of 15 and 33 ppm for gas and oil respectively at baseload proposed in the TEC's original application are within the range of recent determinations for simple cycle CO BACT determinations. By comparison, values of 12 and 20 ppm for gas and oil respectively (at baseload) were proposed for the Oleander's project using identical equipment. Values given in GE-based applications are representative of operations between 50 and 100 percent of full load.

REVIEW OF VOLATILE ORGANIC COMPOUND (VOC) CONTROL TECHNOLOGIES

Volatile organic compound (VOC) emissions, like CO emissions, are formed due to incomplete combustion of fuel. There are no viable add-on control techniques as the combustion turbine itself is very efficient at destroying VOC. The applicant has proposed good combustion practices to control VOC. The limits proposed by TEC for this project are 1.4 and 3.5 ppm for gas and oil firing respectively. According to GE, VOC emissions less than 1.4 ppm were achieved during recent tests of the DLN-2.6 technology when firing natural gas.⁵ At such low emission rates, the project does not trigger PSD and a requirement for a VOC BACT determination. Emissions as low as projected by TEC and GE would easily meet BACT requirements based on the above tables.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

BACKGROUND ON SELECTED GAS TURBINE

TEC plans the purchase of two 165 MW (nominal) General Electric PG 7241FA simple cycle gas turbines. This is the most recent designation of GE's line of "F" Class units.

The first commercial GE 7F Class unit was installed in a combined cycle project at the Virginia Power Chesterfield Station in 1990.⁶ The initial units had a firing temperature of 2300 °F and a combined cycle efficiency exceeding 50 percent. By the mid-90s, the line was improved by higher combustor pressure, a firing temperature of 2400 °F, and a combined cycle efficiency of approximately 56 percent based on a 167 MW combustion turbine. The line was redesignated as the 7FA Class.

The first GE 7F/FA project in Florida was at the FPL Martin Plant in 1993 and entered commercial service in 1994.⁷ The units were equipped with DLN-2 combustors with a permitted NO_x limit of 25 ppmvd. These actually achieved emissions of 13-25 ppmvd of NO_x, 0-3 ppm of CO, and 0-0.17 ppm of VOC.⁸ The City of Tallahassee recently received approval to install a GE 7FA Class unit at its Purdom Plant.⁹ Although permitted emissions are 12 ppmvd of NO_x, the City obtained a performance guarantee from GE of 9 ppmvd.¹⁰ FPL also obtained a guarantee and permit limit of 9 ppmvd NO_x for six GE 7241FA turbines to be installed at the Fort Myers Repowering project.¹¹ The Santa Rosa Energy Center in Pace, Florida, also received a permit with a 9 ppmvd NO_x limit for a GE 7241 turbine with DLN-2.6 burners.¹²

Most recently, the Department issued draft BACT determinations for the simple cycle Oleander project in Brevard County and the combined cycle projects in Volusia (Duke Energy) and Osceola County (Kissimmee Utilities). These three draft permits also include NO_x limits of 9 ppmvd based on the DLN-2.6 technology installed on F Class units.

General Electric has primarily relied on further advancement and refinement of DLN technology to provide sufficient NO_x control for their combined cycle turbines in Florida. Where required by BACT determinations of certain states, General Electric incorporates SCR in combined cycle projects.¹³ In its recent permits, Florida has included separate and lower limits in the event that DLN emissions limits are not attainable or the applicant selects a manufacturer that does not provide combustors capable of meeting 9 ppmvd.

GE's approach of progressively refining such technology is a proven one, even on some relatively large units. Recently GE Frame 7FA units met performance guarantees of 9 ppmvd with "DLN-2.6" burners at Fort St. Vrain, Colorado and Clark County, Washington.¹⁴ Although the permitted limit is 15 ppmvd, GE has already achieved emission levels of approximately 6-7 ppmvd on gas at a dual-fuel 7EA (120 MW combined cycle) KUA Cane Island Unit 2.¹⁵ Unit 2 is equipped with DLN-2 combustors. According to GE, similar performance is expected soon on the 7FA line such as the one that will be installed for TEC Polk Power Station Project. Performance guarantees less than 9 ppmvd can be expected using the DLN-2.6 combustors for units delivered in a couple of years.¹⁶

The 10.5 ppmvd NO_x limit on natural gas requested by TEC is clearly one of the most stringent BACT determinations for simple cycle F Class. In fact, the company obtained a guarantee from GE to achieve 9 ppmvd. However GE's guarantee is for a performance test on a "new and clean unit." The test must be conducted at a steady-state load of 50 to 100 percent and completed within the first 100 fired hours of operation as specified in the GE protocols.

With the frequent start-ups and shutdowns of the unit, TEC is concerned about the ability to maintain the low NO_x values for long periods of time following the performance tests. The Department is not aware of the details of the GE guarantee for Oleander who proposed 9 ppmvd on a simple cycle unit.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

However, the Department is aware from discussions with other applicants that a continuing guarantee is available at a substantial cost.¹⁷

The GE Speedtronic™ Mark V Gas Control System will be used. This control system is designed to fulfill all gas turbine control requirements. These include control of liquid, gas, or both fuels in accordance with the requirements of the speed, load control under part-load conditions, temperature control under maximum capability conditions, or during start-up conditions. Since emissions are controlled utilizing dry low NO_x techniques, fuel staging and combustion mode are also controlled by the Mark V, which also monitors the process. Sequencing of the auxiliaries to allow fully automated start-up, shutdown and cool-down are also handled by the Mark V.¹⁸

DEPARTMENT BACT DETERMINATION

Following are the BACT limits determined for the TEC project assuming full load. Values for NO_x are corrected to 15% O₂ on a dry volume basis. The emission limits or their equivalents in terms of pounds per hour and NSPS units, as well as the applicable averaging times, are given in the permit Specific Conditions No. xx through xx.

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
PM/PM ₁₀ , VE	Pipeline Natural Gas Good Combustion	10 Percent Opacity
VOC	As Above	3 ppm – Gas (non-BACT) 6 ppm – Fuel Oil (non-BACT)
CO	As Above	12 ppm – Gas 20 ppm – Fuel Oil
SO ₂ /SAM	As Above	2 grains of sulfur per 100 ft ³ gas 0.05 percent sulfur in fuel oil
NO _x	Dry Low NO _x , WI for F.O., limited oil use	10.5 ppmvd – Gas 42 ppmvd – Fuel Oil for 750 hours

RATIONALE FOR DEPARTMENT'S DETERMINATION

- General Electric has provided a “clean and new” guarantee of 9 ppmvd NO_x.
- A level of 9 ppmvd NO_x by DLN has been demonstrated on GE 7FA combustion turbines at Fort St. Vrain, Colorado and Clark County, Washington.
- The proposed 9 ppmvd limit at Oleander while firing natural gas is the lowest known Draft BACT value for an “F” frame combustion turbine operating in simple cycle mode and intermittent duty. The 42 ppmvd limit while firing fuel oil is typical.
- The proposed 10.5 ppmvd limit at TEC while firing natural gas is the next lowest Draft BACT value for an F Class simple cycle, intermittent duty unit. The Department will still require TEC to meet to meet the “clean and new” limit of 9 ppmvd during initial testing.
- The proposed BACT limit of 10.5 ppmvd is about one-tenth of the applicable NSPS limit per 40 CFR 60, Subpart GG for units as efficient as the 7FA.
- Typical permit limits nation-wide for these units while operating in simple cycle mode and intermittent duty are 12-15 ppmvd. Limits as high as 25 ppmvd have been recently proposed by some states. The lower limit at TEC will offset emissions while firing fuel oil. Also TEC will operate fewer hours of operation on oil than Oleander. This will help offset the slightly higher emissions on gas from the TEC project compared to Oleander.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

- The units will be operated in simple cycle mode. Therefore control options, which are feasible for combined cycle units, are not applicable. This rules out Low Temperature (conventional) SCR, which achieves 4.5 ppmvd NO_x or lower. It also rules out the possibility of SCONOX. XONON is not available for F Class dual fuel projects.
- The simple cycle "F Class" turbines have very high exhaust temperatures of up to 1200 °F. This is at the higher limit of the present operational temperature of Hot SCR zeolite catalyst (around 1050 °F). The PREPA simple cycle turbines, which use Hot SCR, have exhaust temperatures ranging from 824 to 1024 °F.
- The levelized costs of NO_x removal by Hot SCR for the TEC project were estimated by Environmental Consulting & Technology at \$9,717 per ton of NO_x removed assuming 4,380 and 876 hours per year of operation on gas and oil respectively. This cost-effectiveness value assumes a NO_x reduction from 10.5 ppmvd to 3.5 ppmvd @15% O₂ and a 3-year performance guarantee.
- Using much of the basic capital cost information developed by the City of Lakeland, The National Park Service estimated the cost of NO_x removal by Hot SCR at \$3,802 per ton (excluding the energy penalty) for a *continuous duty* Westinghouse 501 G. A further-refinement of the Park Service estimate by including the energy penalty, using the revised catalyst cost data obtained by the Department, and assuming a five year estimated life for the catalyst (per Engelhard's Lakeland quote) would yield a cost-effectiveness closer to \$3,500 per ton of NO_x removed for that application. However the cost at the Lakeland project was based on reducing NO_x emissions by 16 ppmvd (from 25 ppmvd to 9 ppmvd). This fact and the difference in hours of operation are the main contributors to the difference in costs between the Lakeland and TEC projects.
- The cost effectiveness for NO_x removal given for the PREPA simple cycle project is \$2,200 per ton. This is the only reasonably large project where Hot SCR has actually been installed. The main reason for the relatively low levelized cost is that total costs are applied over a reduction of 40 ppmvd and 8760 hours, whereas the reduction in the TEC case is over a reduction of 7 ppmvd and half the hours. The cost per ton of NO_x removed by Hot SCR at the PREPA project or projected at Lakeland can be re-scaled for the TEC project. This would result in a value on the order of ECT's projections.
- Although the Department does not have a "bright line" cost-effectiveness figure, the values projected by TEC indicate Hot SCR is not cost-effective for this project. The conclusion would be the same even if the Department were to "correct" ECT's cost-effectiveness calculation for estimated 5-7 year life versus the guaranteed 3-year life.
- Comments from the National Park Service on the Oleander project suggested that a reduction in the applicant's proposed NO_x emissions on oil from 42 ppmvd to 25ppmvd is possible based two reported oil-fired units listed in the BACT Clearinghouse. One of the two units cited is a Florida facility that initially had a limit of 25 ppmvd for gas firing. The present limits are 15 ppmvd on gas and 42 ppmvd on oil. The Department has been unable to confirm the report on the second unit. GE has advised that it only offers a 42 ppmvd NO_x guarantee on F Class units when firing oil.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

- It is conceivable that NO_x emissions while firing oil from may be reduced from 42 ppmvd by increasing the water injection rate or even by development of a DLN oil burner. In order to address this possibility, a specific condition will be added to conduct appropriate testing and prepare an engineering report. The report will be submitted for the Department's review to ensure that the lowest reliable NO_x emission rates while firing oil are been achieved with the installed technology.
- The Department's overall BACT determination is equivalent to approximately 0.3 lb/MW-hr by Dry Low NO_x. For reference, the new NSPS promulgated on September 3, 1998 requires that new conventional power plants (based on boilers, etc.) meet a limit of 1.6 lb/MW-hr.
- VOC emissions of 1.4 and 3.5 ppm while firing gas or oil proposed by the applicant clearly reflect BACT and, in fact, exempt the project from a BACT determination for VOC.
- The Department will set CO limits achievable by good combustion as 12 ppm (gas) and 20 ppm (oil). These values are equal to the lowest values from permitted or proposed simple cycle units. These limits are equal to those of the Oleander project.
- ECT evaluated the use of an oxidation catalyst with a 90 percent control efficiency and having a three-year catalyst life. The oxidation catalyst control system was estimated to increase the capital cost of the project by \$1,921,133 with an annualized cost of \$515,433 per year. Levelized costs for CO catalyst control were calculated at \$3,652 per ton to control CO emissions to 30.2 TPY (from a baseline of 303 TPY). This figure does not appear to be cost-effective for removal of CO.
- BACT for PM₁₀ was determined to be good combustion practices consisting of: inlet air filtering; use of pipeline natural gas; use of clean, low ash, low sulfur fuels, and operation of the unit in accordance with the manufacturer-provided manuals.
- PM₁₀ emissions will be very low and difficult to measure. Additionally, the higher emission mode will involve fuel oil firing which will occur only approximately 750 hours per year. It is not practical to require running the turbine on oil, simply to conduct tests. Therefore, the Department will set a Visible Emission standard of 10 percent opacity as BACT for both natural gas and fuel oil firing, consistent with the definition of BACT. Examples of installations with similar VE limits include the City of Lakeland, the City of Tallahassee, Santa Rosa Energy Center, FPL Fort Myers, and the Southern Company Barry projects.

COMPLIANCE PROCEDURES

POLLUTANT	COMPLIANCE PROCEDURE
Visible Emissions	Method 9
Volatile Organic Compounds	Method 18, 25, or 25A (initial tests only)
Carbon Monoxide	Annual Method 10 (can use RATA if at capacity)
NO _x (performance)	Annual Method 20 (can use RATA if at capacity)
NO _x (24-hr average)	NO _x CEMS, O ₂ or CO ₂ diluent monitor, and flow device as needed
SO ₂ and SAM	Custom Fuel Monitoring Schedule

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

A. A. Linero, P.E. Administrator, New Source Review Section
Teresa Heron, Review Engineer, New Source Review Section
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

Howard L. Rhodes, Director
Division of Air Resources Management

Date:

Date:

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

REFERENCES

- ¹ News Release. Goaline Environmental. Genetics Institute Buys SCONOX Clean Air System. August 20, 1999.
- ² "Control Maker Strives to Sway Utility Skeptics." Air Daily. Volume 5, No. 199. October 14, 1998.
- ³ Telecom. Linero, A.A., FDEP, and Beckham, D., U.S. Generating. Circa November 1998.
- ⁴ Letter from Opalinski, M.P., SECI to Linero, A.A., FDEP. Turbines and Related Equipment at Hardee unit 3. December 9, 1998.
- ⁵ Telecon. Vandervort, C., GE, and Linero, A.A., DEP. "VOC Emissions from FA Gas Turbines with DLN-2.6 Combustors."
- ⁶ Brochure. General Electric. "GE Gas Turbines - MS7001FA." Circa 1993.
- ⁷ Davis, L.B., GE. "Dry Low NO_x Combustion Systems for GE Heavy Duty Gas Turbines." 1994.
- ⁸ Report. Florida Power & Light. "Final Dry Low NO_x Verification Testing at Martin Combine Cycle Plant." August 7, 1995.
- ⁹ Florida DEP. PSD Permit, City of Tallahassee Purdom Unit 8. May, 1998.
- ¹⁰ City of Tallahassee. PSD/Site Certification Application. April, 1997.
- ¹¹ Florida DEP. Intent to Issue Permit. FPL Fort Myers Repowering Project. September, 1998.
- ¹² Florida DEP. Final Permit. Santa Rosa Energy Center. December, 1998.
- ¹³ State of Alabama. PSD Permit, Alabama Power/Barry Sithe/IPP (GE 7FA).
- ¹⁴ Telecon. Schorr, M., GE, and Costello, M., Florida DEP. March 31, 1998. Status of DLN-2.6 Program
- ¹⁵ Florida DEP. Bureau of Air Regulation Monthly Report. Jun., 1998.
- ¹⁶ Telecon. Schorr, M., GE, and Linero, A.A., Florida DEP. August, 1998. Cost effectiveness of DLN versus SCR.
- ¹⁷ Telecon. Gianazza, N.B., JEA, and Linero, A.A., Florida DEP. Proposed NO_x limits at Brandy Branch Project.
- ¹⁸ Rowen, W.I. "General Electric Speedtronic™ Mark V Gas Turbine Control System. 1994."

APPENDIX GC
GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

- G.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.
- G.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 or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and 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 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.
- G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment 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.
- G.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.
- G.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.
- G.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 and 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.
- G.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.

APPENDIX GC
GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

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.

- G.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.
- G.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.
- G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, 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.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
- a) Determination of Best Available Control Technology (X)
 - b) Determination of Prevention of Significant Deterioration (X); and
 - c) Compliance with New Source Performance Standards (X).
- G.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 or 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:
 - 1. The date, exact place, and time of sampling or measurements;
 - 2. The person responsible for performing the sampling or measurements;
 - 3. The dates analyses were performed;
 - 4. The person responsible for performing the analyses;
 - 5. The analytical techniques or methods used; and
 - 6. The results of such analyses.
- G.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.

Memorandum

Florida Department of Environmental Protection

TO: ~~Clair-Fancy~~

THRU: Al Linero *CAF 6/30*

FROM: Teresa Heron

DATE: June 28, 1999

SUBJECT: TEC Polk Power Station
Two 165 MW Combustion Turbines
DEP File No. PSD-FL-263 and PA 92-32

Attached is the public notice package for construction of two dual-fuel, intermittent duty, simple cycle 165 MW combustion turbines at the TECO Polk Power Station

Nitrogen Oxides (NO_x) emissions from the gas turbine will be controlled by Dry Low NO_x (DLN-2.6). We propose to require that the unit meet the manufacturer's new and clean (one-shot) guarantee of 9 ppm, and a continuous (24-hour averaged) emission limit of 10.5 ppm. However, we will limit use of fuel oil from the 876 hours requested to 750 hours. We can raise the figure to the requested value if TECO subsequently demonstrates continuous operation at 9 ppm instead of 10.5 ppm.

NO_x emissions will be controlled to 42 ppm during the limited fuel oil use. Emissions of carbon monoxide, volatile organic compounds, sulfur dioxide, sulfuric acid mist, and particulate matter (PM/PM₁₀) will be very low because of the inherently clean pipeline quality natural gas, limited fuel oil use and, especially, the design of the GE unit.

Recent simple cycle emission limits in Region IV have typically been at 15 ppm for simple cycle "F Class" units. In fact, North Carolina recently issued a draft BACT to Dynegy for six dual-fuel Westinghouse "F Class" units with limits of 25 ppm. The Dynegy Westinghouse units must meet 15 ppm by early 2002.

For reference, the draft BACT requested by Oleander is a continuous limit of 9 ppm. Oleander will be allowed to operate on fuel oil for 1000 hours instead of the 2000 hours they requested (or the 750 hours to which TECO will be limited). Oleander is either more willing than TECO to take a risk on continuous compliance or more willing to pay for a continuing guarantee. Oleander's parent company, Constellation, included an identical simple cycle project for its planned High Desert Project in California where LAER is required. They undoubtedly tried to get them permitted for the lowest emission rate while avoiding SCR. When they shifted the simple cycle option to the Florida site, they decided to propose 9 ppm.

Our approach is sensible and our limit on fuel oil will provide some equity between the two determinations. It provides some flexibility in the way companies decide to manage the inherent risk in accepting low NO_x limits on simple cycle intermittent duty units when there is no feasible "fall-back" technology alternative (such as conventional SCR for combined cycle units).

I recommend your approval of the attached Intent to Issue.

AAL/th

Attachments



Jeb Bush
Governor

Department of Environmental Protection

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

David B. Struhs
Secretary

P.E. Certification Statement

Permittee:

DEP File No. PSD-FL-263 (PA92-32)

Tampa Electric Company (TEC)
Polk County

Project type:

Project will be at the TEC Polk Power Station near Mulberry, Polk County. Project is construction of two 165-megawatt GE PG7241FA gas and oil-fired simple cycle combustion turbine-electrical generators and two 114-foot stacks. Fuel oil firing will be limited to 750 hours per year.

The units must meet the manufacturer's "new and clean" nitrogen oxides performance guarantee of 9 parts per million by volume, dry, at 15% oxygen (ppmvd) while burning natural gas. The continuous (24-hour) BACT NO_x limits are 10.5 ppmvd when operating on natural gas and 42 ppmvd by wet injection when burning fuel oil. Other pollutants, including particulate matter (PM/PM₁₀), carbon monoxide, volatile organic compounds, sulfur dioxide, and sulfuric acid mist will be controlled by good combustion and use of clean fuels.

Projected impacts from the proposed project emissions are all less than the applicable significant impact limits corresponding to the nearest PSD Class I (Chassahowitzka National Wilderness Areas) and Class II areas.

***I HEREBY CERTIFY** that the engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).*

A. A. Linero, P.E.

Registration Number: 26032

6/30/99
Date

Department of Environmental Protection
Bureau of Air Regulation
New Source Review Section
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Phone (850) 921-9523
Fax (850) 922-6979

aa 6/30

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Is your RETURN ADDRESS completed on the reverse side?

SENDER: ■ Complete items 1 and/or 2 for additional services. ■ Complete items 3, 4a, and 4b ■ Print your name and address on the reverse of this form so that we can return this card to you ■ Attach this form to the front of the mailpiece, or on the back if space does not permit. ■ Write "Return Receipt Requested" on the mailpiece below the article number ■ The Return Receipt will show to whom the article was delivered and the date delivered		I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.
3. Article Addressed to: Mr. Gregory M Nelson, PE Manager Edu. Planning Tampa Elect. Co. 6944 US Hwy 41 North Apollo Beach, FL 33572-9200	4a. Article Number Z 333 618 185	4b. Service Type <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Express Mail <input type="checkbox"/> Insured <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> COD
5. Received By: (Print Name) Angelia Heath	7. Date of Delivery 7-1-99	
6. Signature: (Addressee or Agent) -X	8. Addressee's Address (Only if requested and fee is paid)	

Thank you for using Return Receipt Service.

Z 333 618 185

US Postal Service
Receipt for Certified Mail
 No Insurance Coverage Provided.
 Do not use for International Mail (See reverse)

Sent to		Gregory Nelson
Street & Number		JECO
Post Office, State, & ZIP Code		Apollo Beach FL
Postage		\$
Certified Fee		
Special Delivery Fee		
Restricted Delivery Fee		
Return Receipt Showing to Whom & Date Delivered		
Return Receipt Showing to Whom, Date, & Addressee's Address		
TOTAL Postage & Fees		\$
Postmark or Date		PALM P.S. 6-29-99 P.O. - FL - 263

PS Form 3800, April 1995