Jeb Bush
Governor

Department of
Environmental Protection

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

David B. Struhs
Secretary

April 14, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Michael F. Vogt
Granite Power Partners II, L.P.
655 Craig Road, Suite 336
St. Louis, Missouri ~~63025~~ 63141

Re: DEP File No. 0490044-001-AC (PSD-FL-281)
Hardee County Generation Facility
Three Simple Cycle Combustion Turbines

Dear Mr. Vogt:

Enclosed is one copy of the Draft Permit, Technical Evaluation and Preliminary Determination, and Draft BACT Determination, for the Hardee County Generation Facility to be located near Wauchula in Hardee County. The Department's Intent to Issue Air construction Permit and the "Public Notice of Intent to Issue Air Construction Permit" are also included.

The Public Notice 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 or contact him at 850/921-9523.

Sincerely,

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

CHF/al

Enclosures

Z 031 391 947

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to Dr. Michael F. Vogt	
Street & Number Granite Power Partners	
Post Office, State, & ZIP Code St Louis, Mo.	
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 0490044-001-AL PSD-FL-281	4-17-00

PS Form 3800, April 1995

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Michael F. Vogt
Granite Power Partners II, L.P.
655 Craig Road, Suite 336
St. Louis, Missouri ~~63025~~ 63141

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* Cindy Schulte — B. Date of Delivery 4-24-00

C. Signature X. [signature] ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
Z 031 391 947

PS Form 3811, July 1999 — Domestic Return Receipt — 102595-99-M-1789

PUBLISHED IN THE NEWSPAPER

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0490044-001-AC (PSD-FL-281)

Granite Power Partners II, L.P.
Hardee County Generation Station – Units 1-3
Hardee County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to Granite Power Partners II, L.P. The permit is to construct: three nominal 120-180 megawatt (MW) natural gas and distillate fuel oil-fired combustion turbine-electrical generators; three 100-foot stacks; a 10 million Btu per hour natural gas-fired heater; and one 1.5 million gallon fuel oil storage tank for the proposed Hardee County Generation Station West of Wauchula in Hardee County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO_2), particulate matter (PM/PM_{10}), nitrogen oxides (NO_x), sulfuric acid mist (SAM), and carbon monoxide (CO) pursuant to Rule 62-212.400, F.A.C. The applicant's name and address are Granite Power Partners II, L.P., 655 Craig Road, Suite 336, St. Louis Missouri 63025.

The gas turbine manufacturer and model have not been selected. The options are: General Electric Model 7FA (170 MW); Westinghouse Model 501D5A (120 MW); Westinghouse Model 501F (170 MW); or ABB Alstom Model GT-24 (180 MW). 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 3,000 hours per year. Within the 3000 hours per year and depending on the model, fuel oil firing will be permitted for 0-500 hours per year.

NO_X emissions will be controlled by Dry Low NO_X combustors or selective catalytic reduction (SCR). The emission limits proposed for gas firing are between 5 and 15 parts per million by volume at 15 percent oxygen (ppm) and depend on the manufacturer, control technology, and use of backup fuel oil. NO_X will be controlled to 42 ppm by wet injection or to 10 ppm by SCR when firing backup fuel oil. Sulfuric acid mist, SO_2, and PM/PM_{10} will be limited by use of clean fuels. Emissions of VOC and CO will be controlled by good combustion practices.

The maximum emissions from the combustion turbines and the natural gas heater in tons per year based on the original application are summarized below. There will be minor emissions of VOC from the fuel oil storage tank.

Pollutant	Maximum Potential Emissions	PSD Significant Emission Rate
PM/PM_{10}	126	25/15
CO	518	100
NO_X	950	40
VOC	74	40
SO_2	108	40
Sulfuric Acid Mist	14	7

Air quality and regional haze impact analyses were 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. There will be insignificant impacts on visibility in the Class I Chassahowitzka National Wildlife Area. Based on the required analyses, the Department has reasonable assurance that the proposed project will not cause or significantly contribute to a violation of any AAQS or PSD increment.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit, 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 public meetings concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this Public Notice of Intent to Issue Air Construction Permit. Written comments and requests for public meetings 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.

IN THE NEWSPAPER

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

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

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information. The Department's technical evaluations and Draft Permit can be viewed at www.dep.state.fl.us/air/permitting.htm by clicking on Construction Permits.

In the Matter of an
Application for Permit by:

Mr. Michael F. Vogt
655 Craig Road, Suite 336
St. Louis, Missouri 63025

DEP File No. 0490044-001-AC (PSD-281)
Hardee County Generation Facility, Units 1 – 3
Hardee County

/

INTENT TO ISSUE AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of DRAFT 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, Granite Power Partners II, L.P. applied on January 18, 2000 to the Department for an air construction permit to construct three combustion turbine-electrical generators with 100-foot stacks, a natural gas fired heater, and one 1.5 million gallon fuel oil storage tank for the Hardee County Generation Facility to be located near Wauchula in Hardee 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 an air construction 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 air construction 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.

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 Air Construction Permit. The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. Rule 62-110.106(7)(b), F.A.C., requires that the applicant cause the notice to be published as soon as possible after notification by the Department of its intended action. 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. 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). 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. 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 public meetingsconcerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of Public Notice of Intent to Issue Air Permit. Written comments and requests for public meetings 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.

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.

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

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. Mediation is not available in this proceeding.

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 AIR CONSTRUCTION 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 4/17/00 to the person(s) listed:

Michael Vogt, GPP-II, L.P.*
Gregg Worley, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Chair, Hardee County BCC
Tom 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.

Charlotte J. Hayes 4/17/00
(Clerk) (Date)

TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

GPP Hardee County Generation Facility Units 1 - 3

Three Combustion Turbines
One 1.5-Million Gallon Fuel Oil Storage Tank
Hardee County

DEP File No. 049044-001-AC (PSD-FL-281)

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

April 14, 2000

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

Granite Power Partners II, L.P.
655 Craig Road, Suite 336
St. Louis, Missouri 63025

Authorized Representative: *Mr. Michael F. Vogt*

1.2 Reviewing and Process Schedule

01-18-00: Date of Receipt of Application
03-27-00: Additional Modeling received, Application Complete
04-14-00: Intent Issued

2. FACILITY INFORMATION

2.1 Facility Location

Refer to Figures 1 and 2 below. The Granite Power Partners II (GPP) Hardee County Generation Facility will be located near Vandolah and Fort Green Ona Roads, approximately 5 miles West of Wauchula, Hardee County. This site is approximately 138 kilometers South-Southeast of the Chassahowitzka Class I National Wilderness Area. UTM coordinates for this facility are Zone 17; 408.49 km E; 3045.73 km N.

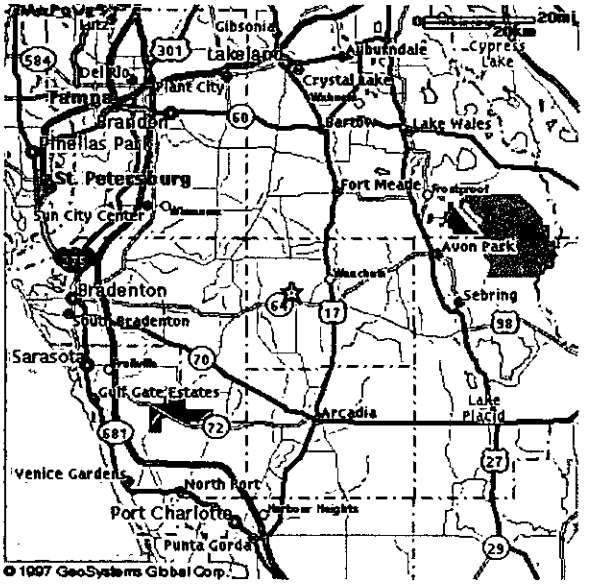


Figure 1 – Project Location

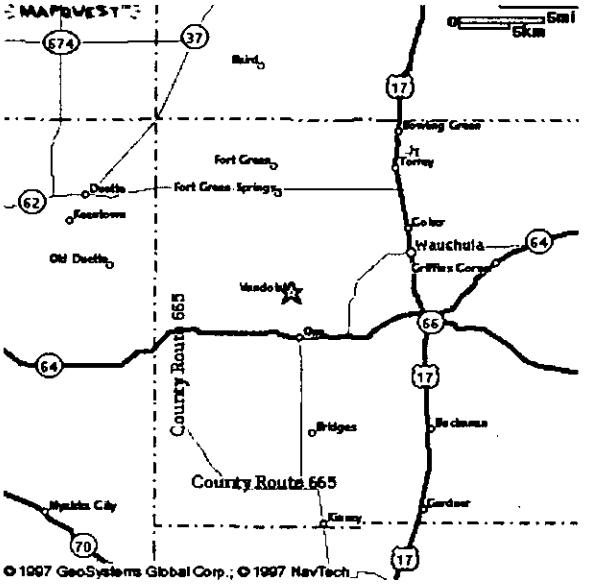


Figure 2 – Vandolah, Hardee County

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 proposed facility will generate between 360 and 540 megawatts (nominal MW) of electrical power. 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/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 TPY.

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD), and a Best Available control Technology determination is required. Given that emissions of at least one single criteria pollutant will exceed 250 TPY, PSD Review and a BACT determination are required for each pollutant emitted in excess of the Significant Emission Rates listed in Table 62-212.400-2, F.A.C. These values are: 40 TPY for NO_X, SO_2, and VOC; 25/15 TPY of PM/PM_{10}; 7 TPY of Sulfuric Acid Mist (SAM); and 100 TPY of CO.

3. PROJECT DESCRIPTION

This permit addresses the following emissions units:

EMISSION UNIT	SYSTEM	Emission Unit Description
001	Power Generation	One nominal 120-180 Megawatt Gas Combustion Turbine-Electrical Generator
002	Power Generation	One nominal 120-180 Megawatt Gas Combustion Turbine-Electrical Generator
003	Power Generation	One nominal 120-180 Megawatt Gas Combustion Turbine-Electrical Generator
004	Fuel Storage	One 1.5-Million Gallon Fuel Oil Storage Tank
005	Fuel Heating	One 10 million Btu/hr gas heater

GPP proposes to construct three nominal 120-180 MW simple cycle, intermittent duty combustion turbine-electrical-generators with 60-foot stacks and one 1.5-million gallon fuel oil storage tank at the planned Hardee County Generation Facility (HCGF).

According to the application, the facility will emit approximately 950 tons per year (TPY) of Nitrogen oxides (NO_X), 518 TPY of carbon monoxide (CO), 126 TPY of Particulate matter (PM/PM_{10}), 108 TPY of sulfur dioxide (SO_2), 74 TPY of volatile organic compounds (VOC), and 14 TPY of sulfuric acid mist (SAM).

Significant emission rate increases per Table 212.400-2, F.A.C. will occur for CO, SO_2, SAM, PM/PM_{10} and NO_X. A BACT determination is required for each of these pollutants. An air quality impact review is also required for CO, PM/PM_{10}, nitrogen dioxide (NO_2), and SO_2.

GPP has not selected a turbine manufacturer. The company is considering the following units manufactured by General Electric (GE), Siemens-Westinghouse (WH) or ABB Alstom:

Unit	GE 7FA	WH 501F	WH 501 D5A	ABB GT-24
Rating (MW)	170	170	120	180
Heat Input (mmBtu/hr) (LHV, 59°F, gas)	1,596	1,791	1,282	1,812

The main fuel will be natural gas and the units are proposed by GPP to operate up to 3,000 hours per year per unit of which 500 hours per year per unit may be on maximum 0.05 percent sulfur distillate fuel oil. Each turbine will be equipped with a version of Dry Low NO_X (DLN) technology for the control of NO_X emissions to the range of 10.5 to 25 ppmvd at 15% O_2.when firing natural gas and wet injection to 42 ppmvd when firing fuel oil.

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 multi-stage compressor where it is compressed by a pressure ratio between 10 and 30 times atmospheric pressure. The compressed air is then directed to the combustor section, where fuel is introduced, ignited, and burned. The key components of an earlier design GE 7FA unit are identified in Figure 3. Views of a typical "501" and an ABB GT24 are shown in Figures 4 and 5 respectively.

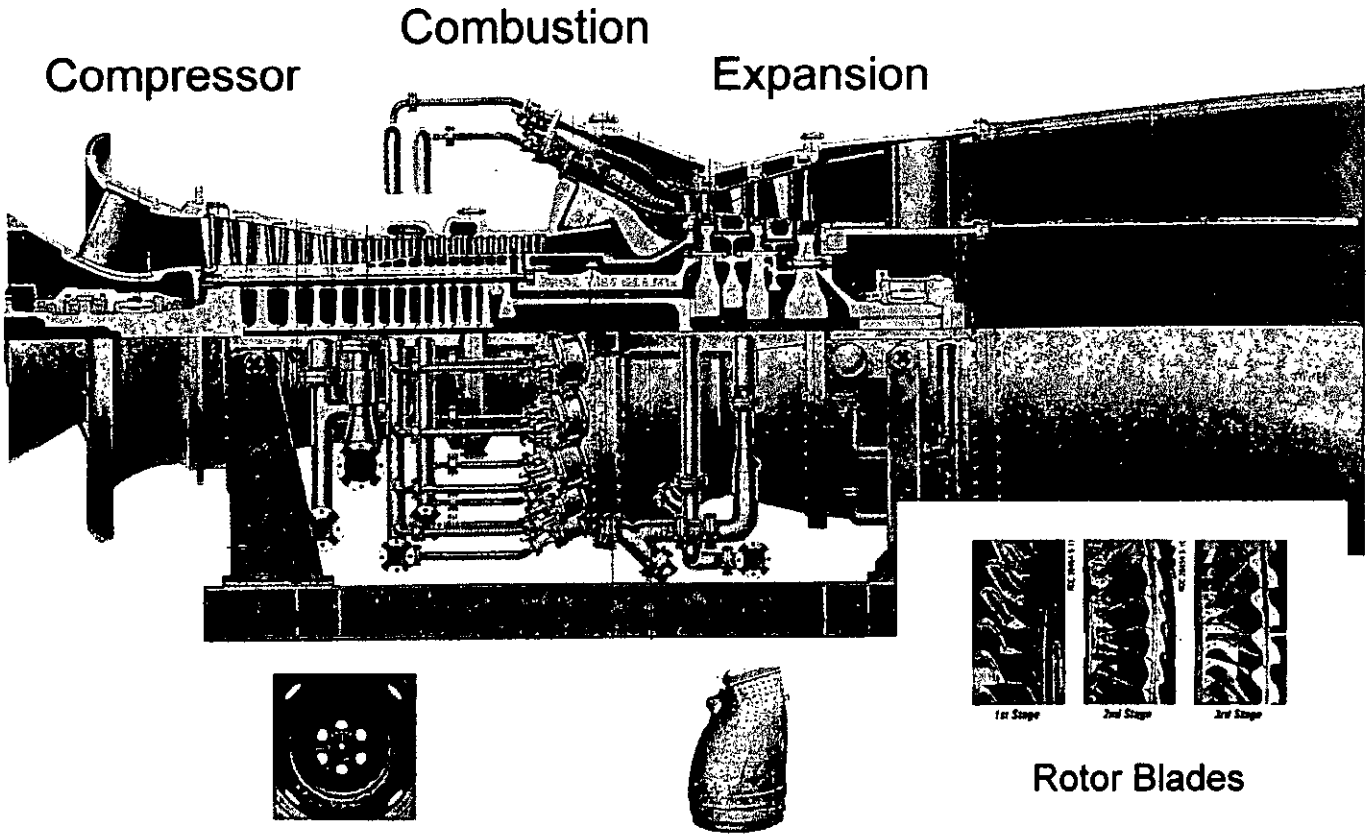
Flame temperatures in a typical combustor section can reach 3600 degrees Fahrenheit (°F). Units such as those under consideration by GPP operate at lower flame temperatures, which minimize NO_X formation. The hot combustion gases are then diluted with additional cool air and directed to the turbine section at temperatures between 2000 and 2500 °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 GPP HCGF Project, the units will operate as peaking units in the simple cycle mode. Cycle efficiency, defined as a percentage of useful shaft energy output to fuel energy input, is approximately 32 to 38 percent for combustion turbines in the simple cycle mode. In addition to shaft energy output, 1 to 2 percent of fuel input energy 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 an additional 60-90 MW. In combined cycle mode, the thermal efficiency of the units under consideration would be between 52 and 58 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 (fogger) 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.



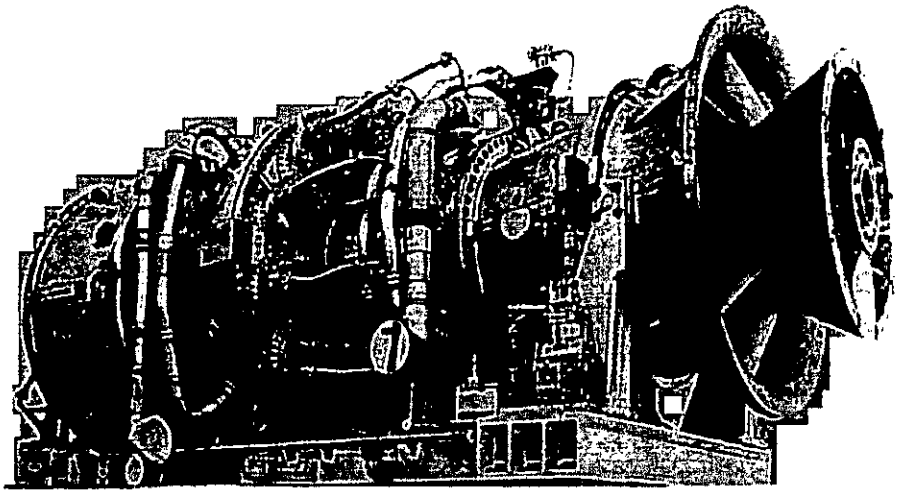
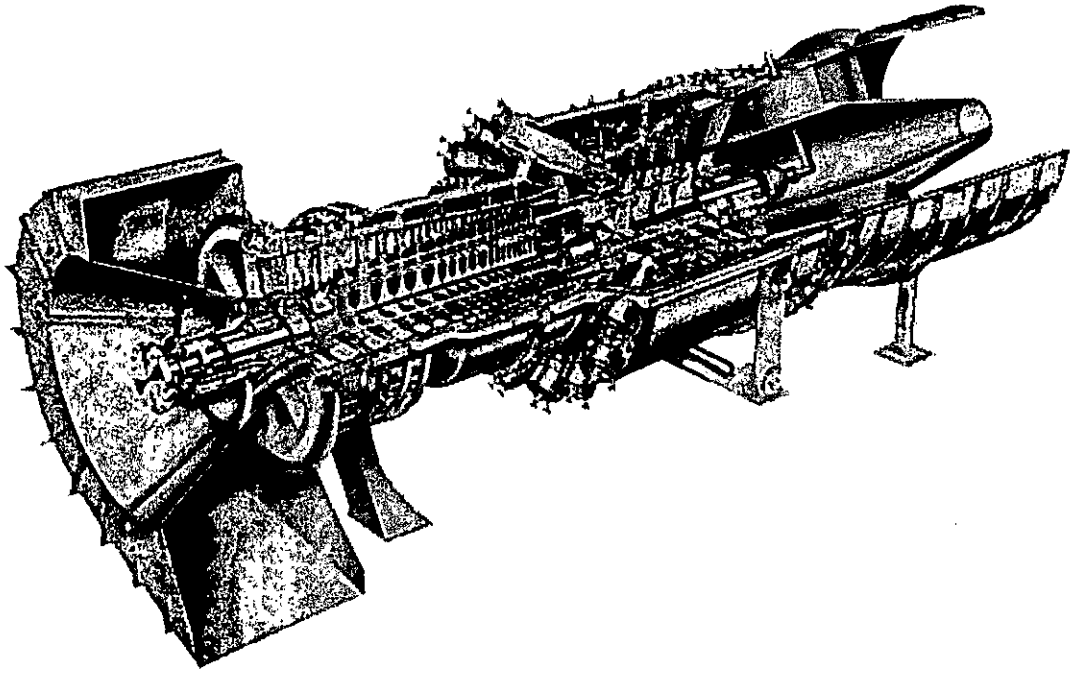


Figure 3 - Internal and External Views of GE MS7001FA



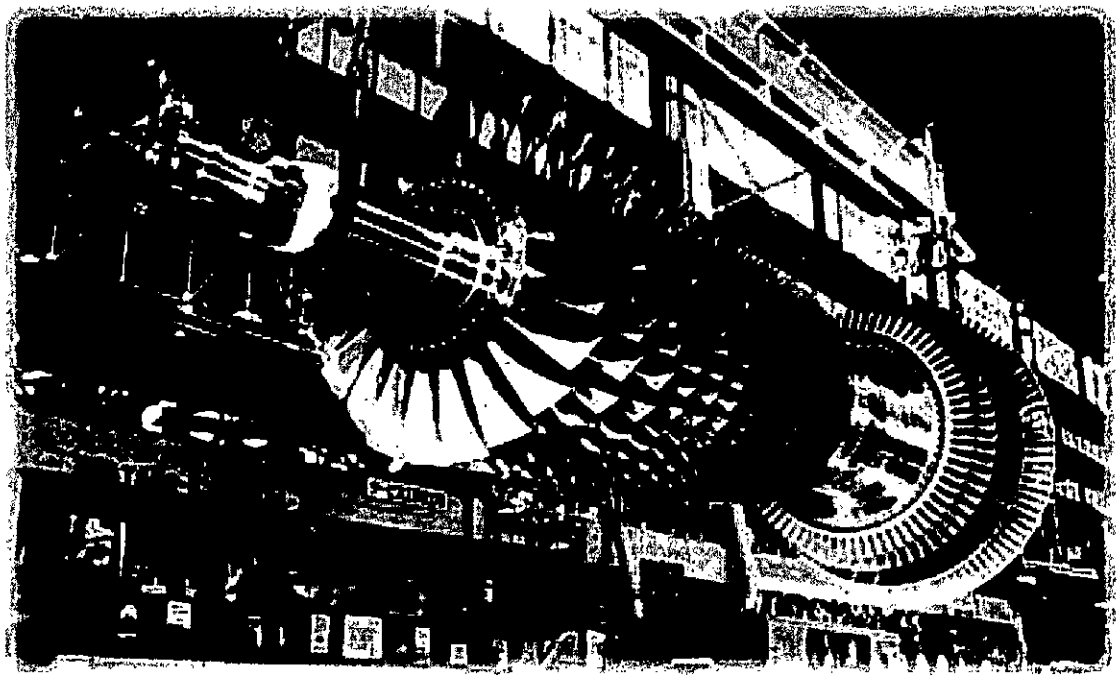


Figure 4 – Artist Rendition of the internal View of a Westinghouse Advanced Combustion Turbine and Photograph of Internal Components of a Mitsubishi 501F (MHI Website)

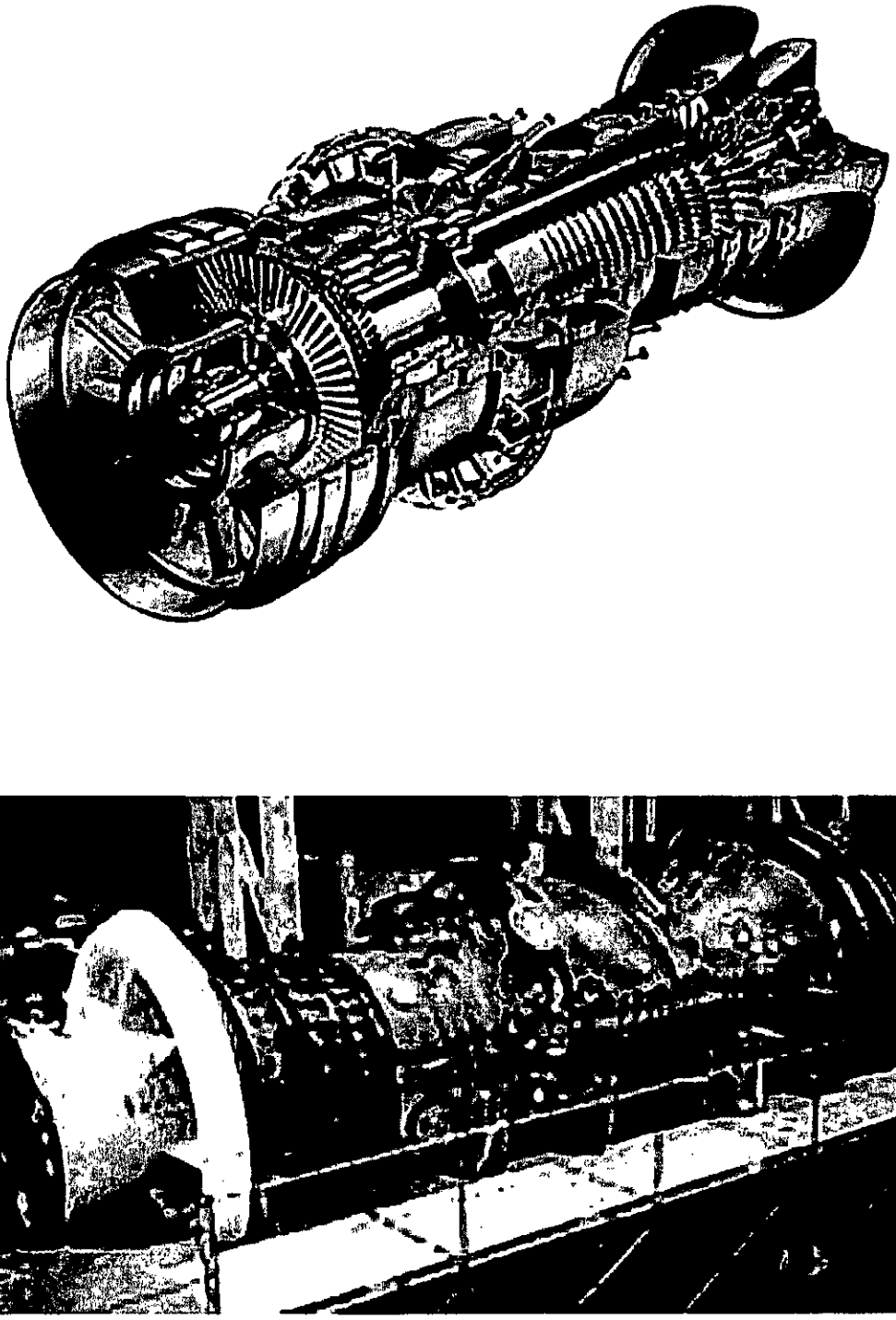


Figure 5 – Artist Rendition of Internal View and a Photograph of the ABB GT24 Combustion Turbine (ABB Website)

5. RULE APPLICABILITY

The proposed project is subject to preconstruction review requirements under the provisions of 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 will be located in Hardee 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/PM_{10}, CO, VOC, 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

The emission units affected by this air construction 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:

5.1 State Regulations

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
Rule 62-213	Operation Permits for Major Sources of Air Pollution
Rule 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 60	Applicable sections of Subpart A, General Requirements, NSPS Subparts GG and Kb
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/PM_{10}, SO_2, NO_X, CO, VOC, 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 Units 1-3 are summarized in the Draft BACT document and Specific Condition Nos. 18-23 of Draft Permit PSD-FL-280.

6.2 Emission Summary

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

PROJECT EMISSIONS (TPY) AND PSD APPLICABILITY

Pollutant	Emissions[1]	PSD Significance	PSD REVIEW?
PM/PM_{10}	125	25	Yes
SO_2	108	40	Yes
NO_X	950	40	Yes
CO	518	100	Yes
Ozone(VOC)	73	40	No
Sulfuric Acid Mist	14	7	Yes
Total Fluorides	0.09	3	No
Mercury	0.0011	0.1	No
Lead	0.03	0.6	No

1. Worst case for highest emitting option. Based on 3,000 hours of gas firing per year per unit of which 500 are on fuel oil. Maximum of 500 hours at low load. Includes natural gas heater. Reference ambient temperature is 59 °F.

6.3 Control Technology

The PSD regulations require new major stationary sources to undergo a control technology review for each pollutant that may be potentially emitted above significant amounts. The control technology review requirements of the PSD regulations are applicable to emissions of NO_X, SO_2, CO, VOC, SAM, and PM/PM_{10}. Emissions control will be accomplished primarily by good combustion of clean natural gas and the limited use of low sulfur (0.05 percent) distillate fuel oil. The 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 Draft Best Available Control Technology (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: PM/PM_{10}, CO, NO_X, SO_2, and VOC. PM_{10}, SO_2 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.

Potential emissions for VOC are above the 40 TPY significance threshold for the pollutant ozone. The applicant presented the potential increases to the Department and the U.S. EPA, and discussed options available to predict potential impacts associated with the emissions and formation of ozone. Based on the available information, the Department has determined that the use of regional models which incorporate the complex chemical mechanisms for predicting ozone formation are not feasible for this project.

The applicant's initial PM_{10}, CO, NO_X, and SO_2 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 PM_{10}, CO, SO_2, and NO_X;
- An analysis of impacts on soils, vegetation, 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 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 Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. It incorporates 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 simple cycle facility for three loads (50%, 75% and 100%) and three seasonal operating conditions (summer, winter and average). Once the worst-case loads are identified, the applicant utilizes the ISCST3 model to evaluate impacts at these loads, and compares the results to the significant impact levels. If this modeling at worst load conditions shows significant impacts, additional multi-facility modeling is required to determine the project's impacts on the existing air quality and any applicable AAQS or PSD increments.

Receptors were placed around 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 Class I area. The CNWA is located approximately 138 km northwest of the project. A combination of fence line, near-field, mid-field, and far-field receptors were utilized for predicting maximum concentrations in the vicinity of the project. The fence line and near-field receptors consisted of discrete Cartesian receptors spaced at 50 meter intervals from the facility fence line out to the first mid-field polar receptor ring. The mid-field and far-field receptors consisted of polar receptor grids with 10 rings and 10° spacing radials. To improve the spatial distribution of the polar receptors, each polar ring was offset by 5°. 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 the significant impact 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	0.059	1	NO
	24-hour	0.87	5	NO
CO	8-hour	112	500	NO
	1-hour	279	2000	NO
NO_2	Annual	0.275	1	NO
SO_2	Annual	0.059	1	NO
	24-hour	0.91	5	NO
	3-hour	4.73	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	0.001	0.2	NO
	24-hour	0.021	0.3	NO
NO_2	Annual	0.0042	0.1	NO
SO_2	Annual	0.0048	0.1	NO
	24-hour	0.090	0.2	NO
	3-hour	0.384	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.

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 PM_{10}, CO, NO_X, SO_2 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 SO_2 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.

Due to the close proximity of this project to the Chassahowitzka Class I area, a multi-tiered regional haze analysis was performed. The first tier consisted of a regional haze analysis that utilized the CALPUFF modeling system in a screening mode otherwise known as CALPUFF Lite. CALPUFF is recommended by the National Park Service (NPS) for use in regional haze analyses because of its ability to handle atmospheric chemical transformations as well as wet/dry deposition. The results of the CALPUFF Lite modeling analysis indicated a change in visibility greater than the NPS threshold of 5%. As a result, the applicant was instructed by the Department to perform a refined CALPUFF analysis that utilized a meteorological data set created by the CALMET meteorological model.

The results of the refined CALPUFF analysis predicted a change in visibility of 3.66%. This impact is below the NPS threshold of 5%, and it indicates that the proposed project will not have an adverse impact on visibility and regional haze in the Chassahowitzka CNWA.

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 few new 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 to 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 low air emissions per unit of electric power generating capacity for intermittent duty.

Hazardous Air Pollutants

Based on the application, 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. The applicant has been requested to recalculate emissions of formaldehyde in response to a review of the application by EPA.

8. 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., Administrator
Chris Carlson, Meteorologist

PERMITTEE:

Granite Power Partners II, LP
655 Craig Road, Suite 336
St. Louis, Missouri 63025

Permit No.	PSD-FL-281
File No.	0490044-001-AC
SIC No.	4911
Expires:	December 31, 2001

Authorized Representative:

Michael F. Vogt

PROJECT AND LOCATION:

Air Construction Permit pursuant to the requirements for the Prevention of Significant Deterioration of Air Quality Permit for: three nominal 120-180 megawatt (MW) combustion turbine-electrical generators; three 100-foot stacks; a 10 million Btu per hour natural gas-fired heater; and one 1.5 million gallon fuel oil storage tank. The units will operate in simple cycle mode and intermittent duty.

The project will be located near Vandolah and Fort Green Roads, approximately 5 miles West of Wauchula, Hardee County. This site is approximately 138 kilometers South/Southeast of the Chassahowitzka Class I National Wilderness Area. UTM coordinates for this facility are Zone 17; 408.49 km E; 3045.73 km N.

STATEMENT OF BASIS:

This Air Construction 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.). 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

SECTION I. FACILITY INFORMATION

FACILITY DESCRIPTION

This facility is a new site. This project is subject to the requirements for the Prevention of Significant Deterioration of Air Quality for: three nominal 120-180 megawatt (MW) combustion turbine-electrical generators; three 100-foot stacks; a 10 million Btu per hour natural gas-fired heater; and one 1.5 million gallon fuel oil storage tank. The units will operate in simple cycle mode and intermittent duty. 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
001	Power Generation	One nominal 120 - 180 Megawatt Simple Cycle Gas Combustion Turbine-Electrical Generator
002	Power Generation	One nominal 120 -180 Megawatt Simple Cycle Gas Combustion Turbine-Electrical Generator
003	Power Generation	One nominal 120 - 180 Megawatt Simple Cycle Gas Combustion Turbine-Electrical Generator
004	Fuel Storage	One 1.5 Million Gallon Fuel Oil Storage Tank
005	Fuel Heating	One 10 million Btu/hr gas heater

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/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is not 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 250 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, SO_2, or VOC; 25/15 TPY of PM/PM_{10}; 100 TPY of CO; or 7 TPY of sulfuric acid mist (SAM). This facility and the project are also subject to applicable provisions of Title IV, Acid Rain, of the Clean Air Act.

SECTION I. FACILITY INFORMATION

PERMIT SCHEDULE

- xx/yy/00 Notice of Intent published in The Tampa tribune
- 04/14/00 Distributed Intent to Issue Permit
- 03/27/00 Application deemed complete
- 01/18/00 Received 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 January 18, 2000
- Department letters dated dated January 20 and February 16, 2000
- Air Quality Impact Analysis from ECT received March 27, 2000
- EPA Region 4 letter dated April 12, 2000
- Department's Intent to Issue and Public Notice Package dated April 14, 2000
- Department's Final Determination and Best Available Control Technology Determination issued concurrently with this permit.

SECTION II. 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 Blair Stone 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 office, 3804 Coconut Palm Drive, Tampa, Florida 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]
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 accordance with Rule 62-212.400(6)(b), F.A.C. (and 40 CFR 51.166(j)(4)), 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 the adequacy of any previous determination of best available control technology for the source." This reassessment will also be conducted for this project if there are any increases in heat input limits, hours of operation, oil firing, low or baseload operation (e.g. conversion to combined-cycle operation) short-term or annual emission limits, annual fuel heat input limits or similar changes. [40 CFR 51.166(j)(4) and Rule 62-212.400(6)(b), F.A.C.]

SECTION II. ADMINISTRATIVE REQUIREMENTS

8. Final Selection of Manufacturer: The Applicant shall provide the Department with the final model, characteristics, and performance/emissions guarantees upon making a final selection of combustion turbines to be installed. The Department may review the adequacy of the BACT determination as described in Condition 7. above.

9. 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 office. [Chapter 62-213, F.A.C.]

10. 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.]

11. 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 office by March 1st of each year. [Rule 62-210.370(2), F.A.C.]

12. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C.

13. Permit Extension: The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit [Rule 62-4.080, 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 office. Each excess emission report shall include the information required in 40 CFR 60.7(c) and 60.334.

SECTION III. EMISSION UNITS 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, 62-103, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 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 Emission Units 001-003, Power Generation, consisting of three 120-180 megawatt combustion turbines 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). [Rule 62-204.800(7)(b), F.A.C.]
5. ARMS Emission Unit 004, Fuel Storage, consisting of one 1.5 million gallon distillate fuel oil storage tank shall comply with all applicable provisions of 40CFR60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels, adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-204.800(7)(b), F.A.C.]
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 these units. [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}

8. Capacity:

   - General Electric 7FA: The maximum heat input rates, based on the lower heating value (LHV) of each fuel to each Unit (1-3) at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,596 million Btu per hour (mmBtu/hr) when firing natural gas and shall not exceed 1,795 mmBtu/hr when firing No. 2 or superior grade of distillate fuel oil.
   - Westinghouse 501F: The maximum heat input rates, based on the lower heating value (LHV) to each Siemens-Westinghouse 501F combustion turbine at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,660 million Btu per hour (mmBtu/hr).
   - Westinghouse 501D5A: The maximum heat input rates, based on the lower heating value (LHV) to each Siemens-Westinghouse 501D5A combustion turbine at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,188 million Btu per hour (mmBtu/hr).
   - ABB GT-24: The maximum heat input rates, based on the lower heating value (LHV) of each fuel to each ABB GT-24 combustion turbine at ambient conditions of 59°F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,644 million Btu per hour (mmBtu/hr) when firing natural gas and shall not exceed 1,812 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. [Rule 62-296.320(4)(c)., F.A.C.]

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.]

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

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: The stationary gas turbines shall only operate up to 3,000 hours on average per unit during any calendar year. Within the 3,000 hours, up to 500 hours may be on fuel oil for the GE 7FA or the ABB GT-24 only. No single combustion turbine shall operate more than 4,000 hours in a single year. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions), Rule 62-212.400, F.A.C. (BACT)]

14. Fuel oil usage: The amount of back-up fuel (fuel oil) burned at the site (in BTU's) shall not exceed the amount of natural gas (primary fuel) burned at the site (in BTU's) during any consecutive 12-month period [Rule 62-210.200, F.A.C. (BACT)]

Control Technology

15. General Electric: Dry Low NO_X (DLN) combustors shall be installed on the stationary combustion turbines to control nitrogen oxides (NO_X) emissions while firing natural gas. A wet 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. (BACT)]

16. Westinghouse 501F or D5A: DLN combustors shall be installed on the stationary combustion turbines to control nitrogen oxides (NO_X) emissions while firing natural gas. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT)]

17. ABB GT-24: The permittee shall install selective catalytic reduction system. A wet injection system shall be installed for use when firing No. 2 or superior grade distillate fuel oil. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT)]

18. 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 consistent with normal operation and maintenance practices and shall be maintained to minimize NO_X emissions and CO emissions, consistent with normal operation and maintenance practices. 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

19. Following is a summary of the emission limits and required technology. Values for NO_X are corrected to 15 % O_2 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, Low Sulfur Fuel Oil	10/17 lb/hr (Gas/Fuel Oil) 5/10% Opacity (Gas/Fuel Oil)
VOC	As Above	3.0 ppmvd (Gas) 7.5 ppmvw (Fuel Oil)
CO	As Above	16 ppmvd (Gas) 20 ppmvd (Fuel Oil)
SO_2 and Acid Mist	As Above	2 gr S/100 ft^3 (in Gas) 0.05% S (in Fuel Oil)
NO_X (GE 7FA)	Dry Low NO_X for Natural Gas Wet Injection and limited Fuel Oil usage	10.5 ppmvd (Gas) 42 ppmvd (Fuel Oil) – 500 hours
NO_X (WH 501F)	Dry Low NO_X, Natural Gas Only	15 ppmvd
NO_X (WH 501D5A)	Dry Low NO_X, Natural Gas Only	15 ppmvd
NO_X (ABB GT-24)	Selective Catalytic Reduction (Gas) Wet Injection (Fuel Oil) Selective Catalytic Reduction (Fuel Oil)	5 ppmvd (Gas) 42 ppmvd (Fuel Oil – first 250 hours) 10 ppmvd (Fuel Oil – next 250 hours)

20. Nitrogen Oxides (NO_X) Emissions:

- General Electric 7FA: While firing natural gas, the emission rate of NO_X in the exhaust gas shall not exceed 10.5 ppmvd @15% O_2 on a 24 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). Refer to Condition 30 for valid hours contributing to the block average. In addition, NO_X emissions calculated as NO_2 shall not exceed 75.7 pounds per hour (at ISO conditions) and 9 ppmvd @15% O_2 to be demonstrated by the initial "new and clean" GE performance stack test. [Rule 62-212.400, 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 (of valid hour hours during which the unit is actually operated only) as measured by the continuous emission monitoring system (CEMS). In addition, NO_X emissions calculated as NO_2 shall not exceed 351 lb/hr (at ISO conditions) and 42 ppmvd @15% O_2 to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]

- Westinghouse 501F: The emission rate of NO_X in the exhaust gas shall not exceed 15 ppmvd @15% O_2 on a 24 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). Refer to Condition 30 for valid hours contributing to the block average. In addition, NO_X emissions calculated as NO_2 shall not exceed 117 pounds per hour (at ISO conditions) and 15 ppmvd @15% O_2 to be demonstrated by the initial stack test. [Rule 62-212.400, F.A.C.]

- Westinghouse 501D5A: The emission rate of NO_X in the exhaust gas shall not exceed 15 ppmvd @15% O_2 on a 24 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). Refer to Condition 30 for valid hours contributing to the block average. In addition, NO_X emissions calculated as NO_2 shall not exceed 80.6 pounds per hour (at ISO conditions) and 15 ppmvd @15% O_2 to be demonstrated by the initial stack test. [Rule 62-212.400, F.A.C.]

- ABB GT-24: While firing natural gas, the emission rate of NO_X in the exhaust gas shall not exceed 5 ppmvd @15% O_2 on a 3 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). Refer to Condition 30 for valid hours contributing to the block average. In addition, NO_X emissions calculated as NO_2 shall not exceed 36.7 pounds per hour (at ISO conditions) and 5 ppmvd @15% O_2 to be demonstrated by the initial stack test. [Rule 62-212.400, F.A.C.]

  During the first 250 hours of fuel oil firing during any calendar year, the emission rate of NO_X in the exhaust gas shall not exceed 42 ppmvd @15% O_2 on a 3 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). Refer to Condition 30 for valid hours contributing to the block average. In addition, NO_X emissions calculated as NO_2 shall not exceed 343 lb/hr hour (at ISO conditions) and 42 ppmvd @15% O_2 to be demonstrated by the initial stack test. [Rule 62-212.400, F.A.C.]

  After the first 250 hours of fuel oil firing during any calendar year, the emission rate of NO_X in the exhaust gas shall not exceed 10 ppmvd @15% O_2 on a 3 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). Refer to Condition 30 for valid hours contributing to the block average. In addition, NO_X emissions calculated as NO_2 shall not exceed 81.7 pounds per hour (at ISO conditions) and 10 ppmvd @15% O_2 to be demonstrated by the initial stack test. [Rule 62-212.400, F.A.C.]

21. Carbon Monoxide (CO) Emissions: The concentration of CO in the stack exhaust gas shall not exceed 16 ppmvd @15% O_2, and shall not exceed 20 ppmvd @15% O_2 while firing fuel oil, where applicable, on a 24 hr block average (of valid hours during which the unit is operated only) as measured by the continuous emission monitoring system (CEMS). In addition, emissions shall not exceed the limits specified below. The permittee shall demonstrate

compliance with the following limits by stack test using EPA Method 10. [Rule 62-212.400, F.A.C.]

- General Electric 7FA: Emissions of CO shall not exceed 57 lb/hr while firing natural gas and shall not exceed 71 lb/hr while firing fuel oil (at ISO conditions). [Rule 62-212.400, F.A.C.]
- Westinghouse 501F: Emissions of CO shall not exceed 57 lb/hr (at ISO conditions). [Rule 62-212.400, F.A.C.]
- Westinghouse 501D5A: Emissions of CO shall not exceed 42 lb/hr (at ISO conditions). [Rule 62-212.400, F.A.C.]
- ABB GT-24: Emissions of CO shall not exceed 57 lb/hr while firing natural gas and shall not exceed 71 lb/hr while firing fuel oil (at ISO conditions). [Rule 62-212.400, F.A.C.]

22. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the stack exhaust gas with the combustion turbine operating on natural gas shall not exceed 3.0 ppmvd while firing natural gas and shall not exceed 7.5 ppmvw while firing fuel oil (ISO conditions). In addition, emissions shall not exceed the limits specified below. The permittee shall demonstrate compliance with these limits by initial stack test using EPA Method 18, 25 or 25A. [Rule 62-212.400, F.A.C.]

    - General Electric 7FA: Emissions of VOC shall not exceed 7.8 lb/hr while firing natural gas and shall not exceed 71.4 lb/hr while firing fuel oil (at ISO conditions). [Rule 62-212.400, F.A.C.]
    - Westinghouse 501F: Emissions of VOC shall not exceed 7.8 lb/hr (at ISO conditions). [Rule 62-212.400, F.A.C.]
    - Westinghouse 501D5A: Emissions of VOC shall not exceed 5.4 lb/hr (at ISO conditions). [Rule 62-212.400, F.A.C.]
    - ABB GT-24: Emissions of VOC shall not exceed 7.8 lb/hr while firing natural gas and shall not exceed 71.4 lb/hr while firing fuel oil (at ISO conditions). [Rule 62-212.400, F.A.C.]

23. Sulfur Dioxide (SO_2) and Sulfuric Acid Mist Emissions (SAM): SO_2 and SAM emissions shall be limited by firing pipeline natural gas (sulfur content less than 2 grain per 100 standard cubic foot) or by firing No. 2 or superior grade distillate fuel oil with a maximum 0.05 percent sulfur. [40CFR60 Subpart GG and Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C]

    [Note: Emissions of SO_2 and SAM will be limited by this condition to 9.2 lb/hr and 1.1 lb/hr respectively while firing natural gas, and 98.1 lb/hr and 11.3 respectively.]

24. Particulate Matter (PM/PM_{10}) PM/PM_{10} emissions shall not exceed 10 lb/hr when operating on natural gas and shall not exceed 17 lb/hr when operating on fuel oil. [Rule 62-212.400, F.A.C.]

25. Visible Emissions (VE): VE emissions shall serve as a surrogate for PM/PM_{10} emissions and shall not exceed 5% opacity while operating on natural gas and 10% opacity while operating on fuel oil. [Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]

EXCESS EMISSIONS

26. 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 two hours in any 24-hour period, regardless of unit cycles (breaker closed to breaker open).

27. 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.

28. 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 Nos. 19, 20 and 21. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (1998 version)].

COMPLIANCE DETERMINATION

29. 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 (1998 version), and adopted by reference in Chapter 62-204.800, F.A.C.

30. Initial (I) performance tests (for both fuels, where applicable) 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. Where initial tests only are indicated, these tests shall be repeated prior to renewal of each operation permit.

- EPA Reference Method 5 or 17, "Determination of Particulate Emissions from Stationary Sources" (I).
- 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" or RATA test data may be used to demonstrate compliance for annual test requirements (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.

31. 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) and 3-hr block average (SCR or WI). 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. 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. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C. These excess emissions periods shall be reported as required in Condition 28. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., 40 CFR 75 and BACT]

    - All continuous monitoring systems (CEMS) shall be in continuous operation except for breakdowns, repairs, calibration checks, and zero and span adjustments. These CEMS shall meet minimum frequency of operation requirements: one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period. Data recorded during periods of continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments shall not be included in the data average. [40CFR60.13]

32. Test Methods for Natural Gas Sulfur Content: For the purposes of demonstrating compliance with the 40 CFR 60.333 SO_2 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 CFR60.335 or 40 CFR75 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).

33. 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.

34. 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.

35. 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.

36. 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).

37. 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.

38. 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

39. Records: All measurements, records, and other data required to be maintained by IPSAPC 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.

40. Compliance Test Reports: A test report indicating the results of the required compliance tests shall be filed as per Condition No. 38 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

41. 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 and carbon monoxide emissions from these units. Upon request from EPA or DEP, the CEMS emission rates for NO_X on these Units shall be corrected to ISO conditions to demonstrate compliance with the NO_X standard established in 40 CFR 60.332. [Rules 62-204.800, 62-210.700, 62-4.130, 62-4.160(8), F.A.C, 40 CFR 75and 40 CFR 60.7 (1998 version)].

42. CEMS for reporting excess emissions: Excess Emissions and Monitoring System Performance Reports shall be submitted as specified in 40 CFR 60.7(c). CEM monitor downtime shall be calculated and reported according to the requirements of 40 CFR 60.7(c)(3) and 40CFR 60.7(d)(2). Periods when NO_X and CO emissions (ppmvd @ 15% oxygen) are above the BACT standards, listed in Specific Conditions No 19, 20 and 21, shall be reported to the DEP Southwest District as required by Specific Condition 28.

43. CEMS in lieu of Water to Fuel Ratio: 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 (1998version). The calibration of the water/fuel monitoring device required in 40 CFR 60.335 (c)(2) (1998 version) will be replaced by the 40 CFR 75 certification tests of the NO_X CEMS.

44. Continuous Monitoring Certification and Quality Assurance Requirements: 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 40CFR75. 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.

45. 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 SO_2 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, SO_2 emissions must be accounted for as required pursuant to 40 CFR 75.11(d).

46. 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).

47. 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)

Granite Hardee County Generation Facility
PSD-FL-281 and 049044-001-AC
Hardee County, Florida

BACKGROUND

The applicant, Granite Power Partners II (GPP or Granite) proposes to install three nominal 120 to 180-megawatt (MW) combustion turbine-electrical generators at the planned Hardee County Generation Facility (HCGF), near Wauchula, Hardee County. The new units will operate in simple cycle mode and intermittent duty and exhaust through separate 100-foot stacks. Granite proposes to operate these units up to 3,000 hours per year per unit of which 500 hours per year per unit may be on maximum 0.05 percent sulfur distillate fuel oil.

The proposed project will constitute a New Major Facility per Rule 62-212.400(d)2.a., Florida Administrative Code (F.A.C.) because it will have the potential to emit at least 250 tons per year of a regulated pollutant. It is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) per Rule 62-212.400, F.A.C.

The application was received on January 18, 2000 and included a BACT proposal prepared by the applicant's consultant, ECT, Inc. Additional information was received on March 27. According to the application, the maximum emissions from the facility will be approximately 950 tons per year (TPY) of NO_X, 518 TPY of CO, 125 TPY of PM/PM_{10}, 108 TPY of SO_2, 14 TPY of SAM, and 73 TPY of VOC. Emissions of each pollutant will exceed its "Significant Emission Rate" with respect to Table 212.400-2, (F.A.C.) thus requiring a BACT Determination. Descriptions of the process, project, air quality effects, and rule applicability are given in the Technical Evaluation and Preliminary Determination dated April 14, 2000, accompanying the Department's Intent to Issue.

BACT DETERMINATION REQUESTED BY THE APPLICANT:

Following are the ranges of values proposed by the applicant as BACT for each pollutant. The ranges reflect the four combustion turbine options under consideration by Granite. A breakdown of these options is provided in subsequent sections.

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED BACT LIMIT
Nitrogen Oxides	Dry Low NO_X Combusts Water Injection (Oil)	10.5 to 25 ppmvd @ 15% O_2 (gas) 42 ppmvd @ 15% O_2 (oil)
Particulate Matter	Pipeline Natural Gas No. 2 Distillate Oil (500 hr/yr) Combustion Controls	10 to 20 percent opacity
Carbon Monoxide	As Above	6 to 16 ppmvd (gas, baseload) 20 to 25 ppmvd (oil baseload)
Volatile Organic Compounds	As Above	1.2 to 3 ppmvd (gas, baseload) 7 to 10 ppmvw (oil baseload)
Sulfur Dioxide and Sulfuric Acid Mist	As Above	2 grain S/100 std cubic feet (gas) 0.05 percent sulfur (oil)

BACT DETERMINATION PROCEDURE:

In accordance with Rule 62-212.400, 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% O_2 (assuming 25 percent efficiency) and 150 ppmvd SO_2 @ 15% O_2 (or <0.8% sulfur in fuel). The BACT proposed by Granite is within the NSPS limit, which allows NO_X emissions in the range of 100-110 ppmvd for the high efficiency units to be purchased for the Hardee County Generation Facility.

No National Emission Standard for Hazardous Air Pollutants exists for stationary gas turbines.

DETERMINATIONS BY EPA AND STATES:

The following tables include some recently permitted intermittent-duty simple cycle turbines. Two continuous-duty project (Lakeland and PREPA) are also included. The BACT applications for the four options proposed for the Granite project are included to facilitate comparison. Two intermittent duty projects (Carson and McClellan) with Lowest Achievable Emission Rate (LAER) determinations are included as the Top technology. A combined cycle project based on the Westinghouse 501 D5A is included for comparison as the only information available on this model.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Project Location	Power Output (MW)	NO_X Limit ppmvd @ 15% O_2 and Fuel	Technology	Comments
Granite Hardee, FL	510	10.5 - NG 42 - No. 2 FO	DLN WI	3x170 MW **GE 7FA** CTs 500 hrs on oil
Granite Hardee, FL	510	15 - NG 42 - No. 2 FO	DLN WI	3x170 MW WH **501F** CTs 500 hrs on oil
Granite Hardee, FL	360	15 - NG 42 - No. 2 FO	DLN WI	3x170 MW WH **501D5A** CTs 500 hrs on oil
Granite Hardee, FL	540	25 - NG 42 - No. 2 FO	DLN WI	3x180 MW **ABB GT-24** CTs 500 hrs on oil
Shady Hills Pasco, FL	510	9 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE PG7241FA CTs Issued 01/00. 1000 hrs on oil
DeSoto Arcadia, FL	510	9 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE PG7241FA CTs Draft 03/00. 1000 hrs on oil
Vandolah Hardee, FL	680	9 - NG 42 - No. 2 FO	DLN WI	4x170 MW GE 7FA CTs Issued 11/99. 1000 hrs on oil
Oleander Brevard, FL	850	9 - NG 42 - No. 2 FO	DLN WI	5x170 MW GE 7FA CTs Issued 11/99. 1000 hrs on oil
JEA Baldwin, FL	510	10.5 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE 7FA CTs Issued 10/99. 750 hrs on oil
Reliant Osceola, FL	510	10.5 - NG 42 - No. 2 FO	DLN WI	3x170 MW GE 7FA CTs Draft 11/99. 750 hrs on oil
TEC Polk Power, FL	330	10.5 – NG 42 – No. 2 F.O.	DLN WI	2x165 MW GE 7FA CTs Issued 10/99. 750 hrs on oil
Dynegy, FL	510	15 – NG	DLN	3x170 MW WH 501F CTs Draft 03/00. Gas only
Dynegy Heard, GA	510	15 – NG	DLN	3x170 MW WH 501F CTs Issued 1999. Gas only
Tenaska Heard, GA	960	15 - NG 42 - No. 2 FO	DLN WI	6x170 MW GE 7FA CTs Issued 12/98. 720 hrs on oil
Calvert City, KY	340	25 - NG	WI	2x170 MW GE 7FA CTs Draft 1999. ?? hrs on oil
Mid-GA Cogen	308	9 NG 20 – FO	DLN & SCR	2x119 MW WH 501D5A CT's Achieves 15 ppmvd by DLN alone
Dynegy Reidsville, NC	900	15 – NG (by 2002) 42 – No. 2 FO	DLN WI	5x180 MW WH 501F CTs Initially 25 ppm NO_X limit on gas Draft 5/98. 1000 hrs on oil.
Lyondell Harris, TX	160	25 – NG	DLN	1x160 MW WH 501F CTs Issued 11/99. Gas only
Southern Energy, WI	525	15/12 – NG 42 - No. 2 FO	DLN WI	3x175 MW GE 7FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil
RockGen Cristiana, WI	525	15/12 – NG 42 - No. 2 FO	DLN WI	3x175 MW GE 7FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil
Carson Energy, CA	42	5 – NG (LAER)	Hot SCR	42 MW LM6000PA. Startup 1995. Ammonia limit is 20 ppmvd
McClelland AFB, CA	85	5 – NG (LAER)	Hot SCR	85 MW GE 7EA. Applied 1999 Ammonia proposal 10 ppmvd
Lakeland, FL	250 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.
PREPA, PR	248 CON	10 – No. 2 FO	WI & HSCR	3x83 MW ABB GT11N CTs Issued 12/95.

CON = Continuous
SC = Simple Cycle
INT = Intermittent
DLN = Dry Low NO_X Combustion
SCR = Selective Catalytic Reduction
HSCR = Hot SCR
FO = Fuel Oil
NG = Natural Gas
WI = Water or Steam Injection
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
Granite Hardee, FL GE	12 – NG 23 – FO	1.2 – NG 2.8 – FO	10% Opacity	Clean Fuels Good Combustion
Granite Hardee, FL 501F	16 – NG 20 – FO	3 – NG 10 – FO	10% Opacity	Clean Fuels Good Combustion
Granite Hardee, FL D5A	10 – NG 28 – FO	3 – NG 10 – FO	10% Opacity	Clean Fuels Good Combustion
Granite Hardee, FL ABB	6 – NG 25 – FO	1.5 – NG 7.5 – FO	10% Opacity	Clean Fuels Good Combustion
Shady Hills Pasco, FL	12 – NG 20 – FO	1.4 – NG 7 – FO	10 lb/hr – NG 17 lb/hr – FO	Clean Fuels Good Combustion
Vandolah Hardee, FL	12 – NG 20 – FO	1.4 – NG 7 – FO	10 lb/hr – NG 17 lb/hr – FO	Clean Fuels Good Combustion
Oleander Brevard, FL	12 – NG 20 – FO	3 – NG 6 – FO	10% Opacity	Clean Fuels Good Combustion
JEA Baldwin, FL	12 – NG 20 – FO	1.4 – NG/FO Not PSD	9/17 lb/hr – NG/FO 10% Opacity	Clean Fuels Good Combustion
Reliant Osceola, FL	10.5 – NG 20 – FO	2.8 lb/hr – NG 7.5 lb/hr – FO	9 lb/hr – NG 17 lb/hr – FO	Clean Fuels Good Combustion
TEC Polk Power, FL	15 – NG 33 – FO	7 – NG 7 – FO	10% Opacity	Clean Fuels Good Combustion
Dynegy, FL	25 – NG		8.2 lb/hr – NG 10% Opacity	Clean Fuels Good Combustion
Dynegy Heard Co., GA	25 – NG	? - NG	0.005 lb/mmBtu – NG 10% Opacity	Clean Fuels Good Combustion
Tenaska Heard Co., GA	15 – NG 20 – FO	? – NG ? – FO	? – NG ? lb/hr – FO	Clean Fuels Good Combustion
Calvert City, KY	30 – NG (full load) 90 – NG (other loads)	? - NG	? - NG	Clean Fuels Good Combustion
Mid-GA Cogen	10 – NG 30 – FO	6 – NG 30 – FO	18 – NG 55 lb/hr – FO	Clean Fuels Good Combustion
Dynegy 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
Lyondell Harris, TX	25 – NG			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
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
Carson Energy, CA	6 – NG			Oxidation Catalyst
McClelland AFB, CA	23 – NG	3.9 - NG	7 lb/hr	Clean Fuels Good Combustion
Lakeland, FL	25 - NG or 10 by Ox Cat 75 - FO @ 15% O_2	4 – NG 10 – FO	10% Opacity	Clean Fuels Good Combustion
PREPA, PR	9 – FO @15% O_2	11 – FO @15% O_2	0.0171 gr/dscf	Clean Fuels Good Combustion

REVIEW OF NITROGEN OXIDES CONTROL TECHNOLOGIES:

Some 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.

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.

The relationship between flame temperature, firing temperature, unit efficiency, and NO_X formation can be appreciated from Figure 1 which is from a General Electric discussion on these principles.

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 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 a significant issue for the Granite project because these units will not be continuously operated, but rather will be "peakers". Also, low sulfur fuel oil (which has more fuel-bound nitrogen than natural gas) is proposed to be used for no more than 500 hours per year (per CT).

Uncontrolled emissions range from about 100 to over 600 parts per million by volume, dry, corrected to 15 percent oxygen (ppmvd @15% O_2). The Department estimates uncontrolled emissions at approximately 200 ppmvd @15% O_2 for each turbine of the Granite Project. The proposed NO_X controls will reduce these emissions significantly.

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 may increase emissions of both of these pollutants.

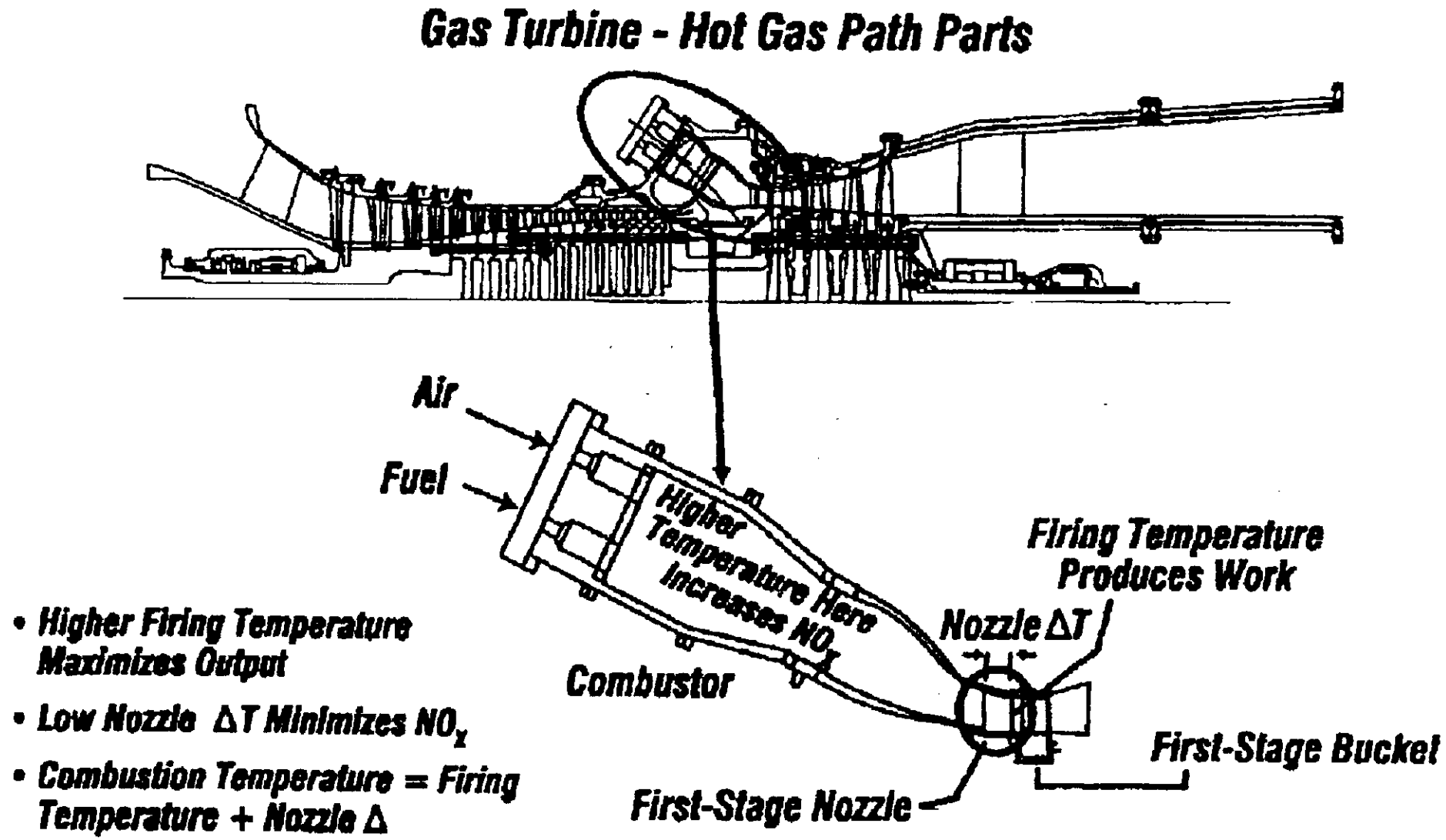


Figure 1 – Relation Between Flame Temperature and Firing Temperature

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 2 for a 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.

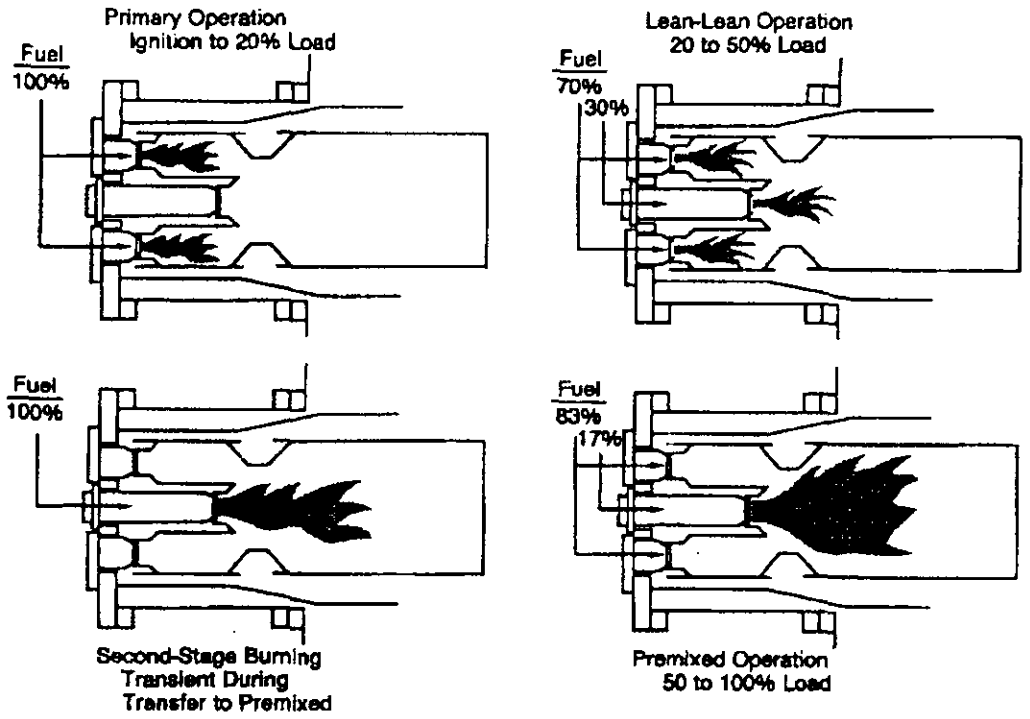
To further reduce NO_X emissions, GE developed the DLN-2.0 (cross section shown in Figure 2) wherein air usage (other than for premixing) was minimized. The venturi and the centerbody assembly were eliminated and each combustor has a single burning zone. So-called "quaternary fuel" is introduced through 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. 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 3 for a unit tuned to meet a 15 ppmvd NO_X limit (by volume, dry corrected to at 15 percent oxygen) at JEA'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 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 ppm of NO_X and 9 ppm of CO. Emissions characteristics by wet injection NO_X control 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 4. Simplified cross sectional views of the totally premixed (while firing natural gas) DLN-2.6 combustor (a candidate for the GPP Hardee project) are shown in Figure 5.

Figure 6 shows some of the burners typically used in Westinghouse products including the 501F and 501D5A turbines proposed as options for this project. These combustors incorporate lean premixed fuel mixing zones surrounding a central pilot.[1] The central pilot provides stability but limits the ability to achieve very low NO_X generation. The characteristics of the gas-only burners to be installed on a Westinghouse 501F at a project in Florida are shown in Figure 7.



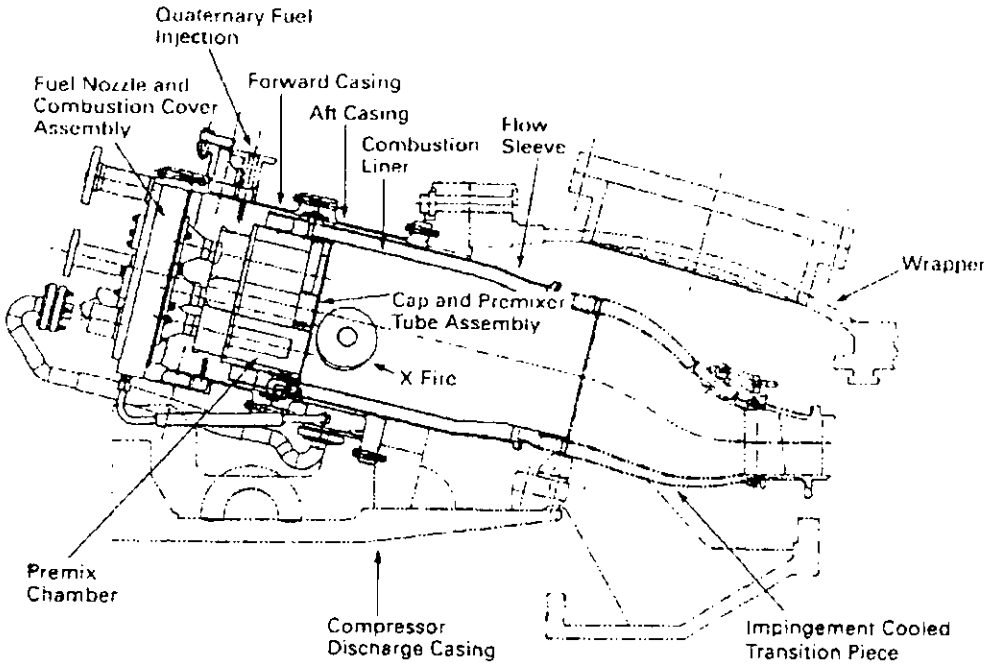


Figure 2 – Dry Low NO_X Operating Modes – DLN-1
Cross Section of GE DLN-2

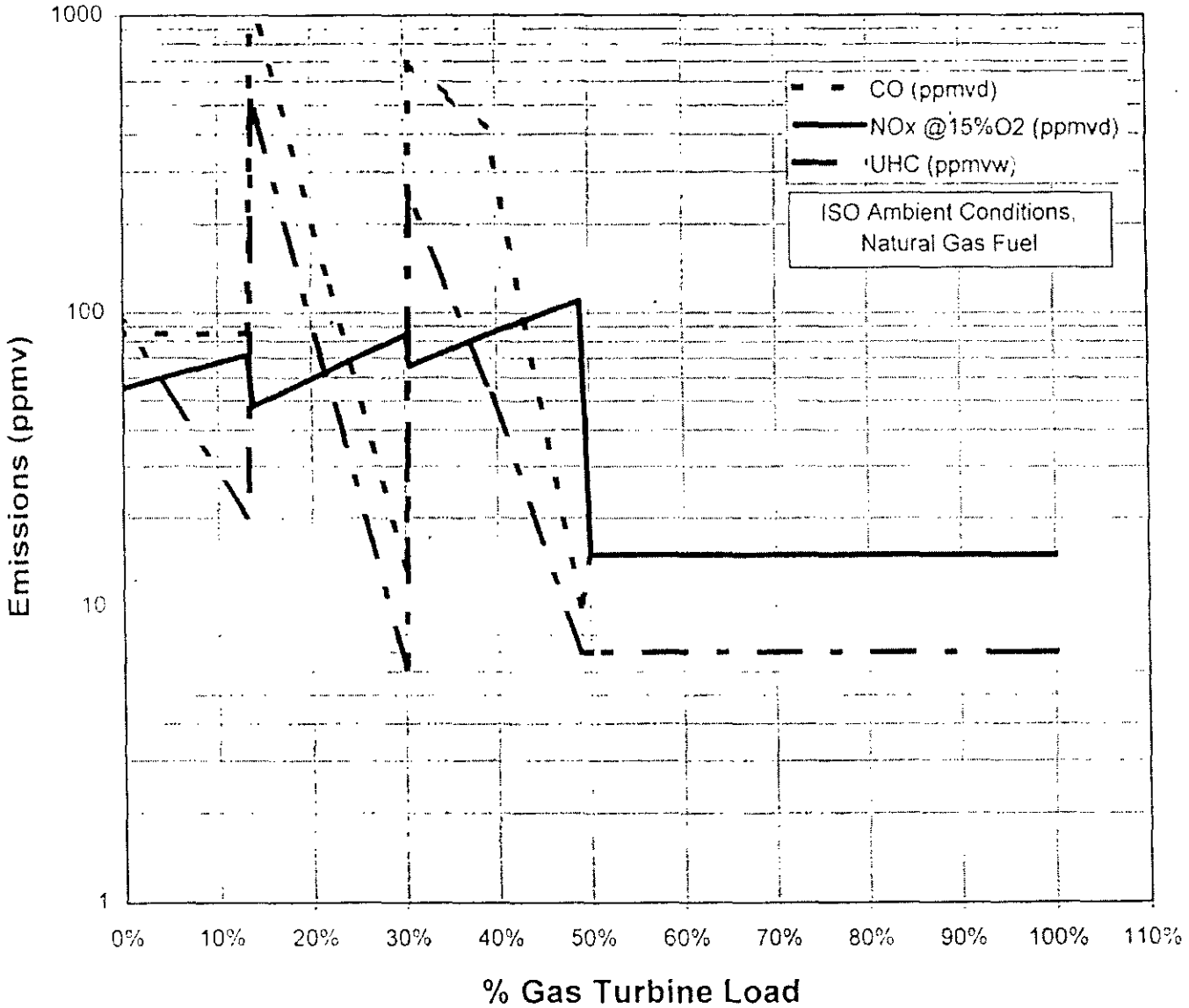


Figure 3 – Emissions Performance Curves for GE DLN-2.6 Combustor Firing Natural Gas in a Dual Fuel GE 7FA Combustion Turbine

(Simple Cycle Intermittent Duty – If Tuned to 15 ppmvd NO_X)

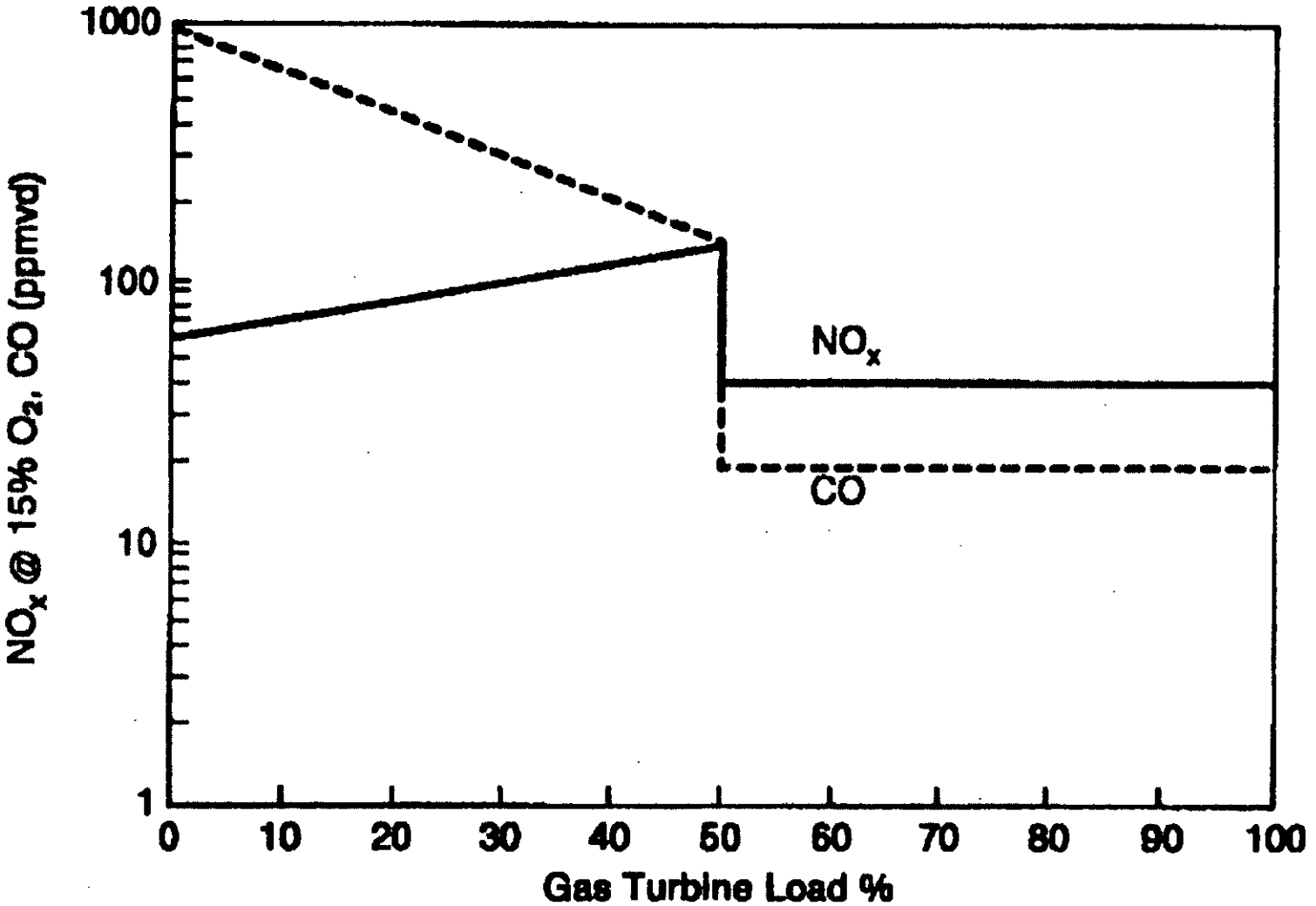


Figure 4 – Emissions Performance for DLN-2 Combustors Firing Fuel Oil in Dual Fuel GE 7FA Turbine

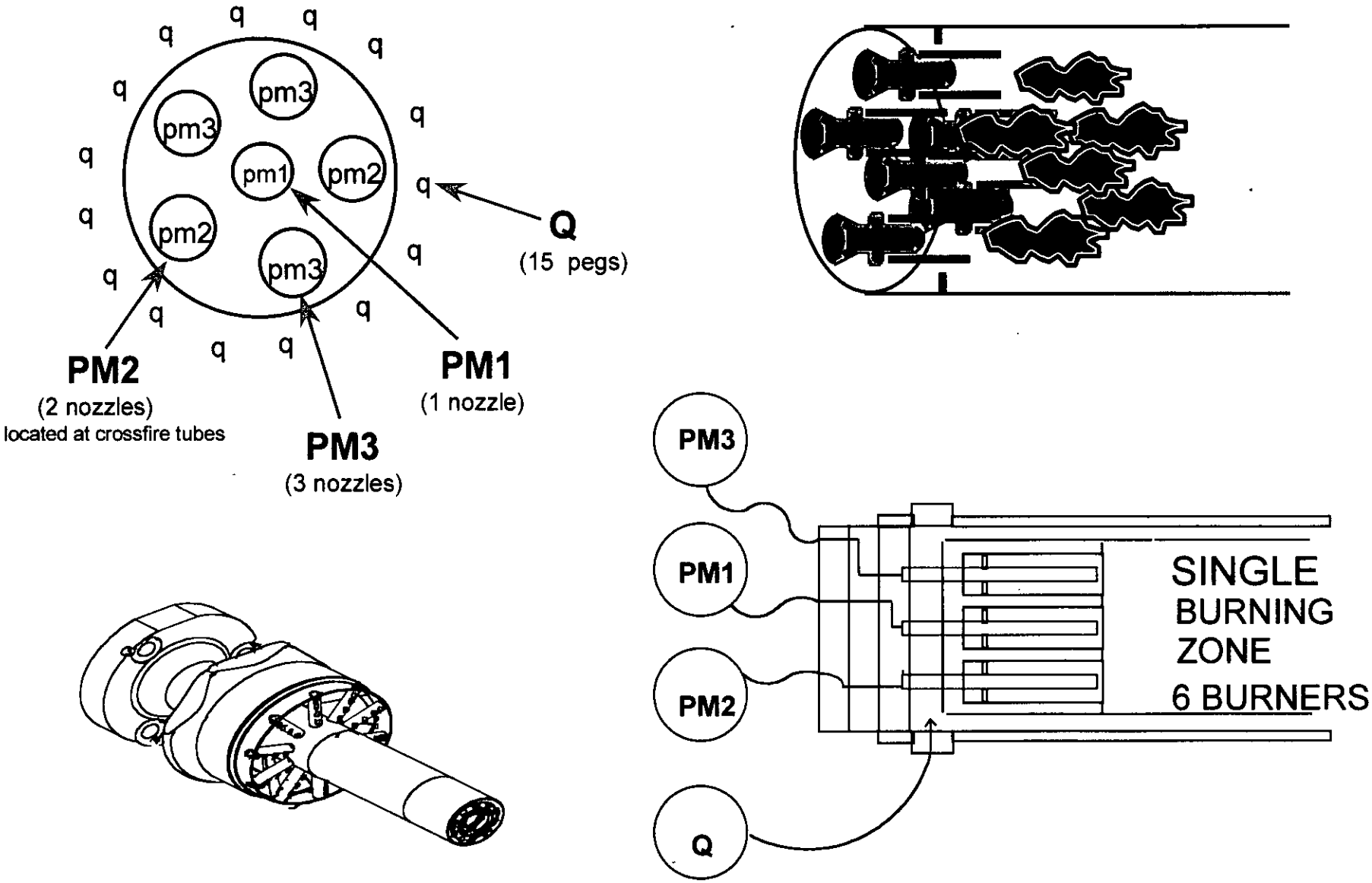


Figure 5 - DLN2.6 Fuel Nozzle Arrangement

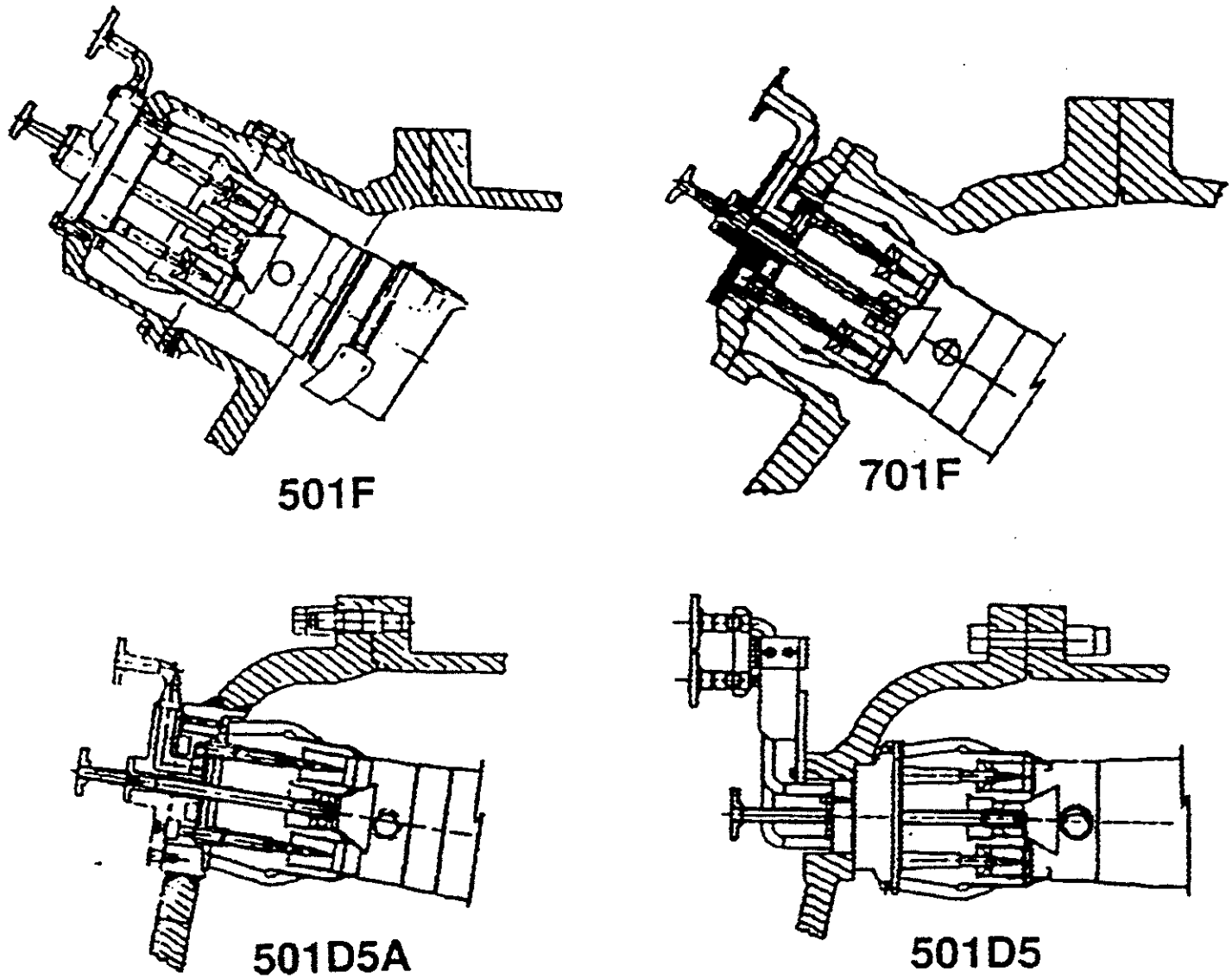


Figure 6 – Typical Westinghouse DLN Combustors

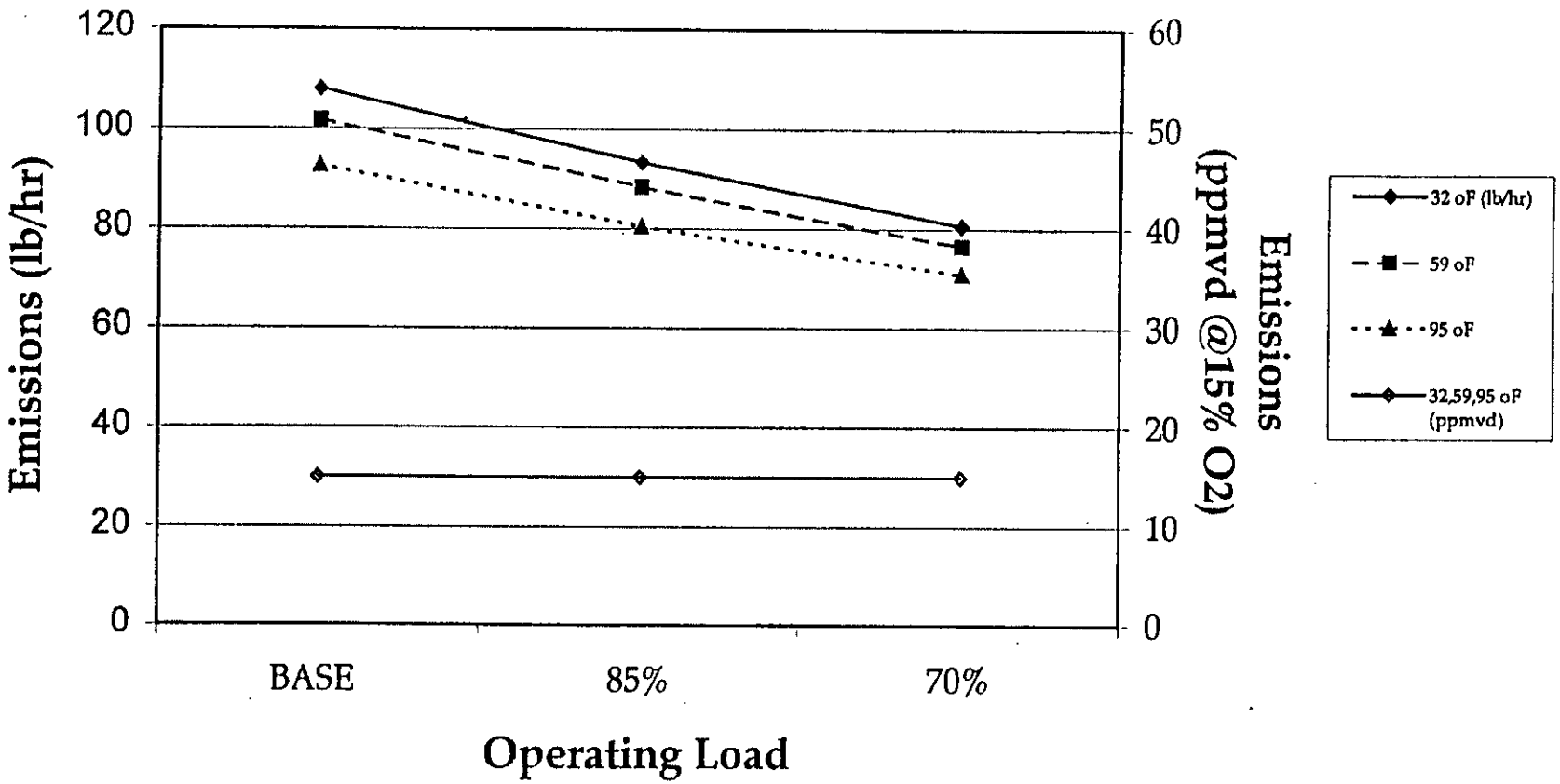


Figure 7 – Emissions Performance for WH501 Combustors Firing Natural Gas Only (Source: Dynegy Palmetto Power Project)

Westinghouse is evaluating and testing fully pre-mixed systems as well as a partial catalytic combustion system.[2] The latter will use the premixed fuel mixing zones, but will replace the central pilot with a flameless catalytic component (see catalytic combustion below).

The ABB GT24 takes an approach known as Sequential Combustion. There are two annular combustion chambers which utilize so-called EV (Environmental) and SEV (Sequential EV) burners, respectively. Sequential combustion means that fuel is injected simultaneously in both chambers, in a manner that provides higher specific output and efficiency. The precise sequence is described by ABB as follows[3]:

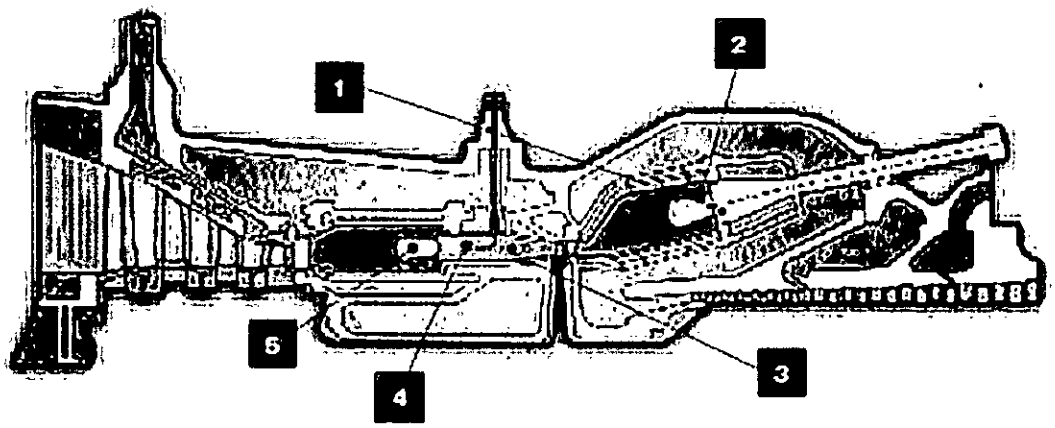


Figure 8 – ABB GT24/26 Sequential Combustion

1. Compressed air is fed into the double-cone EV burner, creating a homogeneous, lean fuel/air mixture. The vortex flow, induced by the shape of the burner, breaks down at the EV burner exit into the combustion zone, forming a recirculation zone.
2. The mixture ignites into a single, low temperature flame ring. The recirculation zone stabilizes the flame in free space within the combustion zone, avoiding contact with the combustor wall.
3. The hot exhaust gas exits this first combustor, moving through the high pressure turbine stage before entering the SEV combustor.
4. Vortex generators in the SEV combustor enhance the SEV mixing process, while carrier air, injected with the fuel at the fuel lance, delays spontaneous ignition until outside of the SEV combustor.
5. Ignition occurs when the fuel reaches self-ignition temperature in the free space of the SEV combustion zone. The hot gas then continues its path into the low pressure turbine.

The Department does not have emissions characteristics for the ABB GT24 product. Granite proposes a NO_X limit of 25 ppmvd for this option.

An important consideration is that power and efficiency are sacrificed in the effort to achieve low NO_X by combustion technology. This limitation is seen in Figure 9 from an EPRI report.[4] Basically developments such as single crystal blading, aircraft compressor design, high technology blade cooling have helped to greatly increase efficiency and lower capital costs. Further improvements are more difficult in large part because of the competing demands for air to support lean premix combustion and to provide blade cooling. New concepts are under development by all of the manufacturers to meet the challenges implicit in Figure 9.

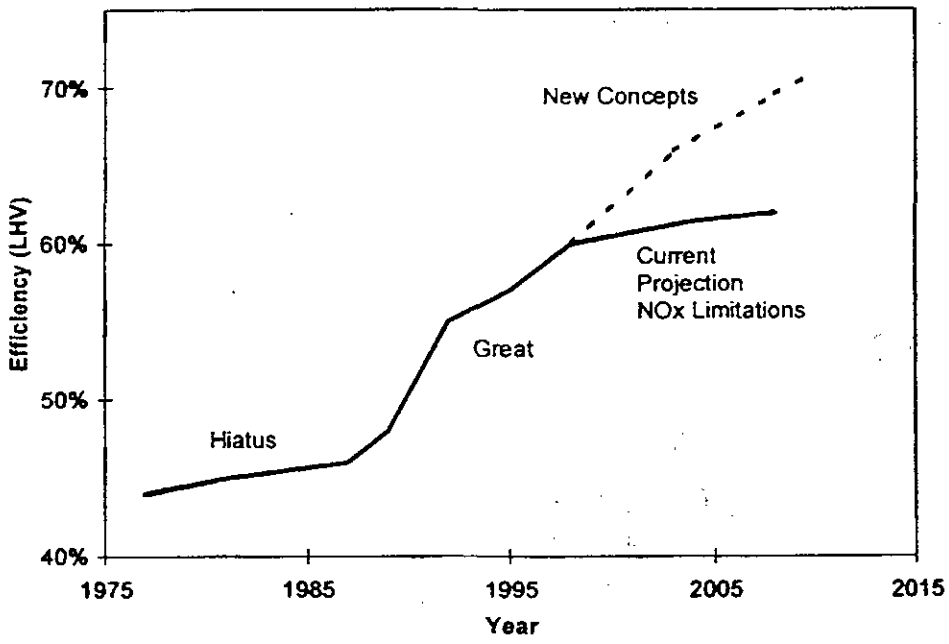


Figure 9 – Efficiency Increases in Combustion Turbines

Further NO_X reductions related to flame temperature control are possible such as closed loop steam cooling. This feature is available only in larger units (G or H Class technology) than the ones under consideration by Granite. It is more feasible for a combined cycle unit with a heat recovery steam generator (HRSG). In simple cycle, a once-through steam generator would be required. Steam is circulated through the internal portion of the nozzle component, the transition piece between the combustor and the nozzle, or certain turbine blades. The difference between flame temperature and firing temperature into the first stage is minimized and higher efficiency is attained. Flame temperatures and NO_X emissions can therefore be maintained at comparatively low levels even at high firing temperatures (refer back to figure 1). At the same time, thermal efficiency should be greater when employing steam cooling instead of air cooling.

At the present time, emissions achieved by combustion controls are as low as 9 ppmvd from large simple cycle gas turbines. Specialized dual fuel DLN burners were installed in a project in Israel[5], but their performance on fuel oil is not known to the Department. Mitsubishi (who also make a 501F) is also developing a dual-fuel DLN Optimization of premix fuel-air nozzle and performance was verified in high-pressure combustion tests. Commissioning tests on gas and oil burning were completed at an undesignated site.[6] The details are not available in English.

Catalytic Combustion

Catalytic combustion involves using a catalytic bed to oxidize a lean air and fuel mixture within a combustor instead of burning with a flame as described above. In a catalytic combustor the air and fuel mixture oxidizes at lower temperatures, producing less NO_X.[7] In the past, the technology was not reliable because the catalyst would not last long enough to make the combustor economical.

There has been increased interest in catalytic combustion as a result of technological improvements and incentives to reduce NO_X emissions without the use of add-on control equipment and reagents. As previously mentioned, Westinghouse is working to replace the central pilot in its DLN technology with a catalytic pilot in a project with Precision Combustion Inc.

Catalytica has developed a system know as 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.

In 1998, Catalytica announced the startup of a 1.5 MW Kawasaki gas turbine equipped with XONON™.[8] The turbine is owned by Catalytica and is located at the Gianera Generating Station of Silicon Valley Power, a municipally owned utility serving the City of Santa Clara, California. Previously, this turbine and XONON™ system had successfully completed over 1,200 hours of extensive full-scale tests at a project development facility in Oklahoma which documented XONON's ability to limit emissions of NO_X to less than 3 ppmvd.

Recently, Catalytica and GE announced that the XONON™ combustion system has been specified as the preferred emissions control system with GE 7FA turbines that have been ordered for Enron's proposed 750 MW Pastoria Energy Facility.[9] The project will enter commercial operation by the summer of 2001.

In principle, XONON™ will work on a simple cycle project. However, the Department does not have information regarding the status of the technology to for fuel oil firing and cycling operations.

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 becoming more available. Catalyst formulation improvements have proven effective in resisting sulfur-induced performance degradation with fuel oil in Europe and Japan, where conventional SCR catalyst life in excess of 4 to 6 years has been achieved, while 8 to 10 years catalyst life has been reported 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. Only one combustion turbine project in Florida (FPC Hines Power Block 1) employs SCR. 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 time the units were to start up in 1998. Seminole Electric will install SCR on a previously permitted 501F unit at the Hardee Unit 3 (Paynes Creek) project. The reasons are similar to those for the FPC Hines Power Block I.

Permit limits as low as 2.0 to 3.5 ppmvd NO_X have been specified using SCR on combined cycle F Class projects throughout the country. The recently permitted Kissimmee Cane Island Unit 3 project is one example.[10]

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.

$SCONO_X$™

$SCONO_X$™ is a catalytic add-on 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 molecular nitrogen during a regeneration cycle that requires dilute hydrogen gas. The technology has been demonstrated on small units in California and has been purchased for a small source in Massachusetts.[11]

California regulators and industry sources have stated that the first 250 MW block to install $SCONO_X$ ™ will be at PG&E's La Paloma Plant near Bakersfield.[12] The overall project includes several more 250 MW blocks with SCR for control.[13] 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 equipped with $SCONO_X$™.

$SCONO_X$™ 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 $SCONO_X$ ™ process include in addition to the reduction of NO_X, the elimination of ammonia and the control of VOC and CO emissions. $SCONO_X$™ has not been applied on any major sources in ozone attainment areas.

Recently EPA Region IX acknowledged that $SCONO_X$™ was demonstrated in practice to achieve 2.0 ppmv NO_X. [14] Permitting authorities planning to issue permits for future combined cycle gas turbine systems firing exclusively on natural gas, and subject to LAER must recognize this limit which, in most cases, would result in a LAER determination of 2.0 ppmv.

According to a recent press release, the Environmental Segment of ABB Alstom Power offers the technology (with performance guarantees) to "all owners and operators of natural gas-fired combined cycle combustion turbines, regardless of size."[15]

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

REVIEW OF SULFUR DIOXIDE (SO_2) AND SULFURIC ACID MIST (SAM)

SO_2 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 SO_2.

For this project, the applicant has proposed as BACT the use of 0.05% sulfur oil and pipeline natural gas. The applicant estimated total emissions for the project at 108 TPY of SO_2 and 14 TPY of SAM. The Department expects the emissions to be lower because of the limited oil consumption and the typical natural gas in Florida that contains less than 2 grain of sulfur per 100 standard cubic feet (gr S/100scf). This value is well below the "default" maximum value of 20 gr. S/100 scf, but high enough to require a BACT determination.

REVIEW OF PARTICULATE MATTER (PM/PM_{10}) 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 (PM_{10}).

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 500 hours per year making any conceivable add-on control technique for PM/PM_{10} either unnecessary or impractical.

A technology review indicated that the top control option for PM/PM_{10} is a combination of good combustion practices, fuel quality, and filtration of inlet air. Total annual emissions of PM_{10} for the project are expected to be approximately 125 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 ppm. 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.[16]

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 are typically permitted between 10 and 25 ppmvd at full load while firing gas. The ranges of 6-16 and 20-25 ppm for gas and oil respectively at baseload proposed in Granite's original application are within the range of recent determinations for simple cycle CO BACT determinations.

There is a great deal of uncertainty regarding actual CO emissions from installed units. Despite the relatively high BACT limits typically proposed, much lower emissions have actually been reported from several facilities without use of oxidation catalyst. For example, although Westinghouse does not offer a single digit CO guarantee on the 501F, the units installed at the FPC Hines Energy Complex achieved CO emissions in the range of 1-3 ppmvd on both gas and fuel oil.[17] GE 7FA units achieved similar results when firing gas at the FPL Martin Power Plant.[18]

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, particularly for simple cycle combustion turbines. The high flame temperature is very efficient at destroying VOC. The applicant has proposed good combustion practices to control VOC. The ranges of 1.2 to 3 ppmvw (gas) and 7 to 10 ppmvw (oil) at baseload proposed in Granite's original application are roughly within the range of recent determinations for simple cycle CO BACT determinations.

BACKGROUND ON PROPOSED GAS TURBINES

GPP plans the purchase of three simple cycle gas turbines. They have not yet determined from which manufacturer they will purchase the units. The most obvious difference between the units under consideration is their performance with respect to NO_X emissions.

Typically, companies obtain a guarantee from GE to achieve 9 ppmvd during a 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. With the frequent start-ups and shutdowns of the units, some applicants are concerned about the ability to maintain the low NO_X values for long periods of time. As a result, some of them agreed to a "new and clean" limit of 9 ppmvd but requested a continuing BACT limit of 10.5 ppmvd.

As detailed in the table above, the Department has issued quite a number of permits for simple cycle GE 7FA requiring achievement of 9-10.5 ppmvd without the requirement of any additional control equipment. The ones with limits of 9 ppmvd are allowed to operate for as many as 1000 hours per year on back-up fuel oil whereas the ones permitted at 10.5 ppmvd are allowed only 750 hours per year of fuel oil. A smaller GE unit known as the 7EA can routinely achieve 9 ppmvd NO_X or lower based on numerous installations in Florida and elsewhere. The 7EA has a lower flame temperature, compression ratio, and power rating (85 MW versus 170) than the 7FA.

The ability to meet a NO_X emission limit of 9 ppmvd by DLN technology involves a substantial efficiency and energy penalty as previously discussed. For example, the 7FA is characterized by a 15.5:1 compression ratio, a 2400 °F firing temperature, 56 percent efficiency, and produces 263 MW in combined cycle. On the other hand, GE offers more efficient F-Class model known as the 7FB, but guarantees a NO_X limit of 25 ppmvd by DLN.

The 7FB is characterized by an 18.5:1 compression ratio, a 2500 °F firing temperature, 57.3 percent efficiency, and produces 280 MW in combined cycle. The clear implication is that the power penalty to reduce NO_X from 25 to 9 ppmvd by DLN technology alone is on the order of 20 MW for a combined cycle (roughly 13 MW on a simple cycle unit).[19]

Granite proposes to meet 15 ppmvd at startup for Westinghouse 501F option for this project. However the Department is not aware of any Westinghouse 501F installations where 15 ppmvd is actually achieved (or even proposed at startup) when burning gas in a dual-fuel burner. The Department is aware that this type of unit was proposed for the Calvert City Project in Kentucky. The proposed limit was to be accomplished by wet injection. EPA objected to the issuance of the PSD and Title V Operation Permit for this facility and requires achievement of 15 ppmvd or lower.[20]

FPC recently requested that the Department provide until October, 2001 to install dual fuel combustors capable of meeting 12 ppmvd when burning gas at the existing Hines Energy Complex. The existing 501F units are controlled to that level with SCR technology.[21] The Department is reviewing a separate application from Dynegy, who have proposed a gas-only project based on the Westinghouse 501F combustion turbine. Dynegy requested a limit for NO_X of 15 ppmvd.

According to the application, the Westinghouse 501F and the GE7FA have similar characteristics (e.g. 9,150 versus 9,370 mmBtu/KWh and 170 MW nominal ratings at 59°F). In order to achieve 9 ppmvd NO_X, Westinghouse needs time and a breakthrough that allows the central pilot flame to operate in fully, but stable, pre-mixed mode or in catalytic combustion.

Granite proposes to meet 15 ppmvd at startup for the 501D5A option for this project. The 501D5A units at Mid-Georgia Cogen can possibly achieve less than 15 ppmvd NO_X while burning gas in a dual fuel burner.[22] This is logical based on the lower firing temperature, compression ratio and power rating of the 501D5A compared with the 501F. The Department does not have reasonable assurance, such as a manufacturer guarantee or actual test results to support a lower limit.

For the ABB GT24 option, GPP proposes to meet a limit of 25 ppmvd by DLN technology while firing gas. According to one reference, the Berkshire Power combined cycle ABB GT-24 at Agawam, Connecticut "is being fitted with a catalyst to bring the NO_X level from 15 to 3.5 ppmvd."[23] This implies that the unit might achieve 15 ppmvd in simple cycle operation. However conversations with ABB Environmental suggest that a 15 ppmvd guarantee is not yet available.[24]

The ABB GT24 is characterized by a 30:1 compression ratio and 58 percent efficiency in combined cycle. It is not surprising that some compromises were made which resulted in greater power, higher efficiency but slowed progress toward single-digit NO_X emissions. According to ABB, "rather than just concentrating on ever lower NO_X levels, ABB has chosen a total solution that limits pollutants and at the same time increases energy efficiency."[25] A lower compression, lower efficiency version of the ABB GT24 might not have the difficulty achieving 15 or even 9 ppmvd by DLN technology alone.

DEPARTMENT BACT DETERMINATION

Following are the BACT limits determined for the GPP Hardee project assuming full load. Values for NO_X are corrected to 15% O_2 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 Nos. 20 through 25 of the air construction permit.

Turbine Model	NO_X ppmvd	CO ppmvd	VOC ppmvw	PM - lb/hr opacity	SO_2/SAM Fuel Sulfur	Comments
GE 7FA	10.5 - NG 42 - FO	16 – NG 20 – FO	3 – NG 7.5 – FO	10/17 lb/hr – NG/FO 10% Opacity	.02 gr/dscf 0.05 % S	500 hrs on fuel oil
WH 501F	15 – NG	16 – NG 20 – FO	3 – NG	10 lb/hr– NG 10% Opacity		No fuel oil firing
WH 501D5A	15 – NG	16 – NG 20 – FO	3 – NG	10 lb/hr– NG 10% Opacity		No fuel oil firing
ABB GT-24	5 - NG 10/42 - FO	16 – NG 20 – FO	3 – NG 7.5 - FO	10/17 lb/hr – NG/FO 10% Opacity	.02 gr/dscf 0.05 % S	First 250 hrs on FO at 42 ppmvd Additional 250 hrs at 10 ppmvd

RATIONALE FOR DEPARTMENT'S DETERMINATION

- The Top technology and Lowest Achievable Emission Rate (LAER) for simple cycle combustion turbines are Hot SCR and an emission limit of 5 ppmvd NO_X.
- It is possible that catalytic combustion technology such as XONON™ can be applied to this project, but only for the GE 7FA option in the foreseeable future. Theoretically XONON can achieve the 5 ppmvd NO_X value and would equate to the top technology.
- An example of the top technology is the Carson Plant in Sacramento, California where there is a Hot SCR system on a simple cycle LM6000PA combustion turbine with a limit of 5 ppmvd.
- Hot SCR is proposed as LAER for the Sacramento Municipal Utilities District simple cycle GE 7EA project at McClellan Air Force Base to achieve 5 ppmvd by Hot SCR.
- The levelized costs of NO_X removal by Hot SCR for the worst case option (ABB GT-24) were estimated in Granite's application as $9,394 per ton. This assumes: 2,500 hours of operation on natural gas; 500 hours on fuel oil; reduction from 25 to 3.5 ppmvd on gas; and reduction from 42 to 10 ppmvd on fuel oil. The capital costs were estimated at $28,344,000. Annualized costs were estimated at $7,405,000.
- In the face of a real requirement to install Hot SCR, a system could be engineered to cool the gases and use the heat in a recuperator of some kind. Additionally a once-through steam generator could accomplish the same end with the generated steam used for steam augmentation. This could increase revenues to defray some of the additional equipment and possibly reduce the cost-effectiveness values.
- While the capital and annualized costs of Hot SCR for the GE and Westinghouse products will be less compared to the ABB product, the levelized costs will be greater. The Department already determined that Hot SCR is not cost-effective for several simple cycle GE 7FA projects that will achieve 9 to 10.5 ppmvd NO_X without a Hot SCR system.

- The proposed emission limit of 25 ppmvd NO_X for the ABB GT-24 option is too high compared with the 10.5 limit for the similar class GE product. The added power and efficiency characteristics of the ABB GT-24 do not justify a BACT for NO_X more than twice that of the GE product.
- The Department is aware of technical difficulties encountered with Hot SCR at the PREPA project where smaller ABB GT-11 gas turbines were used. The chief problem at PREPA relates to the exclusive use of 0.15 percent sulfur fuel oil. The Department believes that such problems will be minimized for the Granite project by use of natural gas and only occasional use of 0.05 percent sulfur backup fuel oil.
- BACT for the ABB option is determined to be 5 ppmvd by Hot SCR while firing natural gas. Up to 250 hours of fuel oil operation are permitted with the Hot SCR system off (NO_X equal to 42 ppmvd) and another 250 hours are permitted with the Hot SCR system in operation (NO_X equal to 10 ppmvd).
- The proposed emission limit of 15 ppmvd for the Westinghouse 501 D5A option is higher than the 10.5 limit for the GE 7FA product. The Department is aware of a Westinghouse 501D5A dual-fuel burner (Mid-Georgia Cogen) that can probably achieve 15 ppmvd of NO_X when firing gas. BACT for the Granite Westinghouse 501 D5A option is determined to be 15 ppmvd and exclusive use of natural gas. No fuel oil operation is permitted.
- The proposed emission limit of 15 ppmvd for the Westinghouse 501 F option is higher than the 10.5 limit for the similar class GE 7FA product. The Department is not aware of a Westinghouse 501F dual-fuel burner that can achieve 15 ppmvd of NO_X when firing gas. Region IV has advised the State of Kentucky that a limit of 15 ppmvd (or lower) is required for the Calvert City project which is based on the Westinghouse 501F. BACT for Granite's Westinghouse 501F option is determined to be 15 ppmvd and exclusive use of natural gas. No fuel oil firing is authorized.
- The units will be operated in intermittent duty and simple cycle mode. Therefore control options, which are feasible only for combined cycle units, are not applicable. This rules out Low Temperature (conventional) SCR, which achieves 3.5 ppmvd NO_X or lower. It also rules out the possibility of $SCONO_X$.
- The Department is aware that ABB offers a DLN technology for fuel oil firing applicable to at least certain smaller combustion turbines (ABB-GTX). GE and Mitsubishi are experimenting with DLN technologies on 7FA and 501F units. It is doubtful that this technology would be cost-effective except when fuel oil is the main fuel and where water resources are scarce. The Department will continue to monitor developments in this field.
- It is possible that the NO_X emissions while firing oil from may be reduced from 42 ppmvd by increasing the water injection rate. 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 have been achieved.

- VOC emissions will initially be set at 3 ppmvd while firing gas and 7.5 while firing fuel oil. The Department will finalize BACT for VOC after Granite advises the Department which specific unit it has selected for the project.
- Granite evaluated the use of an oxidation catalyst to control CO for the project. The oxidation catalyst control system was estimated to increase the capital cost of the project by $5,839,000 with an annualized cost of $1,534,000 and a levelized cost of $3,312 per ton of CO removed. The Department does not necessarily adopt this estimate, but would agree that even lower estimates would not be cost-effective for removal of CO.
- The Department will initially set CO limits achievable by good combustion at full load as 16 ppm (gas) and 20 ppm (oil). The GE, Westinghouse 501 F and ABB-GT-24 models should be capable of easily meeting these values based on the high firing temperatures. The Westinghouse 501D5A should also meet these values based on the experience of the Mid-Georgia Cogen facility. The Department will finalize BACT for CO after Granite advises the Department which specific unit it has selected and after assessing the possible effects on NO_X control.
- BACT for PM_{10} 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. The emission limits for PM_{10} will be set at 10 pounds per hour during gas operation and 17 pounds per hour while operating on fuel oil.
- The Department will set a Visible Emission standard of 5 and 10 percent opacity as BACT for natural gas and fuel oil firing, respectively, consistent with the definition of BACT.

POLLUTANT	COMPLIANCE PROCEDURE
PM_{10}	Method 5 or 17
Visible Emissions	Method 9
Carbon Monoxide	Annual Method 10 (can use RATA)
NO_X (performance)	Annual Method 20 (can use RATA if at capacity)
NO_X (gas - 24-hr block average) (oil – 3-hr block average) CO (24-hr block average)	NO_X and CO CEMS, O_2 or CO_2 diluent monitor, and flow device as needed. During gas operation, 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. A valid hourly emission rate shall be calculated for each hour in which at least two NO_X or CO concentrations are obtained at least 15 minutes apart. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C.
SO_2 and SAM	Custom Fuel Monitoring Schedule

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

A. A. Linero, P.E. Administrator
New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

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

Date:

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

Date:

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Florida Department of
Memorandum Environmental Protection

TO: Clair Fancy

FROM: Al Linero 4/12

DATE: April 12, 2000

SUBJECT: Hardee County Generation Facility
Three 120-180 MW Combustion Turbines
DEP File No. 0490044-001-AC (PSD-FL-281)

Attached is the public notice package for construction of three dual-fuel, intermittent duty, simple cycle, 120-180 MW combustion turbines and one 1.5 million gallon fuel oil storage tank at the planned Hardee Generation Facility.

The applicant presented four scenarios (turbine models) each of which consists of three combustion turbines. The possible models are 170 MW GE 7FA, 120 MW Westinghouse 501D5A, 170 MW Westinghouse 501F, 170 MW GE 7FA, and 180 MW ABB GT-24. Because the capabilities of these machines vary greatly, the BACT determinations are different.

Nitrogen Oxides (NO_X) emissions from the GE 7FA units will be controlled by Dry Low NO_X (DLN-2.6). The applicant proposed an NO_X emission limit of 10.5 ppmvd @15% O_2. We are requiring compliance on a continuous (24-hour average) basis. The use of fuel oil will be allowed up to 500 hours per year per unit in recognition of the low simple cycle NO_X limit on gas. NO_X from the Westinghouse 501D5A and 501F units will be controlled by DLN to 15 ppmvd. No fuel oil will be allowed. NO_X from the ABB GT-24 unit will be controlled by Hot SCR to 5 ppmvd. Fuel oil will be allowed for 500 hours per year as requested.

The NO_X limits and fuel oil usage proposed for the GE and Westinghouse units are consistent with our recent determinations. For example, the Dynegy Palmetto Project permit allows no fuel oil use but allows 15 ppmvd NO_X. We have issued several permits for GE 7FA units with limits at 10.5 and less than 1000 hours of fuel oil use. There is no remedy but to install SCR on the ABB GT-24 unit because (like the Lakeland 501G simple cycle project) it can achieve only 25 ppmvd without add-on control.

Although different values were requested for CO, PM, and VOC for the different models, we propose the same values for all machines. They are tight enough to be recognized as BACT, but (in my opinion) are achievable by all of the proposed units.

I recommend your approval of the attached Intent to Issue.

AAL/al

Attachments

Note: This permit application is at ~Day 16 as of 4/12/00.
day

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

P.E. Certification Statement

Permittee:

DEP File No. 0490044-001-AC (PSD-FL-281)

Granite Power Partners II, L.P.
Hardee County Generation Facility
Hardee County

Project type:

Project is construction of three gas and oil-fired simple cycle combustion turbine-electrical generators with 100-foot stacks, a natural gas-fired heater, and one 1.5-million gallon storage tank. The manufacturer and model of the units have not yet been selected. The options are General Electric 7FA (170 MW), Westinghouse 501D5A (120 MW), Westinghouse 501F (170 MW) or ABB Alstom GT-24 (180 MW). The combustion turbines operate a maximum of 3,000 hours per year per unit of which 0-500 hours (depending on the manufacturer and model) per year per unit may be on No. 2 distillate fuel oil.

Depending on the manufacturer, model, and the control equipment, the units must meet a limit of 5 to 15 parts per million by volume, dry, at 15% oxygen (ppmvd) while burning natural gas. The units must meet 42 ppmvd by wet injection (or 10 ppmvd by selective catalytic reduction) when burning fuel oil. Other pollutants, including particulate matter (PM/PM_{10}), 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 Area) 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. — Date: 4/12/00
Registration Number: 26032

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4/12