Department of
Environmental Protection

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

September 22, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED
Mr. William Reichel, General Manager
FPL Fort Myers Plant
Post Office Box 430
Fort Myers, Florida 33905

Re: DEP File No. 0710002-004-AC
FPL Fort Myers Plant - 1500 MW Gas Repowering Project

Dear Mr. Reichel:

Enclosed is one copy of the Intent to Issue, Draft Air Construction Permit, and Technical Evaluation and Preliminary Determination for the referenced project at the FPL Fort Myers Plant, north of State Road 80, near Tice, Lee 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 OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT" must be published in the legal section of a newspaper of general circulation in Lee County. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please call Mr. Linero at 850/921-9523 or Ms. Teresa Heron at 850/921-9529.

Sincerely,

A. A. Linero, P.E.

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

CHF/aal

Enclosures

Is your RETURN ADDRESS completed on the reverse side?

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Consult postmaster for fee.

3. Article Addressed to:
Mr. William Reichel
FPL Ft. Myers Plant
P O Box 430
Ft. Myers, Fl 33905

4a. Article Number
Z 333 612 512

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

7. Date of Delivery
10-5-98

5. Received By: *(Print Name)*
JOHN J. Mack Jr

6. Signature: *(Addressee or Agent)*
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PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

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Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 0710002-004-AC 9-[illegible]-98 22	

PS Form **3800**, April 1995

In the Matter of an
Application for Permit by:

Mr. William Reichel, General Manager
FPL Fort Myers Plant
Post Office Box 430
Fort Myers, Florida 33905

DEP File No. 0710002-004-AC
1500 MW Gas Repowering Project
Lee 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, Florida Power & Light Company (FPL), applied on September 4,1998 to the Department to install six (6) gas-fired combined cycle units and auxiliary equipment to replace two (2) residual oil-fired steam generators at the Fort Myers Plant near Tice, Lee 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 is required to conduct the 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. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/ 922-6979). The Department suggests that you publish the notice within thirty days of receipt of this letter. You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit or other authorization. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

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

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

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, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. 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.

for 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, and the DRAFT permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 9-22-98 to the person(s) listed:

Mr. William Reichel, FPL*
Mr. Richard Piper, FPL
Ms. Peggy Highsmith, SD
Mr. Doug Neeley, EPA
Mr. John Bunyak, NPS
Mr. Ken Kosky, P.E., Golder Associates
Mr. Peter Cunningham, Esq., HGSS

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.

(Clerk) 9-22-98 (Date)

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0710002-004-AC

Florida Power & Light Fort Myers Plant
1500 Megawatt Repowering Project
Lee County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Florida Power & Light Company (FPL). The permit is to install six combined cycle units to replace two (2) residual oil-fired steam generators at the Fort Myers Plant near Tice, Lee County. A Best Available Control Technology (BACT) determination was not required pursuant to Rule 62-212.400, F.A.C. The applicant's name and address are Florida Power & Light, Fort Myers Plant, Post Office Box 430, Fort Myers, Florida 33905.

Each unit is a nominal 170 megawatt General Electric MS7241FA gas-fired combustion turbine-generator with an unfired heat recovery steam generator (HRSG) that will raise sufficient steam to produce approximately another 80 MW via the existing steam-driven electrical generators. The boilers and the tall stacks associated with existing residual oil-fired units (593 MW total capacity) will be dismantled. The project is in-effect a "gas repowering of existing fossil-fuel fired units." The project also includes: a cooling tower for once-through brackish water; a small boiler or heaters to heat the natural gas prior to use; and two relatively short stacks per unit for simple and combined (with HRSG) operation.

Nitrogen Oxides (NO_X) emissions will be controlled by Dry Low NO_X (DLN-2.6) combustors capable of achieving emissions of 9 parts per million (ppm) by volume at 15 percent oxygen. Emissions of carbon monoxide (CO) will be controlled to 12 ppm, while emissions of volatile organic compounds (VOC) will be less than 1.4 ppm. Emissions of sulfur dioxide (SO_2), sulfuric acid mist (SAM), and particulate matter (PM/PM_{10}) will be very low because of the switch to inherently clean pipeline quality natural gas. There will be no provisions for firing fuel oil.

Although a BACT determination was not required, the proven capabilities of the selected units and the limits that FPL has accepted are more stringent than the requirements to-date for any combustion turbine project in Florida. There will be very substantial decreases in regulated air pollutants except for an insignificant increase in VOC emissions. The maximum potential annual emissions in tons per year are summarized below for comparison with recent annual emissions from Units 1 and 2 slated for retirement.

Pollutants	Units 1/2 Emissions	After Repowering	Increase (decrease)
PM/PM_{10}	607	313	(294)
SAM	915	21	(894)
SO_2	20,561	137	(20,424)
NO_X	7,095	1,845	(5,250)
VOC	47	82	35
CO	1,507	1,267	(240)

The lower NO_X emissions will reduce ozone (smog) formation potential and nitrate fallout. The lower PM/PM_{10}, SO_2 and SAM emissions will reduce visible emissions, fine particulate generation, and acid smut fallout. An air quality impact analysis was conducted. Impacts due to the proposed project emissions are all favorable and the net effect is a "creation of available increment" in the PSD Class I (Everglades) and Class II areas.

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

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

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

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

Florida Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida, 32301
Telephone: (850)488-1344
Fax: (850)922-6979

Florida Department of Environmental Protection
South District Office
2295 Victoria Avebnue, Suite 364
Fort Myers, Florida 33902-2549
Telephone: (941)332-6975
Fax: (941)332-6969

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 904/488-0114, for additional information.

TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

Florida Power & Light Company

Fort Myers Power Plant

1500 Megawatt Repowering Project

Lee County

DEP File No. 0710002-004-AC

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

September 22, 1998

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

Florida Power & Light Company
Fort Myers Power Plant
Post Office Box 430
Fort Myers, Florida 33905

Authorized Representative: William Reichel, Plant General Manager

1.2 Reviewing and Process Schedule

09-04-98: Date of Receipt of Application
09-22-98: Intent Issued

2. FACILITY INFORMATION

2.1 Facility Location

The Fort Myers Plant is located on 460 acres, north of State Road 80 and approximately 2.5 miles east of Tice, Lee County. This site is approximately 97 kilometers from Everglades National Park, a Class I PSD Area. The UTM coordinates of this facility are Zone 17; 422.3 km E; 2,952.9 km N.

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

The Florida Power & Light (FPL) Fort Myers Plant generates electric power from two residual fuel oil-fired steam units with a combined generating capacity of 593 megawatts (MW) and 12 distillate fuel oil-fired simple cycle combustion turbines with a combined generating capacity of 708 MW.

This facility is 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 100 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Per Table 62-212.400-2, modifications at the facility resulting in emissions increases greater than 40 TPY of NO_X or SO_2, 25/15 TPY of PM/PM_{10}, or 3 TPY of fluorides (F) require review per the PSD rules and a determination for Best Available Control Technology (BACT) per Rule 62-212.400, F.A.C. The present modification results in net emissions decreases or less-than-significant increases in PSD pollutants. Therefore the modification is not subject to PSD.

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.

3. PROJECT DESCRIPTION

This permit addresses the following emissions units:

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
018 - 023	Power Generation	Six (6) Combined Cycle Combustion Turbine-Generators with Unfired Heat Recovery Steam Generators
024	Fuel Heating	Natural Gas Boiler or Heater(s)
025	Water Cooling	Mechanical Draft Cooling Tower

Florida Power & Light Company (FPL) proposes to install six (6) natural gas-fired combined cycle units that will consist of six (6) nominal 170 MW (@ 59°F) combustion turbine-generators with heat recovery steam generators (HRSGs). These will replace the two existing residual oil-fired boilers at the Fort Myers Power Plant in Lee County. The HRSGs will raise steam to repower the existing steam turbines thus producing approximately another 80 MW of electricity per unit or 1500 MW for the six combined cycle units.

The project includes a mechanical draft cooling tower to reduce the temperature of the water discharged from the once-through condenser cooling system. A 98-foot bypass stack will be installed for each combustion turbine for simple cycle (non-HRSG) operation. A separate 125-foot stack will also be installed for each combustion turbine for combined cycle operation. An approximately 132 million Btu per hour (MMBtu/hr) gas-fired boiler or direct-fired heaters will be included as well as a 30-foot stack. This unit will be used to heat natural gas prior to combined cycle operation and during cold start-up.

Each unit will initially operate in simple cycle mode until the corresponding HRSG is installed and integrated with the existing steam turbines. The existing stacks and steam generators (boilers) will be dismantled within one year after complete implementation of combined cycle operation.

The turbines will be equipped with Dry Low NO_X (DLN-2.6) combustors for the control of NO_X emissions to 9 ppmvd at 15% O_2 from 50% load up to 100% load conditions during normal operations. Each turbine will have a nominal heat input of 1,600 million Btus per hour, lower heating value (MMBtu/hr, LHV) at 59°F. The HRSGs will not be supplementally fired and will raise steam only from hot (1100°F) combustion turbine exhaust.

Emission decreases will occur for carbon monoxide (CO), sulfur dioxide (SO_2), sulfuric acid mist ($H_2SO_{4\ mist}$ or SAM), particulate matter (PM/PM_{10}), and nitrogen oxides (NO_X). Emission increases of volatile organic compounds (VOC) will be less than the significant emission levels per Table 62-212.400-2, F.A.C. Therefore review for the Prevention of Significant Deterioration (PSD) is not required.

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.[1] Project specific information is interspersed where appropriate.

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

An exterior view of the GE MS 7001FA (a predecessor of the MS 7241FA) is shown in Figure 1. The key components are identified in Figure 2. The unit will be delivered with 14 can-annular design, DLN-2.6 combustors instead of those shown in Figure 2.

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

In the FPL project, the unit will operate primarily in combined cycle mode although FPL plans to operate the unit in simple cycle mode as well. Cycle efficiency, defined as a percentage of useful shaft energy output to fuel energy input, is approximately 35 percent for F-Class combustion turbines in 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 operation, the gas turbine drives an electric generator while the exhausted gases are used to raise steam in a heat recovery steam generator (HRSG). In this case, most of the steam is fed to a separate steam turbine which also drives an electrical generator. Figure 3 is a process flow diagram for combined cycle operation. The bypass stack is used when the unit operates in simple cycle mode. The main stack following the HRSG is required for combined cycle operation. In combined cycle mode, the thermal efficiency of the 7FA can exceed 56 percent.

At high ambient temperature, the units cannot generate as much power because of lower compressor inlet density. To compensate for a portion of the loss of output (which can be on the order of 20 MW compared to referenced temperatures), inlet foggers will be installed ahead of the combustion turbine inlet. At an ambient temperature of 95 °F, roughly 10 MW of power can be regained by using the foggers.

The FPL project is representative of *gas repowering* which is characterized by replacement of a conventional fossil fuel-fired steam unit with one or more combustion turbines and HRSGs. Typically, the existing boiler, stack, and fans are removed or abandoned, while the

existing steam turbines and related auxiliaries are retained as part of the repowered combined-cycle units.[2] This concept is shown in Figure 4.

The first gas repowering project in Florida was at the FPL Lauderdale Plant. FPL installed four (4) Westinghouse 501 F combustion turbines and HRSGs to replace two conventional units. The steam generators were kept. Summer generating capacity was increased from approximately 275 to 850 MW. Whereas the original units were used primarily as peaking units, the more efficient repowered plant has a high availability more representative of a baseload plant. A photograph of the FPL Lauderdale Plant is shown as Figure 5.

Additional process information related to the combustor design, and control measures to minimize NO_X formation are given in the control technology section below.

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 is located in Lee County, an area designated as attainment for all criteria pollutants in accordance with Rule 62-204.360, F.A.C. The proposed project is not subject to review under Rule 62-212.400., F.A.C., Prevention of Significant Deterioration (PSD), because the potential emission increases for PM/PM_{10}, CO, VOC and NO_X do not exceed the significant emission rates given in Chapter 62-212, Table 62-212.400-2, F.A.C.

This evaluation consists of a review of the control technology for PM/PM_{10}, VOC, CO, SO_2, and NO_X to insure that it is sufficient to restrict future emissions to levels lower than past emissions or increases in emissions to levels less than the significant emission rates as described above. An analysis of the air quality impact from proposed project is required to insure that there are no exceedances of the National or State Ambient Air Quality Standards.

The emission units affected by this 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 62-204.800	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 62-213	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	NSPS Subparts GG and Db
40 CFR 60	Applicable sections of Subpart A, General Requirements
40 CFR 72	Acid Rain Permits (applicable sections)
40 CFR 73	Allowances (applicable sections)
40 CFR 75	Monitoring (applicable sections including applicable appendices)
40 CFR 77	Acid Rain Program-Excess Emissions (future applicable requirements)

6. AIR POLLUTION CONTROL TECHNOLOGY

6.1 Applicant Control Technology Proposal

POLLUTANT	CONTROL TECHNOLOGY	PROPOSED LIMIT
Particulate Matter	Pipeline Natural Gas Combustion Controls	
Volatile Organic Compounds	As Above	1.4 ppm
Carbon Monoxide	As Above	12 ppm (CTs) 0.15 lb/mmBtu (Boiler)
Sulfur Dioxide	As Above	1 gr/100 scf (CTs)
Nitrogen Oxides	Dry Low NO_X Combustors (Cts) Dry Low NO_X Burners (Boiler)	9 ppm @ 15% O_2 (30 days) 0.10 lb/mmBtu (Boiler)

According to the application, the new units, will emit approximately 1,845 tons per year (TPY) of NO_X, 1,267 TPY of CO, 82 TPY of VOC, 137 TPY of SO_2, and 313 TPY of PM/PM_{10}.

6.2 Standards of Performance for New Stationary Sources

The minimum project control technology basis is 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). Subpart GG was adopted by the Department by reference in Rule 62-204.800, F.A.C. The key emission limits required by Subpart GG are 75 ppm NO_X @15% O_2. (assuming 25 percent efficiency) and 150 ppm SO_2 @15% O_2 (or <0.8% sulfur in fuel). The proposal is consistent with the NSPS which allows NO_X emissions over 100 ppm for the high efficiency unit to be purchased by FPL. No National Emission Standards for Hazardous Air Pollutants exist for stationary gas turbines.

The small gas heaters or boiler must comply with 40 CFR 60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. The above limits are consistent with the requirements of Subpart Db.

6.3 Determinations by EPA and States

The following table is a sample of information on recent control technology determinations by EPA and the States for combined cycle projects.

Project Location	Power Output (MW)	NO_X Limit ppm @ 15% O_2 and Fuel	Technology	Comments
Lakeland, **FL**	350	9/9/7.5 - NG 4215/15 - No. 2 FO	**DLN**/HSCR/SCR WI/HSCR/SCR	230 MW WH 501G CT Initially 250 MW simple cycle and 25 ppm NO_X limit on gas
Mid-GA Cogen	308	9 - NG 20 - No. 2 FO	DLN & SCR	2x119 MW WH 501D5A CTs
PREPA, PR	248	10 - No. 2 FO	WI & Hot SCR	3x83 MW ABB CTs
Tiger Bay, **FL**	270	15/10 - NG 42 - No. 2 FO	**DLN** &/or SCR WI	184 MW **GE** MS7001**FA** CT DLN/15 ppm or SCR/10 ppm
Hines Polk, **FL**	485	12 - NG 42 - No. 2 FO	**DLN** WI	2x165 MW WH 501**FC** CTs Switched to SCR
Tallahassee, **FL**	260	12 - NG 42 - No. 2 FO	DLN WI	160 MW **GE** MS 7231**FA** CT DLN guarantee is 9 ppm
Eco-Electrica, PR	461	7 - NG 9 - LPG, No. 2 FO	DLN & SCR	2x160 MW WH 501**F** CTs
Sithe/IPP, NY	1012	4.5 - NG	DLN & SCR	4 x160 MW **GE 7FA** CTs
Hermiston, OR	474	4.5 - NG	SCR	2x160 MW **GE 7FA** CTs
Barry, AL	800	3.5 - NG (CT/DB)	DLN & SCR	3x170 MW **GE 7FA** CTs

CT = Combustion Turbine
DB = Duct Burner
WI = Water or Steam Injection
ppm = parts per million
NG = Natural Gas
HSCR = Hot SCR
FO = Fuel Oil
DLN = Dry Low NO_X Combustion
SCR = Selective Catalytic Reduction
LPG = Liquefied Propane Gas
GE = General Electric
WH = Westinghouse
ABB = Asea Brown Bovari
Factors in Common with FPL Project are bolded.

Project Location	CO - ppm (or as shown)	VOC - ppm (or as shown)	PM - lb/mmBtu (or as shown)	Technology and Comments
Lakeland, FL	25 - NG or 10 by Ox Cat 75 - FO@ 15% O_2	4 - NG 10 - FO	10% Opacity	Clean Fuels Good Combustion
Mid-GA Cogen,	10 - NG 30 - FO	6 - NG 30 - FO	18 lb/hr - NG 55 lb/hr - FO	Clean Fuels Good Combustion
PREPA, PR	9 - FO @15% O_2	11 - FO @15% O_2	0.0171 gr/dscf	Clean Fuels Good Combustion
Tiger Bay, FL	0.045 lb/mmBtu-NG 0.053 lb/mmBtu-FO		0.053 - NG 0.009 - FO	Clean Fuels Good Combustion
Hines Polk, FL	25 - NG 30 - FO	7 - NG 7 - FO	0.006 - NG 0.01 - FO	Clean Fuels Good Combustion
Tallahassee, FL	25 - NG 90 - FO			Clean Fuels Good Combustion
Eco-Electrica, PR	33 - NG/LPG @15% O_2 33 - FO @15% O_2	1.5/2.5 - NG/LPG 6 - FO	0.0053 - NG/LPG 0.0390 - FO	Clean Fuels Good Combustion
Sithe/IPP, NY	13 - NG			Clean Fuels Good Combustion
Hermiston, OR	15 - NG			Clean Fuels Good Combustion
Barry, AL	0.034 lb/mmBtu - NG/CT 0.057 lb/mmBtu - CT/DB	0.015 lb/mmBtu After CT and DB	0.011 - CT/DB 10% Opacity	Gas only Good Combustion

6.4 Review of Combustion Turbine Control Technologies

A complete discussion of control options was not required because the project is not subject to a Best Available Control Technology Determination. However the applicant discussed the technology to be employed in order to comply with the New Source Performance Standards and the requested limits. The Department has included other information typically included in a complete BACT determination for comparison purposes.

6.4.1 Nitrogen Oxides Formation

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

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

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

Fuel NO_X is formed when fuels containing bound nitrogen are burned. This phenomenon is not important when combusting natural gas. It is not important for the FPL project because natural gas will be the only fuel used.

Uncontrolled emissions range from about 100 to over 600 parts per million by volume, dry, corrected to 15 percent oxygen (ppm @15% O_2). For large modern turbines, the Department estimates uncontrolled emissions at approximately 200 ppm @15% O_2.

6.4.2 NO_X Control Techniques

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 6 for a General Electric 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 combustor (cross section shown in Figure 6) wherein air usage (other than for premixing) was minimized. The venturi and the centerbody assembly were eliminated and the combustor has a single burning zone. So-called "quaternary fuel" is introduced through pegs located on the circumference of the outward combustion casing.

The emission characteristics of General Electric's DLN 2 combustors are given in Figure 7. NO_X concentrations are higher in the exhaust at lower loads because at lower loads, the combustor do not operate in the lean pre-mix mode. Therefore such a combustor emits NO_X at concentrations of 25 parts per million (ppm) at loads between 50 and 100 percent of capacity, but concentrations as high as 100 ppm at less than 50 percent of capacity.

Simplified cross sectional views of the totally premixed DLN-2.6 combustor to be installed at the FPL project are shown in Figure 8. The combustor is similar to the DLN-2 with the addition of a sixth (center) fuel nozzle to achieve 9 ppm of NO_X and 9 ppm of CO at somewhat less than 50 percent load. Presumably the emission characteristics of the DLN-2.6 are similar are similar to the DLN 2, except that the combustor emits NO_X at concentrations of 9 ppm at loads between 50 and 100 percent. Because of the "totally pre-mixed" design, emissions at less than 50 percent load are probably also lower for the DLN 2.6 than the DLN-2.

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, results in a lower achievable thermal efficiency for the unit.

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

Another important result of steam cooling is that a higher firing temperature can be attained with no increase in flame temperature. Flame temperatures and NO_X emissions can

therefore be maintained at comparatively low levels even at high firing temperatures. At the same time, thermal efficiency should be greater when employing steam cooling. A similar analysis applies to steam cooling around the transition piece between the combustor and first stage nozzle.

The relationship between flame temperature, firing temperature, unit efficiency, and NO_X formation can be appreciated from Figure 9 which is from a General Electric discussion on these principles. In addition to employing pre-mixing and steam cooling, further reductions are accomplished through design optimization of the burners, testing, further evaluation, etc.

At the present time, emissions achieved by combustion controls are low as 9 ppm (and even lower) from gas turbines smaller than about 200 MW (simple cycle), such as the F class. Initial guarantees of 25 ppm by combustion controls are proposed for turbines larger than larger than 200 MW, such as the G and H classes. The guaranteed values are expected to be reduced for the reasons given above. As in the case of wet injection, higher CO and hydrocarbon emissions can occur as a result of employing combustion controls to minimize NO_X.

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. As of early 1992, over 100 gas turbine installations already used SCR in the United States. The only combustion turbines in Florida employing SCR are at the FPC Hines Energy Complex, where the manufacturer was unable to meet the DLN limits at start-up. Virtually all SCR units are used in combination with wet injection or combustion controls.

Ammonia reacts with NO_X in the presence of a catalyst and excess oxygen yielding molecular nitrogen and water. The catalyst used in combined cycle, low temperature applications (conventional SCR), is usually vanadium or titanium oxide and accounts 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.

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

In a manner analogous to balancing control of NO_X from the combustor with emissions of CO and hydrocarbon, similar balancing is required when controlling NO_X by SCR. Excessive ammonia use tends to increase emissions of CO, ammonia (slip), and particulate matter (when sulfur bearing fuels are used). Permit BACT limits as low as 3.5 ppm NO_X have been specified using SCR for an F Class project in Alabama and proposed for another F Class project in Mississippi.

6.4.3 Particulate Matter (PM/PM_{10}) Control

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 will be the only fuels fired and is efficiently combusted in gas turbines. Clean 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.

A technology review indicated that the top control option for PM_{10} is a combination of good combustion practices, fuel quality, and filtration of inlet air. This has been chosen as BACT by the applicant and the Department concurs. Annual emissions of PM/PM_{10} are expected to be less than 313 tons per year (six combustion turbines and small boiler). This represents a decrease of 294 TPY.

Drift eliminators shall be installed on the cooling tower to reduce PM/PM_{10}. The drift eliminators shall be designed and maintained to reduce drift to 0.001 percent of the circulating water flow rate. No PM testing is required.

6.4.4 Carbon Monoxide (CO) Control

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.

Most installations using catalytic oxidation are located in the Northeast. Among them are the 272 Berkshire, Massachusetts facility, 240 MW Brooklyn Navalyard Facility, the 240 MW Masspower facility, the 165 MW Pittsfield Generating Plant in Massachusetts, and the 345 MW Selkirk Generating Plant in New York. 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.

Most combustion turbines incorporate good combustion to minimize emissions of CO. These installations typically achieve CO emissions between 10 and 30 ppm at full load, even as they achieve relatively low NO_X emissions by SCR or dry low NO_X means. By comparison, the value of 12 ppm proposed FPL's application appears relatively low, but consistent with the capabilities of the DLN-2.6 technology as discussed above.

6.4.5 Volatile Organic Compound (VOC) Control

Volatile organic compound (VOC) emissions, like CO emissions, are formed due to incomplete combustion of fuel. There are no viable add-on control techniques as the combustion turbine itself is very efficient at destroying VOC. The applicant has proposed good combustion practices to control VOC to 1.4 ppm. This value is lower than any BACT-based VOC limit listed above. According to GE, even lower VOC emissions were achieved during recent tests of the DLN-2.6 technology when firing natural gas.[3] Annual

emissions of VOC are expected to be approximately 82 TPY from the repowered units. The difference between future emissions and past actual emissions is less than the 40 ton per year (PSD) significant emission rate increase.

6.5 Background on Selected Gas Turbine

FPL plans to the purchase six (6) 170 MW General Electric MS7241FA combined cycle gas turbines with un-fired HRSGs. By using the two existing steam turbine-electrical generators, each combustion turbine will produce approximately another 80 MW of electrical power.

The first commercial GE 7F Class unit was a installed at the Virginia Power Chesterfield Station in 1990.[4] The initial units had a firing temperature of 2300°F and a combined cycle efficiency exceeding 50 percent. By the mid-90s, the line was improved by higher combustor pressure, a firing temperature of 2400°F, and a combined cycle efficiency of approximately 56 percent based on a 167 MW combustion turbine. The line was redesignated as the 7FA Class.

The first GE 7F/FA project in Florida was at the FPL Martin Plant in 1993 and entered commercial service in 1994.[5] The units were equipped with DLN-2 combustors with a permitted NO_X limit of 25 ppm These actually achieve less 25 ppm of NO_X and 15 ppm of CO. The City of Tallahassee recently received approval to install a GE 7FA Class unit at its Purdom Plant.[6] Although permitted emissions are 12 ppm of NO_X, the City obtained a performance guarantee from GE of 9 ppm.[7]

General Electric, other manufacturers, and their customers are relying on further advancement and refinement of DLN technology to provide sufficient NO_X control for their combined cycle turbines in Florida. Where required by BACT determinations of certain states, General Electric incorporates SCR in combined cycle projects.[8]

The approach of progressively refining such technology is a proven one, even on some relatively large units. Basically this was the strategy adopted in Florida throughout the 1990's. Recently GE Frame 7 FA units met performance guarantees of 9 ppm with DLN-2.6 burners at Fort St. Vrain, CO and Clark County, WA.[9] GE has already achieved emissions of approximately 6 ppm on gas at a dual-fuel MW 7EA (120 MW combined cycle) unit at Cane Island Power Park in Kissimmee, FL.[10] The Cane Island unit is equipped with DLN-2 combustors. According to GE, similar performance is expected soon on the 7FA line and performance guarantees less than 9 ppm can be expected using the DLN-2.6 combustors for units delivered in a couple of years.[11]

The 9 ppm NO_X limit on natural gas requested by FPL is comparable with recent BACT determinations for F Class combined cycle units, such as those previously listed.

6.6 Control Technology Determination

Following are the emission limits determined for the FPL project assuming full load. Values for NO_X are corrected to 15% O2. These limits or their equivalents in terms of

pounds per hour, as well as the applicable averaging times, are given in the permit Specific Conditions.

Emission Unit	NO_X	CO	VOC	PM/Visibility (% Opacity)	Technology and Comments
Combustion Turbines	9 ppm (30 day) 75/110 ppm (NSPS)	12 ppm	1.4 ppm	10	Dry Low NO_X Combustors Natural Gas, Good Combustion
Gas Heater/ Boiler	0.10 lb/mmBtu	0.15 lb/mmBtu	-	-	Dry Low NO_X Burners

6.7 Rationale for Control Technology Determination

- FPL obtained a guarantee from GE for DLN-2.6 combustors which have been demonstrated to meet all of the above limits on "7FA" Class gas turbines.
- FPL specifically requested that these limits be incorporated into the permit although the project could "net out" of PSD review and BACT with higher limits (except for VOC).
- All of the combustion turbine emission limits comply with the NSPS and are less than or equal to recent Department BACT determinations applicable to new units at start-up.
- PM_{10} emissions will be very low and difficult to measure. Therefore, the Department, with FPL's concurrence will set a visible emission standard of 10 percent opacity.
- CO emissions from FPL's project are low (approximately 9 ppm). With FPL's concurrence, the Department will set CO limits achievable by good combustion equal to 12 ppm. For reference, CO limits for the Lakeland and Tallahassee projects are 25 ppm on gas.
- VOC emissions of 1.4 ppm proposed by FPL are at the lower end of values determined as BACT. Good Combustion is sufficient to achieve these low levels with the DLN-2.6 combustors while firing natural gas.
- The small boiler for gas heating during startup and simple cycle operation will comply with the NSPS (Subpart Db).

6.8 Compliance Procedures

Pollutant	Compliance Procedure
Visible Emissions	Method 9
Volatile Organic Compounds	Method 18, 25, or 25A (initial tests only)
Carbon Monoxide	Annual Method 10 (can use RATA if at capacity)
NO_X (30-day average)	NO_X CEMS, O_2 or CO_2 diluent monitor, and flow device as needed
NO_X (NSPS initial performance)	Method 20 (can use RATA if at capacity)

6.9 Excess Emissions

Allowable Excess Emissions: Pursuant to Rule 62-210.200 F.A.C., excess emissions are allowable under the following scenarios: Valid hourly emission rates shall not included periods of startup (~240 minutes), shutdown (~180 minutes), or malfunction as defined in Rule 62-210.200 F.A.C., where emissions exceed the applicable NO_X standard. These excess emissions periods shall be reported as required in permit Specific Condition 27. 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. [Rules 62-4.070 F.A.C., 62-210.700 F.A.C and applicant request]

7. SOURCE IMPACT ANALYSIS

7.1 Emission Limitations

The proposed six combustion turbines, cooling tower and small boiler will emit the following PSD pollutants (Table 212.400-2): particulate matter, sulfur dioxide, nitrogen oxides, volatile organic compounds, carbon monoxide, and negligible quantities of sulfuric acid mist, fluorides, beryllium, mercury and lead. The applicant's proposed annual emissions are summarized in the Table below and form the basis of the source impact review.

7.2 Emission Summary

The net emissions increase/decrease for all PSD pollutants as a result of this modification are calculated below:

CONTEMPORANEOUS CREDITABLE CHANGES (TPY)

Pollutants	Past Emissions (Units 1 and 2)	Future Emissions (Repowered)	Increase (decrease)	PSD Significance	PSD Review?
PM/PM_{10}	607	313	(294)	25/15	No
SAM	915	21	(894)	7	No
SO_2	20,561	137	(20,424)	40	No
NO_X	7,095	1,845	(5,250)	40	No
VOC	47	82	35	40	No
CO	1,507	1,267	(240)	100	No

7.3 Air Quality Analysis

7.3.1 Introduction

The proposed project will not result in the increase of emissions of any PSD pollutants at levels in excess of PSD significant amounts. With the exception of VOC emissions, emissions of PSD pollutants will actually decrease due to the project. However, as a

supplement to the air permit application, FPL estimated air quality impacts for the existing plant and the repowered plant including impacts related to construction activities and future operations. This supplemental air quality analysis was done for PM_{10}, CO, SO_2 and NO_X emissions.

Based on these 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. A discussion of these analyses follows.

7.3.2 Models and Meteorological Data Used in the Air Quality Impact Analysis

The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project. The model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model 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 Ft. Myers Page Field, Florida (surface data) and Ruskin, Florida (upper air data). The 5-year period of meteorological data was from 1987 through 1991. 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.

7.3.3 AAQS Analysis

An AAQS analysis was done for PM_{10}, SO_2 and NO_2 due to the project. Predicted CO impacts from the project were less than the applicable significant impact levels; therefore, no further CO modeling for comparison with the AAQS was required. Total air quality impacts for comparison with the PM_{10}, SO_2 and NO_2 AAQS were estimated by adding the maximum predicted concentrations due to project-related sources to background concentrations. Background concentrations are concentrations due to sources not associated with the Fort Myers plant. These concentrations consist of two components: impacts due to other modeled emission sources in the area, and impacts due to sources not explicitly modeled. The non-modeled background concentrations were obtained from air quality monitoring data. The AAQS analysis submitted with this proposed project, and summarized in the two tables below shows that maximum predicted total impacts from PM_{10}, SO_2 and NO_2 emissions do not exceed the AAQS.

Ambient Air Quality Impacts During Construction

Pollutant	Averaging Time	Modeled Sources Impact (ug/m^3)	Background Monitor Concentration (ug/m^3)	Total Impact (ug/m^3)	Total Impact Greater Than AAQS?	Florida AAQS (ug/m^3)
SO_2	Annual	6	5	11	NO	60
	24-hour	126	31	157	NO	260
	3-hour	552	100	652	NO	1300
PM_{10}	Annual	18	1	19	NO	50
	24-hour	33	10	43	NO	150
NO_2	Annual	6	20	26	NO	100

Ambient Air Quality Impacts for Future Operations After Project Completion

Pollutant	Averaging Time	Modeled Sources Impact (ug/m^3)	Background Concentration (ug/m^3)	Total Impact (ug/m^3)	Total Impact Greater Than AAQS?	Florida AAQS (ug/m^3)
SO_2	Annual	3	5	8	NO	60
	24-hour	21	31	52	NO	260
	3-hour	112	100	212	NO	1300
PM_{10}	Annual	18	1	19	NO	50
	24-hour	27	10	37	NO	150
NO_2	Annual	4	20	24	NO	100

7.3.4 PSD Increment Analysis

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant from a baseline concentration which was established in 1977 (the baseline year was 1975 for existing major sources of SO_2) for SO_2 and 1988 for NO_2. This project will expand increment since the proposed emissions after the project is completed will be less than the emissions of these pollutants during the baseline years.

7.3.5 Impact Analysis Impacts On Soils, Vegetation, And Wildlife

The maximum ground-level concentrations predicted to occur for PM_{10}, CO, and NO_X as a result of the proposed project, including background concentrations and all other nearby sources, will be below the associated AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils and vegetation in the vicinity of the plant or the PSD Class I area in the Everglades National Park. In addition, there should be an amelioration of any impacts from the existing plant due to the reduction in acid particulate deposition.

7.3.6 Impact On Visibility

Visibility should improve in the immediate area based on lower emissions of particulate and particulate pre-cursors. The stack visible emissions limits of 10 percent opacity compared with present limits as high as 40 percent will further insure an improvement.

7.3.7 Growth-Related Air Quality Impacts

The proposed project is being constructed to meet current and future state-wide electric demands. Additional growth in the immediate area as a direct result of the additional electric power provided by the project is not expected The project will be constructed and operated with minimum labor and associated facilities and is not expected to significantly affect growth in the local area. Obviously any increase in highly efficient electric power capacity promotes or accommodates further state-wide growth.

8. CONCLUSION

Based on the foregoing technical evaluation of the application and other available information, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations. Furthermore the project will improve ambient air quality in the area and reduce acidic particulate deposition.

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Teresa Heron, Review Engineer
Cleve Holladay, Meteorologist

REFERENCES

[1] EPA. "Alternative Control Techniques for NO_X Emissions from Stationary Gas Turbines." 1993.

[2] Moore, T. "Repowering as a Competitive Strategy." EPRI Journal. September-October, 1995.

[3] Telecon. Vandervort, C., GE, and Linero, A. A., DEP. VOC Emissions From FA Gas Turbines with DLN-2.6 Combustors.

[4] Brochure. General Electric. "GE Gas Turbines - MS7001FA." Circa 1993.

[5] Davis, L.B. :Dry Low NO_X Combustion Systems for GE Heavy Duty Gas Turbines. 1994.

[6] Florida DEP. PSD Permit, City of Tallahassee Purdom Unit 8. May, 1998.

[7] City of Tallahassee. PSD/Site Certification Application. April, 1997.

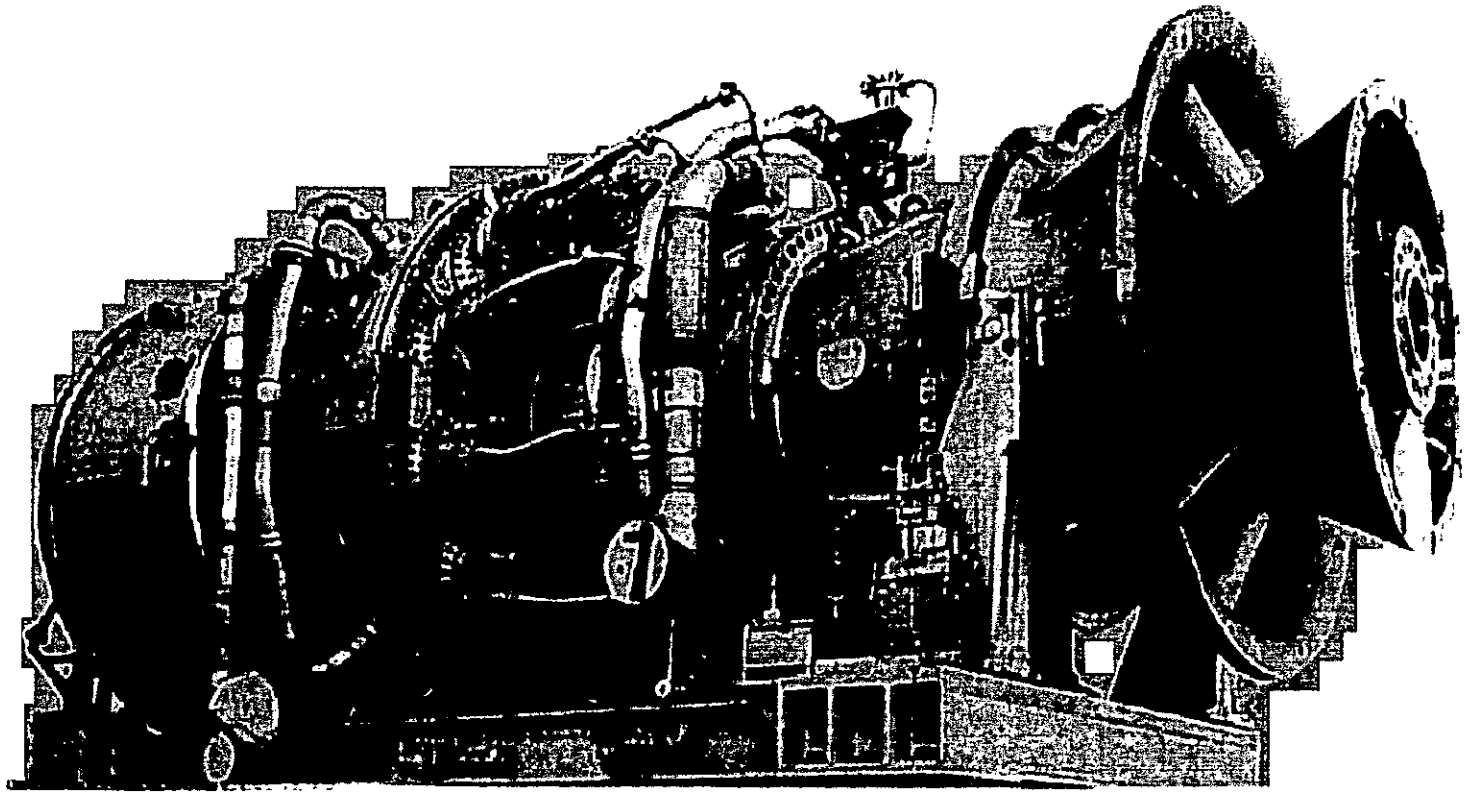
[8] State of Alabama. PSD Permit, Alabama Power/Barry Sithe/IPP (GE 7FA).

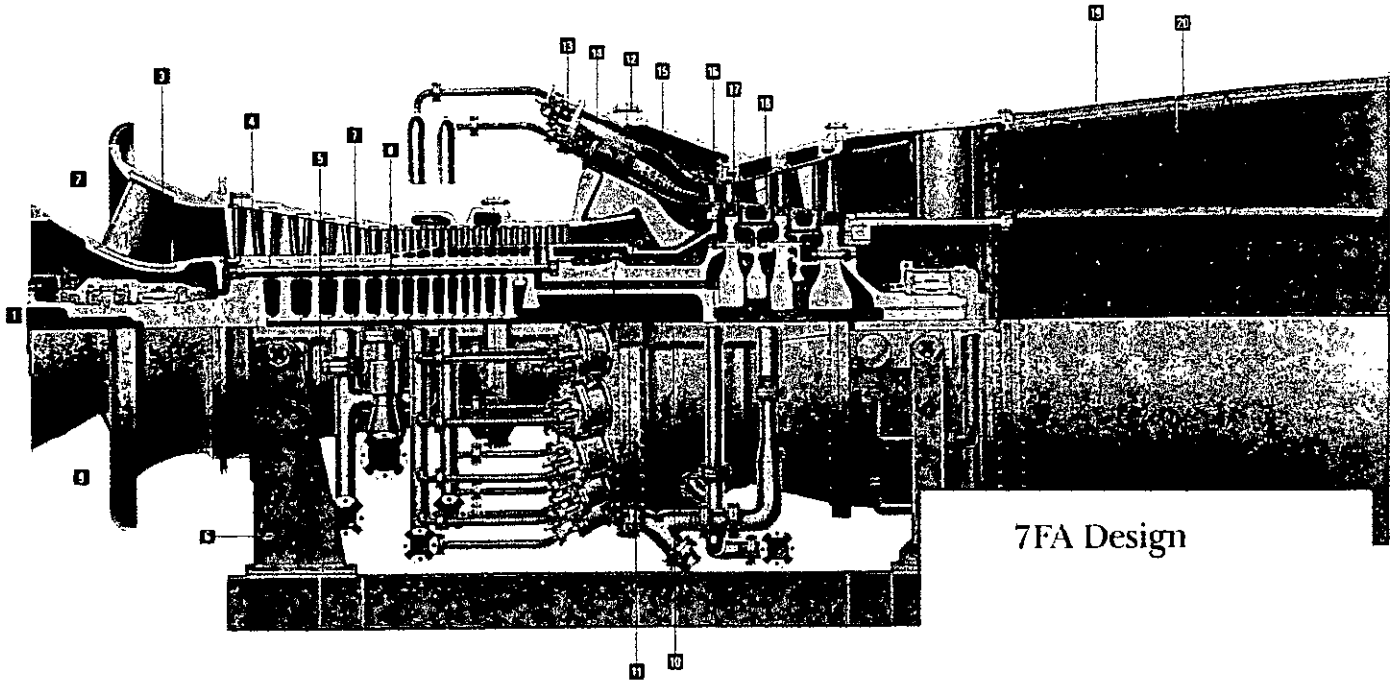
[9] Telecon. Schorr, M., GE, and Costello, M., Florida DEP. March 31, 1998. Status of DLN-2.6 Program.

[10] Florida DEP. Bureau of Air Regulation Monthly Report. June, 1998.

[11] Telecon. Schorr, M., GE, and Linero, A. A., Florida DEP. August, 1998. Cost effectiveness of DLN versus SCR.

Figure 1 - GE MS7001FA

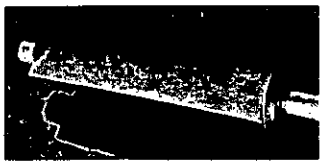




COMPRESSOR

1. Load Coupling – short, rigid coupling can be directly connected to generator flange.

2. Axial/Radial Inlet Casing – proven design provides uniform inlet flow to compressor.



3. Journal Bearings – bearings are tilting-pad type for improved rotor stability and are also pressure-lift for reduced break-away torque.

4. Compressor Blading – an evolution from the 7EA compressor with a zero stage added. Blade length increased for added flow. Blade material upgraded for more demanding requirements. Shrouded stator 17 and exit guide vanes are utilized for improved cyclical life.

5. Compressor Design – based on proven axial-flow design. One piece casing allows easier start-up. Casing material upgraded to accommodate higher temperature and pressure.

6. Rigid Forward Support – in combination with forward thrust bearing, limits thermal expansion of gas turbine into generator.

7. Wheel Construction – machined to nearly constant stress cross-section with contact faces at maximum diameter for high rotor stiffness.

8. Through-Bolt Construction – large bolts at maximum bolt circle provide rigid rotor with required torque capability for front-end drive.

9. Inlet Orientation – available in up, down or side arrangement.

STATOR CASINGS

10. Horizontally Split – all casings split on horizontal centerline with through-bolting to facilitate maintenance.

COMBUSTION

11. Combustor Bulkhead – combustor outer cans attached over elongated holes in combustor bulkhead to permit removal of transition piece without lifting turbine shell.

12. Top and Bottom Manway Access – permits an alternative method for removing combustor transition piece and stage 1 nozzle without lifting turbine shell.

13. Fuel Distribution – single fuel line connection for each combustor with manifolding to six fuel nozzles built into combustor end cover.

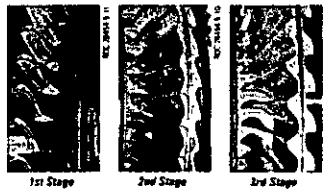
14. Reverse Flow Combustor Chambers – supplement the impingement and film cooling of the liners, prolonging parts life.

15. Impingement Cooled Combustor Transition Piece – separate perforated sleeve around transition piece causes compressor discharge air to impinge on and effectively cool the transition piece.

TURBINE

16. Nozzle Design – sidewalls and internal surfaces of vanes impingement cooled with spent air used for extensive film cooling.

17. Stage 1 Stationary Shroud Design – one part insert of high temperature alloy, extensively convection, impingement and film cooled and coated for maintaining tight clearances with the stage 1 bucket tip.



18. Bucket Design – stage 1 bucket is directionally solidified and uses a turbulated serpentine cooled design with trailing edge bleed cooling, based on GE Aircraft Engine technology. Stage 2 uses turbulated radial cooling holes. Stage 3 is uncooled. Stages 2 and 3 have integral z-lock shrouds for vibration control, and all three stages have long shanks for vibration control and isolation of gas path temperatures from the turbine wheels.

EXHAUST

19. Exhaust Diffuser – axial design (permitted by front end drive) is blanket insulated for thermal stability, safety and reduced heat loss from exhaust before entering heat recovery system.

20. Exhaust Thermocouples – sets of thermocouples supply signals to each of the three SPEEDTRONIC™ Mark V computers. The thermocouples are used for control and also for monitoring the combustion system.

Figure 2 - GE Combustion Turbine MS 7001FA

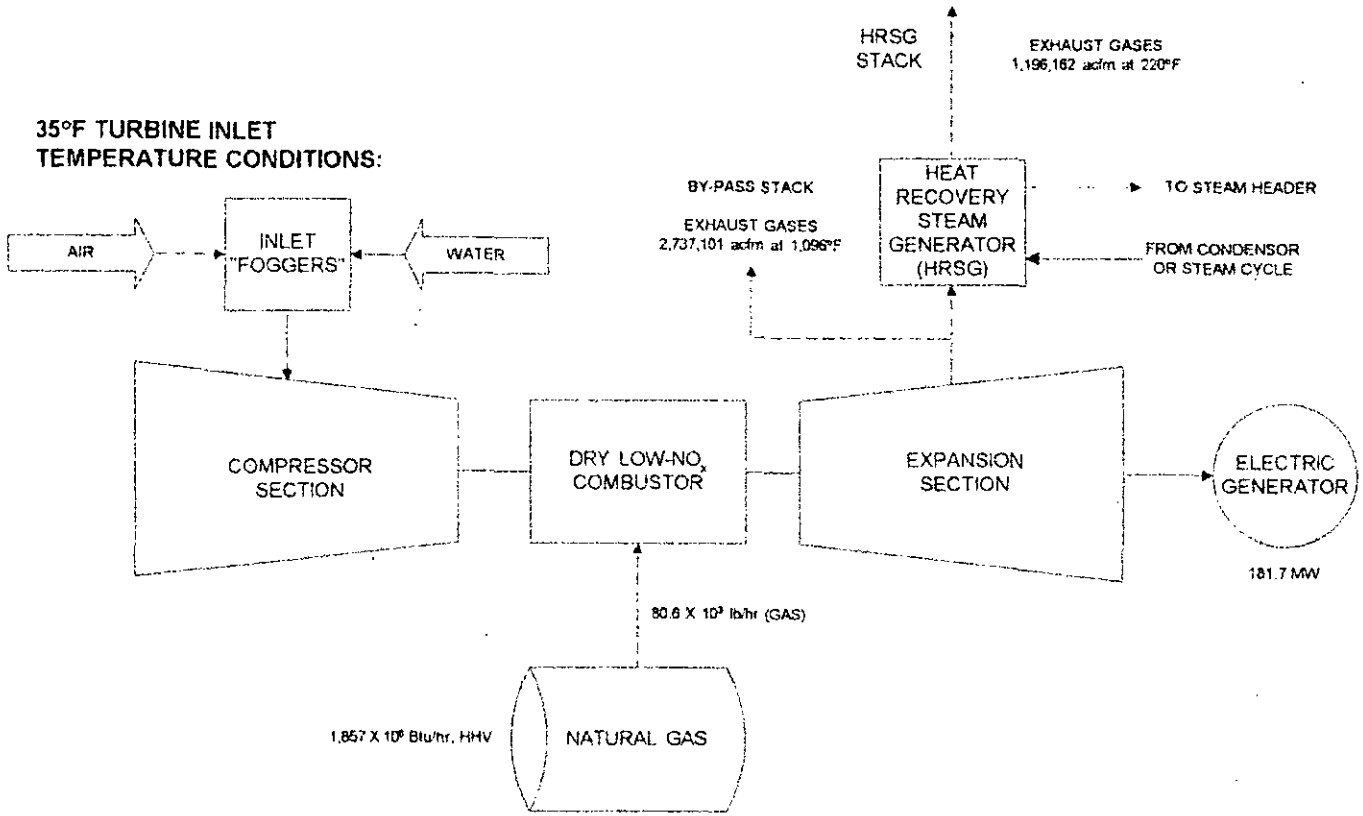


Figure 3 - Simplified Flow diagram of FPL Fort Myers Project

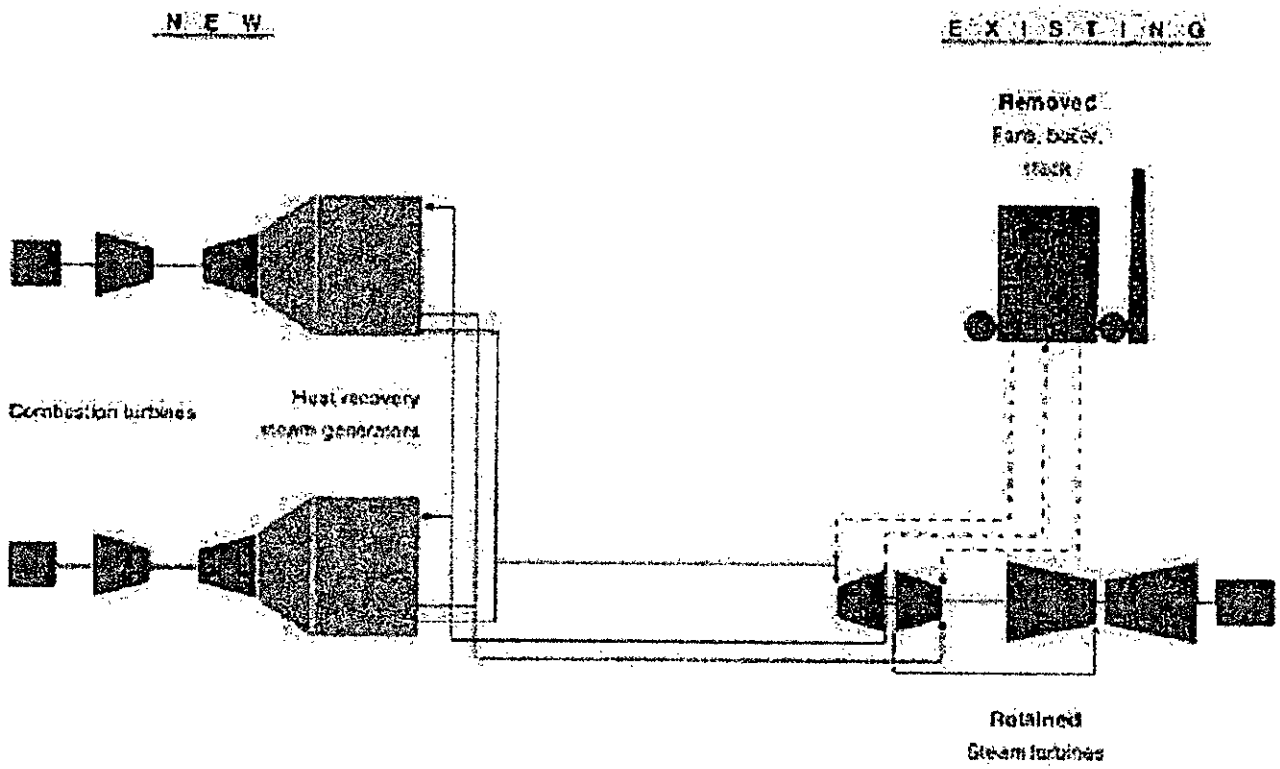


Figure 4 - Simplified Gas Repowering Diagram

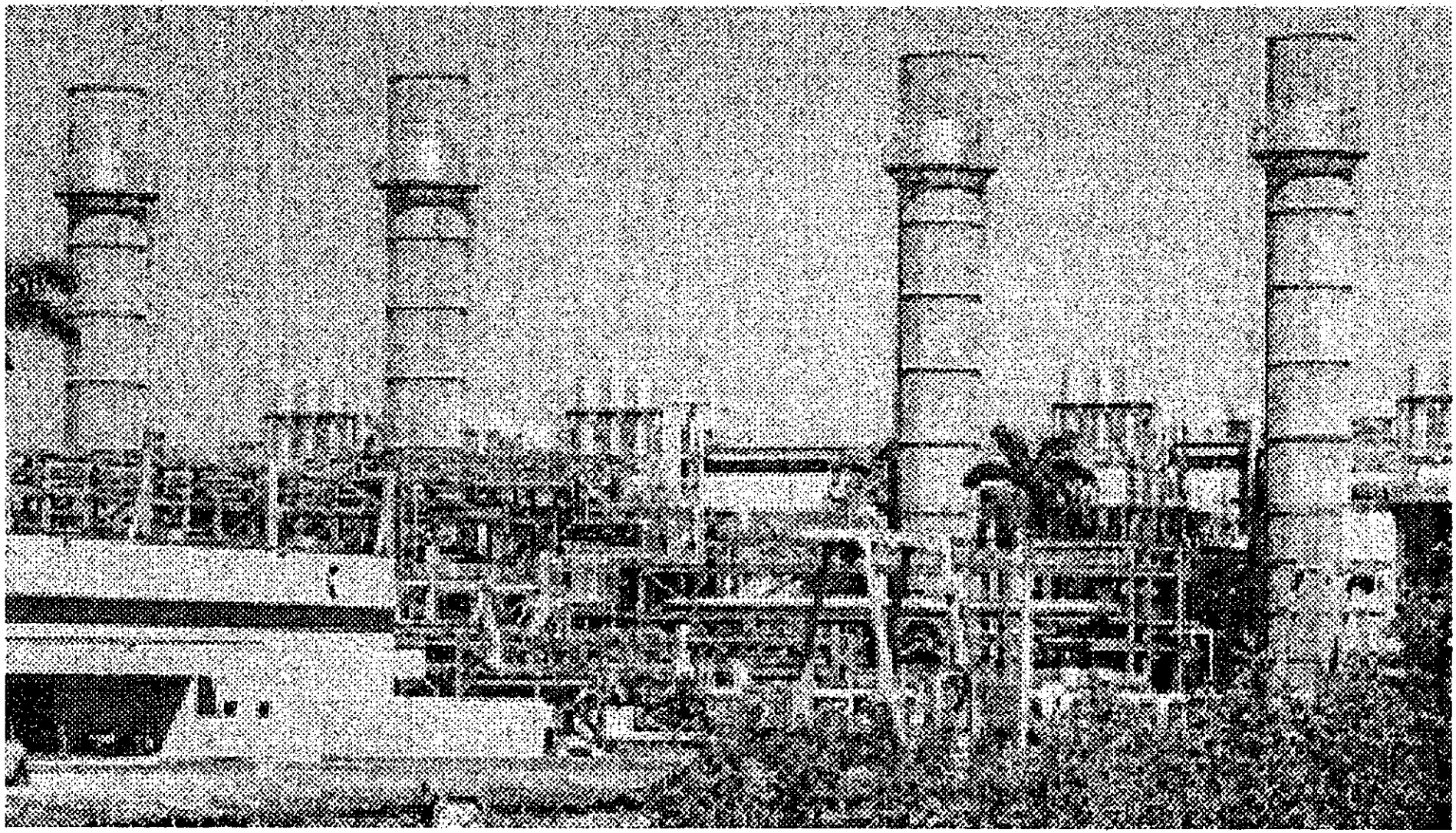
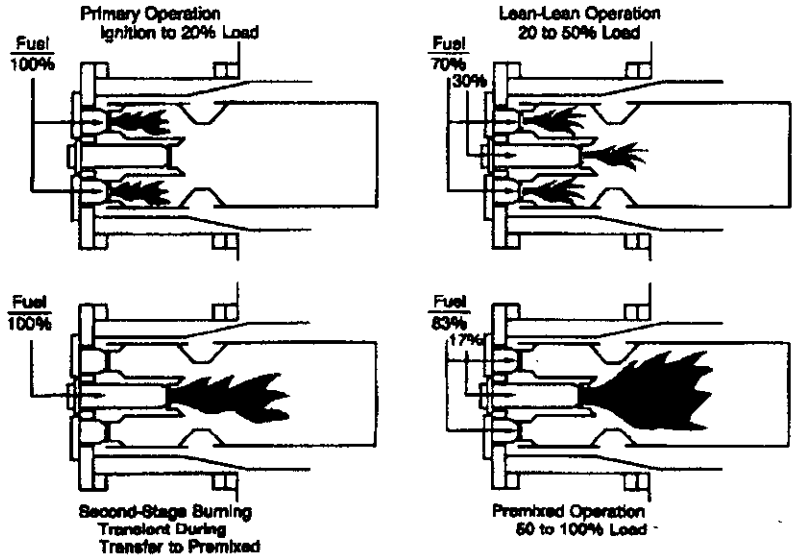


Figure 5 - Repowered FPL Lauderdale Plant



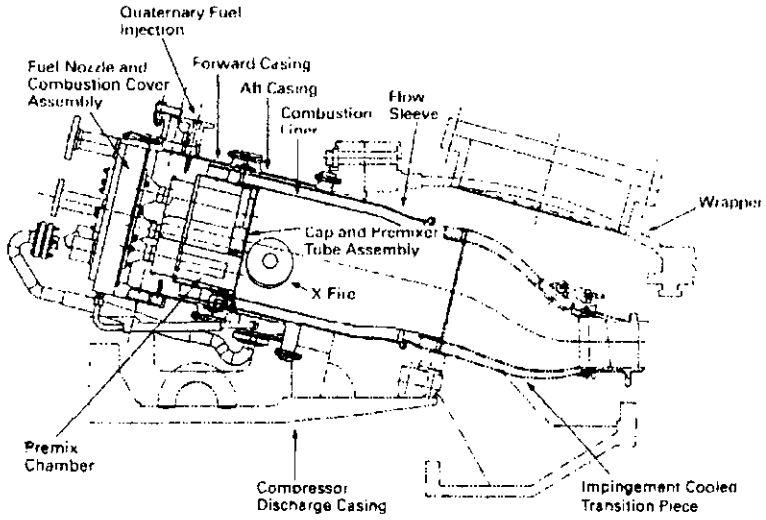


Figure 6 - Dry Low NOx Operating Modes - DLN-1

Cross Section of GE DLN-2

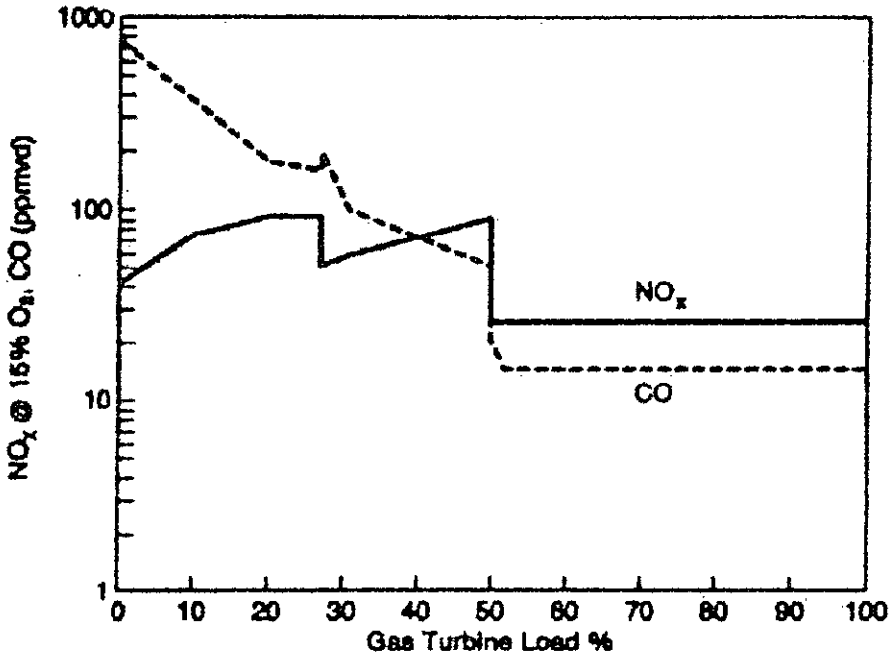


Figure 7 - Emissions Performance for DLN-2 Combustors

Firing Natural Gas in Dual-Fuel 7FA Turbine

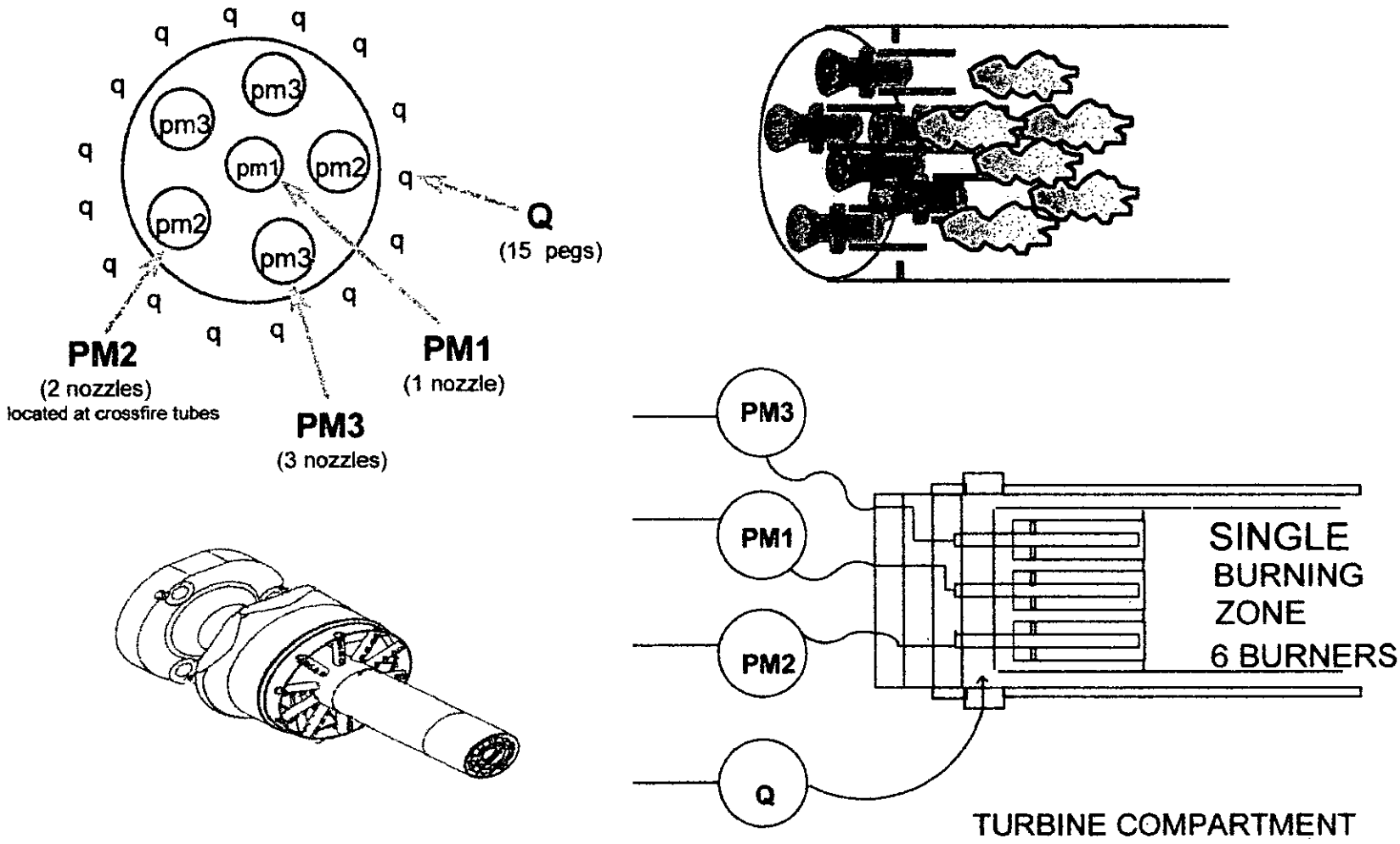


Figure 8 - GE DLN-2.6 Combustor and Nozzle Arrangement

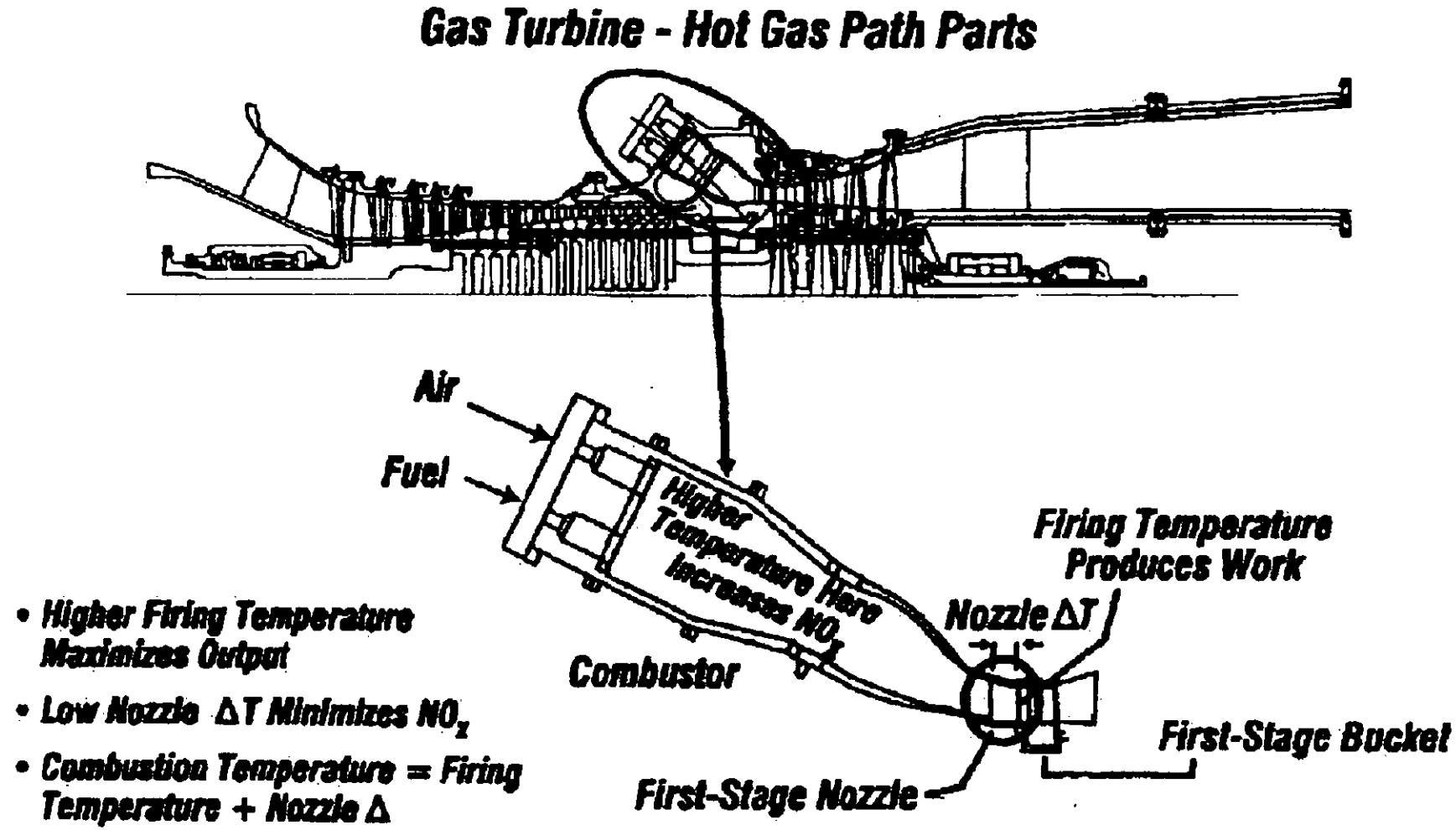


Figure 9 - Relationship of Combustion Temperature to Firing Temperature

PERMITTEE:

Florida Power & Light Company
Fort Myers Power Plant
Post Office Box 430
Fort Myers, Florida 33905

Permit No.	0710002-004AC
Project:	1500 MW Repowering Project
SIC No.	4911 —
Expires:	December 31, 2002

Authorized Representative:

William Reichel
Plant General Manager

PROJECT AND LOCATION:

Permit to install six (6) combined cycle units to replace two (2) residual oil-fired steam generating units. Each unit is a 170 megawatt General Electric MS7241FA gas-fired combustion turbine-generator with an unfired heat recovery steam generator (HRSG) that will raise sufficient steam to produce another 80 MW via the existing steam-driven electrical generators. The boilers and the tall stacks associated with the existing residual oil-fired units (593 MW total capacity) will be dismantled and replaced by two relatively short stacks per unit for simple and combined operation. The project also includes a cooling tower for once-through brackish water and a small boiler or heaters with a 30-foot stack to heat the natural gas prior to use during simple cycle operation and cold start-ups.

This facility is located at 10650 State Road 80 near Tice, Lee County. UTM coordinates are: Zone 17; 422.3 km E and 2,952.9 km N.

STATEMENT OF BASIS:

This 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 MADE A PART OF THIS PERMIT:

Appendix GC Construction Permit General Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

AIR CONSTRUCTION PERMIT 0710002-004-AC

SECTION I. FACILITY INFORMATION

SUBSECTION A. FACILITY DESCRIPTION

Currently, this facility generates electric power from two residual fuel oil-fired steam units with a combined generating capacity of 593 megawatts (MW) and 12 distillate fuel oil-fired simple cycle combustion turbines with a combined generating capacity of 708 MW.

This permitting action (1500 MW Repowering Project) is to install six (6) combined cycle units to replace two (2) residual oil-fired steam generating units. Each unit is a 170 megawatt General Electric MS7241FA gas-fired combustion turbine-generator with an unfired heat recovery steam generator (HRSG) that will raise sufficient steam to produce another 80 MW via the existing steam-driven electrical generators. The boilers and the tall stacks associated with the existing residual oil-fired units (593 MW total capacity) will be dismantled and replaced by two relatively short stacks per unit for simple and combined operation. The project also includes a cooling tower for once-through brackish water and a small boiler or heaters with a 30-foot stack to heat the natural gas prior to use during simple cycle operation and cold start-ups.

This Project is exempt from the requirements of Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) as discussed stated in the Technical Evaluation and Preliminary Determination dated September 18, 1998.

SUBSECTION B. EMISSION UNITS

This permit addresses the following emission units:

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
018 - 023	Power Generation	Six (6) Combined Cycle Combustion Turbine-Generators with Unfired Heat Recovery Steam Generators
024	Fuel Heating	Natural Gas Boiler or Heater(s)
025	Water Cooling	Mechanical Draft Cooling Tower

SUBSECTION C. REGULATORY CLASSIFICATION

This facility, FPL Fort Myers Power Plant, 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 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 100 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

SECTION I. FACILITY INFORMATION

This facility is a major source of hazardous air pollutants (HAPs) and is also subject to the provisions of Title IV, Acid Rain, Clean Air Act as amended in 1990.

SUBSECTION D. PERMIT SCHEDULE

- 10/xx/98 Notice of Intent published in _____
- 09/22/98 Distributed Intent to Issue Permit
- 09/04/98 Received Application
- 05/19/98 Project Presentation

SUBSECTION E. 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 September 4, 1998
- Department's Intent to Issue and Public Notice Package dated September 22, 1998.
- EPA comments dated October xx, 1998.
- FPL's comments dated October xx, 1998.

SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (DEP), at 2600 Blairstone Road, Tallahassee, Florida 32399-2400 and phone number (850)488-0114. All documents related to reports, tests, and notifications should be submitted to the DEP South District office, 2295 Victoria Avenue, Suite 364, Ft Myers, Florida 33902-3381 and phone number 941/332-6975.
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. Permit Extension: *This permit expires on December 31, 2002.* 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.].
7. 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 sent to the Department's South District office. [Chapter 62-213, F.A.C.]
8. 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.]

SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

9. 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 South District office by March 1st of each year.

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

11. Quarterly Reports: Quarterly excess emission reports, in accordance with 40 CFR.60.7 (a)(7) (c) (1997 version), shall be submitted to the DEP's South District office.

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-103, 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 018 through 023, Power Generation, consisting of six (nominal) 170 MW combustion turbines (250 MW in combined cycle operation), 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 required to demonstrate compliance with non-NSPS permit standard(s).
5. ARMS Emission Unit 024, Fuel Heating, shall comply with all applicable provisions of 40CFR60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, adopted by reference in Rule 62-204.800, F.A.C.
6. ARMS Emission Unit 025, Cooling Tower, is an unregulated emission unit.
7. All notifications and reports required by the above specific conditions shall be submitted to the DEP's South District office.

GENERAL OPERATION REQUIREMENTS

8. Fuels: Only pipeline natural gas shall be fired in these units. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
9. Turbine Capacity: The maximum heat input rates, based on the lower heating value (LHV) of the fuel to *each* combustion turbine at ambient conditions of 59°F, 60% relative humidity, 100% load, and 14.7 psia shall not exceed 1,600 million Btu per hour. (MMBtu/hr).

This maximum heat input rate will vary depending upon turbine inlet 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)]

10. Steam Boiler (SB). The maximum heat input rate, based on the lower heating value (LHV) of the fuel to the SB at ambient conditions of 59°F, 60% relative humidity, 100% load, and 14.7 psia shall not exceed 132 MMBtu per hour.

11. 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.

12. 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 South District office 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.]

13. 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.]

14. 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. [Rule 62-210.650, F.A.C.]

15. Maximum Annual Allowable Hours of operation for each of the six combustion turbines, the cooling tower, and the gas heaters/boiler (ARMS Emission Units 018 - 025) are 8760. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

Control Technology

16. Dry Low NO_X (DLN) combustor shall be installed on each stationary combustion turbine to control nitrogen oxides (NO_X) emissions. [Design, Rule 62-4.070, F.A.C.]

17. The permittee shall provide manufacturer's emissions performance versus load diagrams for the DLN systems prior to their installation. DLN systems shall each be tuned upon initial

operation to optimize emissions reductions and shall be maintained to minimize NO_X emissions and CO emissions. [Rule 62-4.070, and 62-210.650 F.A.C.]

EMISSION LIMITS AND STANDARDS

18. Following are the emission limits determined for this project assuming full load. Values for NO_X are corrected to 15% O_2. These limits or their equivalents in terms of pounds per hour, as well as the applicable averaging times, are followed by the applicable specific conditions. [Applicant Requests, Rules 62-204.800(7)(b) (Subparts GG and Db), 62-210.200 (Definitions-Potential Emissions), F.A.C.].

Emission Unit	NO_X	CO	VOC	PM/Visibility (% Opacity)	Technology and Comments
Combustion Turbines (each)	9 ppm (30 day) 75/110 ppm (NSPS)	12 ppm	1.4 ppm	10	Dry Low NO_X Combustors Natural Gas, Good Combustion
Gas Heater/ Boiler	0.10 lb/mmBtu	0.15 lb/mmBtu		10	Dry Low NO_X Burners

19. Nitrogen Oxides (NO_X) Emissions:

- The concentration of NO_X concentrations in the exhaust gas of each CT shall not exceed 9 ppmvd at 15%O_2 on a 30-day rolling average basis as measured by the CEMS (maintained in accordance with 40 CFR 75). Based on CEMS data at the end of each operating day, a new 30-day average rate is calculated from the arithmetic average of all valid hourly emission rates during the previous 30 operating days. In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall exceed neither 9 ppm @15% O_2 nor 65 lb/hr to be demonstrated by stack test.
- When NO_X monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate the specified average time.
- NO_X emission limit from the gas heaters/boiler shall not exceed 0.10 MMBtu/hr (at ISO conditions) to be demonstrated by stack test.

20. Visible Emissions (VE): VE emissions shall not exceed 10 percent opacity. Visible emissions from the gas heaters/steam boiler shall not exceed 10 percent opacity.

21. Carbon Monoxide (CO) emissions: The concentration of CO (@15% O_2 in the exhaust gas shall not exceed 12 ppmvd as measured by EPA Method 10. CO emissions (at ISO conditions) shall not exceed 43 lb/hr (per CT) to be demonstrated by stack test.

22. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the exhaust gas shall not exceed 1.4 ppmvd as determined by EPA Methods 18 or 25 A. VOC emissions (at ISO conditions) shall not exceed 2.9 lb/hr per CT.

23. Sulfur Dioxide (SO_2) emissions: As per Condition 8.

EXCESS EMISSIONS

24. Excess emissions resulting from startup, shutdown, or malfunction shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period except during both "cold start-up" to or shutdowns from combined cycle operation. During cold start-up to combined cycle operation, up to four hours of excess emissions are allowed. During shutdowns from combined cycle operation, up to three hours of excess emissions are allowed. Cold start-up is defined as a startup to combined cycle operation following a complete shutdown lasting at least 48 hours. [Applicant Request; G.E. Combined Cycle Startup Curves Data and Rule 62-210.700, F.A.C.].

25. Excess emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C.

26. Excess Emissions Report: If excess emissions occur for more than two hours due to malfunction, the owner or operator shall notify DEP's South District office 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. Pursuant to the New Source Performance Standards, all excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. Following this format, 40 CFR 60.7, periods of startup, shutdown, malfunction, and fuel switching shall be monitored, recorded, and reported as excess emissions when emission levels exceed the permitted standards listed in Specific Condition No. 18 and 19. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (1997 version)].

COMPLIANCE DETERMINATION

27. Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate at which each unit will be operated, but not later than 180 days following initial operation of the unit, and annually thereafter as indicated in this permit, by using the following reference methods as described in 40 CFR 60, Appendix A (1997 version), and adopted by reference in Chapter 62-204.800, F.A.C.

28. Initial (I) performance tests shall be performed on these units' stacks. 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 these units as indicated. The following reference methods shall be used. No other test methods may be used for compliance testing unless prior DEP approval is received in writing.

- EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" (I, A).
- EPA Reference Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources" (I, A).
- EPA Reference Method 20, "Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines." Initial test only for compliance with 40CFR60 Subpart GG.
- EPA Reference Method 18, and/or 25A, "Determination of Volatile Organic Concentrations." Initial test only.

29. Continuous compliance with the NO_X emission limits: Continuous compliance with the NO_X emission limits shall be demonstrated with the CEM system based on a 30-day rolling average. Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and a new 30 day average emission rate is calculated from the arithmetic average of all valid hourly emission rates during the previous 30 operating days. Valid hourly emission rates shall not include periods of startup, shutdown, or malfunction. 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. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., and 40CFR75]

30. Compliance with the SO_2 and PM/PM_{10} emission limits: Notwithstanding the requirements of Rule 62-297.340, F.A.C., the use of pipeline natural gas is the method for determining compliance for SO_2 and PM_{10}. For the purposes of demonstrating compliance with the 40 CFR 60.333, 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 40CFR60.335 or 40CFR75 are used for determination of fuel sulfur content. Gas analysis, if conducted, 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) (1997 version).

31. Compliance with CO emission limit: An initial test for CO, shall be conducted concurrently with the initial NO_X test, as required. The initial NO_X and CO test results shall be the average of three valid one-hour runs. Annual compliance testing for CO may be conducted at less than capacity when compliance testing is conducted concurrent with the annual NOx RATA testing which is performed pursuant to 40 CFR 75.

32. Compliance with the VOC emission limit: An initial test is required to demonstrate compliance with the VOC emission limit. Thereafter, CO emission limit will be employed as a surrogate and no annual testing is required.

33. Testing procedures: Testing of emissions shall be conducted with the combustion turbine operating at permitted capacity. Permitted capacity is defined as 95-100 percent of the maximum heat input rate allowed by the permit, corrected for the average turbine Intel 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. turbine inlet temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for ambient temperature) and 105 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. Test procedures shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapter 62-204.800 F.A.C.

34. Test Notification: The DEP's South District office shall be notified, in writing, at least 30 days prior to the initial performance tests and at least 15 days before annual compliance test(s).

35. Special Compliance Tests: The DEP may request a special compliance test pursuant to Rule 62-297.310(7), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission standard is being violated.

36. Test Results: Compliance test results shall be submitted to the DEP's South District office no later than 45 days after completion of the last test run.

NOTIFICATION, REPORTING, AND RECORDKEEPING

37. Records: All measurements, records, and other data required to be maintained by the permittee shall be recorded in a permanent form and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These records shall be made available to DEP representatives upon request.

38. Emission Compliance Stack Test Reports: A test report indicating the results of the required compliance tests shall be filed with the DEP South District Office as soon as practical, but no later than 45 days after the last sampling run is completed. [Rule 62-297.310(8), F.A.C.]. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.

MONITORING REQUIREMENTS

39. Continuous Monitoring System: The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from each CT. Thirty day rolling average periods when NO_X emissions (ppmvd @ 15% oxygen) are above the standards, listed in Specific Condition No 18 and 19, shall be provided to the DEP Bureau of Air Monitoring and Mobile Sources pursuant to 40CFR75.

40. CEMS in lieu of the requirement for reporting excess emissions: Subject to EPA approval, the NO_X CEMS shall be used in lieu of the requirement for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1997 version). Upon request from DEP, the CEMS emission rates for NO_X on each CT shall be corrected to ISO conditions to demonstrate compliance with the NO_X standard established in 40 CFR 60.332.

41. Continuous Monitoring System Reports: The monitoring devices shall comply with the certification and quality assurance, and any other applicable requirements of Rule 62-297.520, F.A.C., 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) or 40 CFR Part 75. Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F or 40CFR75. Data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the Department's South District Office for review at least 90 days prior to installation.

42. Natural Gas Monitoring Schedule: The following custom monitoring schedule for natural gas is approved in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2):

    - SO2 emissions shall be quantified pursuant to the monitoring plan approved by the EPA Acid Rain Division for firing only pipeline quality natural gas.

43. 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]

44. Subpart Db Monitoring: The Permittee shall comply with the applicable monitoring requirements of 40CFR60, Subpart Db for the steam boiler.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

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

G.13 This permit also constitutes:

a) Determination of Best Available Control Technology (X);
b) Determination of Prevention of Significant Deterioration non-applicablity (X); and
c) Compliance with New Source Performance Standards (X).

G.14 The permittee shall comply with the following:

a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

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

Memorandum

Florida Department of
Environmental Protection

TO: C. H. Fancy

FROM: A. A. Linero

DATE: September 16, 1998

SUBJECT: FPL Ft. Myers 1500 MW Repowering Project
DEP File No. 0710002-004-AC

Attached is the draft public notice package including the Intent to Issue and the Technical Evaluation and Preliminary Determination for the Ft. Myers Repowering Project. The application is for installation of six (6) 250 megawatt (MW) combined cycle units to replace two (2) residual oil-fired steam generators at the Fort Myers Plant.

Each unit is a 170 megawatt General Electric MS7241FA gas-fired combustion turbine-generator with an unfired heat recovery steam generator (HRSG) that will raise sufficient steam to produce another 80 MW via the existing steam-driven electrical generators. The boilers and the tall stacks associated with existing residual oil-fired units (593 MW total capacity) will be dismantled. The project also includes: a cooling tower for once-through brackish water; a small boiler or heaters to heat the natural gas prior to use; and two relatively short stacks per unit for simple and combined (with HRSG) operation.

Nitrogen Oxides (NO_X) emissions will be controlled by Dry Low NO_X (DLN-2.6) combustors capable of achieving emissions of 9 parts per million (ppm) by volume at 15 percent oxygen. Emissions of carbon monoxide (CO) will be controlled to 12 ppm, while emissions of volatile organic compounds (VOC) will be less than 1.4 ppm. Emissions of sulfur dioxide (SO_2), sulfuric acid mist (SAM), and particulate matter (PM/PM_{10}) will be very low because of the switch to inherently clean pipeline quality natural gas. There will be no provisions for firing fuel oil.

There are very substantial emission reductions for all pollutants except VOC. The project netted out of PSD and no BACT was required. The lower NO_X emissions will reduce ozone (smog) formation potential and nitrate fallout. The lower PM/PM_{10}, SO_2 and SAM emissions will reduce visible emissions, fine particulate generation, and acid smut fallout. An air quality impact analysis was conducted. Impacts due to the proposed project emissions are all favorable and the net effect is a "creation of available increment" in the PSD Class I (Everglades) and Class II areas.

We will meet with Rich Piper and Ken Kosky on Friday morning. Basically, it is my intent to give them this package and discuss it with them. Thereafter they can send us comments. We will send copies to EPA and the Park Service and will consider their comments prior to issuance of the final permit. If their comments are not substantial we will revise the package and give it to them before they leave. I recommend your approval of the attached Intent to Issue and the cover letter.

AAL/aal

Attachments

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

P.E. Certification Statement

Permittee:

DEP File No. 0710002-004-AC

Florida Power & Light Company
FPL Fort Myers Plant
Lee County

Project type:

Project to install six (6) 250 megawatt (MW) combined cycle units to replace two (2) residual oil-fired steam generators at the Fort Myers Plant near Tice, Lee County. Each unit is a 170 megawatt General Electric MS7241FA gas-fired combustion turbine-generator with an unfired heat recovery steam generator (HRSG) that will raise sufficient steam to produce another 80 MW via the existing steam-driven electrical generators. The boilers and the tall stacks associated with existing residual oil-fired units (593 MW total capacity) will be dismantled. The project also includes: a cooling tower for once-through brackish water; a small boiler or heaters to heat the natural gas prior to use; and two relatively short stacks per unit for simple and combined (with HRSG) operation.

Nitrogen Oxides emissions will be controlled by Dry Low NO_X (DLN-2.6) combustors capable of achieving emissions of 9 parts per million (ppm) by volume at 15 percent oxygen. Emissions of carbon monoxide will be controlled to 12 ppm, while emissions of volatile organic compounds will be less than 1.4 ppm. Emissions of sulfur dioxide, sulfuric acid mist, and particulate matter will be very low because of the switch to inherently clean pipeline quality natural gas. The project "nets out" of PSD and a BACT determination was not required.

The lower NO_X emissions will reduce ozone (smog) formation potential and nitrate fallout. The lower PM/PM_{10}, SO_2 and SAM emissions will reduce visible emissions, fine particulate generation, and acid smut fallout. Impacts due to the proposed project emissions are all favorable and the net effect is a "creation of available increment" in the PSD Class I (Everglades) 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. — 9/18/98
Registration Number: 26032 — Date

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

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Florida Power & Light Company, P. O. Box 430, Fort Myers, FL 33902

FPL

September 4, 1998

Mr. Clair Fancy, P.E.
State of Florida
Department of Environmental Protection
Division of Air Resources Management
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Submittal of Air Construction Permit Application
FPL Fort Myers Plant

Dear Mr. Fancy: 0710002-004-AC

Enclosed for your use please find an application for an Air Construction permit for the repowering of the FPL Fort Myers facility. Since the facility currently holds a Title V permit issued by the Department, and this is a non-PSD permit, no permit fee is required, per FDEP Rule 62-4.050(4)(a)2..

FPL is quite interested in moving this application along as expeditiously as possible. I'll be contacting your staff in the next few days to arrange for a review of the application and to answer any questions they may have.

Please do not hesitate to contact me at (561) 691-7058 if I may be of further assistance.

Very truly yours,

Richard Piper
Repowering Licensing Manager
Florida Power & Light Company

Cc: David Knowles FDEP South District, Fort Myers