

Jeb Bush
Governor

Department of Environmental Protection

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

David B. Struhs
Secretary

December 15, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Ben Jacoby, Director
Midway Development Company, L.L.C.
1400 Smith Street
Houston, Texas 77002-7631

Re: DEP File No. 1110099-002-AC (PSD-FL-304)
Midway Energy Center
Three Simple Cycle Combustion Turbines

Dear Mr. Jacoby:

Enclosed is one copy of the Draft Permit, Technical Evaluation and Preliminary Determination, and Draft BACT Determination, for the Midway Energy Center to be located near Port St. Lucie and Fort Pierce in St. Lucie County. The Department's Intent to Issue Air construction Permit and the "Public Notice of Intent to Issue Air Construction Permit" are also included.

The Public Notice must be published one time only as soon as possible in a newspaper of general circulation in the area affected, pursuant to Chapter 50, Florida Statutes. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please submit any other written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address or contact him at 850/921-9523.

Sincerely,

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

CHF/al

Enclosures

SENDER: COMPLETE THIS SECTION

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

1. Article Addressed to:

Mr. Ben Jacoby, Director
 Midway Development Company, L.L.C.
 1400 Smith Street
 Houston, Texas 77002-7631

2. Article Number (Copy from service label)

7099 3400 0000 1453 3280

PS Form 3811, July 1999

COMPLETE THIS SECTION ON DELIVERY

A. Received by (Please Print Clearly) H. W. JETT B. Date of Delivery 12-22-90

C. Signature H. W. JETT Agent Addressee

D. Is delivery address different from item 1? Yes No
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U.S. Postal Service
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Article Sent to:
 Mr. Ben Jacoby, Director

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| Postage | \$ | Postmark here |
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Name (Please Print Clearly, to be completed by mailer)
 Mr. Ben Jacoby, Director
 Street, Apt. No. or PO Box No.
 1400 Smith Street
 City, State, Zip+4
 Houston, Texas 77002-7631

PS Form 3800, July 1999

See Reverse for Instructions

002E 54HT 0000 00HE 6602

In the Matter of an
Application for Permit by:

Mr. Ben Jacoby, Director
Midway Development Company, L.L.C.
1400 Smith Street
Houston, Texas 77002-7631

DEP File No. 1110099-002-AC (PSD-305)
Midway Energy Center, Units 1 - 3
St. Lucie 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, Midway Development Company, L.L.C., applied on November 9, 2000 to the Department for an air construction permit to construct three 170-megawatt dual-fuel combustion turbines with inlet chillers, three 80-foot stacks, a natural gas heater, a 2.5 million gallon fuel oil storage tank, and a 0.6 million gallon fuel oil day storage tank for the Midway Energy Center to be located near Port St. Lucie in St. Lucie County.

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

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

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed Public Notice of Intent to Issue Air Construction Permit. The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. Rule 62-110.106(7)(b), F.A.C., requires that the applicant cause the notice to be published as soon as possible after notification by the Department of its intended action. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/ 922-6979). You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

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

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

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.


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

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

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

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

Executed in Tallahassee, Florida.


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

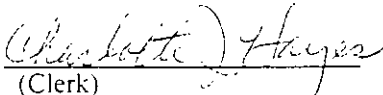
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AIR CONSTRUCTION PERMIT (including the PUBLIC NOTICE, Technical Evaluation and Preliminary Determination, Draft BACT Determination, and the DRAFT permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 12/18/00 to the person(s) listed:

Ben Jacoby, MDC*
Gregg Worley, EPA
John Bunyak, NPS
Isidore Goldman, DEP SED
Chair, St. Lucie County BCC
Blair Burgess, P.E., ENSR

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) 12/18/00
(Date)

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 1110099-002-AC (PSD-FL-305)

Midway Energy Center – Units 1-3
St. Lucie County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to Midway Development Company, L.L.C (an affiliate of Enron North America). The permit is to construct three 170-megawatt (MW) dual-fuel combustion turbines with inlet chillers, three 80-foot stacks, a natural gas heater, a 2.5 million gallon fuel oil storage tank, and a 0.6 million gallon fuel oil day storage tank for the Midway Energy Center to be located West of I-95 near Port St. Lucie and Fort Pierce in St. Lucie County. A Best Available Control Technology (BACT) determination was required for sulfur dioxide (SO₂), particulate matter (PM/PM₁₀), nitrogen oxides (NO_x), sulfuric acid mist (SAM), and carbon monoxide (CO) pursuant to Rule 62-212.400, F.A.C. The applicant's name and address are Midway Development Company (affiliate of Enron North America), 1400 Smith Street, Houston, Texas 77002-7631.

The new units will be nominal 170 MW General Electric PG7241FA combustion turbine-electrical generators. The units will operate in simple cycle mode and intermittent duty. The units will operate primarily on natural gas and will be permitted to operate 3,500 hours per year of which no more than 1000 hours per year will be using maximum 0.05 percent sulfur distillate fuel oil.

NO_x emissions will be controlled by Dry Low NO_x (DLN-2.6) combustors. The units must meet a continuous emission limit of 9 parts per million by volume, dry at 15 percent oxygen (ppm). NO_x will be controlled to 42 ppm by wet injection when firing fuel oil. Sulfuric acid mist, SO₂, and PM/PM₁₀ will be limited by use of clean fuels. Emissions of VOC and CO will be controlled by good combustion practices.

The maximum emissions from the combustion turbines in tons per year based on the original application are summarized below. There will be minor emissions of VOC from the fuel oil storage tank. However total VOC emissions will still be less than significant for PSD purposes.

| <u>Pollutant</u> | <u>Maximum Potential Emissions</u> | <u>PSD Significant Emission Rate</u> |
|---------------------|------------------------------------|--------------------------------------|
| PM/PM ₁₀ | 119 | 25/15 |
| CO | 213 | 100 |
| NO _x | 708 | 40 |
| VOC | 20 | 40 |
| SO ₂ | 190 | 40 |
| Sulfuric Acid Mist | 29 | 7 |

Air quality impact analyses were conducted. Maximum predicted impacts due to proposed emissions from the project are less than the applicable PSD Class I and Class II significant impact levels. There will be insignificant impacts on visibility in the Class I Everglades National Park. Based on the required analyses, the Department has reasonable assurance that the proposed project will not cause or significantly contribute to a violation of any AAQS or PSD increment.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit, unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

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

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

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

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

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

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

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

| | | |
|-----------------------------------|-------------------------------------|-----------------------------------|
| Dept. of Environmental Protection | Dept. of environmental Protection | Dept. of Environmental Protection |
| Bureau of Air Regulation | Southeast District Office | Southeast District Branch Office |
| 111 S. Magnolia Drive, Suite 4 | 400 North Congress Avenue | 1801 SE Hillmoor Drive, Suite 204 |
| Tallahassee, Florida 32301 | West Palm Beach, Florida 33416-5425 | Port St. Lucie, Florida 34952 |
| Telephone: 850/488-0114 | Telephone: 561/681-6600 | Telephone: 561/398-2806 |
| Fax: 850/922-6979 | Fax: 561/681-6755 | Fax: 561/398-2815 |

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information. The draft permit, technical evaluation and preliminary BACT determination can be accessed at www.dep.state.fl.us/air by clicking on permitting and then construction permits.

TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION

Midway Energy Center Units 1 - 3

Three 170-Megawatt Combustion Turbines
One 2.5-Million Gallon Fuel Oil Storage Tank
One 0.6 Million Gallon Fuel Oil Storage Tank
Gas-fired Heater

St. Lucie County

DEP File No. 1110099-002-AC (PSD-FL-305)

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

December 15, 2000

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

Midway Development Company, L.L.C. (Midway)
1400 Smith Street
Houston, Texas 77002-7631

Authorized Representative: *Mr. Ben Jacoby*

1.2 Reviewing and Process Schedule

11-09-00: Date of Receipt of Application

12-15-00: Intent Issued

2. FACILITY INFORMATION

2.1 Facility Location

Refer to Figures 1 and 2 below. The Midway Energy Center will be located in unincorporated St. Lucie County near the east coast of Florida. The site is located to the northwest of the intersection of I-95 and County Road 712 (W. Midway Road) near Port St. Lucie and Fort Pierce. There is already a substation in the vicinity. The location is approximately 180 kilometers North-Northeast of the Everglades National Park. The UTM coordinates for this facility are Zone 17; 556.67 km E; 3028.55 km N.

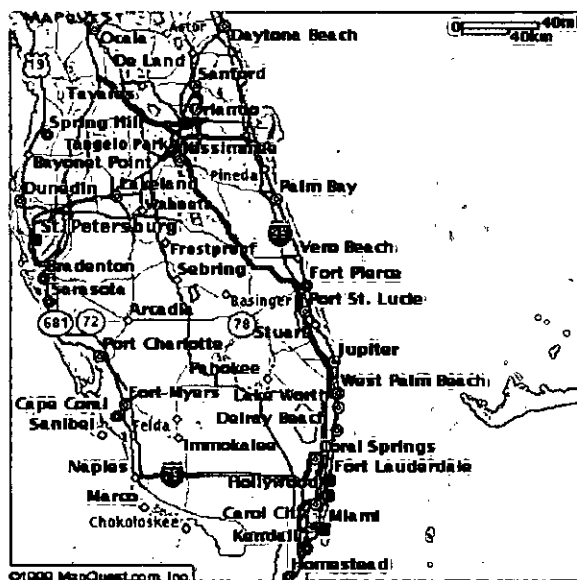


Figure 1 – Regional Location

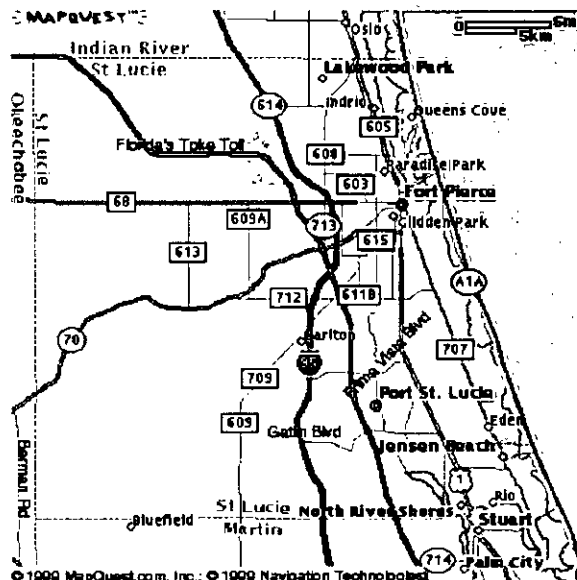


Figure 2 – I-95 and 712 St. Lucie County

2.2 Standard Industrial Classification Codes (SIC)

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

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

2.3 Facility Category

This proposed facility will generate 510 megawatts (nominal MW) of electrical power. The facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM₁₀), sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 TPY.

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD), and a Best Available control Technology determination is required. Given that emissions of at least one single criteria pollutant will exceed 250 TPY, PSD Review and a BACT determination are required for each pollutant emitted in excess of the Significant Emission Rates listed in Table 62-212.400-2, F.A.C. These values are: 40 TPY for NO_x, SO₂, and VOC; 25/15 TPY of PM/PM₁₀; 7 TPY of Sulfuric Acid Mist (SAM); and 100 TPY of CO.

3. PROJECT DESCRIPTION

This permit addresses the following emissions units:

| EMISSION UNIT | SYSTEM | Emission Unit Description |
|---------------|------------------|---|
| 001 | Power Generation | One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator with inlet air chiller |
| 002 | Power Generation | One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator with inlet air chiller |
| 003 | Power Generation | One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator with inlet air chiller |
| 004 | Fuel Storage | One 2.5-Million Gallon Fuel Oil Storage Tank |
| 005 | Fuel Storage | One 0.6 Million Gallon Fuel Oil Storage Tank |
| 006 | Fuel Heating | One 13 million Btu per hour Natural Gas heater |

Midway proposes to construct three nominal 170 MW General Electric PG7241FA simple cycle, intermittent duty combustion turbine-electrical-generators with inlet air chillers, 80-foot stacks, two fuel oil storage tanks, a natural gas heater, and ancillary equipment at the planned Midway Energy Center.

According to the revised application, the facility will emit approximately 708 tons per year (TPY) of nitrogen oxides (NO_x), 213 TPY of carbon monoxide (CO), 119 TPY of particulate matter (PM/PM₁₀), 190 TPY of sulfur dioxide (SO₂), 20 TPY of volatile organic compounds (VOC), and 29 TPY of sulfuric acid mist (SAM).

Significant emission rate increases per Table 212.400-2, F.A.C. will occur for CO, SO₂, SAM, PM/PM₁₀ and NO_x. A BACT determination is required for each of these pollutants. An air quality impact review is also required for CO, PM/PM₁₀, NO_x, and SO₂.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Each turbine will be equipped with Dry Low NO_x (DLN-2.6) combustors for the control of NO_x emissions to 9 ppmvd at 15% O₂ from 50% load up to 100% load conditions during normal operations. Each turbine will have a maximum heat input rating of approximately 1,700 (gas) and 1,900 (oil) mmBtu/hr lower heating value (LHV) at 30°F while operating at 100% load. The main fuel will be natural gas and the units are proposed by Midway to operate up to 3,500 hours per year per unit of which 1000 hours per year per unit may be on maximum 0.05 percent sulfur distillate fuel oil.

The key components of the GE MS 7001FA (a predecessor of the PG 7241FA) are identified in Figure 3. An exterior view is also shown. Each unit will be delivered with 14 can-annular design, DLN-2.6 combustors instead of the earlier-generation combustors supplied with the MS7001FA.

4. PROCESS DESCRIPTION

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

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

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.

Figure 4 is a simplified process flow diagram of the proposed Midway Project. In the Midway Project, the units will operate as peaking units in the simple cycle mode. Cycle efficiency, defined as a percentage of useful shaft energy output to fuel energy input, is approximately 35 percent for F-Class combustion turbines in the simple cycle mode. In addition to shaft energy output, 1 to 2 percent of fuel input energy can be attributed to mechanical losses. The balance is exhausted from the turbine in the form of heat.

At high ambient temperature, the units cannot generate as much power because of lower compressor inlet air density. To compensate for the loss of output (which can be on the order of 20 MW compared to referenced temperatures), an inlet air cooler (fogger or chiller) can be installed ahead of the combustion turbine inlet. At an ambient temperature of 95 °F, roughly 15 MW of power can be regained per unit by using a chiller to cool the inlet air to 50 °F.

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

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

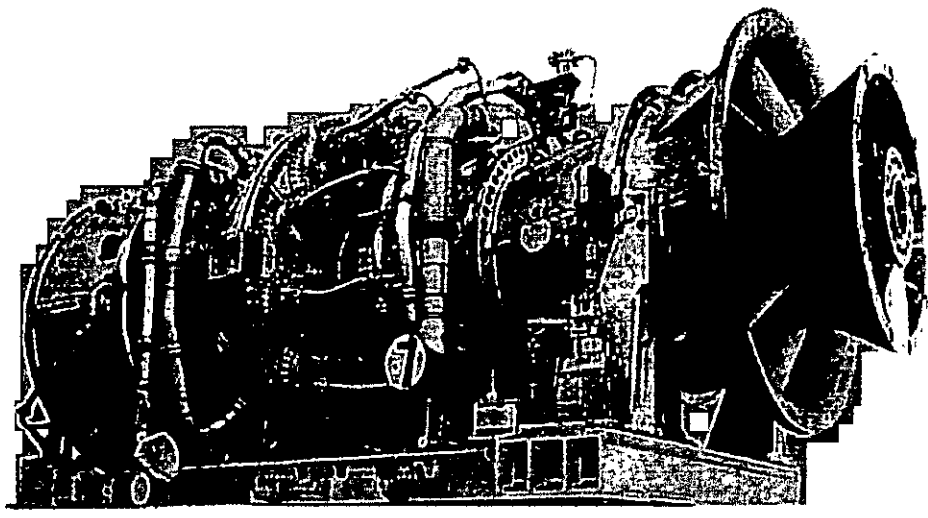
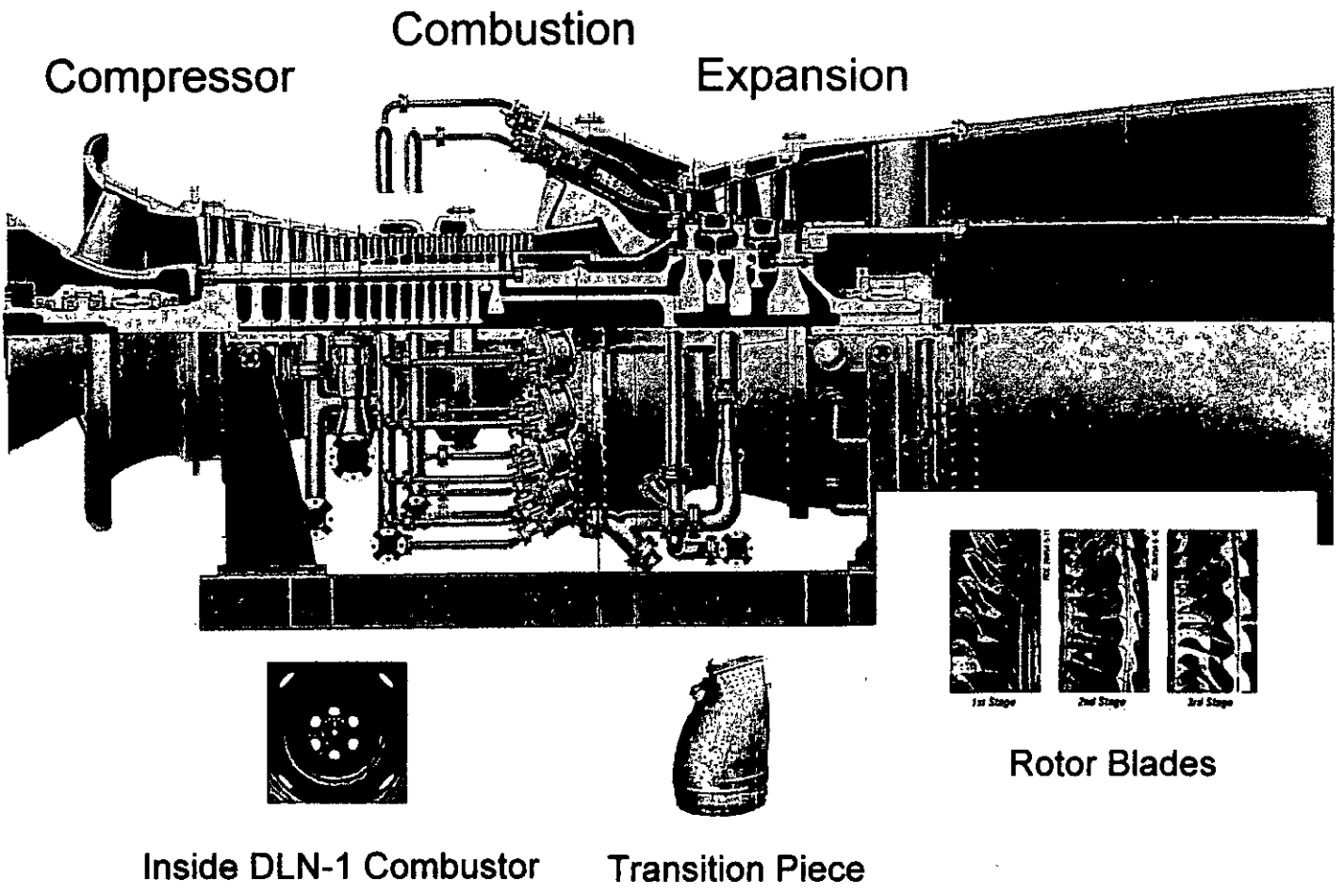


Figure 3 - Internal and External Views of Early GE 7FA

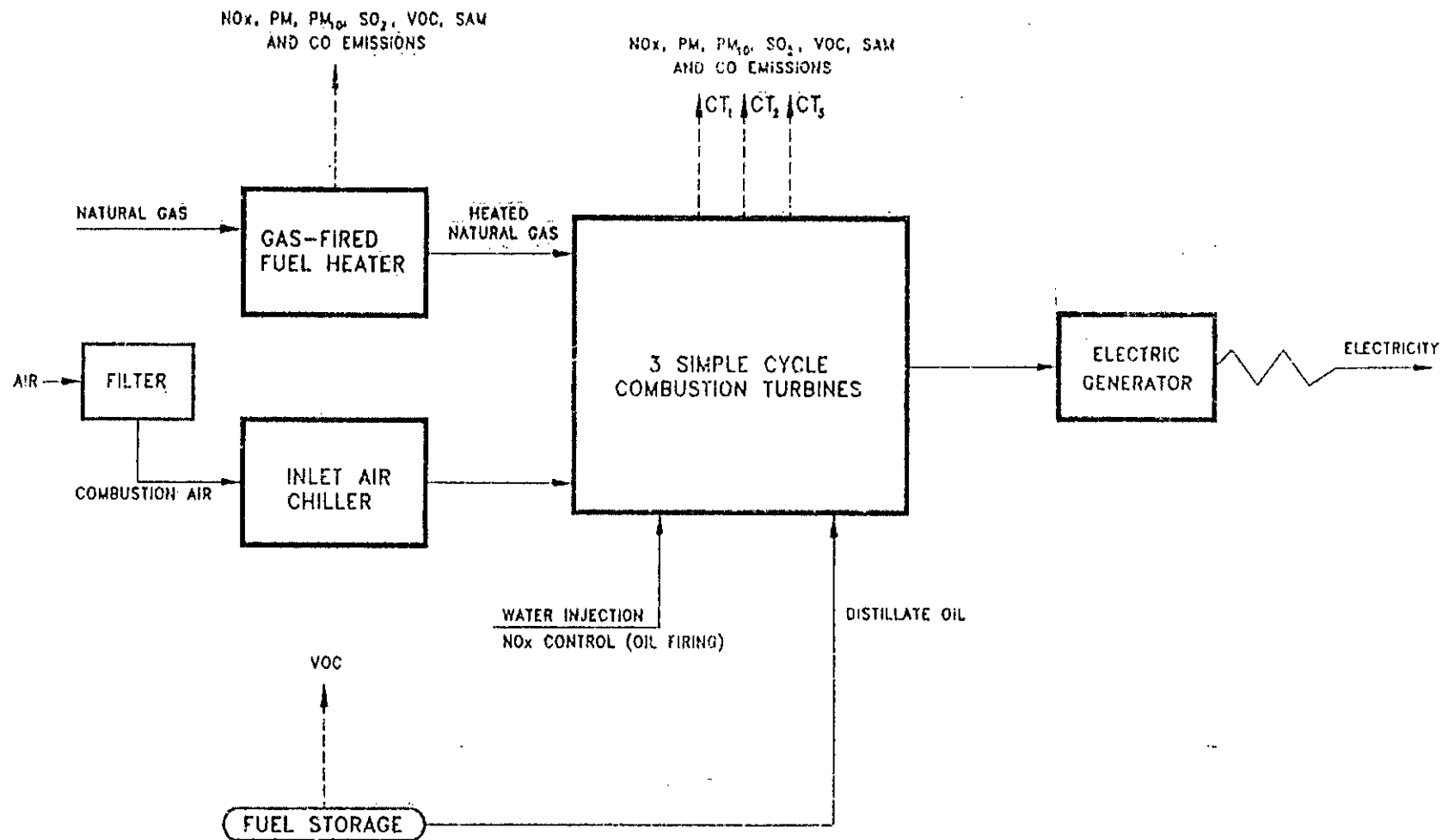


Figure 4 - Simple Cycle Process Flow Diagram

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

5. RULE APPLICABILITY

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

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

This PSD review consists of an evaluation of resulting ambient air pollutant concentrations, and increases with respect to the National Ambient Air Quality Standards and Increments as well as a determination of Best Available Control Technology (BACT) for PM/PM₁₀, CO, SO₂, SAM and NO_x. An analysis of the air quality impact from proposed project upon soils, vegetation and visibility is required along with air quality impacts resulting from associated commercial, residential, and industrial growth

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

5.1 State Regulations

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

5.2 Federal Rules

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

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

6. SOURCE IMPACT ANALYSIS

6.1 Emission Limitations

The proposed Units 1-6 will emit the following PSD pollutants (Table 212.400-2, F.A.C.): PM/PM₁₀, SO₂, NO_x, CO, SAM, and negligible quantities of fluorides (F), mercury (Hg) and lead (Pb). The applicant's proposed annual emissions are summarized in the Table below and form the basis of the source impact review. The Department's proposed permitted allowable emissions for Units 1-3 are summarized in the Draft BACT document and Specific Condition Nos. 18-23 of Draft Permit PSD-FL-305.

6.2 Emission Summary

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

PROJECT EMISSIONS (TPY) AND PSD APPLICABILITY

| Pollutant | Gas Firing ¹ | Oil Firing ² | Total ² | PSD Significance | PSD REVIEW? |
|---------------------|-------------------------|-------------------------|--------------------|------------------|-------------|
| PM/PM ₁₀ | 95 | 51 | 119 | 25 | Yes |
| SO ₂ | 56 | 150 | 190 | 40 | Yes |
| NO _x | 315 | 482 | 708 | 40 | Yes |
| CO | 157 | 100 | 213 | 100 | Yes |
| Ozone (VOC) | 16 | 7 | 20 | 40 | No |
| Sulfuric Acid Mist | 8 | 23 | 29 | 7 | Yes |
| Total Fluorides | ~0 | ~0 | 0.09 | 3 | No |
| Mercury | ~0 | 0.003 | 0.003 | 0.1 | No |
| Lead | ~0 | 0.03 | 0.03 | 0.6 | No |
| HAPs | 5 | 3 | 6 | NA | NA |

1. Based on 3,500 hours of gas firing per year per unit. Includes gas heater. Reference inlet air chiller temperature is 50 °F.

2. Based on 2,500 hours of gas firing and 1000 hours of fuel oil firing per year per unit. Includes storage tanks.

6.3 Control Technology

The PSD regulations require new major stationary sources to undergo a control technology review for each pollutant that may be potentially emitted above significant amounts. The control technology review requirements of the PSD regulations are applicable to emissions of NO_x, SO₂, CO, SAM, and PM/PM₁₀. Emissions control will be accomplished primarily by good combustion of clean natural gas and the limited use of low sulfur (0.05 percent) distillate fuel oil. The combustors will operate in lean pre-mixed mode to minimize the flame temperature and nitrogen oxides formation potential. A full discussion is given in the Draft Best Available Control Technology (BACT) Determination (see Permit Appendix BD). The Draft BACT is incorporated into this evaluation by reference.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

6.4 Air Quality Analysis

6.4.1 Introduction

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

The applicant's initial PM/PM₁₀, CO, NO_x, and SO₂ air quality impact analyses for this project predicted no significant impacts; therefore, further applicable AAQS and PSD increment impact analyses for these pollutants were not required. Also, the maximum predicted impacts for all pollutants were below their respective *de minimis* ambient impact levels. Therefore, pre-construction monitoring at the proposed site was not required for this project. Based on the preceding discussion, the air quality analyses required by the PSD regulations for this project were the following:

- A significant impact analysis for PM₁₀, CO, SO₂, and NO_x in the Surrounding Class II Area.
- An analysis of impacts on soils, vegetation, visibility, and of growth-related air quality modeling impacts.

Based on these required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in *NRDC v. Thomas*, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A more detailed discussion of the required analyses follows.

6.4.2 Models and Meteorological Data Used in the Air Quality Analysis

The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project in the surrounding Class II Area. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. It incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfied 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) station at West Palm Beach, Florida (surface and upper air data). The 5-year

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

period of meteorological data was from 1987 through 1991. This NWS station was selected for use in the study because it is the closest primary weather station to the study area and is most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

6.4.3 Significant Impact Analysis

In order to conduct a significant impact analysis, the applicant conducts modeling using only the proposed project's emissions at worst load conditions. The highest predicted short-term concentrations and highest predicted annual averages predicted by this modeling are compared to the appropriate significant impact levels for the Class I and Class II Areas. If this modeling at worst load conditions shows significant impacts, additional modeling that includes the emissions from surrounding facilities is required to determine the project's impacts on the existing air quality and any applicable AAQS or PSD increments. If no significant impacts are shown, the applicant does not have to conduct any further modeling.

The only significant impact analysis submitted for this project was for the surrounding Class II Area. The closest Class I Area to this project is the Everglades National Park (ENP). Since the ENP is over 180 km from the project site, plus the type and amount of emissions from the source, a Class I Area significant impact analysis was not required for this project. The following paragraphs explain the methodologies and results of the Class II analysis:

Receptors were placed around the proposed facility, which is located in a PSD Class II Area. A combination of fence line, near-field, mid-field, and far-field receptors were utilized for predicting maximum concentrations in the vicinity of the project. The fence line receptors consisted of discrete Cartesian receptors spaced at less than 100 meter intervals around the facility fence line. The remaining receptors consisted of a grouping of Cartesian receptor grids logarithmically spaced out to a distance 20 km from the facility. For each pollutant subject to PSD and also subject to PSD increment and/or AAQS analyses, this modeling compares maximum predicted impacts due to the project with PSD significant impact levels to determine whether significant impacts due to the project are predicted in the vicinity of the facility. The table below shows the results of the significant impact modeling for the Class II Area:

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

| Pollutant | Averaging Time | Max Predicted Impact (ug/m ³) | Significant Impact Level (ug/m ³) | Significant Impact? |
|------------------|----------------|---|---|---------------------|
| SO ₂ | Annual | 0.01 | 1 | NO |
| | 24-Hour | 1.1 | 5 | NO |
| | 3-Hour | 5.6 | 25 | NO |
| PM ₁₀ | Annual | 0.008 | 1 | NO |
| | 24-Hour | 0.6 | 5 | NO |
| CO | 8-Hour | 3.4 | 500 | NO |
| | 1-Hour | 18.2 | 2000 | NO |
| NO ₂ | Annual | 0.05 | 1 | NO |

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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

6.4.4 Additional Impacts Analysis

Impact on Soils, Vegetation, And Wildlife

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

Impact On Visibility

Natural gas and low sulfur distillate fuel oil are clean fuels and produce little ash. This will minimize smoke formation. The low NO_x and SO₂ emissions will also minimize plume opacity. Because no add-on control equipment and no reagents are required, there will be no steam plume or tendency to form ammoniated particulate species. Due to the distance of the source from the ENP PSD Class I Area, plus the type and amount of emissions from the source, there is a low potential for visibility impacts. Therefore, the National Park Service required no regional haze analysis for this project.

Growth-Related Air Quality Impacts

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

The facility will require 6000 truckloads (an average of 17 per day) of fuel oil for 1000 hours of operation. If fuel oil usage is concentrated over a period of a few months, then the truck traffic will be more noticeable. In the near future, more natural gas will be available and less fuel oil will be used, resulting in less impacts.

Over the past few years the Public Service Commission has determined that a number of power projects are needed to help meet the low electrical reserve capacity throughout the State of Florida. No need determination was made for this specific project. A number of projects will be located in this area due to availability of natural gas, substations, and transmission capacity. The project is a response to statewide and regional growth and also accommodates more growth.

There are no adequate procedures under the PSD rules to fully assess these impacts. However, the type of project proposed has a small overall physical "footprint," low water requirements, and among the lowest air emissions per unit of electric power generating capacity for intermittent duty.

Hazardous Air Pollutants

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

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

7. CONCLUSION

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

A. A. Linero, P.E., Administrator
Chris Carlson, Meteorologist

PERMITTEE:

Midway Development Company
1400 Smith Street
Houston, Texas 77002-7631

| | |
|------------|----------------|
| Permit No. | PSD-FL-305 |
| File No. | 1110099-002-AC |
| SIC No. | 4911 |
| Expires: | June 30, 2003 |

Authorized Representative:

Ben Jacoby

PROJECT AND LOCATION:

Air Construction Permit pursuant to the requirements for the Prevention of Significant Deterioration of Air Quality Permit for: three dual-fuel nominal 170 megawatt (MW) General Electric PG7241FA combustion turbine-electrical generators with inlet air chillers; one 2.5-million gallon fuel oil storage tank; one 0.6 million gallon fuel oil storage tank; a natural gas heater; and three 80-foot stacks. The units will operate in simple cycle mode and intermittent duty. The units will be equipped with Dry Low NO_x (DLN-2.6) combustors and wet injection capability.

The project will be located Northwest of the intersection of I-95 and W. Midway Road near Port St. Lucie and Ft. Pierce in unincorporated St. Lucie County. UTM coordinates are Zone 17; 556.7 km E; 3028.5 km N.

STATEMENT OF BASIS:

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

Attached Appendices and Tables made a part of this permit:

Appendix BD
Appendix GC

BACT Determination
Construction Permit General Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

AIR CONSTRUCTION PERMIT PSD-FL-305 (1110099-002-AC)

SECTION I. FACILITY INFORMATION

FACILITY DESCRIPTION

This facility is a new site. This permitting action is to install three dual-fuel nominal 170 megawatt (MW) General Electric PG7241FA combustion turbine-electrical generators with inlet air chillers, three 80-foot stacks, one 2.5-million gallon fuel oil storage tank, one 0.6-million gallon storage tank, a gas heater and ancillary equipment. Emissions from the new units will be controlled by Dry Low NO_x (DLN-2.6) combustors when operating on natural gas and wet injection when firing fuel oil. Inherently clean fuels and good combustion practices will be employed to control all pollutants.

EMISSION UNITS

This permit addresses the following emission units:

| ARMS EMISSION UNIT | SYSTEM | Emission Unit Description |
|--------------------|------------------|---|
| 001 | Power Generation | One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator with inlet air chiller |
| 002 | Power Generation | One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator with inlet air chiller |
| 003 | Power Generation | One nominal 170 Megawatt Gas Combustion Turbine-Electrical Generator with inlet air chiller |
| 004 | Fuel Storage | One 2.5-Million Gallon Fuel Oil Storage Tank |
| 005 | Fuel Storage | One 0.6 Million Gallon Fuel Oil Storage Tank |
| 006 | Fuel Heating | One 13 million Btu per hour Natural Gas heater |

REGULATORY CLASSIFICATION

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

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). Pursuant to Table 62-212.400-2, modifications at this facility resulting in emissions increases greater than any of the following values require review per the PSD rules as well as a determination of Best Available Control Technology (BACT): 40 TPY of NO_x, SO₂, or VOC; 25/15 TPY of PM/PM₁₀; 100 TPY of CO; or 7 TPY of sulfuric acid mist (SAM). This facility and the project are also subject to applicable provisions of Title IV, Acid Rain, of the Clean Air Act.

AIR CONSTRUCTION PERMIT PSD-FL-305 (1110099-002-AC)

SECTION I. FACILITY INFORMATION

PERMIT SCHEDULE

- 12/xx/00 Notice of Intent published in _____
- 12/15/00 Distributed Intent to Issue Permit
- 11/09/00 Received Application

RELEVANT DOCUMENTS:

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

- Application received on November 9, 2000
- Letter from Enron North America dated December 5, 2000.
- Letter from U.S. EPA Region IV dated _____
- Letter from National Park Service dated _____
- Department's Intent to Issue and Public Notice Package dated December 15, 2000
- Department's Final Determination and Best Available Control Technology Determination issued concurrently with this permit.

AIR CONSTRUCTION PERMIT PSD-FL-305 (1110099-002-AC)

SECTION II. ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the *Permitting Authority*: Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP), at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and phone number (850) 488-0114. All documents related to reports, tests, and notifications should be submitted to the *Compliance Authority*: DEP Southeast District office, 400 North Congress Avenue W, West Palm, Florida, 33401 and phone number 561/681-6755, fax 561-681-6755. Copies shall be sent to the DEP Port St. Lucie Branch office, 1801 SE Hillsmoore Dr, C 204, Port St. Lucie, Florida 34952 and phone number 561/398-2806, fax 561/398-2815.
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. PSD Approval to Construct Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)].
7. BACT Determination Revision: In accordance with Rule 62-212.400(6)(b), F.A.C. (and 40 CFR 51.166(j)(4)), the Best Available Control Technology (BACT) determination shall be reviewed and modified as appropriate in the event of a plant conversion. This paragraph states: "For phased construction project, the determination of best available control technology shall be reviewed and modified as appropriate at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. At such time, the owner or operator of the applicable stationary source may be required to demonstrate the adequacy of any previous

AIR CONSTRUCTION PERMIT PSD-FL-305 (1110099-002-AC)

SECTION II. ADMINISTRATIVE REQUIREMENTS

determination of best available control technology for the source.” This reassessment will also be conducted for this project if there are any increases in heat input limits, hours of operation, oil firing (e.g. conversion to combined-cycle operation) short-term or annual emission limits, annual fuel heat input limits or similar changes. [40 CFR 51.166(j)(4) and Rule 62-212.400(6)(b), F.A.C.]

8. Completion of Construction: The permit expiration date is June 30, 2003. Physical construction shall be complete by December 31, 2003. The additional time provides for testing, submittal of results, and submittal of the Title V permit to the Department.
9. Permit Expiration Date Extension: The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit [Rule 62-4.080, F.A.C.]
10. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the DEP's Bureau of Air Regulation, and a copy to the Department's Southeast District office. [Chapter 62-213, F.A.C.]
11. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
12. Annual Reports: Pursuant to Rule 62-210.370(2), F.A.C., Annual Operation Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports shall be sent to the DEP's Southeast District and a copy to the DEP's Port St. Lucie Branch offices by March 1st of each year. [Rule 62-210.370(2), F.A.C.]
13. Quarterly Reports: Semiannual excess emission reports, in accordance with 40 CFR 60.7(a)(7)(c) (2000 version), shall be submitted to the DEP's Southeast District and a copy to the DEP's Port St. Lucie Branch offices. Each excess emission report shall include the information required in 40 CFR 60.7(c) and 60.334.

AIR CONSTRUCTION PERMIT PSD-FL-305 (1110099-002-AC)

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 60, 72, 73, and 75. 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.]
2. 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
3. ARMS Emission Units 001-003, Power Generation, consisting of three 170 megawatt combustion turbines shall comply with all applicable provisions of 40CFR60, Subpart GG, Standards of performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b), F.A.C. The Subpart GG requirement to correct test data to ISO conditions applies. However, such correction is not used for compliance determinations with the BACT standard(s). [Rule 62-204.800(7)(b), F.A.C.]
4. ARMS Emission Unit 004, Fuel Storage, consisting of one 2.5 million gallon distillate fuel oil storage tanks shall comply with all applicable provisions of 40CFR60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels, adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-204.800(7)(b), F.A.C.]
5. ARMS Emission Unit 005, Fuel Storage, consisting of one 0.6 million gallon distillate fuel oil storage tanks shall comply with all applicable provisions of 40CFR60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels, adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-204.800(7)(b), F.A.C.]
6. ARMS Emission Unit 006, Fuel Heating, consisting of one 13 million Btu per hour natural gas heater to heat natural gas used by the combustion turbines.

AIR CONSTRUCTION PERMIT PSD-FL-305 (1110099-002-AC)

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

GENERAL OPERATION REQUIREMENTS

7. Fuels: Only pipeline natural gas or maximum 0.05 percent sulfur fuel oil No. 2 or superior grade of distillate fuel oil shall be fired in these units.
[Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
{Note: The limitation of this specific condition is more stringent than the NSPS sulfur dioxide limitation and thus assures compliance with 40 CFR 60.333 and 60.334}
8. Turbine Capacity: The maximum heat input rates, based on the lower heating value (LHV) of each fuel to each Unit (1-3) at ambient conditions of 30 °F temperature, 60% relative humidity, 100% load, and 14.7 psi pressure shall not exceed 1,700 million Btu per hour (MMBtu/hr) when firing natural gas, nor 1,900 MMBtu/hr when firing No. 2 or superior grade of distillate fuel oil. These maximum heat input rates will vary depending upon ambient conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other ambient conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing.
[Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]
9. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary.
[Rule 62-296.320(4)(c), F.A.C.]
10. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the DEP Southeast District as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations.
[Rule 62-4.130, F.A.C.]
11. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]
12. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]

AIR CONSTRUCTION PERMIT PSD-FL-305 (1110099-002-AC)

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

13. Maximum allowable hours: The three stationary gas turbines shall operate no more than an average of 3,500 hours per installed unit during any calendar year. The three stationary gas turbines shall operate no more than an average of 1000 hours per installed unit on fuel oil during any calendar year. No single combustion turbine shall operate more than 5,000 hours in a single year. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions), Rule 62-212.400, F.A.C. (BACT)]
14. Fuel oil usage: The amount of back-up fuel (fuel oil) burned at the site (in BTU's) shall not exceed the amount of natural gas (primary fuel) burned at the site (in BTU's) during any consecutive 12-month period. The Department may waive this requirement during the first 24 months of operation based on natural gas availability. [Rule 62-212.400, F.A.C. (BACT)]

Control Technology

15. Dry Low NO_x (DLN-2.6) combustors shall be installed on the stationary combustion turbine to control nitrogen oxides (NO_x) emissions while firing natural gas. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT)]
16. A water injection (WI) system shall be installed for use when firing No. 2 or superior grade distillate fuel oil for control of NO_x emissions. [Design, Rules 62-4.070 and 62-212.400, F.A.C. (BACT)]
17. The permittee shall provide manufacturer's emissions performance versus load diagrams for the DLN and wet injection systems prior to their installation. DLN systems shall each be tuned upon initial operation to optimize emissions reductions consistent with normal operation and maintenance practices and shall be maintained to minimize NO_x emissions and CO emissions, consistent with normal operation and maintenance practices. Operation of the DLN systems in the diffusion-firing mode shall be minimized when firing natural gas. [Rule 62-4.070 and 62-210.650 F.A.C.]

EMISSION LIMITS AND STANDARDS

18. Following is a summary of the emission limits and required technology.

| POLLUTANT | CONTROL TECHNOLOGY | EMISSION LIMIT |
|---|--|--|
| PM/PM ₁₀ , VE | Pipeline Natural Gas Good Combustion | 18/34 lb/hr (Gas/Fuel Oil) 10 Percent Opacity (Gas or Fuel Oil) |
| VOC (not PSD) | As Above | 2.8 ppmvd (Gas or Fuel Oil) |
| CO | As Above | 12 ppmvd (Gas) 20 ppmvd (Fuel Oil) |
| SO ₂ and Sulfuric Acid Mist | Pipeline Natural Gas Low Sulfur Fuel Oil | 2 gr S/100 ft ³ (in Gas) 0.05% S (in Fuel Oil) |
| NO _x | Dry Low NO _x for: Natural Gas Wet Injection and limited Fuel Oil usage | 9 ppmvd @15% O ₂ (Gas) 42 ppmvd @15% O ₂ (Fuel Oil) |

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SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

19. Nitrogen Oxides (NO_x) Emissions:

- *While firing Natural Gas:* The emission rate of NO_x in the exhaust gas shall not exceed 9 ppmvd @15% O₂ on a 24-hr rolling average as measured by the continuous emission monitoring system (CEMS) in the manner described below. In addition, NO_x emissions calculated as NO₂ shall exceed neither 62 pounds per hour nor 9 ppmvd @15% O₂ to be demonstrated by the initial stack test using EPA Method 20. [Rule 62-212.400, F.A.C.]
- *While firing Fuel Oil:* The concentration of NO_x in the exhaust gas shall not exceed 42 ppmvd at 15% O₂ on the basis of a 3-hr rolling average as measured by the CEMS in the manner described below. In addition, NO_x emissions calculated as NO₂ shall exceed neither 332 lb/hr nor 42 ppmvd @15% O₂ to be demonstrated by stack test. [Rule 62-212.400, F.A.C.]
- *NO_x Reduction Plan:* The permittee shall develop a NO_x reduction plan when the hours of oil firing reach 500 hours per year per unit. This plan shall include a testing protocol designed to establish the maximum water injection rate and the lowest NO_x emissions possible without adversely affecting the actual performance of the gas turbine. The testing protocol shall set a range of water injection rates and attempt to quantify the corresponding NO_x emissions for each rate and noting any problems with performance. Based on the test results, the plan shall recommend a new NO_x emissions limiting standard and shall be submitted to the Department's Bureau of Air Regulation and Compliance Authority for review. If the Department determines that a lower NO_x emissions standard is warranted for oil firing, this permit shall be revised. [Rule 62-212.400, F.A.C., BACT Determination].

20. Carbon Monoxide (CO) Emissions: The concentration of CO in the stack exhaust gas shall exceed neither 12 ppmvd nor 31 lb/hr (gas) and neither 20 ppmvd nor 46 lb/hr (fuel oil) to be demonstrated by stack tests. [Rule 62-212.400, F.A.C.]

21. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the stack exhaust gas shall exceed neither 2.8 ppmvd nor 6 lb/hr (gas or fuel oil) to be demonstrated by initial stack tests. [To demonstrate non-applicability of Rule 62-212.400, F.A.C.]

22. Sulfur Dioxide (SO₂) and Sulfuric Acid Mist (SAM) Emissions: SO₂ and SAM emissions shall be limited by firing pipeline natural gas (sulfur content less than 2 grains per 100 standard cubic foot) or No. 2 distillate fuel oil with a maximum 0.05 percent sulfur for 1000 hours per year per unit. Emissions of SO₂ shall exceed neither 11 lb/hr (natural gas) nor 104 lb/hr (fuel oil). Emissions of sulfuric acid mist shall exceed neither 2 lb/hr (natural gas) nor 16 lb/hr (fuel oil). These emissions shall be measured by applicable compliance methods described below. [40CFR60 Subpart GG and Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]

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SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

23. Particulate Matter (PM/PM₁₀): PM/PM₁₀ emissions shall exceed neither 18 lb/hr (gas) nor 34 lb/hr (fuel oil) to be demonstrated by initial stack tests. [Rule 62-212.400, F.A.C.]
24. Visible Emissions: Visible Emissions shall not exceed 10 percent opacity to be demonstrated by visual observation tests.
[Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.]

EXCESS EMISSIONS

25. Excess Emissions resulting from startup, shutdown, or malfunction shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period for other reasons unless specifically authorized by DEP for longer duration.
26. Excess Emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C. These emissions shall be included in the 24-hr average for NO_x.
27. Excess Emissions Report: If excess emissions occur due to malfunction, the owner or operator shall notify DEP's Southeast District within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Following the NSPS format, 40 CFR 60.7 Subpart A, periods of startup, shutdown, malfunction, shall be monitored, recorded, and reported as excess emissions when emission levels exceed the permitted standards listed in Specific Condition No. 18 and 19.
[Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (2000 version)].

COMPLIANCE DETERMINATION

28. Compliance Test Schedules: Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate, but not later than 180 days of initial operation of the unit, and annually thereafter as indicated in this permit and as required by the *Compliance Authority*. [Rules 62-204.800 and 62-4.070(3) F.A.C.]
- *Initial*: Initial (I) performance tests (for both fuels) shall be performed on each unit while firing natural gas as well as while firing oil. Initial tests shall also be conducted after any modifications (and shake down period not to exceed 100 days after re-starting the CT) of air pollution control equipment such as change or tuning of combustors.
 - *Annual*: Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.310(7), F.A.C., on each unit as indicated.

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SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

- *Prior Permit Renewal:* All tests shall be conducted within 12 months prior permit renewal.
29. Reference Methods: The following reference methods as described in 40 CFR 60, Appendix A (2000 version), and adopted by reference in Chapter 62-204.800, F.A.C. shall be used to demonstrate compliance with the allowable emissions limits. No other test methods may be used for compliance testing unless prior DEP approval is received in writing.
- EPA Reference Method 5, "Determination of Particulate Matter Emissions from Stationary Sources" (I). (Note: Use Method 202 for condensable fraction)
 - 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 NO_x compliance with 40CFR60 Subpart GG.
 - EPA reference Method 7E, "Determination of Nitrogen Oxides Emissions from Stationary Sources" or RATA test data may be used to demonstrate compliance for annual test requirements.
 - EPA Reference Method 25A, "Determination of Total Hydrocarbon Concentrations." Correction for methane by EPA Method 18 is allowed. Initial test only.
30. Compliance with CO emission limits: An initial test for CO shall be conducted concurrently with the initial NO_x test, as required. The initial NO_x and CO test results shall be the average of three valid one-hour runs. Annual compliance testing for CO may be conducted at less than capacity when compliance testing is conducted concurrent with the annual RATA testing for the NO_x CEMS required pursuant to 40 CFR 75
31. Compliance with the VOC emission limits: An initial test is required to demonstrate compliance with the VOC emission limit. Thereafter, the CO emission limit and periodic tuning data will be employed as surrogate and no annual testing is required.
32. Compliance with the NO_x emission limits: Compliance with the NO_x emissions limits shall be determined by stack tests and a CEMS as specified in specific conditions 30, 45 and 46.
33. Compliance with the PM/PM₁₀ and VE emission limits: Initial and annual tests are required for visible emissions (VE). Initial stack test is required for PM/PM₁₀. Tests for PM and VE shall be conducted concurrently.

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SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

34. Continuous compliance with the PM/PM₁₀, SO₂ and sulfuric acid mist emission limits: Notwithstanding the requirements of Rule 62-297.340, F.A.C., the use of pipeline natural gas and the restricted use of No. 2 distillate fuel oil (or superior grade) are the methods for determining continuous compliance for PM/PM₁₀, SO₂ and sulfuric acid mist.
35. Test Method for Natural Gas and Fuel Oil Sulfur Content: For the purposes of demonstrating compliance with the 40 CFR 60.333 SO₂ standard, ASTM D 2880-71 (or equivalent) for sulfur content of liquid fuel and ASTM methods D4084-82 or D3246-81 (or equivalent) for sulfur content of gaseous fuel shall be utilized in accordance with the EPA-approved custom fuel monitoring schedules. Natural gas supplier data may be submitted or the natural gas sulfur content referenced in 40 CFR 75 Appendix D may be utilized. However, the applicant is responsible for ensuring that the procedures in 40 CFR 60.335 or 40 CFR 75 are used when determination of fuel sulfur content is made. Analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e) (2000 version).
36. Testing procedures: Initial testing of emissions shall be conducted with the combustion turbine operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the maximum heat input rate allowed by the permit, corrected for the average ambient air temperature during the test (with 100 percent represented by a curve depicting heat input vs. ambient temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. In this case, subsequent operation is limited by adjusting the entire heat input vs. ambient temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for ambient temperature) and 110 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Procedures for these tests shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapters 62-204 and 62-297, F.A.C.
37. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C.
38. Test Notification: The DEP's Southeast District and the DEP's Port St. Lucie District offices 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).
39. 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.
40. Test Results: Compliance test results indicating the results of the required compliance tests shall be submitted to the DEP's Southeast District and the DEP's Port St. Lucie District offices no later than 45 days after completion of the last test run. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the

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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.

NOTIFICATION, REPORTING, AND RECORDKEEPING

41. Records and Reports: All measurements, records, and other data required to be maintained by MDCLLC 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.
42. Notifications: All notifications and reports required by 40 CFR60, Subpart A shall be submitted to the DEP's Southeast District and the DEP's Port St. Lucie District offices.

MONITORING REQUIREMENTS

43. Continuous Monitoring System Procedures: The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the NO_x emissions from each CT. Each device shall properly function prior to the initial performance tests and comply with the applicable monitoring system requirements of 40 CFR 75.62. 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.
[Rules 62-4.070 F.A.C., 62-210.700, F.A.C., 62-4.130, F.A.C and 40CFR75]
44. Continuous Monitoring Certification and Quality Assurance Requirements: The monitoring devices shall comply with the certification and quality assurance, and any other applicable requirements of Rule 62-297.520, F.A.C., 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) or 40 CFR Part 75. Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F or 40CFR75. The monitoring plan, consisting of data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the DEP Emissions Monitoring Section Administrator and EPA for review no later than 45 days prior to the first scheduled certification test pursuant to 40 CFR 75.62
45. Continuous Monitoring System Operation: The continuous monitoring systems (CEMS) for NO_x shall be in continuous operation except for breakdowns, repairs, calibration checks, and zero and span adjustments. Emissions shall be monitored and recorded at all times including startup, operation, shutdown, and malfunction. Data recorded during periods of continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments shall not be included in the data average. These CEMS shall meet minimum frequency of operation requirements: one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period. Valid hourly emission rates shall not include periods of startup, shutdown, fuel switching, or

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malfunction unless prohibited by 62-210.700 F.A.C. These excess emissions periods shall be reported as require in Specific Conditions 24 and 46. [Rules 62-4.130, 62-4.160(8), 62-204.800, 62-210.700, 62-4.070 (3), and 62-297.520, F.A.C.; 40 CFR 60.7; 40 CFR 60.13, 40 CFR 75].

46. 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 24-hour rolling average (gas) and 3-hr rolling (oil). Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of 24 valid hourly measurements from the previous operating hours. A valid hourly emission rate shall be calculated for each hour (during which fuel is fired) in which at least two NO_x concentrations are obtained at least 15 minutes apart. Valid hourly emission rates shall not include periods of startup, shutdown, or malfunction unless prohibited by Rule 62-210.700, F.A.C. [Rules 62-4.130, 62-4.160(8), 62-204.800, 62-210.700, 62-4.070 (3), and 62-297.520, F.A.C.; 40 CFR 60.7; 40 CFR 75]
47. CEMS for Reporting Excess Emissions: The NO_x CEMS may be used in lieu of the requirement for reporting excess emissions in 40 CFR 60.334(c)(1), Subpart GG (2000 version). Excess Emissions and Monitoring System Performance Reports shall be submitted as specified in 40 CFR 60.7(c). CEM monitor downtime shall be calculated and reported according to the requirements of 40 CFR 60.7(c)(3) and 40 CFR 60.7(d)(2). Periods when NO_x emissions (ppmvd @ 15 % oxygen) are above the permit limits listed in Specific Conditions 20 and 21 shall be reported to the DEP South District office as required in Specific Condition 29.
48. CEMS in lieu of Water to Fuel Ratio: The NO_x CEMS shall be used in lieu of the water/fuel monitoring system for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (2000 version). The calibration of the water/fuel-monitoring device required in 40 CFR 60.335 (c)(2) (2000 version) will be replaced by the 40 CFR 75 certification tests of the NO_x CEMS.
49. 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):
- The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.
 - The permittee shall submit a monitoring plan, certified by signature of the Designated Representative (DR), that commits to using a primary fuel of pipeline supplied natural gas (sulfur content less than 20 gr/100 scf pursuant to 40 CFR 75.11(d)(2)).
 - Each unit shall be monitored for SO₂ emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

AIR CONSTRUCTION PERMIT PSD-FL-305 (1110099-002-AC)

SECTION III. EMISSION UNITS SPECIFIC CONDITIONS

50. Fuel Oil Monitoring Schedule: The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For all bulk shipments of No. 2 fuel oil received at this facility an analysis which reports the sulfur content and nitrogen content of the fuel shall be provided by the fuel vendor. The analysis shall also specify the methods by which the analyses were conducted and shall comply with the requirements of 40 CFR 60.335(d).
51. Determination of Process Variables:
- The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
 - Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value [Rule 62-297.310(5), F.A.C.]

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Midway Energy Center
PSD-FL-305 and 1110099-002-AC
St. Lucie County, Florida

BACKGROUND

The applicant, Midway development Company, L.L.C. (Midway, an affiliate of Enron North America) proposes to install three nominal 170-megawatt (MW) General Electric PG 7241 FA combustion turbine-electrical generators at the planned Midway Energy Center, East of Arcadia in unincorporated St. Lucie County. The proposed project will constitute a New Major Facility per Rule 62-212.400(d)2.a., Florida Administrative Code (F.A.C.) because it will have the potential to emit at least 250 tons per year of a regulated pollutant. It is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) per Rule 62-212.400, F.A.C. Emissions of particulate matter (PM and PM₁₀), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), and sulfuric acid mist (SAM) will exceed the "Significant Emission Rates" with respect to Table 212.400-2, (F.A.C.). PSD and BACT reviews are required for each of these pollutants.

The new units will operate in simple cycle mode and intermittent duty and exhaust through separate 80-foot stacks. Midway proposes to operate these units up to 3,500 hours per year per unit of which 1000 hr/yr/unit may be on maximum 0.05 percent sulfur distillate fuel oil. Descriptions of the process, project, air quality effects, and rule applicability are given in the Technical Evaluation and Preliminary Determination dated December 15, 2000, accompanying the Department's Intent to Issue.

DATE OF RECEIPT OF A BACT APPLICATION:

The application was received on November 9, 2000 (revised December 5) and included a proposed BACT proposal prepared by the applicant's consultant, ENSR.

REVIEW GROUP MEMBERS:

A. A. Linero, P.E.

BACT DETERMINATION REQUESTED BY THE APPLICANT:

| POLLUTANT | CONTROL TECHNOLOGY | PROPOSED BACT LIMIT |
|-----------------------------------|--|--|
| Nitrogen Oxides | Dry Low NO _x Combustors Water Injection (Oil) | 9 ppmvd @ 15% O ₂ (gas) ¹ 42 ppmvd @ 15% O ₂ (oil) |
| Particulate Matter | Pipeline Natural Gas No. 2 Distillate Oil (1000 hr/yr) Combustion Controls | 18 pounds per hour (gas) 34 pounds per hour (oil) |
| Carbon Monoxide | As Above | 9 ppmvd (gas, baseload) 30 ppmvd (oil baseload) |
| Sulfur Dioxide/Sulfuric Acid Mist | As Above | 2 grain S/100 std cubic feet (gas) 0.05 percent sulfur (oil) |

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

BACT DETERMINATION PROCEDURE:

In accordance with Rule 62-212.400, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 - Standards of Performance for New Stationary Sources or 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The minimum basis for a BACT determination is 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). The Department adopted subpart GG by reference in Rule 62-204.800, F.A.C. The key emission limits required by Subpart GG are 75 ppmvd NO_x @ 15% O₂ (assuming 25 percent efficiency) and 150 ppmvd SO₂ @ 15% O₂ (or <0.8% sulfur in fuel). The BACT proposed by Midway is well within the NSPS limit, which allows NO_x emissions in the range of 100 - 110 ppmvd for the high efficiency units to be purchased for the Midway Energy Center.

A National Emission Standard for Hazardous Air Pollutants (NESHAP) under development exists for stationary gas turbines. However this facility will not be subject to the NESHAP or to a requirement for a case-by-case determination of maximum achievable control technology because HAP emissions will be less than 10 TPY.

DETERMINATIONS BY EPA AND STATES:

The following tables include some recently permitted simple cycle turbines. Two (Carson and McClellan) were permitted in ozone non-attainment areas and two (Lakeland and PREPA) were permitted as continuous duty projects. The proposed Midway Energy Center is included to facilitate comparison.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

| Project Location | Power Output (MW) | NO _x Limit ppmvd @ 15% O ₂ and Fuel | Technology | Comments |
|-----------------------|-------------------|---|---------------------|---|
| Midway St. Lucie, FL | 510 | 9 - NG 42 - No. 2 FO | DLN WI | 3x170 MW GE PG7241FA CTs Application 11/00. 1000 hrs on oil |
| Pompano Beach, FL | 510 | 9 - NG 42 - No. 2 FO | DLN WI | 3x170 MW GE PG7241FA CTs Application 10/00. 1000 hrs on oil |
| DeSoto County, FL | 510 | 9 - NG 42 - No. 2 FO | DLN WI | 3x170 MW GE PG7241FA CTs Issued 7/00. 1000 hrs on oil |
| Shady Hills Pasco, FL | 510 | 9 - NG 42 - No. 2 FO | DLN WI | 3x170 MW GE PG7241FA CTs Application 2/00. 1000 hrs on oil |
| Vandolah Hardee, FL | 680 | 9 - NG 42 - No. 2 FO | DLN WI | 4x170 MW GE PG7241FA CTs Issued 11/99. 1000 hrs on oil |
| Oleander Brevard, FL | 850 | 9 - NG 42 - No. 2 FO | DLN WI | 5x170 MW GE PG7241FA CTs Issued 11/99. 1000 hrs on oil |
| JEA Baldwin, FL | 510 | 10.5 - NG 42 - No. 2 FO | DLN WI | 3x170 MW GE MS7241FA CTs Issued 10/99. 750 hrs on oil |
| Reliant Osceola, FL | 510 | 10.5 - NG 42 - No. 2 FO | DLN WI | 3x170 MW GE MS7241FA CTs Draft 11/99. 750 hrs on oil |
| TEC Polk Power, FL | 330 | 10.5 - NG 42 - No. 2 F.O. | DLN WI | 2x165 MW GE MS7241FA CTs Issued 10/99. 750 hrs on oil |
| Dynegy, FL | 510 | 15 - NG | DLN | 3x170 MW WH 501F CTs Application 10/99. Gas only |
| Dynegy Heard, GA | 510 | 15 - NG | DLN | 3x170 MW WH 501F CTs Application. Gas only |
| Tenaska Heard, GA | 960 | 15 - NG 42 - No. 2 FO | DLN WI | 6x170 MW GE PG7241FA CTs Issued 12/98. 720 hrs on oil |
| Thomaston, GA | 680 | 15 - NG 42 - No. 2 FO | DLN WI | 4x170 MW GE PG7241FA CTs Application. 1687 hrs on oil |
| Dynegy Reidsville, NC | 900 | 15 - NG (by 2002) 42 - No. 2 FO | DLN WI | 5x180 MW WH 501F CTs Initially 25 ppm NO _x limit on gas Draft 5/98. 1000 hrs on oil. |
| Lyondell Harris, TX | 160 | 25 - NG | DLN | 1x160 MW WH 501F CTs Issued 11/99. Gas only |
| Southern Energy, WI | 525 | 15/12 - NG 42 - No. 2 FO | DLN WI | 3x175 MW GE PG7241FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil |
| RockGen Cristiana, WI | 525 | 15/12 - NG 42 - No. 2 FO | DLN WI | 3x175 MW GE PG7241FA CTs 15/12 ppm are on 1/24 hr basis Issued 1/99. 800 hrs on oil |
| Carson Energy, CA | 42 | 5 - NG (LAER) | Hot SCR | 42 MW LM6000PA. Startup 1995. Ammonia limit is 20 ppmvd |
| McClelland AFB, CA | 85 | 5 - NG (LAER) | Hot SCR | 85 MW GE 7EA. Applied 1999 Ammonia proposal 10 ppmvd |
| Lakeland, FL | 250 CON | 9/9 - NG (by 2002) 42/15 - No. 2 FO | DLN/HSCR WI/HSCR | 250 MW WH 501G CT Initially 25 ppm NO _x limit on gas Issued 7/98. 250 hrs on oil. |
| PREPA, PR | 248 CON | 10 - No. 2 FO | WI & HSCR | 3x83 MW ABB GT11N CTs Issued 12/95. |

CON = Continuous
SC = Simple Cycle
INT = Intermittent

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

FO = Fuel Oil
NG = Natural Gas
WI = Water or Steam Injection

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

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

| Project Location | CO - ppm (or as indicated) | VOC - ppm (or as indicated) | PM - lb/hr (or as indicated) | Technology and Comments |
|-----------------------|---|----------------------------------|-----------------------------------|--------------------------------|
| Midway St. Lucie, FL | 9 - NG 30 - FO | 1.4 - NG 1.4 - FO | 18 lb/hr - NG 34 lb/hr - FO | Clean Fuels Good Combustion |
| Pompano Beach, FL | 9 - NG 30 - FO | 1.4 - NG 1.4 - FO | 18 lb/hr - NG 34 lb/hr - FO | Clean Fuels Good Combustion |
| DeSoto County, FL | 12 - NG 20 - FO | 1.4 - NG 7 - FO | 10 lb/hr - NG 17 lb/hr - FO | Clean Fuels Good Combustion |
| Shady Hills Pasco, FL | 12 - NG 20 - FO | 1.4 - NG 7 - FO | 10 lb/hr - NG 17 lb/hr - FO | Clean Fuels Good Combustion |
| Vandolah Hardee, FL | 12 - NG 20 - FO | 1.4 - NG 7 - FO | 10 lb/hr - NG 17 lb/hr - FO | Clean Fuels Good Combustion |
| Oleander Brevard, FL | 12 - NG 20 - FO | 3 - NG 6 - FO | 10% Opacity | Clean Fuels Good Combustion |
| JEA Baldwin, FL | 12 - NG 20 - FO | 1.4 - NG/FO Not PSD | 9/17 lb/hr - NG/FO 10% Opacity | Clean Fuels Good Combustion |
| Reliant Osceola, FL | 10.5 - NG 20 - FO | 2.8 lb/hr - NG 7.5 lb/hr - FO | 9 lb/hr - NG 17 lb/hr - FO | Clean Fuels Good Combustion |
| TEC Polk Power, FL | 15 - NG 33 - FO | 7 - NG 7 - FO | 10% Opacity | Clean Fuels Good Combustion |
| Dynegy, FL | 25 - NG | ? - NG | ? - NG | Clean Fuels Good Combustion |
| Dynegy Heard Co., GA | 25 - NG | ? - NG | ? - NG | Clean Fuels Good Combustion |
| Tenaska Heard Co., GA | 15 - NG 20 - FO | ? - NG ? - FO | ? - NG ? lb/hr - FO | Clean Fuels Good Combustion |
| Dynegy Reidsville, NC | 25 - NG 50 - FO | 6 lb/hr - NG 8 lb/hr - FO | 6 lb/hr - NG 23 lb/hr - FO | Clean Fuels Good Combustion |
| Lyondell Harris, TX | 25 - NG | | | Clean Fuels Good Combustion |
| Southern Energy, WI | 12@>50% load - NG 15@>75% 24@<75% - FO | 2 - NG 5 - FO | 18 lb/hr - NG 44 lb/hr - FO | Clean Fuels Good Combustion |
| RockGen Cristiana, WI | 12@>50% load - NG 15@>75% 24@<75% - FO | 2 - NG 5 - FO | 18 lb/hr - NG 44 lb/hr - FO | Clean Fuels Good Combustion |
| Carson Energy, CA | 6 - NG | | | Oxidation Catalyst |
| McClelland AFB, CA | 23 - NG | 3.9 - NG | 7 lb/hr | Clean Fuels Good Combustion |
| Lakeland, FL | 25 - NG or 10 by Ox Cat 75 - FO @ 15% O ₂ | 4 - NG 10 - FO | 10% Opacity | Clean Fuels Good Combustion |
| PREPA, PR | 9 - FO @ 15% O ₂ | 11 - FO @ 15% O ₂ | 0.0171 gr/dscf | Clean Fuels Good Combustion |

REVIEW OF NITROGEN OXIDES CONTROL TECHNOLOGIES:

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

Nitrogen Oxides Formation

Nitrogen oxides form in the gas turbine combustion process as a result of the dissociation of molecular nitrogen and oxygen to their atomic forms and subsequent recombination into seven different oxides of nitrogen. Thermal NO_x forms in the high temperature area of the gas turbine combustor. Thermal NO_x increases exponentially with increases in flame temperature and linearly

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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 near-stoichiometric combustors and increases for leaner fuel mixtures. This provides a practical limit for NO_x control by lean combustion.

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

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

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Fuel NO_x is formed when fuels containing bound nitrogen are burned. This phenomenon is not important when combusting natural gas. It is not a significant issue for the Midway project because these units will not be continuously operated, but rather will be "peakers". Also, low sulfur fuel oil (which has more fuel-bound nitrogen than natural gas) is proposed to be used for no more than 1000 hours per year (per CT).

Uncontrolled emissions range from about 100 to over 600 parts per million by volume, dry, corrected to 15 percent oxygen (ppmvd @15% O₂). The Department estimates uncontrolled emissions at approximately 200 ppmvd @15% O₂ for each turbine of the Midway Project. The proposed NO_x controls will reduce these emissions significantly.

NO_x Control Techniques

Wet Injection:

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

Gas Turbine - Hot Gas Path Parts

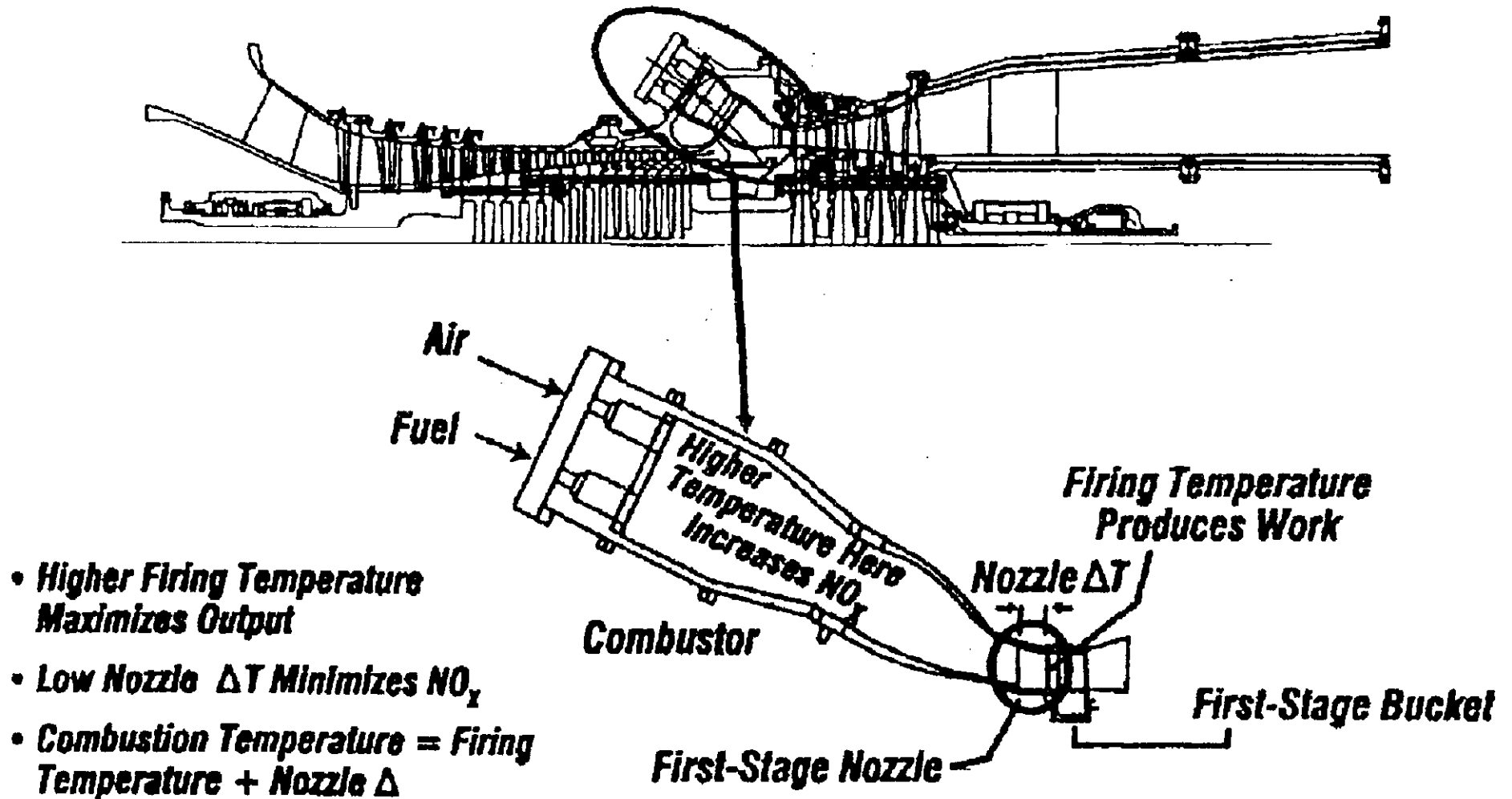


Figure 1 – Relation Between Flame Temperature and Firing Temperature

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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 incorporated into the General Electric DLN-2.6 can-annular combustor shown in Figure 2. Each combustor includes six nozzles within which fuel and air have been fully pre-mixed. There are 16 small fuel passages around the circumference of each combustor can known as quarternary fuel pegs. The six nozzles are sequentially ignited as load increases in a manner that maintains lean pre-mixed combustion and flame stability.

Design emission characteristics of the DLN-2.6 combustor while firing natural gas are given in Figure 3 for a unit tuned to meet a 15 ppmvd NO_x limit (by volume, dry corrected to at 15 percent oxygen) at JEA's Kennedy Station. The combustor can be tuned differently to achieve emissions as low as 9 ppmvd of NO_x.

The combustor emits NO_x at concentrations of 15 ppmvd at loads between 50 and 100 percent of capacity, but concentrations as high as 100 ppmvd may occur at less than 50 percent of capacity. Note that VOC comprises a very small amount of the "unburned hydrocarbons" which in turn is mostly non-VOC methane.

Following are the results of the new and clean tests conducted on a dual-fuel GE PG7241FA combustion turbine operating in simple cycle mode and burning natural gas at the Tampa Electric Polk Power Station.¹ The DLN 2-6 combustors for this project were guaranteed to achieve 9 ppmvd while burning natural gas. The results are all superior to the emission characteristics given in Figure 3.

| Percent of Full Load | NO _x (ppmvd @15% O ₂) | CO (ppmvd) | VOC (ppmvd) |
|----------------------|--|------------|-------------|
| 50 | 5.3 | 1.6 | 0.5 |
| 70 | 6.3 | 0.5 | 0.4 |
| 85 | 6.2 | 0.4 | 0.2 |
| 100 | 7.6 | 0.3 | 0.1 |
| Limit | 10.5 | 15 | 7 |

Emissions characteristics by wet injection NO_x control while firing oil are shown in Figure 4 for the DLN-2.0, a predecessor of the DLN2-6. Operation on fuel oil is not in the premixed mode. Specialized premixed DLN burners for fuel oil operation were installed in a project in Israel² where water is scarce, but the Department has no information on the results.

Mitsubishi (who also make a 501F) is also developing a dual-fuel premixed DLN. Optimization of premix fuel-air nozzle and performance was verified in high-pressure combustion tests. Commissioning tests on gas and oil burning were completed at an undesignated site.³ The details are not available in English.

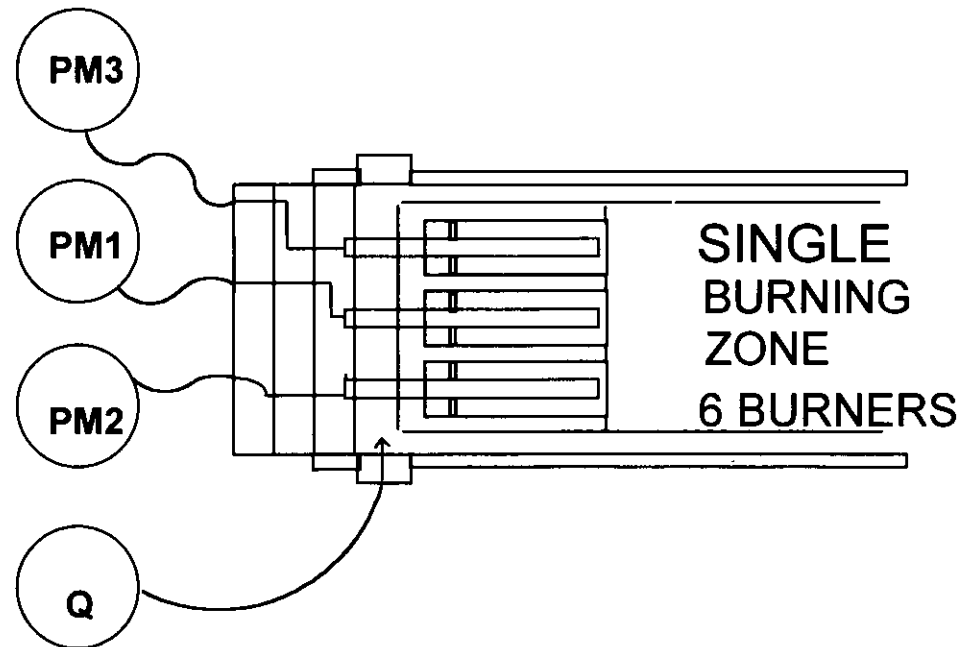
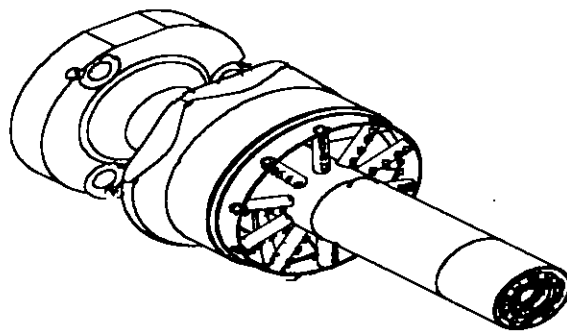
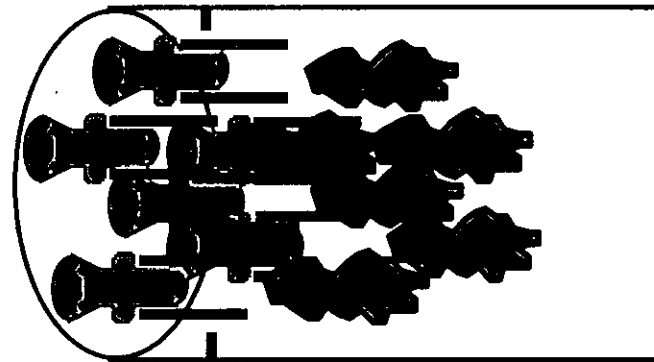
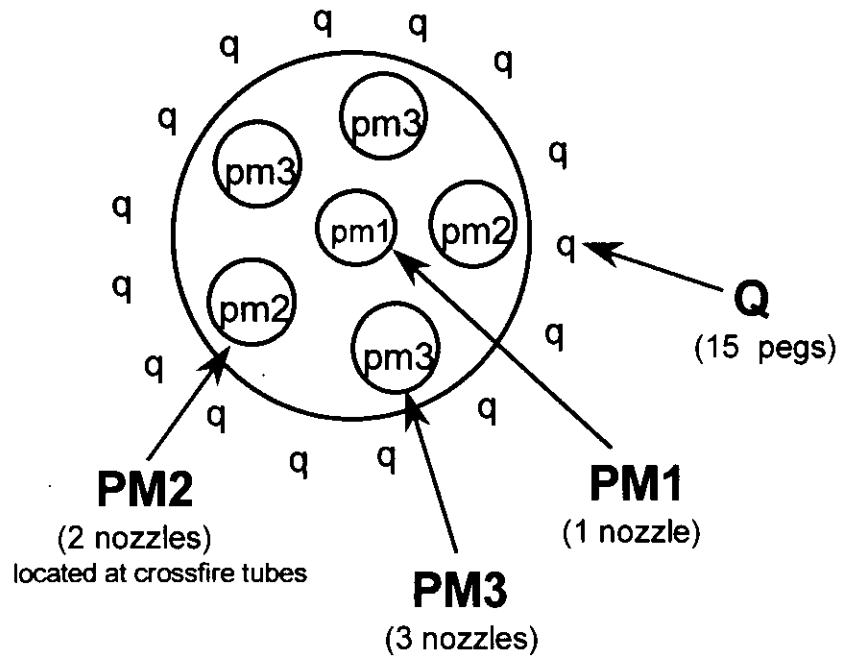


Figure 2 - DLN2.6 Fuel Nozzle Arrangement

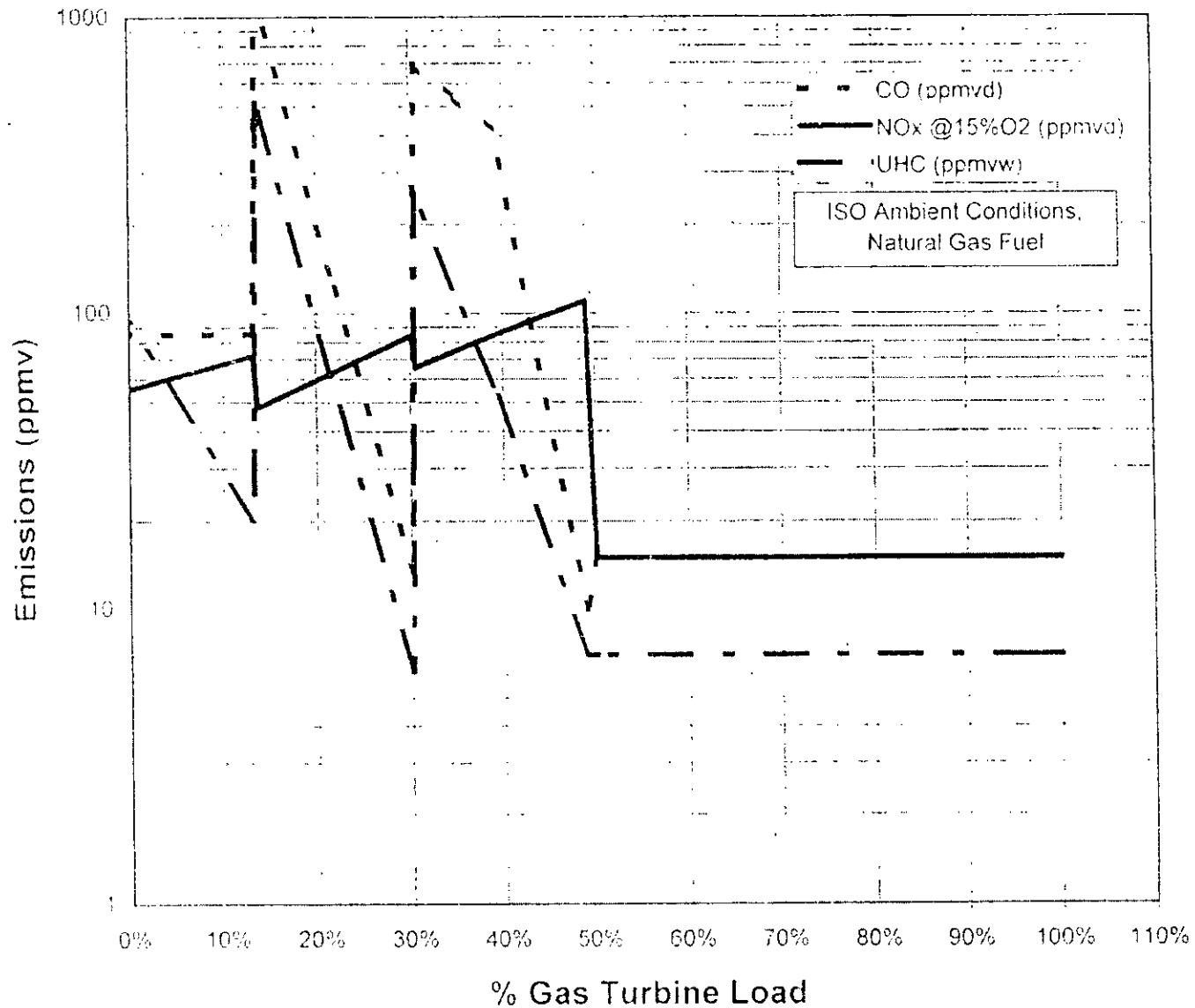


Figure 3 – Emissions Performance Curves for GE DLN-2.6 Combustor
 Firing Natural Gas in a Dual Fuel GE 7FA Combustion Turbine
 (Simple Cycle Intermittent Duty – If Tuned to 15 ppmvd NO_x)

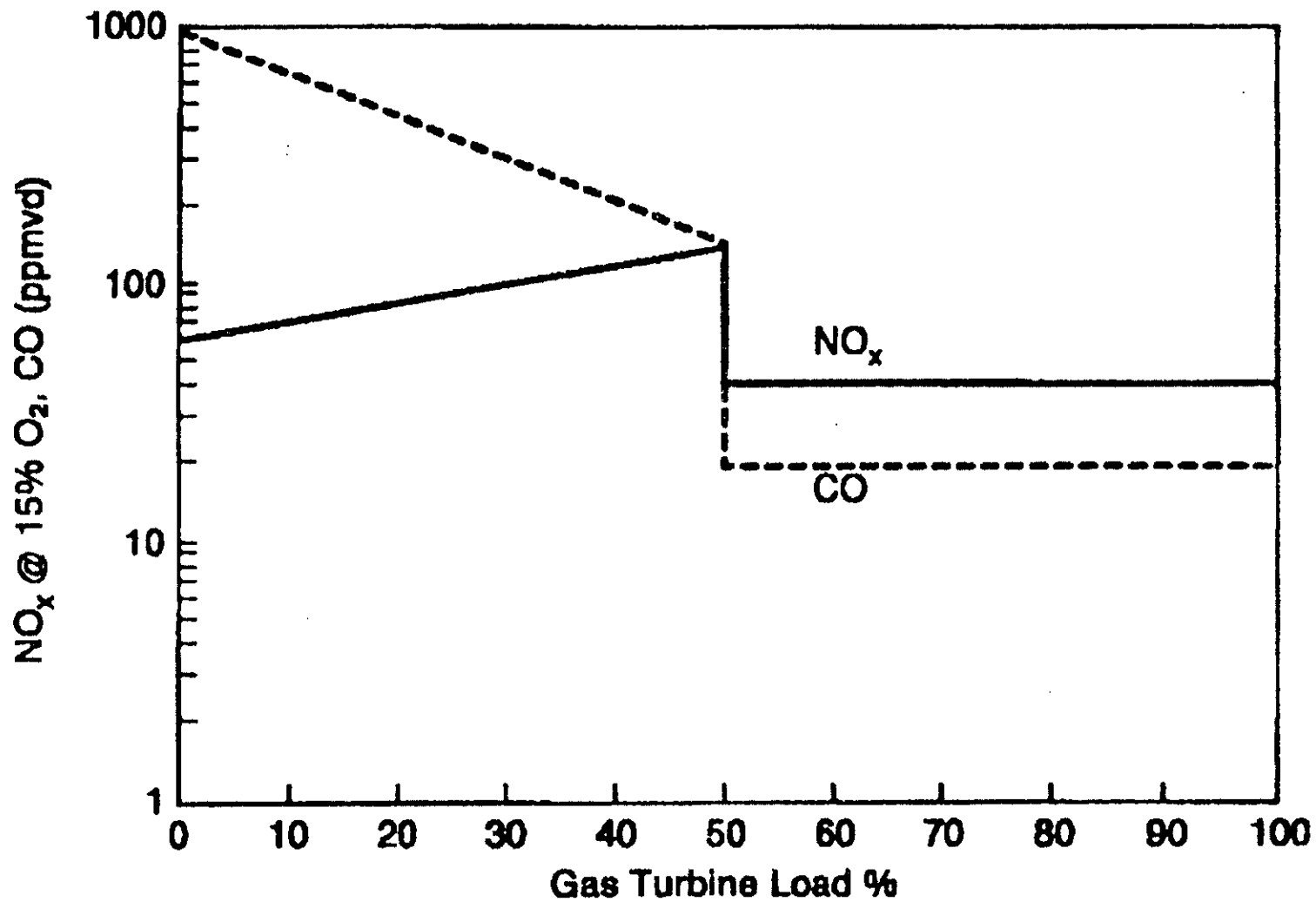


Figure 4 – Emissions Performance for DLN-2 Combustors
Firing Fuel Oil in Dual Fuel GE 7FA Turbine

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An important consideration is that power and efficiency are sacrificed in the effort to achieve low NO_x by combustion technology. This limitation is seen in Figure 5 from an EPRI report.⁴ Basically developments such as single crystal blading, aircraft compressor design, high technology blade cooling have helped to greatly increase efficiency and lower capital costs. Further improvements are more difficult in large part because of the competing demands for air to support lean premix combustion and to provide blade cooling. New concepts are under development by GE and the other turbine manufacturers to meet the challenges implicit in Figure 5.

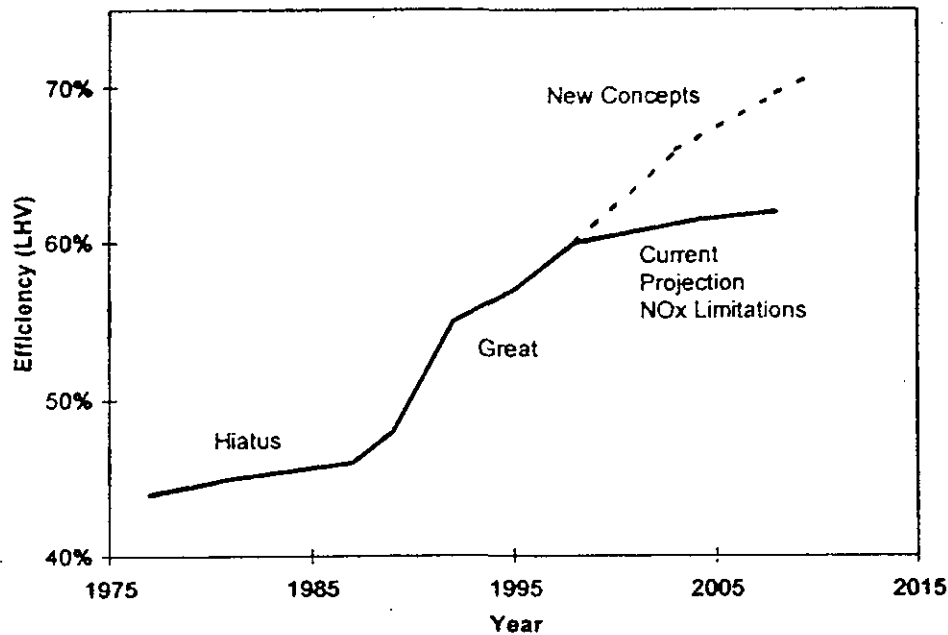


Figure 5 – Efficiency Increases in Combustion Turbines

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

Catalytic Combustion: XONON™

Catalytic combustion involves using a catalytic bed to oxidize a lean air and fuel mixture within a combustor instead of burning with a flame as described above. In a catalytic combustor the air and fuel mixture oxidizes at lower temperatures, producing less NO_x.⁵ In the past, the technology was not reliable because the catalyst would not last long enough to make the combustor economical.

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

Calytica has developed a system know as XONON™, which works by partially burning fuel in a low temperature pre-combustor and completing the combustion in a catalytic combustor. The overall result is low temperature partial combustion (and thus lower NO_x combustion) followed by flameless catalytic combustion to further attenuate NO_x formation.

In 1998, Calytica announced the startup of a 1.5 MW Kawasaki gas turbine equipped with XONON™.⁶ The turbine is owned by Calytica and is located at the Gianera Generating Station of Silicon Valley Power, a municipally owned utility serving the City of Santa Clara, California. Previously, this turbine and XONON™ system had successfully completed over 1,200 hours of extensive full-scale tests at a project development facility in Oklahoma which documented XONON's ability to limit emissions of NO_x to less than 3 ppmvd.

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

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

Selective Catalytic Combustion

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

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

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

As of early 1992, over 100 gas turbine installations already used SCR in the United States. Only one combustion turbine project in Florida (FPC Hines Power Block 1) employs SCR. The equipment was installed on a temporary basis because Westinghouse had not yet demonstrated emissions as low as 12 ppmvd by DLN technology at the time the units were to start up in 1998.

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Seminole Electric will install SCR on a previously permitted 501F unit at the Hardee Unit 3 (Paynes Creek) project. The reasons are similar to those for the FPC Hines Power Block I.

Kissimmee Utilities Authority,⁸ FPC, TECO, and Competitive Power Ventures will install SCR on combined cycle projects to achieve 3.5 ppmvd. Limits as low as 2 ppmvd NO_x have been specified using SCR on combined cycle F Class projects in various parts of the country.

Selective Non-Catalytic Combustion

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

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

SCONO_xTM

SCONO_xTM is a catalytic add-on technology that achieves NO_x control by oxidizing and then absorbing the pollutant onto a honeycomb structure coated with potassium carbonate. The pollutant is then released as molecular nitrogen during a regeneration cycle that requires dilute hydrogen gas. The technology has been demonstrated on small units in California and has been purchased for a small source in Massachusetts.⁹

California regulators and industry sources have stated that the first 250 MW block to install SCONO_xTM will be at PG&E's La Paloma Plant near Bakersfield.¹⁰ The overall project includes several more 250 MW blocks with SCR for control.¹¹ USEPA has identified an "achieved in practice" BACT value of 2.0 ppmvd over a three-hour rolling average based upon the recent performance of a Vernon, California natural gas-fired 32 MW combined cycle turbine equipped with SCONO_xTM.

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

Recently EPA Region IX acknowledged that SCONO_xTM was demonstrated in practice to achieve 2.0 ppmv NO_x.¹² Permitting authorities planning to issue permits for future combined cycle gas turbine systems firing exclusively on natural gas, and subject to LAER must recognize this limit which, in most cases, would result in a LAER determination of 2.0 ppmv.

According to a recent press release, the Environmental Segment of ABB Alstom Power offers the technology (with performance guarantees) to "all owners and operators of natural gas-fired combined cycle combustion turbines, regardless of size."¹³

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

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

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

For this project, the applicant has proposed as BACT the use of 0.05% sulfur oil and pipeline natural gas. The applicant estimated total emissions for the project at 190 TPY of SO₂ and 29 TPY of SAM. The Department expects the emissions to be lower because of the limited oil consumption and the typical natural gas in Florida that contains less than 2 grain of sulfur per 100 standard cubic feet (gr S/100scf). This value is well below the "default" maximum value of 20 gr. S/100 scf, but high enough to require a BACT determination.

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

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

Natural gas and 0.05 percent sulfur No. 2 (or superior grade) distillate fuel oil will be the only fuels fired and are efficiently combusted in gas turbines. Such fuels are necessary to avoid damaging turbine blades and other components already exposed to very high temperature and pressure. Natural gas is an inherently clean fuel and contains no ash. The fuel oil to be combusted contains a minimal amount of ash and its use is proposed for only 1000 hours per year making any conceivable add-on control technique for PM/PM₁₀ either unnecessary or impractical.

A technology review indicated that the top control option for PM/PM₁₀ is a combination of good combustion practices, fuel quality, and filtration of inlet air. Total annual emissions of PM₁₀ for the project are expected to be approximately 119 tons per year.

REVIEW OF CARBON MONOXIDE (CO) CONTROL TECHNOLOGIES

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

All combustion turbines using catalytic oxidation appear to be combined cycle units. Among the most recently permitted ones are the 500 MW Wyandotte Energy project in Michigan, the El Dorado project in Nevada, Ironwood in Pennsylvania, Millenium in Massachusetts, and Sutter Calpine in California. The permitted CO values of these units are between 3 and 5 ppm. Catalytic oxidation was recently installed at a cogeneration plant at Reedy Creek (Walt Disney World), Florida to avoid PSD review. Seminole Electric recently proposed catalytic oxidation in order to meet the permitted CO limit at its planned 244 MW Westinghouse 501FD combined cycle unit in Hardee County, Florida.¹²

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Most combustion turbines incorporate good combustion to minimize emissions of CO. So far this appears to be the only technology proposed at simple cycle turbine projects. These installations are typically permitted between 10 and 25 ppmvd at full load while firing gas. The values of 9 and 30 ppmvd for gas and oil respectively at baseload proposed in Midway's original application are within the range of recent determinations for simple cycle CO BACT determinations. Values given in GE-based applications are representative of operations between 50 and 100 percent of full load.

REVIEW OF VOLATILE ORGANIC COMPOUND (VOC) CONTROL TECHNOLOGIES

Volatile organic compound (VOC) emissions, like CO emissions, are formed due to incomplete combustion of fuel. There are no viable add-on control techniques, particularly for simple cycle combustion turbines. The high flame temperature is very efficient at destroying VOC. The applicant has proposed good combustion practices to control VOC. The limits proposed by Midway for this project are 1.4 ppmvw for gas and fuel oil firing at baseload. These limits are sufficient to keep annual emissions of VOC below the 40 TPY threshold and a BACT determination is not required. According to GE, VOC emissions less than 1.4 ppm were achieved during recent tests of the DLN-2.6 technology when firing natural gas.¹⁵

BACKGROUND ON PROPOSED GAS TURBINE

Midway plans to install three nominal 170 MW General Electric PG 7241FA simple cycle gas turbines. This is the most recent designation of GE's line of "F" Class units.

Typically, companies obtain a guarantee from GE to achieve 9 ppmvd NO_x during a test on a "new and clean unit." The test must be conducted at a steady-state load of 50 to 100 percent and completed within the first 100 fired hours of operation. With the frequent start-ups and shutdowns of the units, some applicants are concerned about the ability to maintain the low NO_x values for long periods of time. As a result, some of them agreed to a "new and clean" limit of 9 ppmvd but requested a continuing BACT limit of 10.5 ppmvd.

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

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

The 7FB is characterized by an 18.5:1 compression ratio, a 2500 °F firing temperature, 57.3 percent efficiency, and produces 280 MW in combined cycle. The clear implication is that the

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power penalty to reduce NO_x from 25 to 9 ppmvd by DLN technology alone is on the order of 20 MW for a combined cycle (roughly 13 MW on a simple cycle unit).¹⁶

Another example of this point is the ABB GT24. It is characterized by a 30:1 compression ratio and 58 percent efficiency in combined cycle. The unit is guaranteed to meet 25 ppmvd of NO_x. The simple cycle version is rated at 183 MW compared to 170 for the GE7FA.

It is not surprising that some compromises were made by ABB, which resulted in greater power and efficiency but slowed progress toward single-digit NO_x emissions. According to ABB, "rather than just concentrating on ever lower NO_x levels, ABB has chosen a total solution that limits pollutants and at the same time increases energy efficiency."¹⁷ A lower compression, lower efficiency version of the ABB GT24 might be capable of 15 ppmvd NO_x or less by DLN technology.

The results during the "new and clean" test of the GE PG7241 at the Polk Power Station (discussed above) are nothing short of spectacular in comparison with the permitted emission limits. It is doubtful that these values can be maintained indefinitely. However, there is good reason to believe that performance will continue to be better than the permitted emission limits. For reference, the values while burning oil were equally good in comparison to the permitted limits for CO and VOC, whereas the NO_x emissions were very close to the permitted value of 42 ppmvd @15% O₂. Visible emissions were 0 percent opacity when firing natural gas or fuel oil.

The GE Speedtronic™ Mark V Gas Control System will be used. This control system is designed to fulfill all gas turbine control requirements. These include control of liquid, gas, or both fuels in accordance with the requirements of the speed, load control under part-load conditions, temperature control under maximum capability conditions, or during start-up conditions. The Mark V also monitors the DLN process and controls fuel staging and combustion modes to maintain the programmed NO_x values.¹⁸

DEPARTMENT BACT DETERMINATION

Following are the BACT limits determined for the Midway project assuming full load. Values for NO_x are corrected to 15% O₂ on a dry volume basis. The emission limits or their equivalents in terms of pounds per hour and NSPS units, as well as the applicable averaging times, are given in the permit Specific Conditions Nos. 18 through 23.

| POLLUTANT | CONTROL TECHNOLOGY | PROPOSED BACT LIMIT |
|--------------------------|--|--|
| PM/PM ₁₀ , VE | Pipeline Natural Gas Good Combustion | 10 Percent Opacity 18/34 lb/hr – Gas/Fuel Oil |
| CO | As Above | 9 ppmvd – Gas 20 ppmvd – Fuel Oil |
| SO ₂ /SAM | As Above | 2 grain of sulfur per 100 ft ³ gas 0.05 Percent Sulfur in Fuel Oil |
| NO _x | Dry Low NO _x , WI for F.O., limited oil use | 9 ppmvd – Gas 42 ppmvd – F.O. for 1000 of 3,500 hrs |

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RATIONALE FOR DEPARTMENT'S DETERMINATION

- The Top technology and Lowest Achievable Emission Rate (LAER) for simple cycle combustion turbines are Hot SCR and an emission limit of 5 ppmvd NO_x.
- It is conceivable that catalytic combustion technology such as XONON™ can be applied to this project. Theoretically XONON can achieve the 5-ppmvd NO_x value and would equate to the top technology.
- An example of the top technology is the Carson Plant in Sacramento, California where there is a Hot SCR system on a simple cycle LM6000PA combustion turbine with a limit of 5 ppmvd.
- Hot SCR is proposed as LAER for the Sacramento Municipal Utilities District simple cycle GE 7EA project at McClelland Air Force Base to achieve 5 ppmvd.
- Hot SCR is not commonly required as BACT on simple cycle combustion turbines. Although it was required on the fuel oil-fired PREPA project (to achieve 10 ppmvd), the requirement has been removed from the permit. It is noted that the specification of the fuel oil was 0.15 percent sulfur. This does not imply that hot SCR it is not technically feasible for intermittent duty simple cycle combustion turbines firing natural gas with 0.05 percent sulfur fuel oil as back-up fuel.
- Hot SCR is required at the simple cycle continuous duty Lakeland McIntosh Unit 5 project if the Westinghouse 501 G unit fails to achieve 9 ppmvd while firing natural gas. Hot SCR was considered cost-effective because the unit will operate continuously and the expected NO_x reduction is from 25 to 9 ppmvd).
- The levelized costs of NO_x removal by Hot SCR for the Midway Project were estimated by ENSR at \$20,700 per ton assuming 3,500 hours of dual-fuel operation. The estimates are based on emissions controlled to 4.5 and 7.5 ppmvd @15% O₂ NO_x while burning gas and fuel oil respectively and 5 ppmvd @15% O₂ ammonia slip.
- The levelized costs of NO_x removal by Hot SCR for the DeSoto project were estimated by Golder at \$11,350 per ton assuming 3,390 hours of operation on natural gas and a reduction to 3.6 ppmvd on gas and 17 ppmvd on fuel oil. The estimates are based on an ammonia slip of 9 ppmvd for gas and 12 ppmvd for oil.
- The Department does not accept the precise hot SCR cost calculations presented by Midway and considers them on the high end. The costs calculated by Golder for the DeSoto Project are probably more accurate. With the actual performance of the GE 7FA at TECO Polk Power Station with no add-on control (5-8 ppmvd @15%O₂), it is easy to see that hot SCR would not be cost-effective. Hot SCR is rejected as BACT.
- The Department will limit operation of the three units to 3,500 hours per year per unit. No single unit may operate more than 5,000 hours per year to insure that the conclusion regarding cost-effectiveness remains applicable.
- The units will be operated in intermittent duty and simple cycle mode. Therefore control options that are feasible only for combined cycle units are not applicable. This rules out Low Temperature (conventional) SCR, which achieves 3.5 ppmvd NO_x or lower. It also rules out

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the possibility of SCONO_x . XONON is available for F Class gas-fired projects. However the status of its development for use in fuel oil or cycling operations is not known.

- General Electric has provided a “clean and new” guarantee of 9 ppmvd NO_x . This value is equal to that required at the Lakeland continuous duty combustion turbine, which has an alternative hot SCR requirement.
- Typical permit limits nation-wide for these GE 7FA units while operating on natural gas and in simple cycle mode and intermittent duty are 9-15 ppmvd even though GE provides the same “new and clean” guarantees for them.
- The 9 ppmvd limit at Oleander, Vandolah, Shady Hills, DeSoto, Virginia Power, and Midway while firing natural gas is the lowest known BACT value for an “F” frame combustion turbine operating in simple cycle mode and intermittent duty. The 42-ppmvd limit for limited fuel oil firing is typical.
- The gas-based NO_x emission limit of 9 ppmvd will be difficult to maintain over short term averaging times. That is the main reason why some operators cannot provide reasonable assurance they can meet such a low limit by DLN. The Department believes a 24-hour averaging time is appropriate. Only periods during which the unit is operated will contribute to the 24-hour average. For example if the unit operates only 6 hours in 24 hours and averages 9 ppmvd during the 6 hours, the reported concentration will still be 9 ppmvd.
- The Department prefers not to set a 24-hour average limit that includes start-up emissions for a peaking unit. There will be a very short period during start-up when emissions might actually exceed 100 ppmvd (see Figure 2). Such periods can probably be absorbed into an emissions limit with a long-term averaging time for continuous duty. It would be much more difficult for an intermittent duty unit that might run only a few continuous hours on occasion.
- The fuel oil-based NO_x emissions limit of 42 ppmvd can be maintained over a short-term averaging period by varying the amount of water injected. The Department has determined that a 3-hour averaging time is appropriate.
- The Department issued permits for the TEC Polk Power, JEA Brandy Branch, and Reliant Osceola Projects with 10.5 ppmvd limit for the same simple cycle GE 7241FA units, but limited the hours of operation on fuel oil to only 750 hours compared with 1000 hours at Oleander, Vandolah, Shady Hills, and DeSoto.
- The proposed BACT limit of 9 ppmvd is less than one-tenth of the applicable NSPS limit per 40 CFR 60, Subpart GG for units as efficient as the 7FA.
- Comments from the National Park Service on the Oleander project suggested that a reduction from 42 to 25 ppmvd in NO_x emissions while burning fuel oil is possible. GE has advised that 42 ppmvd NO_x is the lowest guarantee on F Class units when firing oil. The Department has requested that GE work on developing wet or dry technologies to reduce NO_x emissions for units permitted to fire substantial amounts of fuel oil.¹⁹
- The Department is aware that ABB offers a DLN technology for fuel oil firing applicable to at least certain smaller combustion turbines (ABB-GTX). It is noted, however, that ABB does not offer a guarantee of 9 ppmvd on the same unit when firing natural gas.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

- It is possible that the NO_x emissions while firing oil from may be reduced from 42 ppmvd by increasing the water injection rate. In order to address this possibility, a specific condition will be added to conduct appropriate testing and prepare an engineering report. The report will be submitted for the Department's review to ensure that the lowest reliable NO_x emission rates while firing oil have been achieved.
- The Department's overall BACT determination is equivalent to approximately 0.4 lb/MW-hr by Dry Low NO_x. For reference, the new NSPS promulgated on September 3, 1998 requires that new conventional power plants (based on boilers, etc.) meet a limit of 1.6 lb/MW-hr.
- The applicant estimates VOC emissions of 1.4 ppmvd while firing gas and 1.4 ppmvd while burning fuel oil. The Department will set the limits at 2.8 ppmvd because at this concentration, the project will still not trigger PSD or a requirement for a BACT determination.
- The Department will set CO limits achievable by good combustion at full load as 9 ppmvd (gas) and 20 ppmvd (oil). These values are in the lower range of values from permitted or proposed simple cycle units. These limits are equal to or lower those proposed by the Department for the Oleander, Vandolah, DeSoto, Reliant, JEA Brandy Branch, and TEC Polk Power projects.
- Midway estimated levelized costs for CO catalyst control at \$31,800 per ton. The Department does not adopt this estimate, but would agree that even much lower estimates would not be cost-effective for removal of CO.
- Golder evaluated the use of oxidation catalyst for the DeSoto project with 90 percent control efficiency. Golder estimated levelized costs for CO catalyst control at \$7,500 per ton.
- The cost of CO control by oxidation catalyst is probably closer to the Golder estimate based on reducing *permitted* CO emissions. However in view of the performance of GE 7FA units without add-on control (~1 ppmvd), it is obvious that oxidation catalyst is definitely not cost-effective based on *actual* emissions and appears to not be cost-effective based on permitted emissions.
- The Department will not set a continuous CO limit reflecting the "new and clean test" because GE will not guarantee it. The Department will gather more information and may substantially reduce CO limits in future projects if such performance is maintained at the new installations throughout the state.
- There is no benefit is penalizing the applicant or with a lower limit at this time just because the performance at another site was far better than guaranteed or expected.
- BACT for PM₁₀ was determined to be good combustion practices consisting of: inlet air filtering; use of pipeline natural gas; use of clean, low ash, low sulfur fuels, and operation of the unit in accordance with the manufacturer-provided manuals. The emission limits for PM₁₀ will be set at 18 pounds per hour during gas operation and 34 pounds per hour while operating on fuel oil. These values include front and back half catch in contrast to the limits for most of the other permitted combustion turbines.

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

- PM₁₀ emissions will be very low and difficult to measure. Therefore, the Department will set a Visible Emission standard of 10 percent opacity as BACT for both natural gas and fuel oil firing, consistent with the definition of BACT. Examples of installations with similar VE limits include the City of Lakeland, JEA Brandy Branch, TEC Polk Power, Oleander Power, DeSoto Power, Vandolah, Shady Hills and quite a number of combined cycle projects.

| POLLUTANT | COMPLIANCE PROCEDURE |
|---|--|
| Visible Emissions | Method 9 |
| Carbon Monoxide | Annual Method 10 |
| NO _x (performance) | Annual Method 20 (can use RATA if at capacity) |
| NO _x (gas - 24-hr rolling average) (oil - 3-hr rolling average) | NO _x CEMS, O ₂ or CO ₂ diluent monitor, and flow device as needed. During gas operation, a separate compliance determination is conducted at the end of each operating day and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day. A valid hourly emission rate shall be calculated for each hour in which at least two NO _x concentrations are obtained at least 15 minutes apart. Valid hourly emission rates shall not include periods of start up, shutdown, or malfunction unless prohibited by 62-210.700 F.A.C. |
| SO ₂ and SAM | Custom Fuel Monitoring Schedule |

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

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

Recommended By:

Approved By:

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

 Howard L. Rhodes, Director
 Division of Air Resources Management

 Date:

 Date:

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

REFERENCES

- ¹ Report. Cubix Corporation. "Exhaust Emissions from a GE PG7241FA Simple Cycle Power Turbine at TECO Polk Power Station." September 2000.
- ² Telecom. Linero, A.A., FDEP and Chalfin, J., GE. NO_x control technology for fuel oil.
- ³ Paper. Mandai, S., et. al., MHI. "Development of Low NO_x Combustor for Firing Dual Fuel." Mitsubishi Juko Giho, Vol.36 No.1 (1999).
- ⁴ Paper. Cohn, A. and Scheibel, J., EPRI. Current Gas Turbine Developments and Future Projects. October 1997.
- ⁵ Compliance Manual. California EPA, CARB Compliance Division. Gas Turbines. June 1996.
- ⁶ News Release. Catalytica. First Gas Turbine with Catalytica's XONON installed to Produce Electricity at a Utility. October 8, 1998.
- ⁷ News Release. Catalytica. XONON™ Specified With GE 7FA Gas Turbines for Enron Power Project. December 15, 1999.
- ⁸ Permit. Florida DEP. KUA Cane Island Unit 3. File PSD-FL-254. November 1999.
- ⁹ News Release. Goaline. Genetics Institute Buys SCONOX_x Clean Air System. August 20, 1999.
- ¹⁰ "Control Maker Strives to Sway Utility Skeptics." Air Daily. Volume 5, No. 199. October 14, 1998.
- ¹¹ Telecom. Linero, A.A., FDEP, and Beckham, D., U.S. Generating. Circa November 1998.
- ¹² Letter. Haber, M., EPA Region IX to Danziger, R., GLET. SCONOX_x at Federal Cogeneration. March 23, 1998.
- ¹³ News Release. ABB Alstom Power, Environmental Segment. ABB Alstom Power to Supply Groundbreaking SCONOX™ Technology. December 1, 1999.
- ¹⁴ Letter. Opalinski, M.P., SECI to Linero, A.A., FDEP. Turbines and Related Equipment at Hardee Unit 3. December 9, 1998.
- ¹⁵ Telecon. Vandervort, C., GE, and Linero, A.A., DEP. "VOC Emissions from FA Gas Turbines with DLN-2.6 Combustors."
- ¹⁶ Information Release. General Electric Power Systems. MS7001FB Gas Turbine. Power-Gen, November 1999.
- ¹⁷ ABB Combined Cycle Website. Combustion Turbines. Environmental Burner. www.abbccpp.com.
- ¹⁸ Rowen, W.I. "General Electric Speedtronic™ Mark V Gas Turbine Control System. 1994."
- ¹⁹ Letter. Linero, A. A., FDEP to Forry, J. and Chalfin, J. General Electric. NO_x emissions control while firing fuel oil in Simple Cycle Units. October 12, 1999.

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 any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver 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.

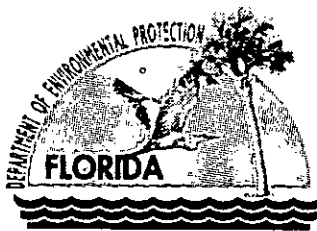
Reasonable time may depend on the nature of the concern being investigated.

- 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.

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

- G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
- a) Determination of Best Available Control Technology (X)
 - b) Determination of Prevention of Significant Deterioration (X); and
 - c) Compliance with New Source Performance Standards (X).
- G.14 The permittee shall comply with the following:
- a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
 - b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
 - c) Records of monitoring information shall include:
 - 1. The date, exact place, and time of sampling or measurements;
 - 2. The person responsible for performing the sampling or measurements;
 - 3. The dates analyses were performed;
 - 4. The person responsible for performing the analyses;
 - 5. The analytical techniques or methods used; and
 - 6. The results of such analyses.
- G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.



Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

P.E. Certification Statement

Permittee:

DEP File No. 1110099-002-AC (PSD-FL-305)

Midway Development Company, L.L.C.
Midway Power Project
St. Lucie County

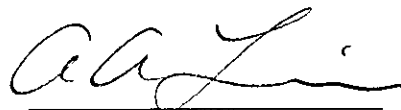
Project type:

Project is construction of three 170-megawatt GE PG7241FA gas and oil-fired simple cycle combustion turbine-electrical generators with 80-foot stacks, inlet air chillers, two fuel oil storage tanks, a gas heater, and ancillary equipment. Units will operate maximum of 3,500 hours per year per unit of which 1000 hours per year per unit may be on No. 2 distillate fuel oil.

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

Projected impacts from the proposed project emissions are all less than the applicable significant impact limits corresponding to the nearest PSD Class I (Everglades National Park) 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).*

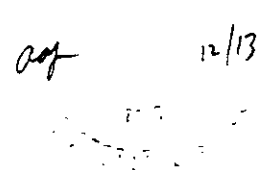
 12/13/00

A A. Linero, P.E.

Date

Registration Number: 26032

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




"More Protection, Less Process"

Memorandum

Florida Department of Environmental Protection

TO: Clair Fancy

FROM: Al Linero  12/13

DATE: December 13, 2000

SUBJECT: Midway Energy Center
Three 170 MW Combustion Turbines
DEP File No. 1110099-002-AC (PSD-FL-305)

Attached is the public notice package for construction of three dual-fuel, intermittent duty, simple cycle, 170 MW combustion turbines with inlet air chillers, two fuel oil storage tanks, a gas heater, and ancillary equipment at the planned (Enron) Midway Energy Center.

Nitrogen Oxides (NO_x) emissions from the gas turbine will be controlled by Dry Low NO_x (DLN-2.6). The applicant proposed an NO_x emission limit of 9 ppmvd @15% O₂. We are requiring compliance on a continuous (24-hour average) basis. The use of fuel oil will be allowed up to 1000 hours per year per unit in recognition of the very low simple cycle NO_x limit on gas.

The NO_x and fuel oil hours are equal to the values in the Oleander and IPSAPC Vandolah, DeSoto and Shady Hills permits. For reference, JEA Brandy Branch, TECO Polk, and Reliant were allowed 10.5 ppmvd NO_x on gas, but only 750 hours per year per unit of operation on fuel oil.

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

For reference, recent testing at TECO Polk Power Station indicated that these units achieve between 5 and 8 ppmvd NO_x under natural gas firing when tested as "new and clean" units. The TECO unit also achieved about 1 ppmvd of CO. Nevertheless, Enron has doubts about meeting a 9 ppmvd limit on a continuous basis. It is possible that we will increase the NO_x limit but reduce fuel oil firing based on comments during the public notice period.

I recommend your approval of the attached Intent to Issue.

AAL/al

Attachments