P 230 524 371

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Sent to	Carl Schulz
Street and No.	FIA GAS Trans
P.O., State, and ZIP Code	Houston, TX
Postage	$
Certified Fee	
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Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
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TOTAL Postage & Fees	$
Postmark or Date	7-20-93

PS Form 3800, June 1991

AC 56-230129
PSO-FI-203

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
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- The Return Receipt will show to whom the article was delivered and the date delivered.

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1. ☐ Addressee's Address
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Consult postmaster for fee.

3. Article Addressed to:
Carl D. Schulz, VP
Project Mgmt Services
Fla. GAS Transmission
P.O. BOX 1188
Houston, TX 77251-1188

4a. Article Number
P 230 524 371

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

7. Date of Delivery
JUL 23 1993

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form 3811, December 1991 ★U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Florida Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

July 20, 1993

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Carl D. Schulz, Vice President
Project Management Services
Florida Gas Transmission Company
Post Office Box 1188
Houston, Texas 77251-1188

Dear Mr Schulz:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit to install one natural gas fired engine in near Fort Pierce, St. Lucie County, Florida.

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

Sincerely,

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

CHF/TH/kt

Attachments

cc: I. Goldman, SE District
B. Andrews, P.E., ENSR
J. Bunyak, NPS
J. Harper, EPA

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CERTIFIED MAIL

In the Matter of an
Application for Permit by:

DEP File No. AC 56-230129
PSD-FL-203

Florida Gas Transmission Company
Post Office Box 1188
Houston, Texas 77251-1188

_____/

INTENT TO ISSUE

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

The applicant, Florida Gas Transmission, applied on April 23, 1993, to the Department of Environmental Protection for a permit to construct one natural gas fired engine located 6 miles west of the town of Ft. Pierce, in St. Lucie County, Florida.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes and Florida Administrative Code (F.A.C.) Chapters 17-212 and 17-4. The project is not exempt from permitting procedures. The Department has determined that a construction permit is required for the proposed work.

Pursuant to Section 403.815, Florida Statutes and Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

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

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

The Petition shall contain the following information;

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

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

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

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this INTENT TO ISSUE and all copies were mailed by certified mail before the close of business on 7-20-93 to the listed persons.

Clerk Stamp

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

Clerk

7-20-93
Date

Copies furnished to:

I. Goldman, SE District
B. Andrews, P.E., ENSR
J. Bunyak, NPS
J. Harper, EPA

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

The Department of Environmental Protection gives notice of its intent to issue a permit to Florida Gas Transmission Company, Post Office Box 1188, Houston, Texas 77251-1188, to install one natural gas fired engine. The Company's facility is located 6 miles west of the town of Ft. Pierce, in St. Lucie County, Florida. Modeling results show that approximately 9 percent of the annual NO_2 Class II PSD increment will be consumed. The maximum predicted NO_2 impact on the PSD Class I area is well below the National Park Service recommended significant impact level. These emissions will not cause or contribute to a violation of any ambient air quality standard or PSD increment. A determination of Best Available Control Technology (BACT) was required. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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

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

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

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

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Park Courtyard
Tallahassee, Florida

Department of Environmental Protection
Southeast District Office
1900 S. Congress Avenue-Suite A
West Palm Beach, Florida 33406

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

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

Technical Evaluation
and
Preliminary Determination

Florida Gas Transmission Company
St. Lucie County
Fort Pierce, Florida
Station No. 20

Natural Gas Compressor Engine
Permit No. AC 56-230129
PSD-FL-203

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

July 20, 1993

I. SYNOPSIS OF APPLICATION

I.1 Applicant Name and Address

Florida Gas Transmission Company
P. O. Box 1188
Houston, Texas 77251-1188

I.2 Reviewing and Process Schedule

Date of Receipt of Application: April 23, 1993

Application Completeness Date: April 23, 1993

II. FACILITY INFORMATION

II.1 Facility Location

Florida Gas Transmission Company's (FGTC) facility is located at 8701 Orange Avenue in Fort Pierce, Florida. The UTM coordinates are Zone 17, 558.01 km E and 3035.68 km N.

II.2 Standard Industrial Classification Code

This facility is classified as follows:

Major Group No. 49 - Electric, Gas and Sanitary Services

Group No. 492 - Gas Production and Distribution

Industry No. 4922 - Natural Gas Transmission

II.3 Facility Category

The FGTC site, in Fort Pierce, is classified as a major emitting facility for nitrogen oxides (NO_X). The proposed project will increase NO_X emissions by 77.53 tons per year and CO emissions by 81.71 tons per year. The total permitted emissions for this facility shall not exceed 658.08 tons NO_X per year and 214.21 tons CO per year.

III. PROJECT DESCRIPTION

The FGTC proposed to install one natural gas fired engine (Cooper-Bessemer 10V-275C, equipped with lean burn technology). The engine has 10 power cylinders and is rated at 4,000 bhp at 275 revolutions per minute (rpm). The engine is turbocharged, increasing the air inlet manifold pressure, which allows the engine to operate at a high air-to-fuel ratio. This turbocharging produces more power output from the engine than would otherwise be attained without having to use a larger size engine. A flow diagram of the integral engine compressor unit is presented in the attached Figure 2.1.

CE679259
(DALLAS/HPCL21)

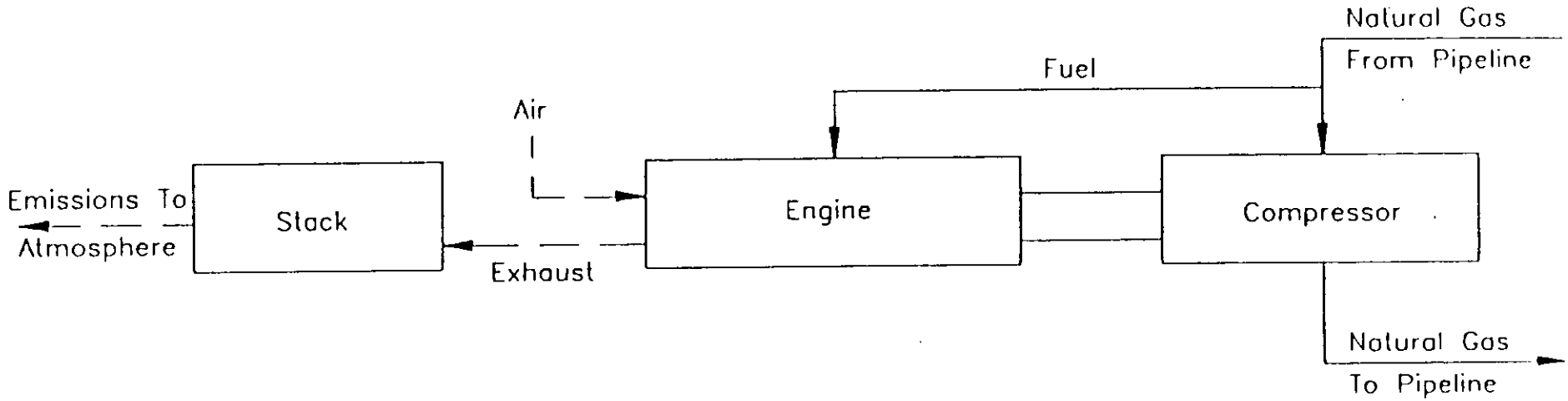

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FIGURE 2-1
PROCESS FLOW DIAGRAM
OF AN
ENGINE-COMPRESSOR UNIT

DRAWN:	DC/SH	DATE: 11-6-92	PROJECT NUMBER:
APPV'D:		REVISED 3-16-93	6792-0[illegible]8

III.1 Background Information

The FGTC existing compressor station consists of four natural gas fired reciprocating IC engines (two 1,500 bhp, one 2,000 bhp, and one 2,400 bhp). These compressor units were installed before the CAA amendment of 1977: two Worthington engines, 1,500 bhp Model SEHG-6 each were installed in 1966, a Worthington 2,000 bhp Model SEHG-8 engine was installed in 1968 and a 4,000 bhp Dresser-Rand Model 412-KVSR was installed in 1991. These existing engines are not being modified as part of this Phase II expansion project.

In general, the FGTC Phase III expansion project will be increasing the natural gas transport capacity of the existing Florida gas pipeline system. The scope of the work for Phase III includes expansions by the addition of state-of-the art compressor engines at four existing compressor stations and two new proposed compressor stations. The proposed engines would be used solely for the purpose of transporting natural gas in the pipeline for distribution in Florida. The main gas pipeline and the approximate locations of the existing and proposed compressor stations along the main pipeline are shown in Figure 1-1.

IV. **RULE APPLICABILITY**

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Florida Administrative (F.A.C.) Chapters 17-209 through 17-297.

This plant is located in an area (St. Lucie County) designated attainment for all criteria pollutants as in accordance with Rule 17-275.400.

The proposed project will be reviewed in accordance with F.A.C Rule 17-212.400, Prevention of Significant Deterioration, because it will be a major modification to a major facility. This review consists of a determination of Best Available Control Technology (BACT) and unless otherwise exempted, an air quality impact of the increased emissions. The review also includes a review of the project's impacts on soils, vegetation, visibility and air quality impact resulting from residential and industrial growth.

The proposed facility shall comply with applicable provisions of F.A.C. Chapter 17-297, Stationary Sources-Emissions Monitoring; F.A.C. 17-296, Stationary Sources-Emissions Standards; F.A.C. Rule 17-296.300 Best Available Control Technology; and F.A.C. Rule, 17-212.400, Prevention of Significant Deterioration.

CE679265
12-15-92

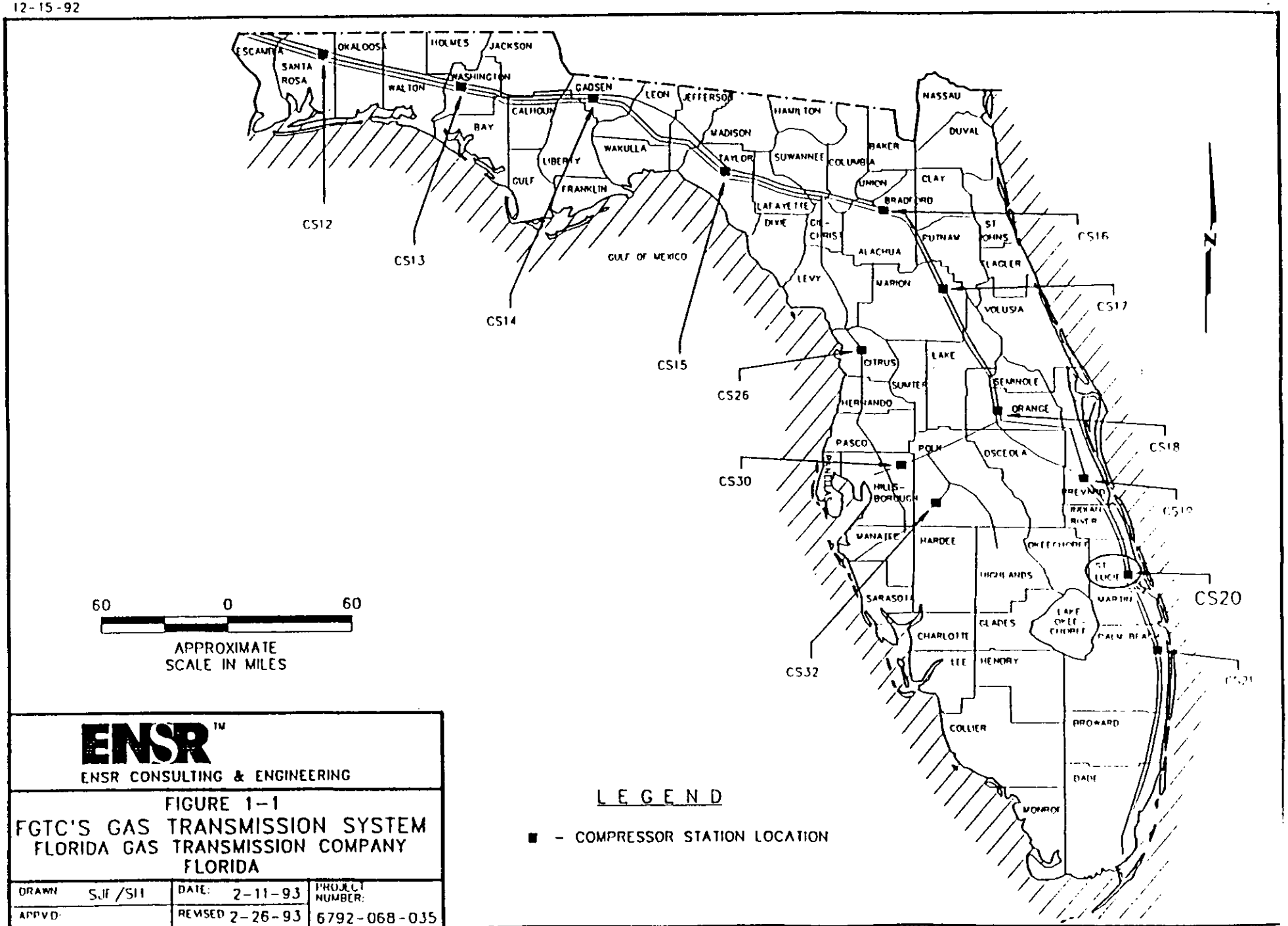

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FIGURE 1-1
FGTC'S GAS TRANSMISSION SYSTEM
FLORIDA GAS TRANSMISSION COMPANY
FLORIDA

DRAWN SJF/SH	DATE: 2-11-93	PROJECT NUMBER:
APPVD:	REVISED 2-26-93	6792-068-035

V. SOURCE IMPACT ANALYSIS

V.1 Control Technology Review

A complete BACT evaluation was submitted with the application. This evaluation included analyzing technologies involving engine modification and technologies involving exhaust gas treatment. Furthermore, the evaluation also included the feasibility of the different NO_x control methods and a comparison of the technical environmental, energy and economic impacts. Based on this approach, the lean-burn engine was determined to represent BACT.

The proposed engine will incorporate "lean-burn" technology, which is state-of-the-art design for minimizing air pollutant concentration in the exhaust gases from gas-fired reciprocating IC engines. In the lean-burn design, a small, fuel-rich mixture is combusted in a preignition chamber. The hot combustion gases from the preignition then pass to the main combustion chamber, where they ignite a lean mixture of fuel. Since most of the fuel entering the engine is burned in a lean state (i.e., high ratio of air to fuel), exhaust NO_x emissions are minimized.

V.2 Emission Limitations

The operation of this source will produce emissions of NO_x, CO, VOCs, particulates, and SO_2 from the burning of natural gas. Table I summarizes the proposed emissions from this source. Table II summarizes total emissions from this station No. 20.

TABLE I
SUMMARY OF EMISSIONS
(Unit No. 2005)

Maximum Potential

Pollutant	Emissions From Proposed Compressor Engine (lbs/hr)	(TPY)	Significant Emission Rate (TPY)
Nitrogen Oxides	17.64	77.26	40
Carbon Monoxide	18.52	81.12	100
Volatile Organic Compounds (non-methane)	5.29	23.18	40
Particulate Matter (TSP)	0.13	0.57	25
Particulate Matter (PM_{10})	0.13	0.57	15
Sulfur Dioxide	0.76	3.33	40

V.3 Air Quality Analysis

a. Introduction

The proposed Florida Gas Transmission pipeline compressor station No. 20 will emit one pollutant which is PSD significant nitrogen oxides (NOx).

TABLE II

Annual (TPY) Emission Levels
FGTC's Compressor Station No. 20

SOURCE ID	DESCRIPTION	NO_x	CO	VOC (NM/NE HC)	SO_2	PM
EXISTING FACILITY						
	COMPRESSOR ENGINES:					
2001	1500 bhp Recip. Engine	159.36	20.28	6.37	1.34	0.23
2002	1500 bhp Recip. Engine	159.36	20.28	6.37	1.34	0.23
2003	2000 bhp Recip. Engine	212.47	27.04	8.50	1.79	0.31
2004	2400 bhp Recip. Engine	49.36	64.90	39.40	2.09	0.41
	OTHER SOURCES: *	—	—	2.89	—	—
EXISTING TOTAL		580.55	132.50	63.53	6.56	1.18
PROJECT RELATED						
	COMPRESSOR ENGINE:					
2005	4000 bhp Recip. Engine	77.26	81.12	23.18	3.33	0.57
2011	EMERGENCY GENERATOR	0.27	0.59	0.01	0.03	0.01
	FUGITIVE	—	—	0.10	—	—
PROJECT TOTAL		77.53	81.71	23.29	3.36	0.58
STATION TOTAL **		658.08	214.21	86.82	9.92	1.76

* - Other Sources includes; ancillary equipment, storage tanks and equipment leaks.
** - STATION TOTAL = EXISTING + PROJECT

The air quality impact analysis required by the PSD regulations for this pollutant includes:

* An analysis of existing air quality;
* A PSD increment analysis;
* An Ambient Air Quality Standards (AAQS) analysis;
* An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts; and
* A "Good Engineering Practice" (GEP) stack height determination.

The analysis of existing air quality generally relies on preconstruction monitoring data collected with EPA-approved methods. The PSD increment and AAQS analysis depends on the air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on the required analysis, the Department has reasonable assurance that the proposed Florida Gas Transmission pipeline compressor station No. 20, as described in this report and subject to the approval proposed herein, will not cause or contribute to a violation of any ambient air quality standard or PSD increment. A discussion of the modeling methodology and required analysis follows.

b. Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review. An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined by air quality modeling, is less than a pollutant-specific "de minimus" concentration.

The predicted impact of the proposed project for NO_2, the only pollutant subject to PSD review for this project is 1.84 ug/m^3, annual average. The annual average de minimus concentration level for NO_2 is 14 ug/m^3. Therefore, an ambient monitoring analysis is not required.

c. Modeling Methodology

The EPA-approved Industrial Source Complex long-term (ISCLT2) dispersion model was used to evaluate the pollutant emissions from the proposed facility. All recommended EPA default options were used. Direction-specific downwash parameters were used because the stacks were less then the good engineering practice (GEP) stack height.

Meteorological data used in the modeling consisted of five years (1982-1986) of hourly surface data taken at West Palm Beach, Florida and twice-daily upper air data also taken at West Palm Beach.

These data were used in the National Climate Data Center (NCDC) stability array (STAR) preprocessor program for the ISCLT2 model. The STAR program converts the hourly data into the joint frequency of occurrence of wind direction, wind speed, and atmospheric stability.

The highest predicted yearly impact from the proposed NOx emissions was compared with the standards.

d. Modeling Results

All PSD Class II dispersion modeling was performed with receptors placed at 100m intervals on a 31 x 31 grid centered on the project. The maximum air quality impact from the proposed facility is 1.84 ug/m^3, which is greater than the PSD significant impact level of 1.0 ug/m^3 for NOx. Therefore, further dispersion modeling for comparison with AAQS and PSD Class II increment consumption for NO_2 was required. The significant impact area was determined to be 1 km and an emissions inventory for NOx sources in the area was developed. The maximum predicted PSD Class II NO_2 increment consumption is 2.31 ug/m^3, annual average. This value is less than the PSD Class II NO_2 increment of 25 ug/m^3, annual average. However, the maximum predicted concentration due to all NOx sources in the area is 287 ug/m^3, annual average. This value is greater than 100 ug/m^3, annual average, which is the AAQS for NO_2. When the use of the ISCLT2 model predicts values greater than the NO_2 AAQS, a refined method may be used to arrive at a maximum predicted NO_2 concentration. The ozone limiting method, which is approved by the Department and EPA, involves an initial comparison of the estimated NOx concentration and the ambient O_3 concentration to determine which is the limiting factor to NO_2 formation. The maximum predicted NO_2 concentration using the ozone limiting method is 74 ug/m^3, which is less than the AAQS of 100 ug/m^3.

The facility is within 150 km of the Everglases National Park, a PSD Class I area. For potential impacts to this Class I area, a modeling analysis was performed for NO_2 to calculate concentrations out to 30 km from the facility. The results showed that potential NO_2 annual concentrations (0.01 ug/m^3) in the direction (South and Southwest) of the Everglases National Park, were well below the National Park Service Class I screening level of 0.025 ug/m^3 annual average. Therefore, no further PSD Class I modeling was required.

e. Additional Impacts Analysis

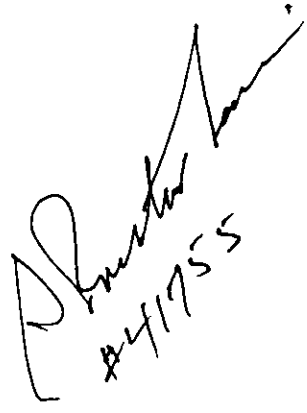
The applicant did an air quality related values analysis. Since the maximum project impact for NOx is predicted to be less than the applicable AAQS including the national secondary standards developed to protect public welfare-related values, the project is not expected to have a harmful impact on soils and vegetation.

Visual Impact Screening and Analysis, known as VISCREEN, the EPA-approved Level I visibility computer model was used to estimate the impact of proposed project's emissions upon visibility in Class I area. The results indicated the maximum visibility impacts caused by the project do not exceed the screening criteria inside or outside the Class I area. As a result, there is no significant impact upon visibility predicted for the Class I area.

There will be a small number of temporary construction workers constructing the additional facilities at Compressor Station No. 20. However, there will be no increase in the permanent regional work force. As a result there will be no permanent impacts on air quality due to associated population growth.

VI. **CONCLUSION**

Based on the information provided by Florida Gas Transmission Company, the Department has reasonable assurance that the proposed project, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-209 through 17-297 of the Florida Administrative Code.



Florida Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

PERMITTEE:

Florida Gas Transmission Company
P. O. Box 1188
Houston, Texas 77251-1188

Permit Number: AC 56-230129
PSD-FL-203
Expiration Date: June 30, 1995
County: St. Lucie
Latitude/Longitude: 27°26'43"N
80°24'47"W
Project: Natural Gas Compressor Engine (Unit No. 2005) Station No. 20

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-210, 212, 272, 275, 296, and 297; and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of one natural gas fired engine to be located at 8701 Orange Avenue, Fort Pierce, Florida. The UTM coordinates are Zone 17, 558.01 km East and 3035.68 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to Construct/Operate Air Pollution Sources DEP Form 17-1.202(1).

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

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

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

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

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules.

GENERAL CONDITIONS:

This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

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

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

a. a description of and cause of non-compliance; and

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

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

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source

GENERAL CONDITIONS:

which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, 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.

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

13. This permit also constitutes:

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

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

GENERAL CONDITIONS:

permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

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

SPECIFIC CONDITIONS:

Emission Limits

1. The maximum allowable emissions from this unit shall not exceed the emission rates as follows:

Pollutant	lbs/hr	tons/yr	Emission Factor
Nitrogen Oxides	17.4	77.26	2.0 g/bhp-hr
Carbon Monoxide	18.52	81.12	2.8 g/bhp-hr
Volatile Organic Compounds (non-methane)	5.29	23.18	1.7 g/bhp-hr
Particulate Matter (TSP)	0.13	0.57	5 lbs/MMscf
Particulate Matter (PM_{10})	0.13	0.57	5 lbs/MMscf
Sulfur Dioxide	0.70	3.33	10 gr/100scf

2. Visible emissions shall not exceed 10% opacity.

Operating Rates

3. This source is allowed to operate continuously (8760 hours per year).

SPECIFIC CONDITIONS:

4. This source is allowed to burn natural gas only.

5. The permitted operating parameters and utilization rates for this natural gas compressor engine shall not exceed the values stated in the application. The parameters include, but are not limited to:

- Maximum natural gas consumption shall not exceed 0.0267 MMscf/hr.
- Maximum heat input shall not exceed 27.8 MMBtu/hr.

6. Any change in the method of operation, equipment or operating hours shall be submitted to the DEP's Bureau of Air Regulation and Southeast District offices.

7. Any other operating parameters established during compliance testing and/or inspection that will ensure the proper operation of this facility shall be included in the operating permit.

Compliance Determination

8. Compliance with the allowable emission limits shall be determined within 60 days after achieving the maximum production rate at which this facility will be operated, but not later than 180 days after initial start-up and annually thereafter, by the following reference methods as described in 40 CFR 60, Appendix A (July 1992 version) and adopted by reference in Chapter 17-297, F.A.C.

- Method 1. Sample and Velocity Traverses
- Method 2. Volumetric Flow Rate
- Method 3 or 3A Gas Analysis
- Method 7E Determination of Nitrogen Oxide Emissions from Stationary Source.
- Method 9. Determination of the Opacity of the Emissions from Stationary Sources
- Method 10. Determination of the Carbon Monoxide Emissions from Stationary Sources
- Method 25A. Determination of Total Gaseous Organic Concentrations Using a Flame Ionization Analyzer

9. Other DEP approved methods may be used for compliance testing after prior Department approval. Compliance with the SO_2 emission limit can be determined by calculations based on fuel analysis using ASTM D1072-80, D3031-81, D4084-82, or D3246-81 for sulfur content of gaseous fuels.

SPECIFIC CONDITIONS:

10. Initial compliance with the volatile organic compound (VOC) emissions limits will be demonstrated by EPA Method 25 or Method 18. Thereafter, except as provided in F.A.C. Rule 17-297.340(2), compliance with the VOC emission limits will be assumed, provided the CO allowable emission rate is achieved.

11. Stack sampling facilities shall be required and shall comply with the requirements of F.A.C. Rule 17-297.345. Tests results will be the average of 3 valid runs. The Southeast District office will be notified at least 30 days in writing in advance of the compliance test(s). The source shall operate between 95% and 100% of maximum capacity for the ambient conditions experienced during compliance test(s). Compliance test results shall be submitted to the Southeast District office no later than 45 days after completion.

12. The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from this source. The continuous emission monitor must comply with 40 CFR 60, Appendix B, Performance Specification 2 and 40 CFR 60, Appendix F, Quality Assurance Procedures (July 1, 1992 version). Pursuant to F.A.C. Rule 17-4.160(14), the permittee shall retain all monitoring records related to the requirements of this permit for a period of three (3) years.

13. The permittee shall annually perform a visual inspection of the turbine compressor engine, filters, associated piping system for rust spots, cracks, leaks and odors. Also ensure that safety valves and the stack are in proper order and working properly. The permittee shall document the findings and corrective action taken.

14. When the Department, after investigation, has good reason (such as odor complaints, increased visible emissions, excess emissions, etc.), to conclude that any applicable emission standard contained in this permit is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of air pollutant emissions from the facility and to provide a report of said tests to the Department (F.A.C. Rule 17-297.340(2)).

Rule Requirements

15. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-210, 212, 275, 296, 297 and 17-4, Florida Administrative Code and 40 CFR 60 (July, 1992 version).

SPECIFIC CONDITIONS:

16. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-210.300(1)).

17. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor pursuant to F.A.C. Rule 17-296.320(2). Objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonable interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance pursuant to F.A.C. Rule 17-296.200(123).

18. This source shall be in compliance with all applicable provisions of F.A.C. Rules 17-210.650: Circumvention; 17-210.700: Excess Emissions; Chapter 17-297: Stationary Sources-Emissions Monitoring; Chapter 17-296: Stationary Source- Emission Standards and, 17-4.130: Plant Operation-Problems.

19. If construction does not commence within 18 months of issuance of this permit, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which construction has not commenced (40 CFR 52.21(r)(2)).

21. Fugitive dust emissions, during the construction period, shall be minimized by covering or watering dust generation areas.

22. Pursuant to F.A.C. Rule 17-210.300(2), Air Operating Permits, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur content and the lower heating value of the fuel being fired, fuel usage, hours of operation, RPM, air emissions limits, etc. Annual reports shall be sent to the Department's Southeast District office by March 1 of each calendar year.

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

SPECIFIC CONDITIONS:

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

Issued this _____ day

of _____, 1993

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

_____
Virginia B. Wetherell, Secretary

Best Available Control Technology (BACT) Determination
Florida Gas Transmission Company
St. Lucie County-PSD-FL-203

The applicant proposes to expand its existing natural gas pipeline compressor station No. 20 near the town of Ft. Pierce, St. Lucie County, Florida. The proposed expansion consists of adding one new Cooper- Bessemer 4,000 brake horsepower (BHP) natural-gas-fired, reciprocating internal engine.

The applicant has indicated the maximum total annual tonnage of regulated air pollutants emitted from the proposed turbine engine based on 8,760 hrs/year operation and ISO standard conditions to be as follows:

Pollutant	Max. Net Increase in Emissions (TPY)	PSD Significant Emission Rate (TPY)
NOx	77.26	40
SO_2	3.33	40
PM/PM_{10}	0.57	25/15
CO	81.12	100
VOC	23.18	40

Rule 17-212.400(2)(f)(3) of the Florida Administrative Code (F.A.C.) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table. In this case, BACT is only required for nitrogen oxides (NOx).

BACT Determination Requested by the Applicant

The BACT Determination requested by the applicant is given below:

Pollutant	Determination
NOx	2.0 g/bhp-hr

Date of Receipt of a BACT Application

April 23, 1993

Review Group Members

This determination was based upon comments received from the applicant and the Permitting and Standards Section.

BACT DETERMINATION PROCEDURE

In accordance with F.A.C. Chapter 17-212, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into

account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available control methods, systems and techniques. In addition, the regulations require that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other State.

(d) The social and economic impact of the application of such technology.

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

BACT ANALYSIS FOR NITROGEN OXIDES (NOx)

CONTROL TECHNOLOGY REVIEW

The uncontrolled emissions of nitrogen oxides (424.9 TPY) represent a significant proportion of the total emissions generated by this project, and need to be controlled if deemed appropriate. As such, the applicant presented an extensive analysis of the different available technologies for NOx control.

All potentially applicable control technologies for reciprocating engines were evaluated in the application. These technologies can be separated into major groups.

- engine modifications, and
- add-on control technology

A summary of technical feasibility of NOx emission control technologies is presented in Table I.

In addition to the technical feasibility of each one of the control technologies presented, the applicant has examined the energy and economic impacts of using ignition timing retardation, derating power output and exhaust gas recirculation. In each case these alternatives resulted in emissions that were essentially equivalent to that proposed or provided little benefit for the associated expense. As this is the case, none of these control strategies will be elaborated upon in this determination.

The analysis presented has evaluated three of the technically feasible control alternatives or possible BACT for this project, the rich- burn engine with NSCR, the lean burn engine with SCR and the lean burn engine technology (air-to-fuel ratio change). An analysis of these technologies as stated by the applicant follows:

- **Analysis of Lean-Burn Technology** (air-to-fuel ratio change)

The proposed turbocharged reciprocating engine will operate according to the manufacturer's specified operating parameters. The engine's state-of-the-art design includes small pre-ignition chambers in which a rich fuel mixture is spark-ignited. The hot gases then enter the main combustion chambers and create spontaneous combustion of the lean fuel mixture. As a result, the overall combustion process is conducted under very lean fuel conditions. Operating on the lean side of the air-to-fuel ratio allows the proposed engine to obtain peak fuel economy.

In general, thermal NOx formation is directly proportional to the combustion temperature and residence time of the combustion gases. The high mass flow rate at full-load, as indicated by the 80,640 pounds per hour of exhaust mass flow rate, reduces the residence time of the combustion gases compared to a rich-burn engine, which operates at an air-to-fuel ratio near unity. High mass flow rate also means the engine operates below the peak temperature region for thermal NOx formation. The exhaust temperature for the proposed engine is 540°F, which falls in the range of typical exhaust temperatures for reciprocating engines.

- **Analysis of Rich-Burn Engine/NSCR**

Because they operate at near stoichiometric air-to-fuel ratios, rich-burn engines generate cylinder temperatures in the range of 1,200° to 1,300°F. Engine manufacturers have found that such high temperatures do not allow high engine loading. For greater power output, engine manufacturers have found that engine modifications

(i.e., turbocharged engines which can produce more power enhancements with lower emission levels) are a better choice than building larger engine blocks.

Normally, rich-burn engine/NSCR combination applications are found only on small engines of approximately 1,000 bhp or less. The application of NSCR to an engine the size to be installed at Compressor Station No. 20 may pose unforeseen technical problems not encountered in installations on smaller units.

o Analysis of Lean-Burn Engine with SCR

As the most effective NOx abatement process in terms of removal efficiency, SCR technology has been applied for control of NOx emissions from state-of-the-art reciprocating engines. However, the reliability of SCR's performance on reciprocating engines has not been consistently demonstrated. Data on sustained NOx reduction performance for reciprocating engines are very limited.

Selective catalytic reduction is a post-combination method for control of NOx emissions. The SCR process combines vaporized ammonia with NOx in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90% reduction of NOx with a new catalyst. As the catalyst ages, the maximum NOx reduction will decrease to approximately 86 percent.

The effect of exhaust gas temperature on NOx reduction depends on the specific catalyst formulation and reactor design. Most commercial SCR systems operate over a temperature range of about 600-750°, although recently developed zeolite-based catalysts are claimed to be capable of operating at temperatures as high as 950°. At levels above and below this window, the specific catalyst formulation will not be effective and NOx reduction will decrease. Operating at high temperatures can permanently damage the catalyst through sintering of surfaces.

For this type of engine, technical concerns involved in SCR use are the narrow operating temperature range and the possible damage to the catalyst and downstream equipment. A stack gas reheat system would be required to heat the exhaust gases to the SCR's operating temperature. The integration of a reheat system adds another design criteria to an already complex system consisting of SCR components and an ammonias handling system.

A review of the BACT/LAER Clearinghouse determinations made to date on gas-fired reciprocating engines reveals that SCR has never been

applied specifically to any large-bore (i.e., greater than 1,000 bhp) and low-speed (i.e., 300 rpm) lean-burn engines due to their already low NOx emission rate.

BACT EVALUATION BY THE DEPARTMENT

Although technically feasible, the applicant has rejected using lean burn engine with SCR and rich-burn engine with NSCR on this type of engine because of economic, energy and environmental impacts. The following limitations, identified by the applicant, have been evaluated by the Department:

Energy Impact

The addition of SCR to a lean-burn engine imposes a fuel requirement of 36,733 MMBtu/yr for stack gas reheat. In addition, electrical power is required for the ammonia vaporizer and injection system. The rich-burn engine with NSCR has the highest energy requirements. Operating a rich-burn engine requires and additional 36,792 MMBtu/yr of heat input compared to using an engine with lean-burn technology. The lean-burn engine shows a savings of 36,792 MMBtu/yr in heat input over the rich-burn engine because of its inherent fuel efficient design. Therefore, a lean burn engine has no energy impact compared to the other BACT options evaluated.

Economic Impacts

When the three feasible NOx control alternatives are compared in terms of total cost effectiveness, the lean-burn engine/SCR technology has the highest cost effectiveness value of $1,723 per ton of NOx removed. The rich-burn engine/NSCR technology is the next highest with $537 per ton of NOx removed. The lean-burn engine has a nominal total cost effectiveness value of 347.7 per ton of NOx removed.

The incremental cost effectiveness values for the lean-burn engine/SCR technology and the rich-burn engine/NSCR technology are $19,205 and $6,415 per ton of NOx removed, respectively. The lean-burn engine has an incremental cost effectiveness of $-49 per ton of NOx removed. Therefore, the lean-burn engine is the most cost effective control option for this project.

Environmental Impacts

SCR poses the greatest potential for toxic impacts due to ammonia handling and storage and ammonia slip. When the alternatives are compared in terms of adverse environmental impacts the lean-burn

engine with SCR is the worst due to potential ammonia release and disposal of the catalyst. The rich-burn engine with NSCR will also require disposal of catalyst. The lean-burn engines does not create any waste; therefore, it is the best alternative in terms of the environmental impact analysis.

In addition to nitrogen oxides and ammonia, the impacts of toxic pollutants associated with the combustion of natural gas have been evaluated. These toxics (formaldehyde and polycyclic organic matter) common to the combustion of natural gas, are expected to be emitted in minimal amounts and will not have an impact on air quality or this BACT analysis.

BACT DETERMINATION BY DEP

Based on the information presented by the applicant and the studies conducted, the Department believes that the NOx control technology proposed (lean-burn technology) satisfies the BACT requirement for nitrogen oxides. Although engine modifications and add-on control (SCR) could be used to provide additional control, the benefits that would be obtained do not warrant the cost. The emission limit for this compressor engine is thereby established as follows:

Pollutant	Emissions Limit
NOx	2.0 grams/bhp-hr

Details of the Analysis May be Obtained by Contacting:

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

Recommended by:

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

_____1993
Date

Approved by:

Virginia B. Wetherell, Secretary
Dept. of Environmental Protection

_____1993
Date

TABLE I

Summary of Technical Feasibility of NO_x Emission Controls for Reciprocating Engines

Control Technology	NO_x Controlled Emission Rate	Technical Feasibility	Comments
Engine Modification Alternatives			
Steam Injection	Not Applicable	No	Technically infeasible due to irreversible structural damage to engine block.
Air-to-fuel Ratio Change (or Lean-Burn Technology)	2.0 g/bhp-hr	Yes	Lowest emission rate achievable by engine modification, at least 80% control efficiency.
Retarding Ignition Timing Rich-burn Engine Lean-burn Engine	 9.4 g/bhp-hr Not Applicable	 Yes No	Engine timing retard between 2° and 6°; average 15% NO_x reduction.
Derating Power Output Rich-burn Engine Lean-burn Engine	 7.2 g/bhp-hr 1.3 g/bhp-hr	 Yes Yes	Average 35% NO_x reduction at 25% of engine power derated for gas-fired engines as a group. NO_x reductions for turbo charged engines are less due to the lower effect on air-to-fuel ratio.
Exhaust Gas Recirculation Rich-burn Engine Lean-burn Engine	 7.3 g/bhp-hr Not Applicable	 Yes No	Maximum 34% NO_x reduction from standard engine. Ineffective for lean-burn engine.
Add-on Control Technology*			
NO_xOUT Process	Not Applicable	No	Technically infeasible (1000-1600°F), cost prohibitive for high temperature auxiliary equipment.
THERMAL DeNO_x	Not Applicable	No	Technically infeasible (above 1000°F), cost prohibitive for high temperature auxiliary equipment.
Lean-Burn Engine/NSCR	Not Applicable	No	Technically infeasible for lean-burn engine, require <4% 0_2 conc. in the exhaust stream.
Lean-Burn Engine/SCR	0.4 g/bhp-hr	Yes	Applicable to lean-burn engine with control efficiency of 80 percent.
Rich-Burn Engine/NSCR	1.1 g/bhp-hr	Yes	Applicable to rich-burn engine only, required greater than 4% 0_2 conc. In exhaust gas stream. Control efficiency of 90%.

* Except for the rich-burn engine/NSCR option, all add-on control technologies are for lean-burn engines.

Source: FGTC's air pollution permit application (1993)