Florida Department of Environmental Protection

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Sent by Electronic Mail – Received Receipt Requested

PERMITTEE

Florida Gas Transmission Company
2405 Lucien Way, Suite 200
Maitland, Florida 32751-7047

Authorized Representative:
Davis W. Shellhouse, VP, Southeast Operations

Air Permit No. 0410004-018-AC
Permit Expires: December 1, 2011

Compressor Station 24
Minor Source Air Construction Permit
Heat Rate Modification EU001 & EU004

This is the final air construction permit, which authorizes the increase of Maximum Heat Input Rates for EU001 (Engine No. 2401) & EU004 (Engine No. 2403). The proposed work will be conducted at the Compressor Station 24, which is a natural gas pipeline (Standard Industrial Classification No. 4922). The facility is located in Gilchrist County near Trenton at 5030 North U.S. Highway 129 in Trenton, Florida. The UTM coordinates are Zone 17, 321.3 km East, and 3282.8km North. As noted in the Final Determination provided with this final permit, only minor changes and clarifications were made to the draft permit.

This final permit is organized by the following sections.

Section 1. General Information

Section 2. Administrative Requirements

Section 3. Emissions Unit Specific Conditions

Section 4. Appendices

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of Section 4 of this permit.

SECTION 1. GENERAL INFORMATION (FINAL)

This air pollution 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 permittee is authorized to conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and is not subject to the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Jacksonville, Florida

Christopher L. Kirts, P.E.
District Air Program Administrator

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Final Air Permit package (including the Final Determination and Final Permit) was sent by electronic mail (or a link to these documents made available electronically on a publicly accessible server) with received receipt requested before the close of business on September 7, 2011 to the persons listed below.

Davis Shellhouse, VP Southeast Op. - Florida Gas transmission Company (dave.shellhouse@sug.com)
Paul Newman, Manager -Florida Gas transmission Company (paul.newman@sug.com)
Thomas W. Davis, P.E. of Record, Environmental Consulting & Technology, Inc. (tdavis@ectinc.com)

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.

Monique Jordan

(Clerk) 9/6/2011 (Date)

FACILITY AND PROJECT DESCRIPTION

Florida Gas Transmission Company (FGTC) operates existing Compressor Station 24 in Gilchrist County for their natural gas pipeline. The station currently consists of a 15,000 bhp gas turbine (Engine 2401), a 7222 bhp gas turbine (Engine 2402), a 20,500 hp gas turbine (Engine2403), and miscellaneous support activities.

Project 018-AC makes changes to EU001 and 004:

ID No.	Emission Unit Description
001	Engine 2401: Solar Model Mars 100-T15000S gas turbine rated at 15,000 bhp
004	Engine 2403: Solar Model Titan 130-20502SA gas turbine rated at 20,500 hp

The project is part of FGTC's overall Phase VIII project intended to increase the natural gas supply capacity and reliability to service domestic, commercial, and industrial customers in Florida. The permit consolidates the regulatory requirements for the emissions units at this facility.

FACILITY REGULATORY CLASSIFICATION

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility has no units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.

This facility is subject to regulation under 40 CFR 60, Subpart KKKK, Standards of Performance for Stationary Combustion Turbines and 40 CFR 60, Subpart A– General Provisions:

Emissions Unit	Description
001	Engine 2401: 15,000 bhp natural gas fired turbine compressor unit Dry Low-NOx (DLN) Combustion

EU004 is also subject to regulation under 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines:

Emissions Unit	Description
004	Engine 2403: 20,500 hp gas turbine rated Dry Low-NOx (DLN) Combustion

1. Permitting & Compliance Authority: The permitting authority for this project is the Northeast District Office, Air Resources Section, Florida Department of Environmental Protection (Department). The Northeast District Office's mailing address is 7825 Baymeadows Way, Suite 200B, Jacksonville, Florida 32256-7590. All documents related to applications for permits to operate an emissions unit shall be submitted to the Northeast District Office. The Permitting Authority's telephone number is 904/256-1700.

2. Appendices: The following Appendices are attached as part of this permit:

   a. Appendix A. Citation Formats and Glossary of Common Terms;

   b. Appendix B. General Conditions;

   c. Appendix C. Common Conditions; and

   d. Appendix D. Common Testing Requirements.

3. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units 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 Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

4. New or Additional Conditions: 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.]

5. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No new emissions unit shall be constructed and no existing emissions unit shall be modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

6. Source Obligation:

   (a) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

   (b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

   [Rule 62-212.400(12), F.A.C.]

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS (FINAL)

A. EU 001 (Engine No. 2401) & EU004 (Engine No. 2403)

This section of the permit addresses the following emissions units.

ID No.	Emission Unit Description
001	Gas Turbine No. 2401. 132.3 MMBtu per hour **NOTE (1)** *Fuel*: The combustion turbine will fire approximately 127,300 cubic feet per hour of pipeline natural gas (SCC No 2-02-002-01) at maximum permitted capacity. *Capacity*: At 132.3 MMBtu per hour of heat input, the combustion turbine produces approximately 15,000 bhp. After initial startup, the unit is intended to operate at or near capacity. *Controls*: Natural gas contains little or no ash, sulfur, or other contaminants, which minimizes emissions of particulate matter and sulfur dioxide. The efficient combustion of natural gas at high temperatures results in lower emissions of carbon monoxide and volatile organic compounds. Lean premix combustion technology will minimize the formation of nitrogen oxides. *Stack Parameters*: When operating at capacity, exhaust gases will exit a 58 feet tall stack that is 8.7 feet in diameter with a flow rate of approximately 193,613 acfm at 903° F.
004	Gas Turbine No. 2403. 174.5 MMBtu per hour **NOTE (2)** *Fuel*: The combustion turbine will fire approximately 167,800 cubic feet per hour of pipeline natural gas (SCC No 2-02-002-01) at maximum permitted capacity. *Capacity*: At 174.5 MMBtu per hour of heat input, the combustion turbine produces approximately 20,500 bhp. After initial startup, the unit is intended to operate at or near capacity. *Controls*: Natural gas contains little or no ash, sulfur, or other contaminants, which minimizes emissions of particulate matter and sulfur dioxide. The efficient combustion of natural gas at high temperatures results in lower emissions of carbon monoxide and volatile organic compounds. Lean premix combustion technology will minimize the formation of nitrogen oxides. *Stack Parameters*: When operating at capacity, exhaust gases will exit a 55 feet tall stack that is 7.5 feet x 8 feet in diameter with a flow rate of approximately 232,782 acfm at 944° F.

{Permitting note REGULATIONS: EU001 & EU004 are subject to 40 CFR 60, Subpart KKKK - Standards of Performance for Stationary Combustion Turbines and 40 CFR 60, Subpart A– General Provisions. Emissions Unit 004 shall also comply with the New Source Performance Standards (NSPS) of Subpart GG in 40 CFR 60. }

PERFORMANCE RESTRICTIONS

1. **Relation to Other Permits.** The conditions of this permit will supplement and comply with conditions of all existing, valid, Department permits.
[Rules 62-4.210, 62-4.030, and 62-210.300(1)(b), F.A.C.]

A. EU 001 (Engine No. 2401) & EU004 (Engine No. 2403)

2.a. Permitted Capacity (EU001). The maximum heat input rate to the combustion turbine is 132.3 MMBtu per hour of heat input, while producing approximately 15,000 bhp. Maximum Heat Input Rate is based on gas turbine output power of 15,000 hp, heat rate of 8,403 Btu/hp-hr, HHV at ISO conditions (i.e., 59^0 F, 50% relative humidity, and one atmosphere pressure), natural gas heat content of (1040 BTU/scf) HHV, and a 5% margin for measurement variability. Heat input rate will vary with gas turbine characteristics, load and ambient conditions.

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2.b. Permitted Capacity (EU004). The maximum heat input rate to the combustion turbine is 174.5 MMBtu per hour of heat input, the combustion turbine produces approximately 20,500 bhp. Maximum Heat Input Rate is based on gas turbine output power of 20,500 bhp, heat rate of 8,105 Btu/hp-hr, HHV at ISO conditions (i.e., 59^0 F, 50% relative humidity, and one atmosphere pressure), natural gas heat content of (1040 BTU/scf) HHV, and a 5% margin for measurement variability. Heat input rate will vary with gas turbine characteristics, load and ambient conditions.

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3.a. Hours on Operation EU001). The hours of operation of the combustion turbine are not restricted (8760 hours per year).

[Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

3.b. Restricted Operation (EU004). The hours of operation of the combustion turbine are not restricted (8760 hours per year). Except for startup and shutdown, operation below 50% base load is prohibited.

[Rules 62-4.070(3), 62-210.200(PTE), F.A.C., and Air Construction Permit No. 0410004-016-AC]

4. Authorized Fuel. The combustion turbine shall fire only natural gas with a maximum sulfur content of 10 grains per 100 standard cubic feet of natural gas.

[Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.; and NSPS Subpart KKKK in 40 CFR 60]

5. Recordkeeping (EU004). Using the automated gas turbine control system, the permittee shall monitor and record heat input (MMBtu), power output (bhp), and hours of operation for the gas turbine. If requested by the Department, the permittee shall be able to provide a summary of this information within at least ten days of such request. The information shall also be used for submittal of the required Annual Operating Report.

[Rule 62-4.070(3), F.A.C., and Air Construction Permit No. 0410004-016-AC]

EMISSIONS STANDARDS

6. Emissions Standards. The permitted maximum allowable emission rate for each pollutant is as follows:

Pollutant	Standards Engines 2401 and 2403	Equivalent Maximum Emissions [6]				Rule Basis
		Engine 2401		Engine 2403		
		lb/hr	TPY	lb/hr	TPY	
CO [1]	50.0 ppmvd @ 15% O_2	16.0	70.2			Rule 62-4.070(3), F.A.C.
	25.0 ppmvd @ 15% oxygen			9.5	41.7	Rule 62-212.400(12), F.A.C.
NO_x [2] EU001	25.0 ppmvd @ 15% O_2	13.2	57.7	---	---	Rule 62-4.070(3), F.A.C. 40 CFR 60.332
NO_x [2] EU004	15.0 ppmvd @ 15% O_2	---	---	9.4	41.1	Rule 62-212.400(12), F.A.C. 40 CFR 60.4320 40 CFR 60.332
SO2 [3] EU001	≤110 nanograms per Joule (ng/J) (0.90 pounds per megawatt-hour (lb/MWh)) gross output, or ≤ 26 ng SO2/J (0.060 lb SO2/MMBtu) heat input.	---	15.9	---	---	Rule 62-4.070(3), F.A.C. 40 CFR 60.4330(a)(1) and (2)
SO2 [3] EU004	10 grains of sulfur/100 scf			---	21.0	Rule 62-212.400(12), F.A.C.
	0.060 lb SO_2/MMBtu			---	---	CFR 60.4330
Opacity [5] EU001 & EU004	10% opacity, 6-minute average	Not Applicable				Rule 62-4.070(3), F.A.C.
PM/PM_{10} [4]	Lean premix combustion design		3.8		5.0	Rule 62-4.070(3), F.A.C.
VOC [4]	Lean premix combustion design		2.0		2.4	Rule 62-4.070(3), F.A.C.

1 The CO standards are based on the average of three test runs as determined by EPA Method 10.

2 Sate Rule: The NO_x standards are based on the average of three test runs as determined by EPA Method 7E or 20. Federal Rule: Compliance with the federal NO_X standard shall be demonstrated as determined EPA Method 7E or 20 and the applicable requirements of 40 CFR 60.4400.

Specific Condition No. 6 continued:

[3] EU001 and EU004: Maximum SO_2 standards are based on the maximum level specified by Federal Energy Regulatory Commission (FERC), which is 10 grains of sulfur per 100 standard cubic feet of natural gas. Actual fuel sulfur levels are expected to be less than 1 grain per 100 SCF of natural gas.

[4] For both PM and VOC, the efficient combustion of clean fuels is indicated by compliance with opacity and CO standards. Equivalent maximum PM emissions were based on data in Table 3.1-2a in AP-42. Regulated VOC emissions were conservatively assumed to be 10% of the manufacturer's estimated emissions for total hydrocarbons. No testing required.

[5] The opacity standard is based on a 6-minute block average, as determined by EPA Method 9. {Permitting Note: This standard is established as reasonable assurance of good combustion practices to minimize emissions.}

[6] Equivalent maximum emissions for each gas turbine is provided for informational purposes and based on: permitted capacity, a turbine inlet air temperature of 59° F, full operation (8760 hours per year), and the permit standards (CO, NOx, and SO2) or the maximum expected emissions (PM and VOC).

TESTING REQUIREMENTS

7. **<u>Initial Compliance Tests</u>**. Each gas turbine shall be tested to demonstrate initial compliance with the emissions standards for CO, NOx, visible emissions. The initial tests shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial operation of the unit. CO and NOx emissions shall be tested concurrently at permitted capacity. For each required NOx test, emissions shall be corrected to equivalent terms and compared to the NSPS Subpart GG standard identified in NSPS Subpart KKKK standard identified in Appendix KKKK. SO_2 emissions shall be calculated based on the vendor analysis of fuel sulfur content and the fuel consumption rate. Thereafter, **during each federal fiscal year** (October 1st to September 30th), each emissions unit shall be tested to demonstrate compliance with the emissions standards for CO, NOx, visible emissions.

[Rule 62-297.310(7)(a)1, F.A.C.]

8. **<u>Test Requirements</u>**. The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit.

[Rule 62-297.310(7)(a)9, F.A.C.]

9. **Test Methods.** Required tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content
7E	Determination of Nitrogen Oxide Emissions from Stationary Sources
9	Visual Determination of the Opacity of Emissions from Stationary Sources
10	Determination of Carbon Monoxide Emissions from Stationary Sources (The method shall be based on a continuous sampling train.)
19	Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates (Optional F-factor method may be used to determine flow rate and gas analysis to calculate mass emissions in lieu of Methods 1-4.)
20	Determination of Nitrogen Oxides, Sulfur Dioxide and Diluent Emissions from Gas Turbines

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800 and 62-297.100, F.A.C.; and Appendix A of 40 CFR 60]

RECORDS AND REPORTS

10. **Test Reports**. The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix D (Common Testing Requirements) of this permit. For each test run, the report shall also indicate the natural gas firing rate (cubic feet per hour), heat input rate (MMBtu per hour), the power output (bhp), percent base load, and the compressor inlet temperature.

[Rule 62-297.310(8), F.A.C.]

11. **Records Retention**. All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request.

[Rule 62-4.160(14) and 62-213.440(1)(b)2, F.A.C.]

12. <u>Turbine Component Replacement Language</u>: For the replacement of gas turbine components to facilitate prompt repair and return the unit to its original specifications, the permittee shall comply with the following notification and testing requirements.

a) Components shall only be replaced with functionally equivalent "like-kind" equipment. Replacement components may consist of improved or newer equipment, but such components shall not change operation or increase the capacity (heat input and power output rates) of the gas turbine. Replacement components that affect emissions shall be designed to achieve the emissions standards specified in all valid air permits and shall achieve these standards or better. After a component replacement, the gas turbine compressor engine remains subject to the standards of all valid air permits. [Rule 62-210.200(PTE), F.A.C.]

b) The permittee shall notify the Compliance Authority within seven days after beginning any replacement of the gas generator component of the compressor engine. Within seven days of first fire on a replacement gas generator, the permittee shall submit the following information to the Compliance Authority: date of first fire and certification from the vendor that the replacement gas generator is a functionally equivalent "like-kind" component. The vendor certification shall also identify the make, model number, maximum heat input rate (MMBtu/hour), power output (bhp) at ISO conditions, and that the permitted emission rates are achievable with the replacement component. This notification may be made by letter, fax or email. A copy of the information shall be kept on site at the compressor station. Within 60 days of restarting the unit after a gas generator replacement, the permittee shall conduct stack tests to demonstrate compliance with the applicable emission standards. The permittee shall notify the Compliance Authority in writing at least 15 days prior to conducting these tests. The permittee shall comply with all permit requirements for test notification, test methods, test procedures, and reporting. [Rules 62-4.130, 62-4.160(2),(6), and(15) and 62-297.310(7)(b), F.A.C.]

c) After investigation and for good cause, the Department may require special compliance tests pursuant to Rule 620297.310(7)(b), F.A.C.