



Florida Gas Transmission Company

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April 18, 2003

CERTIFIED MAIL – RETURN RECEIPT

Mr. Clair H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Bldg.
2600 Blairstone
Tallahassee, FL 32399-2400

RECEIVED

APR 23 2003

BUREAU OF AIR REGULATION

Reference: Facility: 0390029
Compressor Station No: 12, Santa Rosa County

Dear Mr. Fancy:

Subject: Application for Air Construction Permit

Florida Gas Transmission Company (FGT) is proposing to upgrade an existing natural gas fired compressor turbine from 13,000 bhp to 15,000 bhp at Compressor Station No. 12 located in Santa Rosa County. The facility is a major source under New Source Review definitions, but the proposed turbine modification will have a NO_x emission increase of less than 40 tpy. Therefore, a state only construction permit is required.

FGT is also installing jet cells on two existing 2,000 bhp reciprocating engines at the above referenced facility.

Enclosed is an Application with supporting documentation for an Air Construction Permit for the proposed modifications. FGT understands that no processing fee is required since this facility is operated under a Part 70 Permit.

If you have any questions or need additional information, please call me at (800) 381-1477.

Sincerely,

Jim Thompson
Project Manager, Environmental

CC: James Alexander, Phase VI w/o attachments
Rick Craig, w/o attachments
Frank Diemont

Jake Krautsch
Kevin Mcglynn
Duane Pierce, AQMcs, LLC
Compressor Station No. 12

Florida Gas Transmission Company

Phase VI Expansion Project

Compressor Station No. 12

**APPLICATION
For
AIR CONSTRUCTION
PERMIT**

March 2003

Prepared by AQMcs, LLC

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1.0 INTRODUCTION

Florida Gas Transmission Company (FGT), a Delaware Corporation and an ENRON/EL PASO affiliate of Houston, Texas, is proposing to expand its existing natural gas pipeline facility near Munson, in Santa Rosa County, Florida (Compressor Station No. 12). This proposed modification is part of FGT's Phase VI Expansion Project, aimed at increasing the supply capacity of FGT's network servicing domestic suppliers, commercial, and industrial customers in Florida. The scope of work for the Phase VI Expansion Project includes expansion through the addition of state-of-the-art compressor engines at four existing compressor stations within the State of Florida.

Compressor Station No. 12 is located in Santa Rosa County, Florida, north of Munson on Highway 191, approximately 5 miles north of Highway 4. Figure 1-1 shows the location of the existing compressor station.

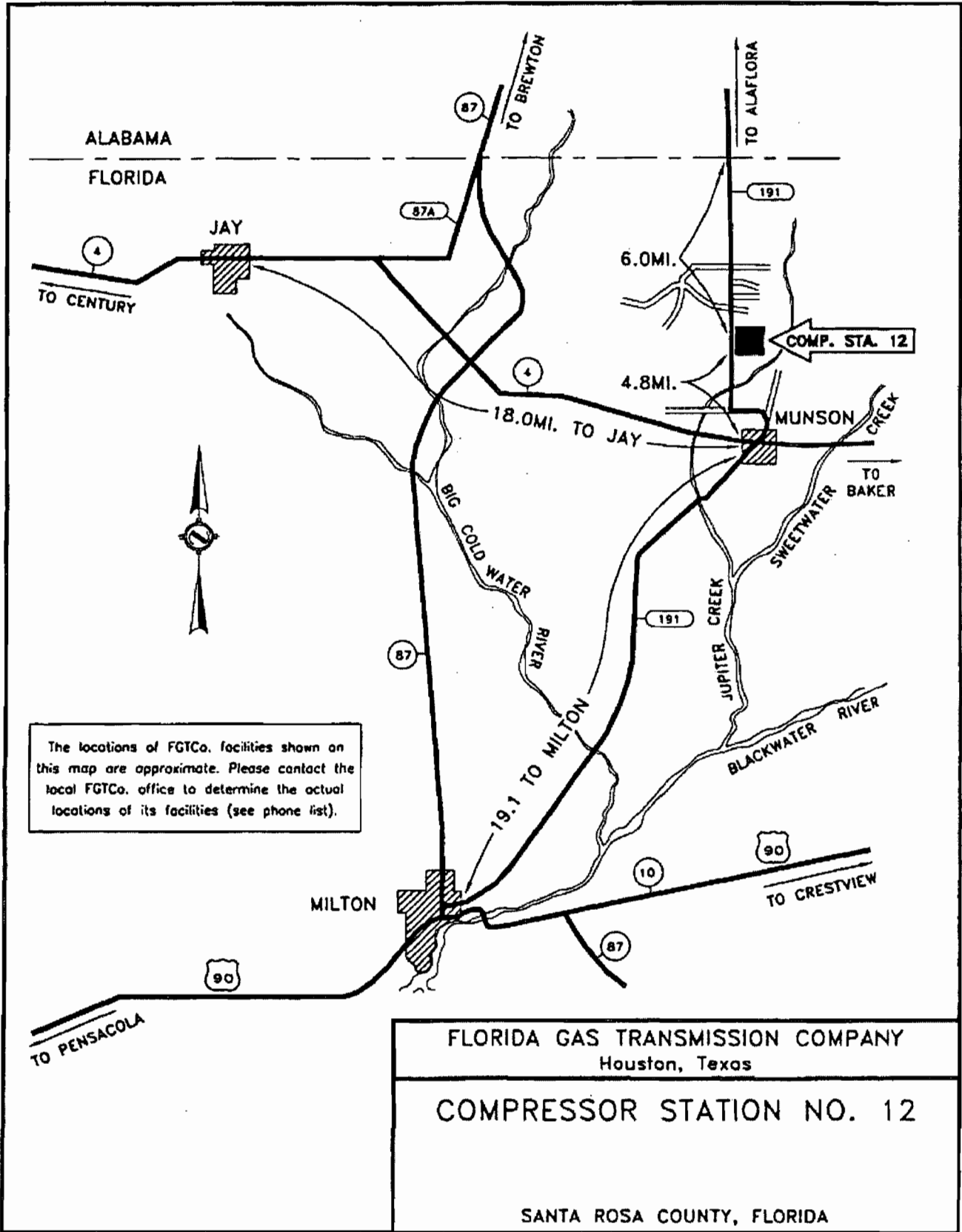
The proposed expansion consists of the upgrading of an existing turbine from 13,000 bhp to 15,000 bhp. The upgrade to a Solar Mars 100 T-15000S unit is being made as part of FGT's Phase VI project. This compressor engine will be used solely for transporting natural gas by pipeline for distribution to markets in Florida.

Based on projected new annual emission rates, the proposed modifications would result in a NO_x potential emission increase of 4.6 tpy. This and other contemporaneous changes will not constitute a significant modification at an existing major stationary source under Prevention of Significant Deterioration (PSD) regulations. The projected net annual NO_x emission rate change for the contemporaneous period will be 37.3 tpy. Since there will be no PSD significant increase in the emissions of any contaminant, a state only construction permit is required.

Additionally, FGT is also proposing to add jet cell technology to two existing 2,000 bhp reciprocating compressor engines to improve operation of the engines.

This narrative contains three additional sections. Descriptions of the existing operation at FGT's Compressor Station No. 12, the proposed upgraded turbine and the jet cells addition to the reciprocating engine are presented in Section 2.0. The air quality review requirements and applicability of state and federal regulations are discussed in Section 3.0. References are included in Section 4.0. FDEP permit application forms are provided in Attachment A. Attachment B contains a plot plan of the facility. Attachment C contains vendor information and Attachment D contains emission calculations.

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2.0 PROJECT DESCRIPTION

A plot plan of FGT's Compressor Station No. 12, showing the location of the plant boundaries, and the location of the engine to be modified, is presented in Attachment B. The following sections provide a description of the existing operations at this location, as well as a description of the proposed project.

2.1 Existing Operations

FGT's existing Compressor Station No. 12 consists of five 2,000 bhp and one 4,100 bhp natural-gas-fired reciprocating internal combustion (IC) engines, and one 13,000 bhp (ISO) and one 15,700 bhp (ISO) natural gas-fired turbines. Table 2-1 summarizes engine manufacturer, model, and the date of installation for each of the existing engines. The original installation was made in 1958 (Compressor Engines 1201 through 1203). Engine 1204 was installed in 1966 and engine 1205 was installed in 1968. Reciprocating engines 1204 and 1205 were later modified to reduce emissions as part of the Phase V Expansion Project. An addition referred to as Phase II was constructed in 1991 (Compressor Engine 1206) and was subject to PSD review. Compressor Engine 1207 was installed in February 2001 as part of the Phase IV Expansion Project and up-rated in 2002 as part of the Phase V Expansion Project. Compressor engine 1208 was installed in 2002 as part of the Phase V Expansion Project.

The existing facility also has supporting equipment including lube and used oil storage tanks, air compressors and emergency generators.

2.2 Proposed Modifications

FGT proposes to increase the horsepower capacity of Compressor Station No. 12, as part of the Phase VI Expansion Project. This will involve upgrading an existing gas-fired turbine (Compressor Engine 1207). The upgraded engine will be used to increase the volumetric delivery capacity by driving a gas compressor that is a part of a gas transmission line that transports natural gas from source wells in Texas and Louisiana for delivery throughout Florida. Without the proposed modifications, it would not be possible to increase the volumetric delivery capacity necessary to meet both short and long-term demands for natural gas in Florida.

In addition, as part of the project, jet cells are being added to two existing natural gas fired reciprocating engines 1204 and 1205 in order to improve their operation. No emissions from these emission units will be changed and no other engines will be changed. Details of the changes are described in the following sections.

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Table 2-1 Summary of Existing Compressor Engines

Engine #	Date of Installation	Type	Manufacturer	Model #	Brake Horse Power (bhp)
1201	1958	Reciprocating	Cooper-Bessemer	LS-8-SG	2,000
1202	1958	Reciprocating	Cooper-Bessemer	LS-8-SG	2,000
1203	1958	Reciprocating	Cooper-Bessemer	LS-8-SG	2,000
1204	1966	Reciprocating	Cooper-Bessemer	LS-8-SG	2,000
1205	1968	Reciprocating	Cooper-Bessemer	LS-8-SG	2,000
1206	1991	Reciprocating	Dresser-Rand	TVC-10	4,100
1207	2001	Turbine	Solar	Mars 90 T-13000S	13,000
1208	2002	Turbine	Nuovo Pignone	PGT-10B	15,700

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2.2.1 Upgraded Compressor Turbine

FGT proposes to upgrade one existing natural gas-fired turbine engine compressor unit at Compressor Station No. 12. The engine is a Solar Mars 90 T-13000S turbine compressor unit rated at 13,000 bhp (ISO) that will be replaced by a Solar Mars 100 T-15000S turbine compressor rated at 15,000 bhp (ISO). Fuel will be exclusively natural gas from FGT's natural gas pipeline. Engine specifications and stack parameters for the proposed engine are presented in Table 2-2.

Table 2-2 Proposed Upgraded Turbine (1207) Specifications and Stack Parameters

Parameter	Design
Compressor Engine	1207
Type	Gas Turbine
Manufacturer	Solar
Model	Mars 100 T-15000S
Unit Size (shaft)	14,903 bhp (ISO, 90 ft. Elev.)
Specific Heat Input ^a	8,355 Btu/hp-hr
Heat Rate ^a	124.51 MM Btu/hr
Maximum Fuel Consumption ^b	0.1197 MMscf/hr
Speed	8,956 rpm
Stack Parameters	
Stack Height	58 ft
Stack Diameter	7.5 ft x 8 ft (rectangular)
Exhaust Gas Flow	193,357 acfm
Exhaust Temperature	903 °F
Exhaust Gas Velocity	53.7 ft/sec

NOTE:

acfm	=	actual cubic feet per minute.
bhp	=	brake horsepower.
Btu/hp-hr	=	British thermal units per brake horsepower per hour.
°F	=	degrees Fahrenheit.
ft	=	feet.
ft/sec	=	feet per second.
MMscf/hr	=	million standard cubic feet per hour.
rpm	=	revolutions per minute.

^a Based on vendor provided lower heating value (LVH) heat rate of 7,595 Btu/hp-hr plus 10% for a higher heating value (HHV) and natural gas with a HHV of 1040 British thermal units per standard cubic foot (Btu/scf).

^b While producing 14,903 bhp at ISO conditions and 90 ft. elevation and with gas with HHV of 1040 Btu/scf

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Hourly and annual emissions of regulated pollutants from the proposed upgraded turbine at ISO conditions are presented in Table 2-3. Emissions of oxides of nitrogen (NO_x), carbon monoxide (CO) and non-methane hydrocarbons (NMHC) or volatile organic compounds (VOC) are based on the engine manufacturer's supplied data (See Attachment C). These values are based on ISO conditions corrected for an elevation of 90 ft. Other factors such as inlet, outlet losses and ambient temperature can affect these rates.

Typically, turbine vendors do not provide information on particulate matter (PM), sulfur dioxide (SO₂) or hazardous air pollutant (HAP) emissions; therefore, particulate matter emissions are based upon USEPA publication AP-42 Section 3.1 (USEPA, 2000), HAP emissions are based on the proposed 40 CFR 63 Subpart YYYY emission factors (68 Fed. Reg. 1,888, January 14, 2003) and emissions of SO₂ are based on FGT's Federal Energy Regulatory Commission (FERC) certificate limit of 10 grains sulfur per 100 cubic feet of natural gas.

Table 2-3 Proposed Upgraded Turbine (1207) Compressor Engine Emissions

Pollutant	Emission Factor	Reference	lb/hr	TPY
Nitrogen Oxides*	11.26 lb/hr	Manufacturer Data	11.26	49.3
Carbon Monoxide*	13.71 lb/hr	Manufacturer Data	13.71	60.1
Volatile Organic* Compounds	0.39 lb/hr	Manufacturer Data	0.39	1.7
Particulate Matter**	0.0066 lb/MMBtu	AP-42, Table 3.1-2a	0.82	3.6
Sulfur Dioxide**	10 grains/100 scf	FERC Limit	3.42	15.0
HAPs	0.000644 lb/MMBtu	Proposed 40 CFR 63 Subpart YYYY***	0.08	0.4

* Emissions based on vendor provided values at ISO conditions and 90 ft. elevation.

** Emissions based on vendor provided heat rate plus 10 per cent

*** 68 Fed. Reg. 1,888 (January 14, 2003)

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2.2.2 Jet Cell Addition for Two Reciprocating Engine

The following describes the jet cell modifications to be made to Engines 1204 and 1205.

2.2.3.1 Previous Modifications

Previously as part of the Phase V Expansion Project, FGT modified two older slow speed engines (Engines 1204 and 1205) in order to reduce NO_x emissions. The modifications consisted of modifying the turbocharger aerodynamics and the unit control system. The end result was lower emissions but at a cost of added fuel and harder work from the turbochargers.

2.2.3.2 Jet Cell Description

Since the NO_x reductions were made to the two reciprocating engines, the operation of the engines has deteriorated with increased operational and maintenance costs. In order to improve operation of these two emission units, jet cells will be installed. The following description of Jet Cells was provided by Cooper Energy Services. See Attachment C.

“The Jet Cell is actually a small pre-combustion chamber that is installed in the power cylinder head. The Jet Cell receives a small amount of fuel gas that is admitted through a poppet style check valve operating on differential pressure. In the fuel line at the check valve is an orifice to control the amount of gas admitted to the pre-chamber. Also in the pre-chamber is a standard spark plug that is fired by a standard type ignition system, which consistently ignites the rich air/fuel mixture in the pre-chamber. Once ignition in the pre-chamber is established the high intensity flame front is introduced into the larger main chamber of the power cylinder via a carefully positioned exit hole in the tip of the Jet Cell. This high intensity flame front acts like a torch ignition source and is capable of consistently igniting various degrees of air/fuel mixture in the main combustion chamber. In regards to natural gas spark ignited engines this concept was pioneered to ignite extremely lean air/fuel mixtures necessary to significantly reduce NO_x formation. These mixtures allow for low emissions engines that are typically too lean for a standard ignition system alone to consistently ignite. A secondary benefit was that this torch ignition source also consistently ignites the non-homogeneous or extremely lean air/fuel mixtures commonly found when the engines operate at off peak conditions. The result is more complete combustion and reduced fuel consumption.”

2.2.3 Emissions Summary

The total changes in emissions resulting from the project are listed on Table 2-4. The calculations used to estimate these emissions are presented in Attachment D.

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Table 2-4 Potential Annual Emissions (tpy) Summary

SOURCE ID	DESCRIPTION	NO _x	CO	VOC ^a	SO ₂	PM
EXISTING FACILITY						
1201	2000 bhp Recip. Engine	212.5	27.0	8.5	1.8	0.6
1202	2000 bhp Recip. Engine	212.5	27.0	8.5	1.8	0.6
1203	2000 bhp Recip. Engine	212.5	27.0	8.5	1.8	0.6
1204	2,000 bhp recip engine	104.3	15.5	1.9	2.0	0.7
1205	2,000 bhp recip engine	104.3	15.5	1.9	2.0	0.7
1206	4100 bhp Recip. Engine	77.2	96.6	38.6	3.5	0.6
1207	13,000 bhp Turbine Engine	44.7	54.5	1.6	13.6	3.3
1208	15,700 bhp Turbine engine	61.8	30.8	2.0	16.2	3.9
GEN03	637 bhp Recip. Engine	0.7	0.6	0.2	0.0	0.0
	Other Sources: ^c	0.0	0.0	3.5	0.0	0.0
EXISTING ANNUAL POTENTIAL TOTALS:		1030.5	294.5	75.2	42.7	11

PROPOSED MODIFIED FACILITY						
1201	2000 bhp Recip. Engine	212.5	27.0	8.5	1.8	0.6
1202	2000 bhp Recip. Engine	212.5	27.0	8.5	1.8	0.6
1203	2000 bhp Recip. Engine	212.5	27.0	8.5	1.8	0.6
1204	2,000 bhp recip Engine	104.3	15.5	1.9	2.0	0.7
1205	2,000 bhp recip Engine	104.3	15.5	1.9	2.0	0.7
1206	4100 bhp Recip. Engine	77.2	96.6	38.6	3.5	0.6
1207	15,000 bhp Turbine Engine –upgraded	49.3	60.1	1.7	15.0	3.6
1208	15,700 bhp Turbine engine	61.8	30.8	2.0	16.2	3.9
GEN03	637 bhp Recip. Engine	0.7	0.6	0.2	0.0	0.0
	Other Sources: ^b	0.0	0.0	3.9	0.0	0.0
PROPOSED ANNUAL POTENTIAL TOTALS:		1035.1	300.1	75.7	44.1	11.3

NET CHANGES IN POTENTIAL EMISSIONS:	4.6	5.6	0.5	1.4	0.3
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(a) VOC = Non-methane/non-ethane hydrocarbons

(b) Other Sources Includes ancillary equipment, storage tanks and equipment leaks

3.0 REGULATORY ANALYSIS

This section presents a review of federal and Florida State air quality regulations, which govern the operations and proposed modifications to be conducted at Compressor Station No. 12.

3.1 Federal Regulations Review

The federal regulatory programs administered by the USEPA have been developed under the authority of the Clean Air Act. The following subsections review the essential elements of the federal regulatory program and the impact they have on the operations and proposed modifications at Compressor Station No. 12.

3.1.1 Classification of Ambient Air Quality

The 1970 Amendments to the CAA gave the USEPA specific authority to establish the minimum level of air quality that all states would be required to achieve. These minimum values or standards were developed in order to protect the public health (primary) and welfare (secondary). The federally promulgated standards and additional state standards are presented on Table 3-1.

Areas of the country that have air quality equal to or better than these standards (i.e., ambient concentrations less than a standard) are designated as "Attainment Areas", while those where monitoring indicates air quality is worse than the standards are known as "Non-attainment Areas." The designation of an area has particular importance for a proposed project as it determines the type of permit review to which the application will be subject.

Major new sources or major modifications to existing major sources located in attainment areas are required to obtain a PSD permit before initiation of construction. Similar sources located in areas designated as non-attainment or that adversely impact such areas undergo more stringent Non-attainment New Source Review (NNSR). In either case, it is necessary, as a first step, to determine the air quality classification of a project site.

All areas of all states are classified as either attainment, non-attainment or unclassifiable for each criteria pollutant. Santa Rosa County is designated as unclassifiable or attainment for all criteria pollutants. These designations were obtained from 40 CFR 81.310, as updated in the June 5, 1998 Federal Register (FR31036) and 62-204.340 F.A.C.

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Table 3-1 National and State Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$)

POLLUTANT	AVERAGING PERIOD	EPA STANDARDS		FLORIDA STANDARDS
		PRIMARY	SECONDARY	
PM ₁₀	24-hour ¹	150	150	150
	Annual ²	50	50	50
SO ₂	3-hour ¹	---	1,300	1,300
	24-hour ¹	365	---	260
	Annual ²	80	---	60
CO	1-hour ¹	---	40,000	40,000
	8-hour ¹	10,000	---	10,000
NO ₂	Annual ²	100	100	100
O ₃	1-hour ³	235	235	235

1) Not to be exceeded more than once per year.
 2) Never to be exceeded.
 3) Not to be exceeded on more than 3 days over 3 years.

Sources: 40 CFR 50; 36FR22384; Chap. 17-2.300.

The designation of Unclassifiable indicates that there is insufficient monitoring data to prove that the area has attained the federal standards; however, the limited data available indicate that the standard has been achieved. Areas with this classification are treated as attainment areas for permitting purposes. Since Santa Rosa County is considered in attainment for all pollutants, the proposed new emissions are potentially subject to PSD review and not non-attainment review.

3.1.2 PSD Applicability

The 1977 CAA Amendments added Part C: Prevention of Significant Deterioration to the Act. This part required proposed new major stationary sources or existing sources planning a major modification in an area that has attained the National AAQS, to conduct a preconstruction review that includes a detailed analysis of the impacts from the source's emissions.

Federal air quality permitting regulations for attainment areas are codified in the Code of Federal Regulations (CFR), Title 40- Protection of the Environment, Part 52.21 - Prevention of Significant Deterioration (40 CFR 52.21).

For the PSD regulations to apply to a given project, the project's potential to emit must constitute a major stationary source or major modification to an existing major stationary source.

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A major stationary source is defined as any of the 28 sources identified in 40 CFR 52.21 that has a potential to emit 100 tons or more per year of any regulated pollutant, or any other stationary source that has the potential to emit 250 tons or more per year of a regulated pollutant. "Potential to emit" is determined on an annual basis after the application of air pollution control equipment, or any other federally enforceable restriction.

According to the "Draft New Source Review Workshop (NSR) Manual (USEPA, October 1990)," for a modification to be classified as major and therefore, subject to PSD review:

- (1) The modification must occur at an existing major stationary source, and
- (2) The net emissions increase of any pollutant emitted by the source, as a result of modification, is "significant", or
- (3) The modification results in emissions increases, which if considered alone would constitute a major stationary source.

"Significant" emission rates are defined as amounts equal to or greater than the emission rates given in Table 3-2.

Table 3-2 Applicability of PSD Significant Emission Rates

Pollutant	Emission Rate Tons/Year
Carbon Monoxide	100
Nitrogen Oxides	40
Sulfur Dioxide	40
Particulate Matter (PM/PM ₁₀)	25/15
Ozone (VOC)	40
Lead	0.6
Fluorides	3
Reduced Sulfur including Hydrogen Sulfide	10
Total Reduced Sulfur including Hydrogen Sulfide	10
Sulfuric Acid Mist	7
Lead	0.6
Mercury	0.1
VOC = Volatile Organic Compounds Sources: 40 CFR 52.21(b)(23); Table 212.400-2 62-212 F.A.C.	

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Proposed project increases are determined for each pollutant and are equal to the actual emissions (average of the actual emissions over the two years immediately prior to the proposed project) subtracted from the proposed new allowable emissions. Fugitive emissions are only included in the potential to emit if the source is one of the 28 named source categories in 40 CFR 52.21(b)(1) or belongs to a stationary source category that is subject to an NSPS proposed prior to August 7, 1980 or that is subject to an NESHAPS promulgated prior to August 7, 1980.

Netting is required for each regulated pollutant for which the proposed project increases (decreases are not considered yet) result in a significant increase in emissions. Netting is performed by identifying both the creditable and contemporaneous increases and the reductions in emissions. The contemporaneous period is defined as the period of time from five years prior to estimated start of construction through estimated start of operation.

- a. 10 /15/ 03 Date of estimated start of construction.
- b. 10 / 15/ 98 Five years prior to estimated start of construction date.
- c. 11 / 01/ 03 Date of estimated start of operation.
- d. 10 / 15/ 98 to 11/ 01/ 03 Contemporaneous period (b. to c.).

The requirements for creditable increases and reductions are listed below.

- The increases/reductions occurred within the contemporaneous period.
- For each unit at the source at which the change occurred, the increases/reductions were calculated as the allowable emissions after the change minus the actual emissions averaged over the two-year period immediately preceding the change.
- The increases/reductions occurred at the applicant's contiguous or adjacent plant site and came from units under the same common ownership or control.
- The reductions have not been relied upon in issuing a previous PSD permit (including use in netting for a PSD permit).
- The reductions have not been relied upon in issuing a non-attainment permit and the reductions have not been used as an offset¹ in a non-attainment permit or reserved in

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an application for use as an offset.

- The reductions will be federally enforceable by the start of construction of the proposed project and actually accomplished by the start of operation.
- The reductions have the same qualitative significance for public health as the increase from the proposed project.

A summary of contemporaneous emission increases and decreases for Compressor Station No. 12 are listed in Table 3.3.

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Table 3-3 Contemporaneous Emission Changes

Project Date	Emission Unit At Which Change Occurred	Project Name Or Activity	A. Allowable Emissions After The Activity (Tons/Year)	B. Actual Emissions Prior To The Activity (Tons/Year)	Difference (A-B) (Tons/Year)	Creditable Decrease Or Increase
NOx						
01/01/01	1207 (Ph IV)	New turbine	38.6	0.0	38.6	38.6
01/01/01	GEN03	New Generator	0.7	0.0	0.7	0.7
12/01/01	1204 (Ph V)	Engine modified	104.3	130.9	-26.6	-26.6
12/01/01	1205 (Ph V)	Engine modified	104.3	152.2	-47.9	-47.9
12/01/01	1207 (Ph V)*	Uprated turbine	6.1	0.0	6.1	6.1
12/01/01	1208	New turbine	61.8	0.0	61.8	61.8
10/15/03	1207 (Ph VI)**	Uprated turbine	4.7	0.0	4.7	4.6
						37.3

* Phase V portion only
 ** Phase VI portion only

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To summarize, since Compressor Station No. 12 is not one of the 28 named source categories, but does emit >250 TPY of at least one regulated pollutant, it is considered a major source. However, the net increase in emissions resulting from the proposed actions will not exceed the PSD significant rates; therefore, the compressor station is not subject to PSD pre-construction review as shown in Table 3.4.

Table 3-4 PSD Applicability

Regulated Pollutant:	NOx
Significance level as defined in 40 CFR 52.21(b)(23)	40
Net contemporaneous change from Table 3-4 (tpy)	37.3
Is PSD review applicable?	No

3.1.3 Non-Attainment New Source Review (NNSR) Applicability

Based on the current non-attainment provisions, all new major stationary sources, or major modifications to such sources, located in a non-attainment area must undergo non-attainment New Source Review, if they have the potential to emit above an NSR significant threshold. For major new sources or major modifications in an attainment or unclassifiable area, the non-attainment provisions apply if the source or modification is located within the area of influence of a non-attainment area. The area of influence is defined as an area, which is outside the boundary of a non-attainment area, but within the locus of all points that are 50 kilometers outside the non-attainment area.

Compressor Station No. 12 is located in an area that is designated as either attainment or not classifiable for all criteria pollutants and is not located in an area of influence outside a non-attainment area. Therefore, this compressor station is not subject to federal non-attainment New Source Review.

3.1.4 Applicability of New Source Performance Standards (NSPS)

Standards of Performance for New Sources are published in 40 CFR 60. All Standards apply to all new sources within a given category, regardless of geographic location or ambient air quality at the location.

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The new turbine to be installed at Compressor Station No. 12 is subject to Subpart GG, Standards of Performance for Stationary Gas Turbines, because it will have a maximum heat input at peak load of >10.7 gigajoules/hour (10 MMBtu/hr) based on the lower heating value of the natural gas fuel. This regulation establishes emission limits for NO_x and SO₂ and requires performance testing and daily monitoring of fuel nitrogen and sulfur.

The NO_x emission limit for Subpart GG is calculated as follows:

$$STD = 0.0150 (14.4/Y) + F$$

$$STD = \text{Allowable NO}_x \text{ emissions \% by volume}$$

$$Y = \text{Heat rate at peak load not to exceed 14.4 Kj/watt-hour}$$

$$F = \text{NO}_x \text{ emission allowance}$$

The fuel bound nitrogen in natural gas is less than 0.015% by weight. Therefore, the value of F as defined in 40 CFR 60.332(3) is equal to zero.

For uprated Engine No. 1207

$$Y = \text{Btu/bhp-hr} \times 1.055 \text{ Kj/Btu} \times \text{hp-hr/745.7 watt-hour}$$

$$= 7,595 \text{ Btu/bhp-hr} \times 1.055 \text{ Kj/Btu} \times \text{hp-hr/745.7 watt-hour}$$

$$= 10.7 \text{ Kj/watt-hr}$$

$$STD = 0.0150 (14.4/10.7) + 0$$

$$= 0.0202 \%$$

$$= 202 \text{ ppm}_v$$

Table 3-5 summarizes the NSPS applicability for the proposed gas engines.

The turbine will meet the NSPS for NO_x of 202 ppm_v (i.e., manufacturer's estimation of 25 ppm_v), and for SO₂ of 150 ppm_v (estimated for this turbine to be 4 ppm_v).

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Table 3-5 Applicability of New Source Performance Standards

NSPS Subpart	NSPS Regulations	Equipment	Fuel	Pollutant	Heat Input Applicability	Equipment Design Maximum*	NSPS Emission Limits	Equipment Emissions
GG	60.332(a)(2)	Engine No. 1207 Gas Turbine	Gas	NO ₂	>10 MM Btu/hr	102 MM Btu/hr	202 ppm _v	25 ppm _v
GG	60.333(a)	Engine No. 1207 Gas Turbine	Gas	SO ₂	>10 MM Btu/hr	102 MM Btu/hr	150 ppm _v	~4 ppm _v

Design maximum based on vendor data of 14,903 hp and heat input of 7,595 Btu/hp-hr (LHV).

3.1.5 Applicability of National Emission Standards for Hazardous Air Pollutants (NESHAPS)

Currently the only NESHAPS potentially applicable to this compressor station is 40 CFR 63 Subpart HHH. Compressor Station No. 12 has no affected sources as defined by 40 CFR 63 Subpart HHH and is, therefore, not subject to this subpart.

This is a Major Source for Hazardous Air Pollutants and this turbine will potentially be subject to the proposed turbine MACT regulations (40 CFR 63 Subpart YYYY). As a result, a Part One MACT Hammer application has been submitted. However, the final MACT regulations have not been promulgated at the time of this application

3.2 Florida State Air Quality Regulations

Compressor Station No. 12 is currently operating under Permit No.1130037-001-AV and is subject to the provisions of that permit. Rule 62, F.A.C., contains the air quality rules and regulations for the State of Florida. The primary federal regulations that affect Compressor Station No. 12 have been incorporated into or are referenced by these rules. The significant state regulations that are applicable to the new emission units are briefly listed below.

3.2.1 Rule 62-210.300 Permits Required

FGT is required to obtain a construction permit prior to modification of an emission unit. This requirement is being met by the submittal of this application.

3.2.2 Rule 62-204.240 Ambient Air Quality Standards

FGT must not violate any of the ambient air quality standards listed under this rule. The proposed new emissions will not violate any air quality standards. Potential NO_x emissions and impacts will be decreased.

3.2.3 Rule 62-296.320(2) Objectionable Odors

This rule prohibits the discharge of pollutants that will cause or contribute to an objectionable odor. There will be no odors from the proposed changes.

3.2.4 Rule 62-296.320(4)(b)1 General Particulate Emission Limiting Standards.

FGT is prohibited from allowing the new compressor engine to discharge into the atmosphere the emissions of air pollutants, the density of which is equal to or greater than that designated

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as Number 1 on the Ringelmann Chart (20 percent opacity). The new and modified engines will not violate this standard.

4.0 REFERENCES

U.S. Environmental Protection Agency (USEPA). 1980. PSD Workshop Manual. Research Triangle Park, NC.

U.S. Environmental Protection Agency (USEPA). 2000. Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources (5th Ed.) AP-42. Supplement E, Research Triangle Park, NC.

Attachment A

DEP Forms



Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: Florida Gas Transmission Company	
2. Site Name: Compressor Station No. 12	
3. Facility Identification Number: 1130037 [] Unknown	
4. Facility Location: Street Address or Other Locator: Rt. 1, Box 146 City: Milton County: Santa Rosa Zip Code: 32570-9740	
5. Relocatable Facility? [] Yes [X] No	6. Existing Permitted Facility? [X] Yes [] No

Application Contact

1. Name and Title of Application Contact: Jim Thompson, Environmental Project Manager	
2. Application Contact Mailing Address: Organization/Firm: Florida Gas Transmission Company Street Address: 111 Kelsey Lane, Ste. A City: Tampa State: FL Zip Code: 33619	
3. Application Contact Telephone Numbers: Telephone: (800) 381-1477 Fax: (813) 655-3951	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	4-23-03
2. Permit Number:	1130037-007-AC
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

Initial Title V air operation permit for an existing facility which is classified as a Title V source.

Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: _____

Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: _____

Operation permit number to be revised: _____

Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected: _____

Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised: _____

Reason for revision: _____

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

Air construction permit to construct or modify one or more emissions units.

Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official: Rick Craig, Vice President, Southeastern Operations
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: Florida Gas Transmission Company Street Address: P.O. Box 1188 City: Houston State: TX Zip Code: 77251
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: (713) 646-7227 - Fax: (713) 646-6128
4. Owner/Authorized Representative or Responsible Official Statement: <i>I, the undersigned, am the owner or authorized representative*(check here [] , if so) or the responsible official (check here [X], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.</i> Signature: <u>Richard A. Craig</u> Date: <u>04-22-03</u>

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: Kevin McGlynn Registration Number: 50908
2. Professional Engineer Mailing Address: Organization/Firm: McGlynn Consulting Company Street Address: 2906 Abbotsford Way City: Tallahassee State: FL Zip Code: 32312
3. Professional Engineer Telephone Numbers: Telephone: (850)297-0099 Fax: (850) 297-0561

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

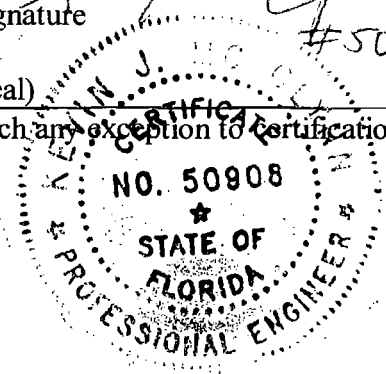
If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Ken J. McGowan, P.E.
Signature

April 18, 2003
Date

(seal)

* Attach any exception to certification statement.



Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
008	Turbine Compressor Engine No. 1207, 15,000 bhp ISO Natural Gas Fired	NA	\$0

Application Processing Fee

Check one: [] Attached - Amount: \$ _____ [X] Not Applicable_

Construction/Modification Information

1. Description of Proposed Project or Alterations:

Florida Gas Transmission Company (FGT) is proposing to upgrade an existing Solar Mars 90 T-13000S to a Mars 100 T15000S 15,000 bhp (ISO).

2. Projected or Actual Date of Commencement of Construction: 10/01/03

3. Projected Date of Completion of Construction: 10/15/03

Application Comment

This proposed modification is part of FGT's Phase VI Expansion project, aimed at increasing the supply capacity of FGT's network servicing domestic, commercial, and industrial customers in Florida.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: 16 East (km): 510.83 North (km): 3419.03			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): 30/54/42 Longitude (DD/MM/SS): 86/53/12			
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s): 4922
7. Facility Comment (limit to 500 characters): Compressor Station No. 12 is an existing natural gas pipeline compressor station with six reciprocating compressor engines and two compressor turbines.			

Facility Contact

1. Name and Title of Facility Contact: Wesley Orso, Team Environmental Leader			
2. Facility Contact Mailing Address: Organization/Firm: Florida Gas Transmission Company Street Address: Rt. 1, Box 146 City: Milton State: FL Zip Code: 32570-9740			
3. Facility Contact Telephone Numbers: Telephone: (850) 850-5200 Fax: (850) 850-5201			

Facility Regulatory Classifications

Check all that apply:

1. <input type="checkbox"/> Small Business Stationary Source?	<input type="checkbox"/> Unknown
2. <input checked="" type="checkbox"/> Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. <input type="checkbox"/> Synthetic Minor Source of Pollutants Other than HAPs?	
4. <input checked="" type="checkbox"/> Major Source of Hazardous Air Pollutants (HAPs)?	
5. <input type="checkbox"/> Synthetic Minor Source of HAPs?	
6. <input type="checkbox"/> One or More Emissions Units Subject to NSPS?	
7. <input type="checkbox"/> One or More Emission Units Subject to NESHAP?	
8. <input type="checkbox"/> Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters):	

List of Applicable Regulations

FDEP Title V Core List	
62-296-320(4)(b)1 General Visible Emissions Standards	
40 CFR 60, Subpart GG Standards of Performance for Stationary Gas-fired Turbines	

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B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap		4. Basis for Emissions Cap	5. Pollutant Comment
		lb/hour	tons/year		
NO _x	A				
CO	A				
VOC	B				
SO ₂	B				
PM	B				
HAPs	A				

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: [X] Attached, Document ID: <i>Narrative Fig. 1-1</i> [] Not Applicable [] Waiver Requested
2. Facility Plot Plan: [X] Attached, Document ID: <i>Att. B</i> [] Not Applicable [] Waiver Requested
3. Process Flow Diagram(s): [] Attached, Document ID: _____ [] Not Applicable [X] Waiver Requested
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [] Attached, Document ID: _____ [X] Not Applicable [] Waiver Requested
5. Fugitive Emissions Identification: [] Attached, Document ID: _____ [X] Not Applicable [] Waiver Requested
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: <i>Att. C</i> [] Not Applicable
7. Supplemental Requirements Comment: Attachment B contains a plot plan. Attachment C has vendor supplied information. Attachment D has supporting calculations.

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
9. List of Equipment/Activities Regulated under Title VI: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Equipment/Activities On site but Not Required to be Individually Listed <input checked="" type="checkbox"/> Not Applicable
10. Alternative Methods of Operation: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
12. Identification of Additional Applicable Requirements: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
13. Risk Management Plan Verification: <input type="checkbox"/> Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID: _____) or previously submitted to DEP (Date and DEP Office: _____) <input type="checkbox"/> Plan to be submitted to CEPPO (Date required: _____) <input checked="" type="checkbox"/> Not Applicable
14. Compliance Report and Plan: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
15. Compliance Certification (Hard-copy Required): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

**A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)**

Emissions Unit Description and Status

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.</p>			
<p>2. Regulated or Unregulated Emissions Unit? (Check one)</p> <p><input checked="" type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.</p> <p><input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.</p>			
<p>3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):</p> <p>15,000 bhp (ISO) natural gas fired turbine compressor unit, Engine No. 1207</p>			
<p>4. Emissions Unit Identification Number: <input type="checkbox"/> No ID</p> <p>ID: 008 <input type="checkbox"/> ID Unknown</p>			
<p>5. Emissions Unit Status Code:</p> <p style="text-align: center;">A</p>	<p>6. Initial Startup Date: 1/19/01</p>	<p>7. Emissions Unit Major Group SIC Code:</p> <p style="text-align: center;">49</p>	<p>8. Acid Rain Unit?</p> <p style="text-align: center;"><input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>The existing 13,000 bhp (ISO) Solar Mars 90 turbine engine will be replaced by a 15,000 bhp (ISO) Solar Mars 100. Fuel will be exclusively natural gas from the FGT's gas pipeline. The proposed engine will incorporate dry, low NO_x combustion technology.</p>			

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

The proposed engine will incorporate dry, low NO_x combustion technology.

2. Control Device or Method Code(s): NA

Emissions Unit Details

1. Package Unit:		
Manufacturer:	Solar	Model Number: Mars 100 T-15000S
2. Generator Nameplate Rating:		MW
3. Incinerator Information:		
	Dwell Temperature:	°F
	Dwell Time:	seconds
	Incinerator Afterburner Temperature:	°F

**B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)**

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	124.51	mmBtu/hr
2. Maximum Incineration Rate: NA	lb/hr	tons/day
3. Maximum Process or Throughput Rate: NA		
4. Maximum Production Rate: NA		
5. Requested Maximum Operating Schedule:		
	24 hours/day	7 days/week
	52 weeks/year	8760 hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		
<p>Heat input is 124.51 MM Btu/hr based on vendor lower heating value (LHV) specifications of 7,595 Btu/Bhp-hr plus 10% to convert to higher heating value (HHV) and 14,903 bhp (ISO with elevation of 90 ft).</p>		

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

FDEP Title V Core List	
62-296.320(4)(b)1 General Visible Emissions Standards	
40 CFR 60, Subpart GG Standards of Performance for Stationary Gas-fired	

**D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)**

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? 1207		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): NA			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: None			
5. Discharge Type Code: V	6. Stack Height: 58 feet	7. Exit Diameter: 7.5 x 8 feet	
8. Exit Temperature: 903 °F	9. Actual Volumetric Flow Rate: 193,357 acfm	10. Water Vapor:	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: 16 East (km): 510.830 North (km): 3419.030			
14. Emission Point Comment (limit to 200 characters):			

**E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)**

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Natural gas fired turbine engine driving a natural gas compressor, operating full time.		
2. Source Classification Code (SCC): 2-02-002-01		3. SCC Units: million cubic feet burned
4. Maximum Hourly Rate: 0.1197	5. Maximum Annual Rate: 1048.57	6. Estimated Annual Activity Factor: NA
7. Maximum % Sulfur: 0.03	8. Maximum % Ash: 0.0	9. Million Btu per SCC Unit: 1040
10. Segment Comment (limit to 200 characters): Percent Sulfur is based on maximum Federal Energy Regulatory Commission (FERC) limit of 10 gr S/100scf and gas density of 0.0455 lb/scf.		

Segment Description and Rate: Segment NA of

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		CC Units:
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

**F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)**

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC			EL
SO ₂			EL
PM			EL
NO _x			EL
CO			EL
PM ₁₀			EL
HAPs			NS

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: NOX		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 11.26 lb/hour 49.3 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 11.26 lb/hr Reference: Vendor's data		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): (11.26 lb/hr)(1 ton/2000 lb)(8760hr/1 yr) = 49.32 tons/year			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Vendor's data based on ISO conditions with site elevation.			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: RULE		2. Future Effective Date of Allowable Emissions: NA	
3. Requested Allowable Emissions and Units: 25 ppmv		4. Equivalent Allowable Emissions: 11.26 lb/hour 49.3 tons/year	
5. Method of Compliance (limit to 60 characters): Initial performance test.			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): 40 CFR 60.332(a)(2) limits NOX emissions to 202 ppmv.			

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: CO		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 13.71 lb/hour 60.05 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 13.71 lb/hr Reference: Vendor's data		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): (13.71 lb/hr)(1 ton/2000 lb)(8760 hr/1 yr) = 60.05 tons/year			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Vendor emission factor is based on a guaranteed value of 50 ppmv.			

Allowable Emissions Allowable Emissions NA of

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions: NA
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

**G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)**

Potential/Fugitive Emissions

1. Pollutant Emitted: VOC		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 0.393 lb/hour 1.72 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 3.93 lb/hr UHC Reference: Vendor's data		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): Vendor factor for unburned hydrocarbons (UHC) = 3.93 lb/hr. Assume 10% is VOC. (0.393 lb/hr)(1 ton/2000 lb)(8760 hr/1 yr) = 1.72 tons/year			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions : NA of _____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance (limit to 60 characters):	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):	

**G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)**

Potential/Fugitive Emissions

1. Pollutant Emitted: SO2		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 3.42 lb/hour 14.98 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 10 gr/100scf Reference: Vendor's fuel use and FERC limitation		7. Emissions Method Code: 3	
8. Calculation of Emissions (limit to 600 characters): $(10 \text{ gr S}/100 \text{ scf})(0.10847 \text{ MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) = 1.71 \text{ lb S/hr}$ $(1.71 \text{ lb S/hr})(2 \text{ lb SO}_2/\text{lb S}) = 3.42 \text{ lb SO}_2/\text{hr}$ $(3.42 \text{ lb SO}_2/\text{hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 14.98 \text{ ton/yr}$			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Based on vendor's fuel use data plus 10%. SO2 emission factor is based on maximum Federal Energy Regulatory Commission (FERC) limit of 10 gr S/100 scf and gas density of 0.0455 lb/scf.			

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: RULE		2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units: 4 ppmv		4. Equivalent Allowable Emissions: 3.42 lb/hour 15.0 tons/year	
5. Method of Compliance (limit to 60 characters): Initial performance test and fuel monitoring.			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): 40 CFR 60.333(a) limits SO2 emissions to 150 ppmv.			

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: PM/PM10		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 0.82 lb/hour 3.6 tons/year		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: 0.0066 lb/MM Btu Reference: Table 3.1-2a, AP-42 4/00 Supplement E		7. Emissions Method Code: 4	
8. Calculation of Emissions (limit to 600 characters): $(0.0066 \text{ lb/MM Btu})(124.5 \text{ MM Btu/hr}) = 0.82 \text{ lb/hr}$ $(0.82 \text{ lb/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 3.60 \text{ ton/y}$			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Based on vendor's heat input data plus 10% and fuel heat value of 1040 Btu/scf.			

Allowable Emissions Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code:		2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):			

**G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)**

Potential/Fugitive Emissions

1. Pollutant Emitted: HAPs		2. Total Percent Efficiency of Control:	
3. Potential Emissions: 0.08 lb/hour		4. Synthetically Limited? []	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 to _____ tons/year		0.35 tons/year	
6. Emission Factor: 0.000644 lb/MM Btu Reference: Draft 40 CFR 63 Subpart YYYY		7. Emissions Method Code: 5	
8. Calculation of Emissions (limit to 600 characters): $(0.000644 \text{ lb/MM Btu})(124.5 \text{ MM Btu/hr}) = 0.080 \text{ lb/hr}$ $(0.080 \text{ lb/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) = 0.35 \text{ ton/yr}$			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): HAP emissions are included in VOC emissions.			

Allowable Emissions Allowable Emissions NA of _____

1. Basis for Allowable Emissions Code:		2. Future Effective Date of Allowable Emissions:	
3. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):			

Emissions Unit Information Section 1 of 1

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype: VE10	2. Basis for Allowable Opacity: [X] Rule [] Other
3. Requested Allowable Opacity: Normal Conditions: 10 % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor NA of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	[] Rule [] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

**J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)**

Supplemental Requirements

1. Process Flow Diagram <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input checked="" type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input checked="" type="checkbox"/> Attached, Document ID: <u> Narrative </u> <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment: Supplemental information is provided in the narrative description and Attachment C accompanying these forms.

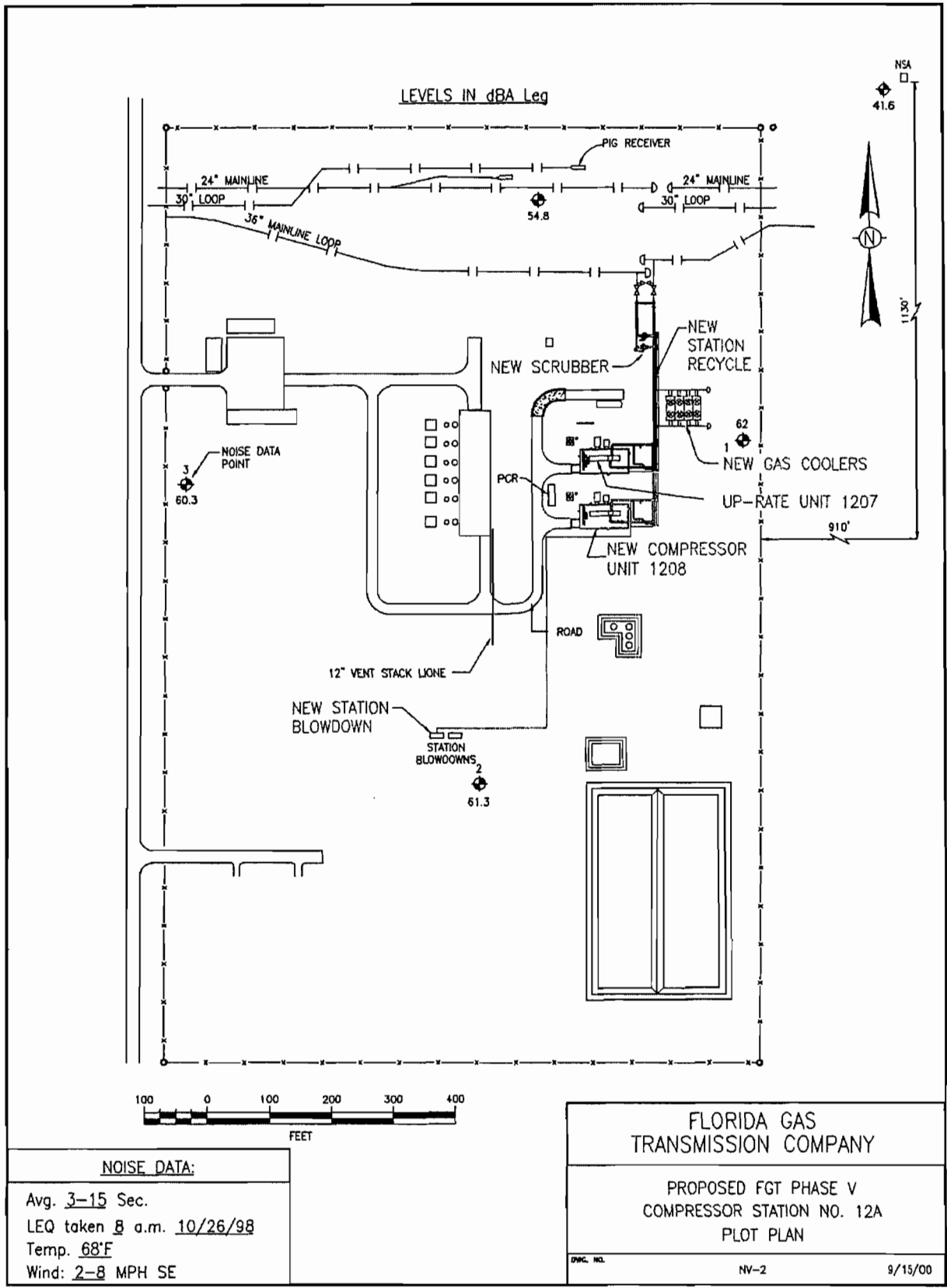
Emissions Unit Information Section 1 of 1

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
12. Alternative Modes of Operation (Emissions Trading) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
13. Identification of Additional Applicable Requirements <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
14. Compliance Assurance Monitoring Plan <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
15. Acid Rain Part Application (Hard-copy Required) NA <input type="checkbox"/> Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____ <input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____ <input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____ <input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____ <input type="checkbox"/> Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID: _____ <input type="checkbox"/> Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID: _____ <input type="checkbox"/> Not Applicable

Attachment B

Plot Plan
(From Phase V)



NOISE DATA:

Avg. 3-15 Sec.
 LEQ taken 8 a.m. 10/26/98
 Temp. 68°F
 Wind: 2-8 MPH SE

Attachment C

Vendor Information

Solar Model Mars 100 T-15000S Turbine

Cooper Energy Services Jet Cells

Solar Model Mars 100 T-1500S Turbine

Solar[®] Turbines

A Caterpillar Company

PREDICTED EMISSION PERFORMANCE

Customer Florida Gas	
Job ID	
Inquiry Number	
Run By Anthony M Jones	Date Run 19-Mar-03

Engine Model MARS 100-15000S CS/MD 122F MATCH SHIPMENTS AFTER 1/95	
Fuel Type SD NATURAL GAS	Water Injection NO
Engine Emissions Data REV. 0.0	Engines Tested 0

NOx EMISSIONS	
Nominal	Maximum

CO EMISSIONS	
Nominal	Maximum

UHC EMISSIONS	
Nominal	Maximum

1	14903-Hp	100.0% Load	Elev. 90 ft	Rel. Humidity 60.0%	Temperature 59.0 Deg. F	
PPMvd at 15% O2	*	25.00	*	50.00	*	25.00
ton/yr	*	49.33	*	60.06	*	17.20
lbm/MMBtu (Fuel LHV)	*	0.100	*	0.121	*	0.035
lbm/(MW-hr)	*	1.01	*	1.23	*	0.35
(gas turbine shaft pwr) lbm/hr	*	11.26	*	13.71	*	3.93

Important Notes

1. For short-term emission limits such as lbs/hr., Solar recommends using "worst case" anticipated operating conditions specific to the application and the site conditions. Worst case for one pollutant is not necessarily the same for another. The emission values on this form are only predicted emissions at the specific operating conditions listed.
2. Solar's typical SoLoNOx warranty is for greater than 0 deg F, and between 50% and 100% load for gas fuel, and between 80% and 100% load for liquid fuel. An emission warranty for non-SoLoNOx equipment is for greater than 0 deg F and between 80% and 100% load.
3. Fuel must meet Solar standard fuel specification ES 9-98. Predicted emissions are based on the attached fuel composition, or, San Diego natural gas or equivalent.
4. If needed, Solar can provide generic documents to address turbine operation outside typical warranty ranges, as well as non-warranted emissions of SO2, PM10/2.5, VOC, and formaldehyde.
5. Solar can optionally provide factory testing in San Diego to ensure the actual unit(s) meet the above values within the tolerances quoted. Pricing and schedule impact will be provided upon request.

Solar Turbines

A Caterpillar Company

PREDICTED ENGINE PERFORMANCE

Customer Florida Gas	
Job ID	
Run By Anthony M Jones	Date Run 19-Mar-03
Engine Performance Code REV. 3.13	Engine Performance Data REV. 3.1

Model MARS 100-15000S
Package Type CS/MD
Match 122F MATCH
Fuel System GAS
Fuel Type SD NATURAL GAS

DATA FOR NOMINAL PERFORMANCE

Elevation	feet	90
Inlet Loss	in H2O	0
Exhaust Loss	in H2O	0
Engine Inlet Temperature	deg F	59.0
Relative Humidity	%	60.0
Driven Equipment Speed	RPM	8956
Specified Load	HP	FULL
Net Output Power	HP	14903
Fuel Flow	mmBtu/hr	113.18
Heat Rate	Btu/HP-hr	7595
Therm Eff	%	33.51
Engine Exhaust Flow	lbm/hr	336294
Exhaust Temperature	deg F	903

Fuel Gas Composition (Volume Percent)	CH4	92.79	C2H6	4.16	C3H8	0.84	C4	0.18	C5	0.04	C6	0.04
	CO2	0.44	H2S	0.0001	N2	1.51						
Fuel Gas Properties	LHV (Btu/Scf)	939.2			Specific Gravity	0.5970	Wobbe Index at 60F	1215.6				

Cooper Energy Services Jet Cells



Cooper Energy Services Jet Cells

Cooper Energy Services offers Jet Cell conversion packages for a variety of natural gas fueled spark ignited engines. The Jet Cell is actually a small pre-combustion chamber that is installed in the power cylinder head. The Jet Cell receives a small amount of fuel gas that is admitted through a poppet style check valve operating on differential pressure. In the fuel line at the check valve is an orifice to control the amount of gas admitted to the pre-chamber. Also in the pre-chamber is a standard spark plug that is fired by a standard type ignition system, which consistently ignites the rich air/fuel mixture in the pre-chamber. Once ignition in the pre-chamber is established the high intensity flame front is introduced into the larger main chamber of the power cylinder via a carefully positioned exit hole in the tip of the Jet Cell. This high intensity flame front acts like a torch ignition source and is capable of consistently igniting various degrees of air/fuel mixture in the main combustion chamber. In regards to natural gas spark ignited engines this concept was pioneered to ignite extremely lean air/fuel mixtures necessary to significantly reduce NOx formation. These mixtures for low emissions engines are typically too lean for a standard ignition system alone to consistently ignite. A secondary benefit was that this torch ignition source also consistently ignites the non-homogeneous or extremely lean air/fuel mixtures commonly found when the engines operate at off peak conditions. The result is more complete combustion and reduced fuel consumption.

Generally, by itself the Jet Cell does not significantly lower exhaust emissions. However, by providing more complete combustion at off peak conditions hydrocarbon emissions are reduced and by extending the lean combustion limit NOx emissions can be reduced, especially when the air source (turbocharger) can be adjusted to make the combustion leaner. Depending on the degree of re-calibration possible on the turbocharger the NOx reduction can be significant.

Chuck Melcher
Manager, Sales Support Engineering

Attachment D
Emission Calculations

Compressor Station No. 12

Engine No. 1207 EPN: 008

NOx Emissions: (Based on Vendor Data)

$$\text{lb NOx/hr} = 11.26$$

$$\begin{aligned} \text{tons NOx/yr} &= (\text{lb NOx/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (11.26 \text{ lb NOx/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000) \\ &= \text{lb} \\ &= 49.32 \end{aligned}$$

CO Emissions: (Based on Vendor Data)

$$\text{lb CO/hr} = 13.71$$

$$\begin{aligned} \text{tons CO/yr} &= (\text{lb CO/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (13.71 \text{ lb CO/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 60.05 \end{aligned}$$

VOC Emissions: (Based on Vendor Data)

$$\text{lb UHC/hr} = 3.93$$

$$\text{Portion VOC} = 0.1$$

$$\begin{aligned} \text{lb VOC/hr} &= (\text{lb UHC/hr})(\text{Portion VOC}) \\ &= (3.93 \text{ lb UHC/hr})(0.10) \\ &= 0.393 \end{aligned}$$

$$\begin{aligned} \text{tons VOC/yr} &= (\text{lb VOC/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.393 \text{ lb VOC/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000) \\ &= \text{lb} \\ &= 1.72 \end{aligned}$$

SO2 Emissions: (Based on FERC Limits)

$$\begin{aligned} \text{lb S/hr} &= (\text{gr S}/100 \text{ scf})(\text{MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) \\ &= (10 \text{ gr S}/100 \text{ scf})(0.1197 \text{ MMscf/hr})(1 \text{ lb}/7000 \text{ gr}) \\ &= 1.71 \end{aligned}$$

$$\begin{aligned} \text{lb SO2/hr} &= (\text{lb S/hr})(2 \text{ lb SO2}/\text{lb S}) \\ &= (1.71 \text{ lb S/hr})(2 \text{ lb SO2}/\text{lb S}) \\ &= 3.42 \end{aligned}$$

$$\begin{aligned} \text{tons SO2/yr} &= (\text{lb SO2/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (3.42 \text{ lb SO2/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 14.98 \end{aligned}$$

PM Emissions: (Based on AP-42 Table 3.1-2a, 4/00)

$$\begin{aligned} \text{lb PM/hr} &= (\text{lb PM}/\text{MMBtu})(\text{MMBtu/hr}) \\ &= (0.0066 \text{ lb}/\text{MMscf})(124.50 \text{ MMscf/hr}) \\ &= 0.82 \end{aligned}$$

$$\begin{aligned} \text{tons PM/yr} &= (\text{lb PM/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.82 \text{ lb PM/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 3.60 \end{aligned}$$

HAPs Emissions: (Based on Draft 40 CFR 63 Subpart YYYYY)

$$\begin{aligned} \text{lb HAP/hr} &= (\text{lb HAP}/\text{MMBtu})(\text{MMBtu/hr}) \\ &= (0.000644 \text{ lb}/\text{MMBtu})(124.50 \text{ MMBtu/hr}) \\ &= 0.080 \end{aligned}$$

$$\begin{aligned} \text{tons HAP/yr} &= (\text{lb HAP/hr})(\text{hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= (0.080 \text{ lb HAP/hr})(8760 \text{ hr/yr})(1 \text{ ton}/2000 \text{ lb}) \\ &= 0.35 \end{aligned}$$