



Florida Gas Transmission Company

1967 Commonwealth Lane, Tallahassee, FL 32303, (850) 350-5000, Fax Downstairs (850) 350-5001, Fax Upstairs (850) 350-5002

June 6, 2002

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

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JUN 07 2002

BUREAU OF AIR REGULATION

Reference: Facility: 1230034
Permit No. 1230034-007-AC
Compressor Station No. 15, Perry, Taylor County

Dear Mr. Fancy:

Subject: Application for Air Construction Permit Revision

Florida Gas Transmission Company (FGT) has received the above referenced construction permit to increase the horsepower of an existing Solar Mars 90 turbine from 12,600 hp (ISO) to 13,000 hp (ISO). Solar Turbines cannot supply a Mars 90 turbine to replace the existing turbine and can only provide a Mars 100 de-rated to 13,000 hp (ISO). FGT is requesting a change of the existing construction permit to allow the replacement of the Mars 90 with a de-rated Mars 100. The de-rated Mars 100 has a slightly higher heat input than the Mars 90. Emissions will remain essentially the same and FGT requests that the emission limits in the construction permit not be changed.

Enclosed are supporting information and application pages for the proposed change. FGT understands that no processing fee is required since this facility is operated under a Part 70 Permit.

FGT respectfully requests that this application be expedited in order that the new turbine can be installed during the first week of July. Your expedited review will be greatly appreciated.

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

Sincerely,

Jacob Krautsch
Division Environmental Specialist

Attachments

CC: Rick Craig, w/o attachments
Jim Thompson, Phase V
V. Duane Pierce, Ph.D., AQMcS, LLC
Larry Parrish, Compressor Station No. 15

Attachment A
Comparison Tables And Supporting Information

Table 1. Engine Parameters: Mars 90 T-13000 vs. Mars 100 Derated to T-13000 at ISO Conditions

Parameter	Mars 90 T-13000	Mars 100 Derated To T-13000
Compressor Engine	1507	1507
Type	Gas Turbine	Gas Turbine
Manufacturer	Solar	Solar
Unit Size	13,000 bhp (ISO)	13,000 bhp (ISO)
Heat Input ^a	8,419 Btu/hp-hr	8,165 Btu/hp-hr
Maximum Fuel Consumption ^b	0.1067 MMscf/hr	0.1099 MMscf/hr
Speed	8,779 rpm	8,982 rpm
Stack Parameters	60 ft	60 ft
Stack Height	7.55 ft x 7.55 ft	7.55 ft x 7.55 ft
Stack Diameter	(rectangular)	(rectangular)
Exhaust Gas Flow	177,911 acfm	184,818 acfm
Exhaust Temperature	868 °F	896 °F
Exhaust Gas Velocity	52.0 ft/sec	54.0 ft/sec
<p>NOTE:</p> <p>acfm = actual cubic feet per minute.</p> <p>bhp = brake horsepower.</p> <p>Btu/hp-hr = British thermal units per brake horsepower per hour.</p> <p>°F = degrees Fahrenheit.</p> <p>ft = feet.</p> <p>ft/sec = feet per second.</p> <p>MMscf/hr = million standard cubic feet per hour.</p> <p>rpm = revolutions per minute.</p> <p>^a Based on vendor heat rate value plus 10%</p> <p>^b Based on vendor value plus 10% and heating value for natural gas of 1040 British thermal units per standard cubic foot (Btu/scf).</p>		

Table 2. Emissions: Mars 90 T-13000 vs. Mars 100 Derated to T-13000 at ISO Conditions

Pollutant	Reference	Mars 90 Emissions (lb/hr)	Mars 100 Emissions (lb/hr)
Nitrogen Oxides	Manufacturer Data	10.04	10.33
Carbon Monoxide	Manufacturer Data	12.23	12.58
Volatile Organic Compounds	Manufacturer Data	0.35	0.36
Particulate Matter*	AP-42, Table 3.1-2a	0.73	0.75
Sulfur Dioxide*	FERC Limit	3.05	3.14
HAPs	GRI HapCalc 3.0	0.63	0.63

Applicability of New Source Performance Standards (NSPS)

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

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

$$STD = \text{Allowable NO}_x \text{ emissions}$$

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

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

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. 1507

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

$$= 8,982 \text{ Btu/bhp-hr} \times 1.055 \text{ Kj/Btu} \times \text{hp-hr}/745.7 \text{ watt-hour}$$

$$= 12.7 \text{ Kj/watt-hr}$$

$$STD = 0.0150 (14.4/12.7) + 0$$

$$= 0.017 \%$$

$$= 170 \text{ ppm}_v$$

ATTACHMENT B
DEP Forms

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. 15	
3. Facility Identification Number: 1230034 [] Unknown	
4. Facility Location: Street Address or Other Locator: P.O. Box 8 City: Perry County: Taylor Zip Code: 32347-0930	
5. Relocatable Facility? [] Yes [X] No	6. Existing Permitted Facility? [X] Yes [] No

Application Contact

1. Name and Title of Application Contact: Jacob Krautsch, Division Environmental Specialist	
2. Application Contact Mailing Address: Organization/Firm: Florida Gas Transmission Company Street Address: 1967 Commonwealth Lane City: Tallahassee State: FL Zip Code: 32303	
3. Application Contact Telephone Numbers: Telephone: (850) 350-5042 Fax: (850) 350-5001	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	6-7-02
2. Permit Number:	1230034-009-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: _____

[X] 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: 1230034-003-AV

[] 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)

[X] 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: Allan Weatherford, Tallahassee Regional Director
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: Florida Gas Transmission Company Street Address: 1967 Commonwealth Lane City: Tallahassee State: FL Zip Code: 32303
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: (850)350-5020 Fax: (850)350-5001
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 6/4/02 Date

* 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: 1967 Commonwealth Lane City: Tallahassee State: FL Zip Code: 32303
3. Professional Engineer Telephone Numbers: Telephone: (850)380-5035 Fax: (850) 350-5001

4. Professional Engineer Statement:

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

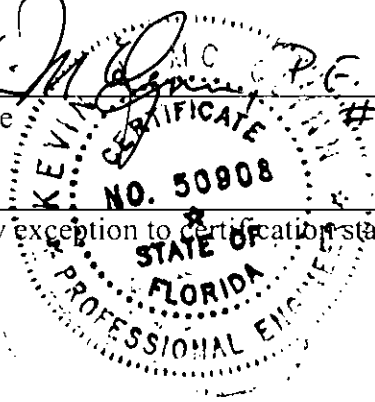
(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions 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 [X], 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.

Kevin M. [Signature]
Signature _____
(seal) 

June 4, 2002
Date _____

* Attach any exception to certification statement.

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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>13,000 ISO bhp natural gas fired turbine compressor unit, Engine No. 1507 (12,720 bhp at site elevation and with inlet and outlet losses).</p>			
<p>4. Emissions Unit Identification Number:</p> <p><input checked="" type="checkbox"/> No ID ID: 003</p>			
<p>5. Emissions Unit Status Code:</p> <p>A</p>	<p>6. Initial Startup Date: 4/2/02</p>	<p>7. Emissions Unit Major Group SIC Code:</p> <p>49</p>	<p>8. Acid Rain Unit?</p> <p><input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>The existing Solar Mars 90 T-13000S turbine engine will be replaced by a Mars 100 derated to 13,000 bhp (ISO). 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 Information Section 2 of 4

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-T13000S
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:	114.25 mmBtu/hr	
2. Maximum Incineration Rate:	NA	lb/hr
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):	Heat input is 114.25 MM Btu/hr based on vendor specifications of 103.86 MMBtu/hr plus 10%.	

**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? 1507	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: 60 feet	7. Exit Diameter: 7.55 x 7.55 feet
8. Exit Temperature: 896 °F	9. Actual Volumetric Flow Rate: 184,818 acfm	10. Water Vapor;
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates: Zone: 17 East (km): 249.02 North (km): 3339.60		
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: 0.1099	5. Maximum Annual Rate: 962.30	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): Fuel use based on vendor data plus 10%. 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):	SCC 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): 		

ATTACHMENT C

Vendor Information

Solar Mars 100 Turbine Derated to T-13000S

Mars 15000S derated to 13000S hp at site conditions

SOLAR TURBINES INCORPORATED
 ENGINE PERFORMANCE CODE REV. 2.88
 CUSTOMER: Florida Gas
 JOB ID:

DATE RUN: 30-MAY-02
 RUN BY: witherspoon, leslie

MARS 100-T15000S
 CS/MD
 122F MATCH
 GAS
 TMF-2S REV. 3.1

DATA FOR NOMINAL PERFORMANCE

Fuel Type	SD NATURAL GAS		
Elevation	Feet	110	
Inlet Loss	in. H2O	3.0	
Exhaust Loss	in. H2O	3.0	
Engine Inlet Temp.	Deg. F	59.0	95.0
Relative Humidity	%	60.0	60.0
Elevation Loss	Hp	52	43
Inlet Loss	Hp	167	143
Exhaust Loss	Hp	70	64
Driven Equipment Speed	RPM	8601	8413
Optimum Equipment Speed	RPM	8601	8413
Gas Generator Speed	RPM	10879	10811
Specified Load	Hp	12720	10380
Net Output Power	Hp	12720	10380
Fuel Flow	MMBtu/hr	103.86	91.00
Heat Rate	Btu/Hp-hr	8165	8767
Inlet Air Flow	lbm/hr	319182	280492
Engine Exhaust Flow	lbm/hr	323103	283925
PCD	psi(g)	222.9	195.1
PT Inlet Temp. (T5)	Deg. F	1286	1297
Display T5, S/W	Deg. F	1326	1329
Exhaust Temperature	Deg. F	896	940

SOLAR TURBINES INCORPORATED
ENGINE PERFORMANCE CODE REV. 2.88
CUSTOMER: Florida Gas
JOB ID:

DATE RUN: 30-MAY-02
RUN BY: witherspoon, leslie

NEW EQUIPMENT PREDICTED EMISSION PERFORMANCE
DATA FOR POINT NUMBER 1

Fuel: SD NATURAL GAS Customer: Florida Gas
Water Injection: NO Inquiry Number:
Number of Engines Tested: 0
Model: MARS 100-T15000S CS/MD 122F MATCH GAS
 SHIPMENTS AFTER 1/95
Emissions Data: REV. 0.0

The following predicted emissions performance is based on the following
specific single point: (see attached)

Hp= 12720, %Full Load= 86.9, Elev= 110 ft, %RH= 60.0, Temperature= 59.0 F

NOX		CO		UHC	
NOM	MAX	NOM	MAX	NOM	MAX
*	25.00	*	50.00	*	25.00 PPMvd at 15% O2
*	10.33	*	12.58	*	3.60 lbm/hr
*	45.24	*	55.09	*	15.78 ton/yr

* NOMINAL EMISSIONS DATA UNAVAILABLE FOR THIS ENGINE

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.

***** NOMINAL EMISSIONS DATA UNAVAILABLE *****

SOLAR TURBINES INCORPORATED
 ENGINE PERFORMANCE CODE REV. 2.88
 CUSTOMER: Florida Gas
 JOB ID:

DATE RUN: 30-MAY-02
 RUN BY: witherspoon, leslie

NEW EQUIPMENT PREDICTED EMISSION PERFORMANCE
 DATA FOR POINT NUMBER 2

Fuel: SD NATURAL GAS Customer: Florida Gas
 Water Injection: NO Inquiry Number:
 Number of Engines Tested: 0
 Model: MARS 100-T15000S CS/MD 122F MATCH GAS
 SHIPMENTS AFTER 1/95
 Emissions Data: REV. 0.0

The following predicted emissions performance is based on the following
 specific single point: (see attached)

Hp= 10380, %Full Load= 80.6, Elev= 110 ft, %RH= 60.0, Temperature= 95.0 F

NOX		CO		UHC	
NOM	MAX	NOM	MAX	NOM	MAX
*	25.00	*	50.00	*	25.00 PPMvd at 15% O2
*	8.92	*	10.86	*	3.11 lbm/hr
*	39.06	*	47.56	*	13.62 ton/yr

* NOMINAL EMISSIONS DATA UNAVAILABLE FOR THIS ENGINE

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.