



Florida Gas Transmission Company

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

November 18, 1993

RECEIVED

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Division of Air
Resources Management

Mr. Clair Fancy, Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Air Permit AC 56-230129 / PSD-FL-203
Natural Gas Compressor Station No. 20, St. Lucie County

Dear Mr. Fancy:

As discussed in a telephone conversation with Ms. Teresa Heron of your staff on November 17, Florida Gas Transmission Company's (FGT) Phase III Expansion Engineering Group has refined the design of the Phase III expansion for Compressor Station No. 20 and FGT proposes to make some desirable minor changes from the original design submitted in the original air permit application. FGT understands that these changes are minor and of an administrative nature and that they do not require public notice or a lengthy review period.

It is extremely important to FGT that the start of construction not be delayed. If the FDEP should decide that either a public notice or lengthy review is required for these proposed changes, then FGT will not make them.

These proposed changes do not involve increases in any air emissions or air quality impacts from the engine covered by this permit. Additionally, air dispersion modeling of NO_x emissions has been performed using the U.S. EPA's ISCLT2 model to evaluate the relative effect on air quality impacts of these proposed changes. The modeling demonstrates that these proposed changes will result in an improvement in the already minimal air quality impacts of this project.

CHANGES

The proposed changes are described below.

1. The new Compressor Building will have an increased width and a decreased length. The original and new dimensions are given in the table below.

New Compressor Building Dimension Changes

BUILDING DIMENSION	ORIGINAL	NEW
HEIGHT	41' (12.5 m)	NO CHANGE
LENGTH	72' (21.94 m)	63.5' (19.35 m)
WIDTH	60' (18.29 m)	62.25' (18.97 m)

2. The Emergency Generator size requirement has been decreased and will be changed from a 625 hp unit to 457 hp unit. The unit will still not be operated more than 400 hours per year. NO_x, CO and VOC lb/hr emission rates will all decrease and some other parameters will be changed. Some of these changes have the potential to change impacts, therefore the stack height has been increased. The changes are summarized in the table below. Vendor information is provided in Attachment A.

Revised Emergency Generator Parameters

PARAMETER	ORIGINAL	NEW
Size (hp)	625	457
Stack Height (ft)	22 (6.71 m)	26 (7.92 m)
Stack Diameter (ft)	0.5 (0.15 m)	NO CHANGE
Exhaust Flow Rate (acfm)	3043 (86.16 m ³)	2341 (66.28 m ³)
Exhaust Temperature (° F)	1112 (600° C)	1050 (566° C)
NO _x Emissions (lb/hr)	1.35	0.99
CO Emissions (lb/hr)	2.95	2.16
VOC Emissions (lb/hr)	0.055	0.04

3. Minor changes have been made to the original plot plan. A new one is provided in Attachment B.

DISPERSION MODELING

Air dispersion modeling was performed using ISCLT2 to compare the relative effects on air quality impacts of these changes. The same meteorology used in the original application (West Palm Beach, upper and surface data, 1982-1986) was used for this dispersion modeling. The model input files used in the original application were modified to reflect the proposed changes as follows:

- 1) Downwash parameters were changed to reflect the new Compressor Building dimensions, the new Emergency Generator stack height and the new configuration shown in the plot plan. The same input file and downwash program (Bowman Engineering's GEP Program) that were used in the original application were used to generate downwash parameters for the modeling of these proposed changes.
- 2) Stack coordinates and Emergency Generator stack parameters were changed to reflect the new values.
- 3) The receptor grids were revised to meet the limitations of the ISCLT2 version used. This version limits the number of receptors to 500. Since the original modeling used receptor grids larger than 500, the grid sizes had to be reduced. The reduced grid sizes were located so that they included the receptors with the highest impacts in the original application modeling.

The maximum concentration resulting from the ISCLT2 modeling decreased from 1.842 ug/m³ with our permitted parameters to 1.832 ug/m³ with the new parameters. Modeling was repeated for the PSD increment analysis and the National Ambient Air Quality Standard (NAAQS) analysis. Both analyses indicated a decreased impact with the new parameters. The results are summarized below.

As stated above, this indicates that the proposed changes should result in even lower ambient air quality impacts than the already predicted low impacts. The output from the modeling runs and the downwash program and a computer disk with both input and output files have been sent to Mr. Cleveland Holladay of the FDEP under separate cover.

NO_x Air Dispersion Modeling Results

PARAMETERS	MAXIMUM OFFSITE CONCENTRATION (ug/m ³)	YEAR	RECEPTOR LOCATION	
			East meters	North meters
New Sources				
Original	1.842	1986	-200	0
Proposed	1.833	1986	-200	0
PSD Increment Analysis				
Original	2.316	1986	557700	3035725
Proposed	2.107	1986	557200	3035725
NAAQS Analysis (Without O ₃ Limiting Analysis)				
Original	286.54	1982	557800	3035725
Proposed	285.99	1982	557800	3035725

In summary, the changes in the Emergency Generator stack parameters and the Compressor Building dimensions should result in improved air quality impacts compared to what was proposed in FGT's original application.

Again, FGT would like to restate that it is extremely important that these proposed changes do not delay start of construction for this project and that FGT will not make these changes if that is the case.

Should you have any questions concerning these changes or need additional information, please do not hesitate to call me at (713) 853-3569.

Sincerely,



V. Duane Pierce, Ph.D.
Air Quality Supervisor
Phase III Expansion Project
Florida Gas Transmission Company

Florida Gas Transmission Company
Compressor Station No. 20
November 18, 1993

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cc: Carlon Nelson
William Osborne
Allan Weatherford
Files

FILE: 20FDER01.LTR

ATTACHMENT A
EMERGENCY GENERATOR
VENDOR INFORMATION

Engine: Cummins GTA19 in-line, 6-cylinder

Turbocharged and Aftercooled

POWER RATINGS (without fan)

COMPRESSION RATIO	8.5:1	10:1
Bore: 6 1/4" (159 mm)	(See Note 1)	(See Note 2)
Stroke: 6 1/4" (159 mm)	Propane	Nat. Gas
STANDBY POWER (ENGINE OUTPUT POWER) RATING - HP (Kw) - WITHOUT FAN		
RPM	1800	430(321) 457(341)

Cooling	
Heat Rejection To Coolant	17366 Btu/Min
Coolant Capacity(with radiator)	34 US Gal
Coolant Flow Rate	189 Gal/Min
Maximum Coolant Friction Head	5.0 psi
Maximum Coolant Static Head	60 ft
Radiator Fan Load	25 HP
Air	
Combustion Air	755 cfm
Maximum Air Cleaner Restriction	10 in H ₂ O
Alternator Cooling Air	1770 cfm
Radiator Cooling Air	42218 cfm
Minimum Air Opening to Room	56 sq ft
Minimum Discharge Opening	28 sq ft
Maximum Restriction at Radiator Discharge (static)	0.5 in H ₂ O
Exhaust	
Gas Flow (Full Load)	2341 cfm
Gas Temperature	1100 °F
Maximum Back Pressure	27 in H ₂ O

Data shown above represents gross engine performance capabilities obtained and corrected in accordance with SAE J1349 conditions of 29.61 in. Hg. (100kPa) barometric pressure [300 ft. (91m) altitude], 77° F (25° C) inlet air temperature, and 0.30 in. Hg. (1kPa) water vapor pressure using dry processed natural gas fuel with 905 BTU per standard cubic foot (33.72 k J/l) lower heating value.

Cooling System: High flow centrifugal pump with spin-on corrosion resistor/additive filter. Aftercooled model includes an air to air separate low temperature cooling system. High ambient 110° F radiator cooling system.

Exhaust System: High performance turbocharger and watercooled exhaust manifold that improves flow and lowers the exhaust temperature.

Notes:

- 54° C (130° F) or lower water temperature to the aftercooler or air to air aftercooler W/130° F or lower air temperature to the radiator.
- 32° C (90° F) or lower water temperature to the aftercooler or use of air to air aftercooler W/100° F or lower air temperature to the radiator.

Fuel System: Balanced air-cooled intake manifold for even fuel distribution. Impco carburetor developed for high altitude application.

Ignition System: Highly reliable, solid state, breakerless, low tension system. Low cranking speed firing from a magneto-type power source for easy starting. Long spark plug life and fully sealed modular-type electronics for low maintenance.

Lubrication: Positive pressure feed to all bearings and wear surfaces. Includes large tubular oil cooler and high capacity oil pan for extended service intervals. Pistons receive additional cooling from oil spray located below each cylinder. The lube oil capacity is 48 US quarts and the oil that is required is API CD 15W-40. The lube oil filter is the canister type.

Valve Train: Specifically designed for natural gas. Includes hard, high alloy valves, valve inserts, and positive action rotators on intake and exhaust ports.

Speed Control: Adjustable hydraulic governor provides stable RPM control under all load conditions.

EMERGENCY STANDBY RATING

Emergency Standby Rating is applicable for supplying emergency electric power for the duration of the utility power outage. NO OVERLOAD capability is available for this rating.

All data is based on the engine operating with fuel system, water pump, lubricating oil pump, air cleaner, and muffler; not included are alternator, compressor, fan, optional equipment, driven components or installation of a catalytic converter.

Altitude and Ambient Temperature Requirements:

The generator set may be operated at the STANDBY RATING up to 3000 ft. (914m) altitude and 100° F (38° C) inlet air temperature. For sustained operation at high load factors at higher altitudes and temperatures, see Southern Plains Power or your distributor.

FUEL APPLICATION GUIDE

COMPRESSION RATIO	10:1	8.5:1
Dry, Processed, Natural Gas	X	X
Propane (HD-5)	-	X

All other gases, such as field gas and digester/sewage gas, will require an analysis and pre-approval from SPP. Consult your Cummins Distributor for details.

GT-19
REV. (A) 12/19

**FGT PHASE III RECIPROCATING COMPRESSION EXPANSION
ENGINE DRIVEN GENERATOR SET
EMISSIONS DATA**

Location: Station 20, Ft. Pierce, Florida

Project No.: W.O. S22138

1.0 MAXIMUM EMISSION DATA

The following emission data is the maximum allowable for EPA compliance.

NOx, Grams/HP-Hour (NOTE 1)	0.98
CO, Grams/HP-Hour (NOTE 1)	2.14
HC, Grams/HP-Hour	0.8
NMHC, Grams/HP-Hour (NOTE 1)	0.04
O ₂ , % Observed Dry	0.5
Volume Air/Fuel Ratio	9.5:1
Stack Temp., °F	1112
Exhaust Flow, CFM	3043
Airflow, KG/Hour	1929
BSFC, BTU/HP-Hour	8387

NOTE 1: The data for NOx, CO, and NMHC includes the reduction by the catalytic muffler, which should reduce the emissions by 90%, 80%, and 50%, respectively, to the above.

2.0 ACTUAL ENGINE EMISSION LEVEL DATA

2.1 The vendor shall provide the following emission quantities and guarantee that they will not be exceeded over the entire power range:

NOx, Grams/HP-Hour:	0.98
CO, Grams/HP-Hour:	2.14
CO ₂ , Grams/HP-Hour:	N/A
Total HC, Grams/HP-Hour:	0.8
NMHC, Grams/HP-Hour:	0.04
H ₂ O, Grams/HP-Hour:	N/A
N ₂ , Grams/HP-Hour:	N/A
O ₂ , Grams/HP-Hour:	N/A

(A)

SMITH 10
REV. (A) 10/19/93

FGT PHASE III RECIPROCATING COMPRESSION EXPANSION

ENGINE DRIVEN GENERATOR SET
EMISSIONS DATA

- 2.2 The vendor shall provide the following engine parameters at the above guaranteed emission rates:

Air/Fuel Ratio:	10.5:1	
Exhaust Mass Flow:	(2344 ACFM)	3602 lb/hr.
Ignition Timing:	26	° BTDC
Air Manifold Pressure:	7.4	psia
Maximum Ambient Air Temperature:	110	°F
Exhaust Temperature:	1120	°F
at Engine or Turbo Outlet	(1050 inlet to turbo outlet)	
Maximum Allowable Backpressure:	27.2	" W.C.
Fuel Consumption:	3.838	MCFH
	7600	BTU/BHP-Hr

- 2.3 The vendor shall provide a description of the emission control system supplied with the engine generator set.

See Attached.



**MECHANICAL EQUIPMENT
INC.**

October 19, 1993

Southern Plains Power
P.O. Box 2088
Houston, Texas 77252

Attention: Mr. Jim Huhn

Reference: MEI Quote # 93-07-1695
MEI Quote # 93-07-1696
MEI Quote # 93-07-1703

*App I
p. 1*

Gentlemen:

In response to your fax of 10-15-93, following are the NEW conditions for which the emissions equipment quoted is to perform. Further, please note the qualifying conditions:

Quote # 93-07-1695 GTA-28
Enron's Station 10

NOx = 0.98 gm/BHP-HR
CO = 2.14 gm/BHP-HR
NMHC = 0.04 gm/BHP-HR

Quote # 93-07-1696 GTA-19
Enron's Station 20

NOx = 0.98 gm/BHP-HR
CO = 2.14 gm/BHP-HR
NMHC = 0.04 gm/BHP-HR

ATTACHMENT B
REVISED PLOT PLAN



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

OCT 15 1993

4APT-AEB

DEPARTMENT OF
ENVIRONMENTAL PROTECTION

OCT 18 1993

Mr. Clair H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

OFFICE OF THE SECRETARY

RE: Florida Gas Transmission Company, Compressor Station
Number 20, St. Lucie County, FL (PSD-FL-203)

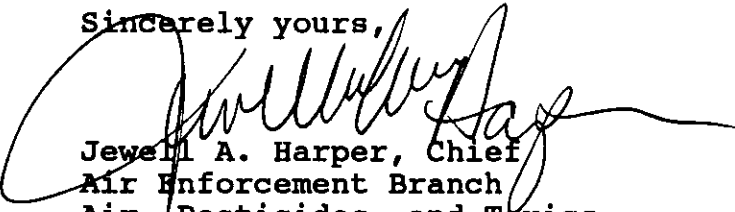
Dear Mr. Fancy:

This is to acknowledge receipt of your final determination and Prevention of Significant Deterioration (PSD) permit for the above referenced facility, dated September 28, 1993. The proposed expansion to the existing facility will be the addition of one Cooper-Bessemer 10V-275C natural gas fired, reciprocating, internal combustion engine, equipped with lean-burn technology. The proposed engine is rated at 4,000 brake horsepower and will be used to drive gas compressors for transporting natural gas by pipeline for distribution to markets in the Gulf Coast region. The proposed modification is subject to PSD review on the basis of significant NO_x emissions.

Your determination proposes to limit NO_x emissions from the combustion engine through lean-burn technology.

We have reviewed the package as submitted and have no adverse comments. Thank you for the opportunity to review and comment on the package. If you have any questions or comments, please contact Mr. Scott Davis of my staff at (404) 347-5014.

Sincerely yours,


Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics
Management Division

cc: J. Aaron
C. Holladay
J. Goldmann, S.E. Dist.
G. Bunnell, NPS
B. Andrews, ENSR

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