STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit by:

Mr. Mark J. Hornick
General Manager, Polk Power Station
Tampa Electric Company
P.O. Box 111
Tampa, Florida 33601-0111

Facility I.D. No. 0530233
DEP Permit No. PSD-FL-194F
Polk Power Station
Polk County

_____/

Enclosed is Final Permit Number 1050233-007-AC for the Polk Power Station IGCC unit, Emission Unit 001. This permit requires Tampa Electric Company to comply with a NO_X emission limit of 15 ppmvd @ 15% O_2 on a 30-day rolling average effective July 1, 2003. This permit is issued pursuant to Chapter 403, Florida Statutes.

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

Executed in Tallahassee, Florida.

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

CERTIFICATE OF SERVICE

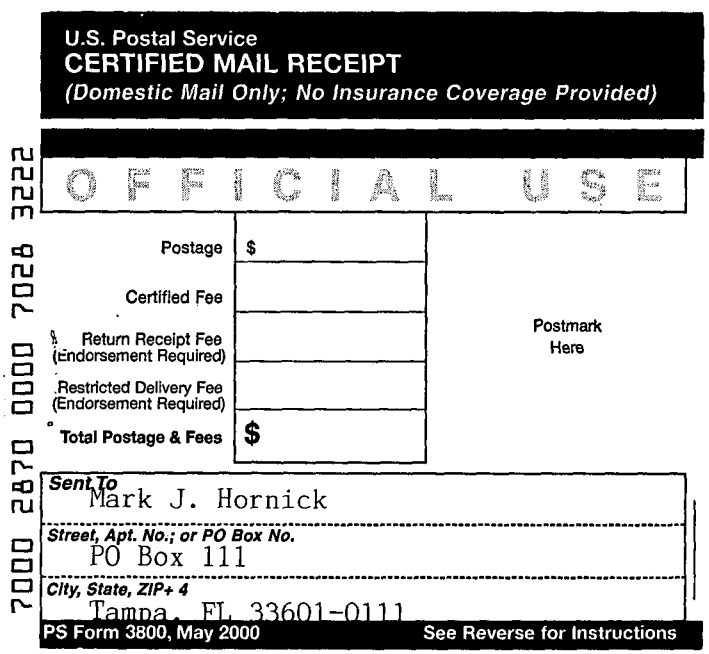
The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Final Permit (including the Final permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 2/5/02 to the person(s) listed:

Mark J. Hornick, TEC*
Gregg Worley, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Mr. Jeff Spence, Polk County ESD
Buck Oven, DEP PPSO
Thomas W. Davis, P.E, ECT

Clerk Stamp

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

Victoria Gibson (Clerk) February 5, 2002 (Date)



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PS Form 3800, May 2000 See Reverse for Instructions

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

PERMITTEE

Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Authorized Representative:
Mark J. Hornick, General Manager
Polk Power Station

DEP File No. 1050233-007-AC
Permit No. PSD-FL-194F
Emission Unit 001
NO_X Emissions Reduction
SIC No. 4911

PROJECT AND LOCATION

As per the original PSD permit: "*One month after the test period ends (estimated to be by June 1, 2001), the Permittee will submit to the Department a NO_X recommended BACT Determination as if it were a new source using the data gathered on this facility, other similar facilities and the manufacturer's research. The Department will make a determination on the BACT for NO_X only and adjust the NO_X emission limits accordingly.*" Based upon the Department's review of the permittee's submittals, the Department has determined that the NO_X emission limits for Emission Unit 001 should be reduced.

The emission unit is located at the Polk Power Station, 9895 State Road 37 South, Mulberry, Polk County. The UTM coordinates are Zone 17, 402.45 km E and 3067.35 km N.

STATEMENT OF BASIS

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

ATTACHED APPENDIX MADE A PART OF THIS PERMIT

Appendix BD-2001

Howard L. Rhodes, Director
Division of Air Resources Management

FACILITY DESCRIPTION

Tampa Electric Company (TEC) Polk Power Station (PPS) Unit 1 located in Polk County, Florida is a nominal 260-megawatt (MW) electric generation facility. Major components of PPS Unit 1 include solid fuel handling and gasification systems, a sulfuric acid plant for processing of the solid fuel gasification system gas cleanup stream, an auxiliary boiler fired with No. 2 distillate fuel oil, and one integrated gasification combined cycle (IGCC) General Electric (GE) 7F combustion turbine (CT) fired with synthetic natural gas (syngas) or No. 2 distillate fuel oil. The unit is additionally authorized to burn syngas produced from the gasification of fuel blends of up to 60 percent petroleum coke.

REGULATORY CLASSIFICATION

This facility, TEC Polk Power Station, is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

PERMIT SCHEDULE

- 05/23/01 Department published the Public Notice in the Tampa Tribune.
- 05/10/01 Department distributed initial Intent to Issue Permit.
- 02/15/01 Department received additional information; application deemed complete.
- 12/04/00 Department requested additional information.
- 11/17/00 Department received applicant's BACT submittal

RELEVANT DOCUMENTS

The documents listed below are the basis of the permit. They are specifically related to this permitting action. These documents are on file with the Department.

- Application received on November 17, 2000;
- Department's incompleteness letter dated December 4, 2000;
- TEC's response to Department's incompleteness letter received on February 15, 2001;
- Draft BACT Determination issued by the Department dated May 10, 2001;
- Department's Intent to Issue and Public Notice Package dated May 10, 2001;
- Additional submittals provided by TEC to Department subsequent to May 10, 2001;
- Permits PSD-FL-194, PSD-FL-194B, PSD- FL-194C, PSD-FL-194D and PSD-FL-194E.

PERMIT SPECIFIC CONDITIONS

This permit addresses the following emissions unit:

E.U. ID No.	Brief Description
-001	Integrated Gasification Combined Cycle Unit No. 1

1. The provisions of the Title V Operating Permit 1050233-001-AV remain in effect. However, an application shall be submitted to revise that permit consistent with the emission limit changes herein.

2. The provisions of air construction permits PSD-FL-194, PSD-FL-194A, PSD-FL-194C, PSD-FL-194D and PSD-FL-194E are incorporated into this air construction permit except for the changes to the NO_X emission limit while firing syngas in the affected portions of Specific Condition H below.

   H. Emission Limits

   1. The maximum allowable emissions from the IGCC combustion turbine, when firing syngas and low sulfur fuel oil, in accordance with the BACT determination, shall not exceed the following:

EMISSIONS LIMITATIONS - 7F CT POST DEMONSTRATION PERIOD

POLLUTANT	FUEL	BASIS[a]	LB/HR*	TPY[b]
NO_X	Oil	42 ppmvd**	311	N/A
	Syngas	~~25~~ 15 ppmvd	~~222.5~~ 132	~~1,044~~ 620

(*) Emission limitations in lbs/hr are 30-day rolling averages, except for NO_X while firing syngas, which as of July 1, 2003 is limited in ppmvd (at 15% oxygen) and complied with on a 30-day rolling average via CEMS. Pollutant emission rates may vary depending on ambient conditions and the CT characteristics. Manufacturer's curves for the emission rate correction to other temperatures at different loads shall be provided to DEP for review 120 days after the Siting Board approval of the site certification. Subject to approval by the Department, the manufacturer's curves may be used to establish pollutant emission rates over a range of temperatures for the purpose of compliance determination.

   5. After the demonstration period, permittee shall operate the combustion turbine to achieve the lowest possible NO_X emission limit but shall not exceed 25 ppmvd corrected to 15 percent oxygen and ISO conditions. Effective July 1, 2003, permittee shall operate the combustion turbine to achieve the lowest possible NO_X emission limit but shall not exceed 15 ppmvd corrected to 15 percent oxygen and ISO conditions.

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Tampa Electric Company
Polk Power Station
PSD-FL-194 and PA92-32
Polk County, Florida

BACKGROUND

The applicant, Tampa Electric Company (TEC) is responsible for the operation of an existing facility known as the Polk Power Station. This facility is located at 9995 State Route 37 South, Mulberry, Polk County; UTM Coordinates: Zone 17, 402.45 km East and 3067.35 km North; Latitude: 27° 43' 43" North and Longitude: 81° 59' 23" West. The regulated emissions units at the coal gasification facility include a 260 megawatt (electric) combined cycle combustion turbine which fires syngas or No. 2 fuel oil; an auxiliary boiler which fires No. 2 fuel oil; a sulfuric acid plant; a solid fuel handling system; and a solid fuel gasification system.

As per the original PSD permit, (as well as the Site Certification and Title V permit) the combined cycle combustion turbine is now required to undergo an analysis for NO_X only. Specific Condition **H.7.** of the Site Certification document reads as follows: "*One month after the test period ends (estimated to be by June 1, 2001), the Permittee will submit to the Department a NO_X recommended BACT Determination as if it were a new source using the data gathered on this facility, other similar facilities and the manufacturer's research. The Department will make a determination on the BACT for NO_X only and adjust the NO_X emission limits accordingly.*" Based upon existing permit conditions, the test period ended during November 2000.

PROPOSAL SUBMITTED BY APPLICANT:

TEC submitted a revised proposal on January 30, 2002 recommending an emission limits as follows:

POLLUTANT	CONTROL TECHNOLOGY	TEC PROPOSAL
NO_X	Syngas firing - N_2 diluent	15 ppmvd @ 15% O_2

This proposal would provide for a 40% reduction in the current (temporary) emission limit while firing syngas.

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES:

The minimum basis for a BACT determination is 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). The Department adopted subpart GG by reference in Rule 62-204.800, F.A.C. The key emission limits required by Subpart GG are 75 ppmvd NO_X @ 15% O_2. (assuming 25 percent efficiency) and 150 ppmvd SO_2 @ 15% O_2 (or <0.8% sulfur in fuel). Although this determination is required for NO_X only, the applicant's proposal is consistent with the NSPS, which allows NO_X emissions in the range of 110 ppmvd for the unit.

DETERMINATIONS BY EPA AND STATES:

The following table is a sample of information on some recent determinations by states for combined cycle stationary gas turbine projects. This particular review has been limited to gas turbines in the United States which are permitted to combust coal or pet-coke produced syngas. The applicant's proposal is included for reference.

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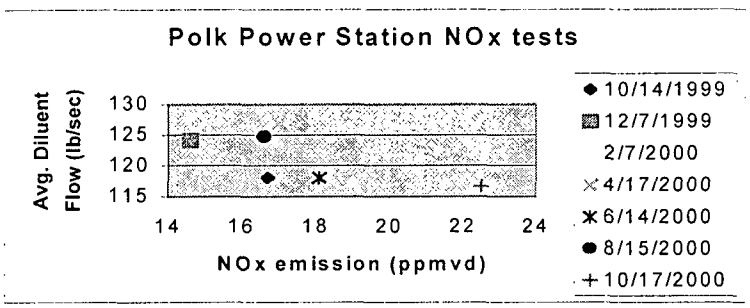
TABLE 1

RECENT LIMITS FOR NITROGEN OXIDES FOR LARGE STATIONARY GAS TURBINE COMBINED CYCLE PROJECTS WHICH COMBUST SYNGAS

Project Location	Power Output Megawatts	NO_X Emission Rate	Gasification Technology	Comments
Pinon Pine; Sierra Pacific, NV	100	0.07 lb/MMBtu	KRW air-blown pressurized fluidized bed	95% SO_2 removal
Wabash River; Terre Haute, IN	262	0.096 lb/MMBtu	Destec two-stage pressurized oxygen-blown entrained flow	
Kentucky Pioneer **(proposed)**	580	0.07 lb/MMBtu	British Gas / Lurgi slagging fixed bed	99% SO_2 removal
Motiva; Delaware City, DE	240	16 ppmvd	Texaco pressurized oxygen-blown entrained-flow	
TECO POLK; Polk County FL)	260	15 ppmvd (approx. equiv. 0.076 lb/MMBtu)	Texaco pressurized oxygen-blown entrained-flow	96% SO_2 removal

EVALUATION BY DEPARTMENT:

An analysis of the data gathered from the facility was conducted. Two sets of data exist: one which represents seven "full load tests" which were completed between October 1999 and October 2000, and the other is comprised of data from continuous emission monitoring systems (CEMS). Regarding the former, the data is represented on the chart below:



TEC has cautioned against an analysis of NO_X emissions as compared to diluent flow, noting that "*although the diluent flow is an important parameter for controlling NO_X emissions, a more appropriate measure is the ratio of diluent flow to syngas flow. On an overall basis, this ratio represents the proportional flows of NO_X controlling diluent and the syngas flow. Additional complicating factors that prevent a straightforward linear analysis of diluent flow rate or ratio and the NO_X emissions rate include the varying composition of the syngas, and the heating value of the fuel. Although these data are presented, TEC recommends against using these data to establish firm operating ranges due to the variability in other factors that significantly contribute to NO_X emissions from this combustion turbine.*" Since diluent flow will likely increase with generating load (up to some load point) and since syngas flow is directly proportional to unit load, it is likely that a measure of diluent flow to syngas flow (which the applicant purports is more appropriate) makes some sense, as in the case of reviewing the entire load range of a combustion turbine. However, the Department wishes to better understand the impact of diluent flow on NO_X emissions, given that the diluent is the control media for NO_X. Since the tests are at a similar load point, the syngas flow and its associated variability can be effectively ignored. This yields a chart similar to the one above, indicating some level of correlation (albeit with 7 data points) between the diluent flow

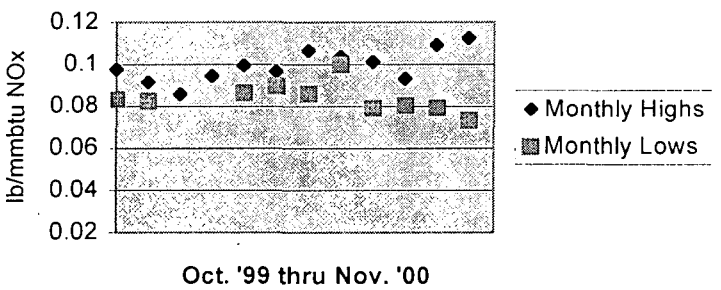
and NO_X emissions. Given the very limited amount of tests, one initial conclusion which might be drawn is that NO_X emissions are likely to be less than 19 ppmvd if the diluent flow is held to 120 lb/sec or higher.

Regarding the latter set of data (from the CEMS), 14 months of data was reviewed, with the month of March 2000 ignored due to low operating time. In order to understand the range of data with respect to syngas NO_X emissions, only days where daily hours of operation firing syngas equaled 24 (all day) were analyzed. From this data set, the 5 highest and lowest daily average NO_X emission rates (in lb/MMBtu) were computed. This led to the chart below, with the lowest values during the months of December 1999 and January 2000 excluded due to calculated values around 0.01 lb/MMBtu. The following preliminary conclusions are drawn from this analysis:

1) There seems to be an increasing variability over the latter months, with highs increasing and lows decreasing.
2) The average of the monthly highs is just under 0.10 lb/MMBtu and the average of the monthly lows is just under 0.085 lb/MMBtu.
3) The facility should be able to easily comply with its current limit of 25 ppmvd (approximately 0.126 lb/MMBtu) and likely will operate closer to 0.09 lb/MMBtu (approximately 18 ppmvd) on a monthly average basis.

Each analysis of the facility data referred to herein suggests that a NO_X limit of 0.09 lb/MMBtu (approximately 18 ppmvd) would likely be reasonable, given that certain changes may be required.

CEMS DATA



DEPARTMENT DETERMINATION:

Although little incentive existed to maintain a NO_X limit below 25 ppm, the data shows that emissions can be maintained at much lower levels with minor changes.

POLLUTANT	DETERMINATION
NO_X (syngas - all operating modes)	15.0 ppmvd – 30-day rolling average via CEMS

The rationale is:

1) Polk IGCC is not a green-field unit, and additional controls effectively result in a retrofit
2) Other (similar) domestic IGCC units are able to comply with an emission limit of 15 ppmvd and
3) The process of gasification is likely to expand to renewable fuels, possibly complicating the application of more stringent controls.

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DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Michael P. Halpin, P.E. Review Engineer
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

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

2/4/02
Date:

Approved By:

Howard L. Rhodes, Director
Division of Air Resources Management

2/4/02
Date: