

*CORPORATE ENVIRONMENTAL SERVICES  
AIR PROGRAMS REPORT*

*NITROGEN OXIDES - BEST  
AVAILABLE CONTROL  
TECHNOLOGY DETERMINATION  
SOURCE EMISSION TEST #5*

*POLK POWER GENERATING STATION*

*AIRS # 1050233*

*UNIT NO.1 COMBUSTION TURBINE &  
HEAT RECOVERY STEAM GENERATOR  
FIRED ON SYNGAS*


*JUNE 14, 2000*

*Prepared by Tampa Electric Company  
Environmental Affairs  
July 10, 2000*

## REPORT CERTIFICATION

---

I have calculated and reviewed all data in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 7/11/2000 Signature   
QA/QC Coordinator  
Senior Environmental Technician  
Environmental Affairs  
Tampa Electric Company

The sampling and analysis performed for this report were carried out under my direction, and I hereby certify that this test report is authentic and accurate.

Date 7-11-00 Signature   
Test Team Leader  
Environmental Affairs  
Tampa Electric Company

I have reviewed the testing details and results in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 7/11/08 Signature   
Coordinator-Air Programs  
Environmental Affairs  
Tampa Electric Company

## TABLE OF CONTENTS

---

<u>SECTION</u>	<u>PAGE NO.</u>
1.0 SUMMARY OF RESULTS	1
2.0 SOURCE DESCRIPTION/TEST PROCEDURES	2
FIGURE 1...OXYGEN TRAVERSE LOCATION DIAGRAM	6
FIGURE 2...SAMPLING TRAVERSE LOCATION DIAGRAM	7
FIGURE 3...TEST SYSTEM DIAGRAM	8
3.0 TEST RESULTS	9
NITROGEN OXIDES TEST SUMMARY	10

## APPENDICES

- A. SOURCE TEST CALCULATIONS
  - A-1 NITROGEN OXIDE CALCULATIONS
  - A-2 OXYGEN CALCULATIONS
  
- B. TURBINE DATA
- C. UNCORRECTED REFERENCE METHOD DATA
  
- D. SAMPLING EQUIPMENT CALIBRATIONS
  - D-1 LINEARITY CALIBRATIONS
  - D-2 DRIFT ASSESMENT CALS
  - D-3 CYLINDER GAS CERTIFICATIONS
  - D-4 CONVERTER EFFICIENCY RESULTS
  
- E. PROJECT PARTICIPANTS

## 1.0 SUMMARY OF RESULTS

---

On June 14, 2000, the Environmental Affairs, Air Services and Auditing group of Tampa Electric Company performed source emission tests on IGCC Unit No. 1 at the Polk Power Station. The combustion turbine was fired with syngas from a coal gasification system. This test was conducted to satisfy requirements in Title V permit no. 1050233-001-AV for NO<sub>x</sub> Best Available Control Technology (BACT) determinations. Testing was performed according to USEPA test methods as referenced in 40 CFR Part 60, Appendix A.

The Nitrogen Oxides (NO<sub>x</sub>) emission rate was derived from three test runs. The calculated average was 18.1 ppm corrected to 15% oxygen on a dry basis.

During the tests on June 14, 2000, Unit No. 1 Combustion Turbine was operated at an average load of 190 megawatts. Details of turbine operation are included in Appendix C.

## 2.0 SOURCE DESCRIPTION/TEST PROCEDURES

---

Polk Power Station is located at County Road 630 approximately 13 miles southwest of Bartow, Polk County, Florida. Unit No. 1 is an IGCC generating unit, 192 MW capacity when fired with Syngas fuel. The source sampling location consists of a circular stack 19 ft. in diameter with four sample ports located 90E apart on the stack circumference.

A diagram of the stack sampling location is included in Figure 1 and 2 along with other pertinent information on the test site.

Nitrogen Oxides sampling was performed in accordance with USEPA Reference Method 20 (40 CFR Part 60, Appendix A) "Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines". Testing was performed using a Thermo Environmental Model 10 A/R Chemiluminescent NO-NO<sub>x</sub> Gas Analyzer. Details of fuel bound nitrogen is found in Appendix B.

Diluent sampling was performed in accordance with USEPA Reference Method 3-A (40 CFR Part 60, Appendix A), "Determination of Oxygen and Carbon Dioxide concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)". Testing was performed using a Servomex 1400 B Oxygen Analyzer.

## **TCEMS Description**

The following discussion briefly outlines the operation principles of Corporate Environmental Services Transportable Continuous Emissions Monitoring System (TCEMS). Additional information on instrument operation may be found in the individual instrument manuals provided by the manufacturers. A schematic of the TCEMS set-up is presented in Figure 3.

### **Servomex Model 1400 B O<sub>2</sub> Analyzer**

The Servomex 1400B oxygen analyzer measures the paramagnetic susceptibility of the sample gas by means of a magneto-dynamic type measuring cell.

### **Thermo Environmental Instruments Model 10A/R NO/NO<sub>x</sub> Analyzer**

The Thermo Environmental Instruments model 10A/R NO/NO<sub>x</sub> analyzer automatically and continuously determines the concentration of nitric oxide (NO) and/or oxides of nitrogen (NO<sub>x</sub>) in a flowing gas mixture. The analytical technique is chemiluminescence.

To measure NO concentrations, the gas sample to be analyzed is blended with ozone (O<sub>3</sub>) in a reaction chamber. The resulting chemiluminescence activity is monitored through an optical filter by a high sensitivity photomultiplier tube positioned at one end of the chamber.

This filter and photomultiplier combination responds to light of a narrow wavelength band unique to the NO/O<sub>3</sub> reaction, producing an interference free signal. The output from the photomultiplier is linearly proportional to the NO concentration.

To measure NO<sub>x</sub> concentrations (i.e., NO plus NO<sub>2</sub>), the sample gas flow is diverted through an NO<sub>2</sub>-to-NO converter. The chemiluminescent action in the reaction chamber to the converter effluent is linearly proportional to the NO<sub>x</sub> concentration entering the converter.

### **Data Acquisition System**

The data acquisition system (DAS) developed by Entropy Environmentalists Inc. uses a portable personal computer with an internal 32 bit analog-to-digital converter with an external 16 channel multiplexer. In addition to providing an instantaneous display of analyzer responses, the DAS can average data, calculate emission rates, and document analyzer calibrations. The test results and calibrations are stored on the hard disk and printed on a dot matrix printer.

### **TCEMS Sample Handling System**

The extractive monitors utilized in the TCEMS require that the effluent stream be conditioned to eliminate any possible interference (i.e., water vapor and particulate matter), before being transported and injected into each analyzer. Figure 3 depicts a schematic of the entire sample handling system. The major components of this system are listed below:

- Gas transport tubing
- Moisture removal system
- Sampling pump

### **Gas Transport Tubing**

Two separate 1/4 inch O.D. Teflon tubes were used for the sample gas transport.

### **Moisture Removal System**

The moisture removal system was comprised of an ice bath condenser, constructed of a 30-foot section of 3/8 inch O.D. Teflon tubing wrapped in a 12-inch coil. Effluent travels through this coil and then passes, in series, through two stainless steel moisture traps where the condensate drops out and is removed via a condensate discharge pump. With the exception of the discharge pump, the entire assembly is chilled in an ice bath.

### **Sampling Pump**

The Thomas Model 2107CE20-TFE pump is used to transport the effluent sample through the conditioning system to the analyzers. All internal parts of the pump that come into contact with the gas sample are constructed of 316 stainless steel or Teflon.



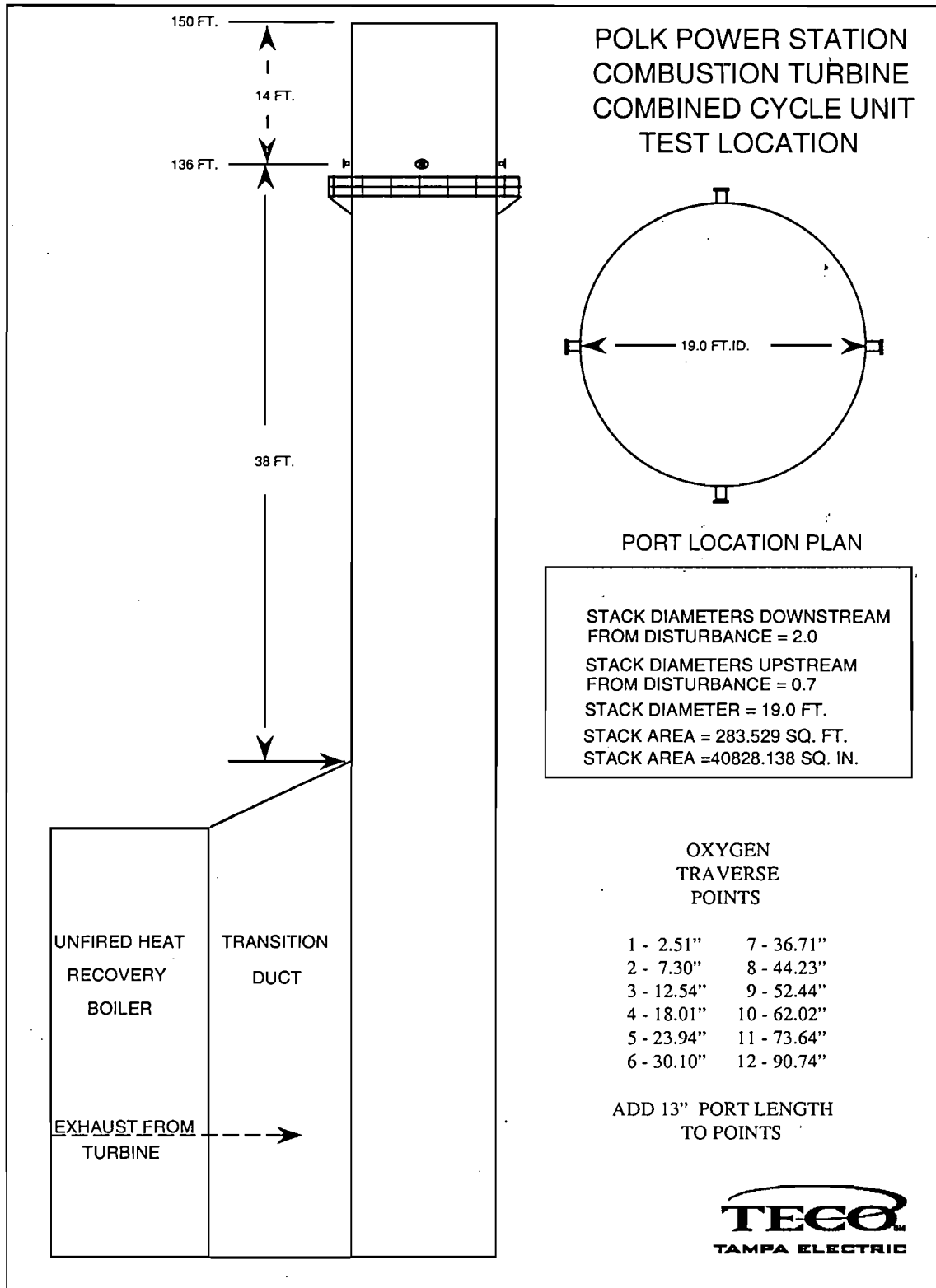


FIGURE 1

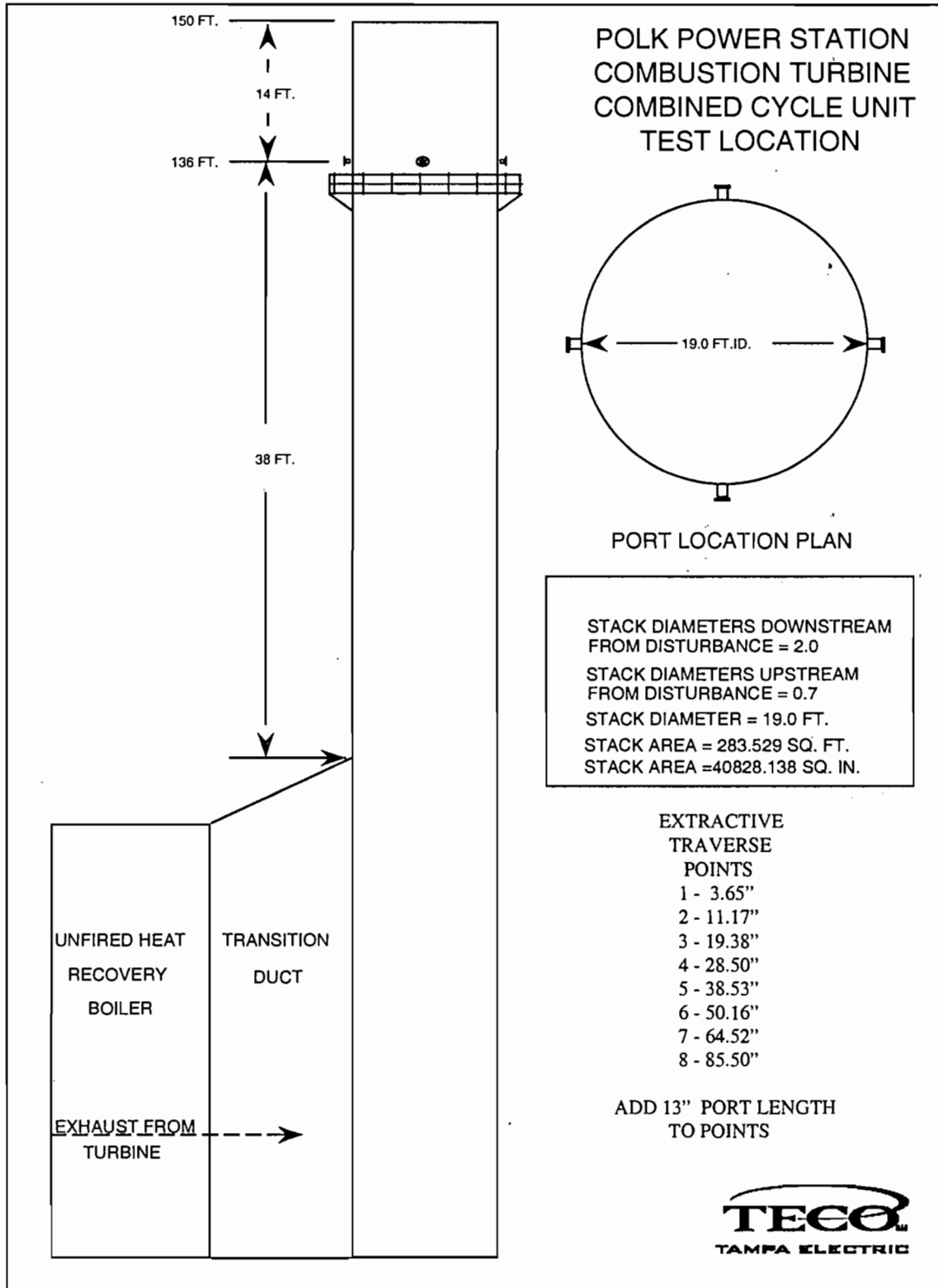


FIGURE 2

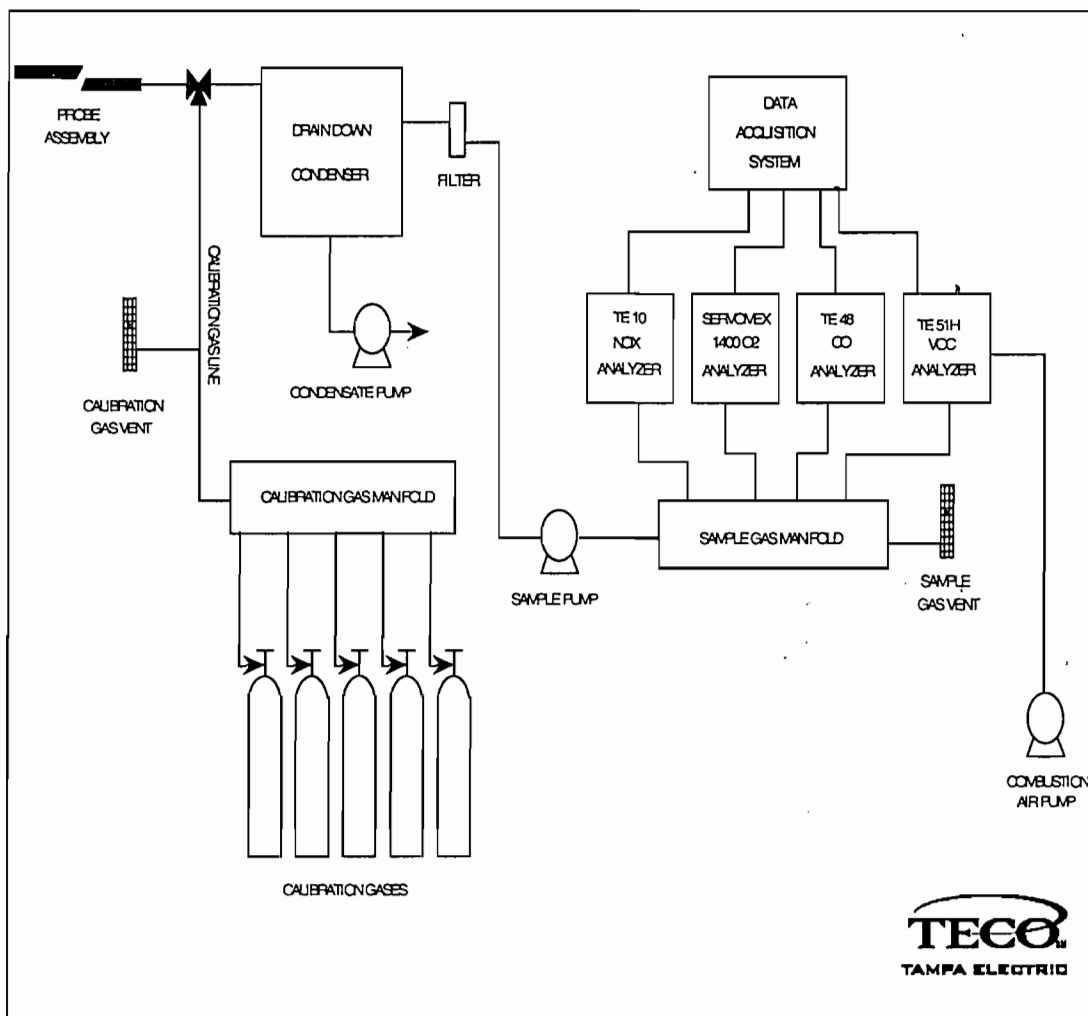


FIGURE 3  
 Extractive Method Sampling Trains  
 USEPA METHOD CDS 3A, 10, 20, 25A

**TECO**  
 TAMPA ELECTRIC

**3.0 TEST RESULTS**

---

**POLK POWER ELECTRICAL GENERATING STATION  
NITROGEN OXIDES BACT TESTING**

---

**IGCC COMBUSTION TURBINE UNIT 1  
JUNE 14, 2000**

<b>RUN NO.</b>	<b>TIME</b>	<b>O2%</b>	<b>ppm NOx Dry</b>	<b>CORRECTED 15% O2</b>
1	11:02 – 12:02	11.8	28.0	18.2
2	12:12 – 13:12	11.8	28.0	18.2
3	13:24 – 14:24	11.7	28.0	18.0
	<b>Average</b>	11.8	28.0	18.1

Corrected NOx calculated as:

Concentration (ppm NOx) x (Cd / (20.9 - %O<sub>2</sub>))

Where:

Cd = NOx coefficient of 5.9

**APPENDIX A**

**SOURCE TEST CALCULATIONS**

**APPENDIX A - 1    NITROGEN OXIDE CALCULATIONS**

**APPENDIX A - 2    OXYGEN CALCULATIONS**

**APPENDIX A - 1**

**NITROGEN OXIDE CALCULATIONS**

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1  
 SOURCE: POLK POWER STATION UNIT NO.1  
 TEST DATE: 06/14/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	0.7	1.9	1.3
49.5 ppm NOx	48.4	48.7	48.6
0.00 % Oxygen	0.00	0.04	0.02
11.96 % Oxygen	11.86	11.86	11.86
$\bar{C}(\text{NOx}) =$	28.1	$\bar{C}(\text{O}_2) =$	11.69

CORRECTED RESULTS

28 ppm NOx  
 11.8 % Oxygen  
 18.2 ppm NOx @ 15% O2

$$\text{Corr. Conc.} = \bar{C}_{ma}(C - C_o)/(C_m - C_o) \quad (\text{for NOx})$$

$$\text{Corr. Conc.} = [(C_{ma} - C_{oa})/(C_m - C_o)](C - C_m) + C_{ma} \quad (\text{for O}_2)$$

Where:  $\bar{C}$  = mean reference measurement  
 $C_o$  = mean zero calibration response  
 $C_{oa}$  = actual low-level calibration gas concentration  
 $C_m$  = mean mid or upscale calibration gas response  
 $C_{ma}$  = actual mid or upscale calibration gas concentration

$$E = (\text{ppm NOx})(5.9)/(20.9 - \% \text{ Oxygen})$$

8200  
 1.194E-07



CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2  
 SOURCE: POLK POWER STATION UNIT NO.1  
 TEST DATE: 06/14/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	1.9	3.5	2.7
49.5 ppm NOx	48.7	50.5	49.6
0.00 % Oxygen	0.04	0.01	0.03
11.96 % Oxygen	11.86	11.86	11.86
$\bar{C}(\text{NOx}) =$	28.9	$\bar{C}(\text{O}_2) =$	11.67

CORRECTED RESULTS

28 ppm NOx  
 11.8 % Oxygen  
 18.2 ppm NOx @ 15% O2

Corr. Conc. =  $\bar{C}_m(C - C_o)/(C_m - C_o)$  (for NOx)

Corr. Conc. =  $[(C_m - C_o)/(C_m - C_o)](C - C_m) + C_m$  (for O2)

Where:  $\bar{C}$  = mean reference measurement  
 C<sub>o</sub> = mean zero calibration response  
 C<sub>o</sub>a = actual low-level calibration gas concentration  
 C<sub>m</sub> = mean mid or upscale calibration gas response  
 C<sub>m</sub>a = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

8200  
 1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: POLK POWER STATION UNIT NO.1

TEST DATE: 06/14/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	3.5	3.7	3.6
49.5 ppm NOx	50.5	52.3	51.4
0.00 % Oxygen	0.01	0.03	0.02
11.96 % Oxygen	11.86	11.85	11.86
$\bar{C}(\text{NOx}) =$	30.4	$\bar{C}(\text{O}_2) =$	11.65

CORRECTED RESULTS

28 ppm NOx  
 11.7 % Oxygen  
 18.0 ppm NOx @ 15% O2

Corr. Conc. =  $\bar{C}_m(C - C_o)/(C_m - C_o)$  (for NOx)

Corr. Conc. =  $[(C_m - C_o)/(C_m - C_o)](C - C_m) + C_m$  (for O2)

- Where:  $\bar{C}$  = mean reference measurement  
 C<sub>o</sub> = mean zero calibration response  
 C<sub>o</sub>a = actual low-level calibration gas concentration  
 C<sub>m</sub> = mean mid or upscale calibration gas response  
 C<sub>m</sub>a = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

**APPENDIX A - 2**

**OXYGEN CALCULATIONS**

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 1  
 SOURCE: POLK POWER STATION UNIT 1  
 TEST DATE: 06/14/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.00	0.04	0.02
11.96 % Oxygen	11.86	11.86	11.86

$\bar{C} =$  11.69

CORRECTED RESULTS

11.8 % Oxygen

Corrected Conc. =  $C_{ma}(C - \bar{C}_o)/(C_m - C_o)$

- Where:  $\bar{C}$  = mean reference measurement  
 $C_o$  = mean zero calibration response  
 $C_m$  = mean mid or upscale calibration gas response  
 $C_{ma}$  = actual mid or upscale calibration gas concentration

# CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 2

SOURCE: POLK POWER STATION UNIT 1

TEST DATE: 06/14/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.04	0.01	0.03
11.96 % Oxygen	11.86	11.86	11.86

$\bar{C} =$  11.67

## CORRECTED RESULTS

11.8 % Oxygen

$$\text{Corrected Conc.} = C_{ma}(C - \bar{C}_o)/(C_m - C_o)$$

Where:  $\bar{C}$  = mean reference measurement

$C_o$  = mean zero calibration response

$C_m$  = mean mid or upscale calibration gas response

$C_{ma}$  = actual mid or upscale calibration gas concentration

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 3  
SOURCE: POLK POWER STATION UNIT 1  
TEST DATE: 06/14/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.01	0.03	0.02
11.96 % Oxygen	11.86	11.85	11.86

$\bar{C} =$  11.65

CORRECTED RESULTS

11.7 % Oxygen

$$\text{Corrected Conc.} = C_{ma}(C - \bar{C}_o)/(C_m - C_o)$$

Where:  $\bar{C}$  = mean reference measurement  
 $C_o$  = mean zero calibration response  
 $C_m$  = mean mid or upscale calibration gas response  
 $C_{ma}$  = actual mid or upscale calibration gas concentration

**APPENDIX B**

**TURBINE DATA**

All values are averages for time period given

TEST PERIOD 1

START TIME 06/14/2000 11:02  
END TIME 06/14/2000 12:02

1TSYFI910	GT SYNGAS	MASS FLOW	LB/SEC	101.0831985
1PWRJI900	GT GEN LOAD	WATTS	MW	190.0554962
1GMLJI962	GT GENERATOR	WATTS	MW	190.8286133
1TSYJYI910	GT SYNGAS LOWER HEATING VA	BTU/LB		248.2949524
1NITFI920A	GT N2 FLOW		LB/SEC	117.9871902
1TMSTI922M	GT CPRSR MAX INL FLANGE TE		F	87.11254883
1TMSPI909	AMBIENT BAR	PRESS	IN HGA	29.91853333



1 MINUTE AVERAGES

TEST PERIOD 1

06/14/2000 11:02  
06/14/2000 12:02

	GT SYNGAS 1TSYF1910	MASS FLOW	GT GEN LOAD 1PWRJ1900	WATTS	GT GENERATOR 1GMLJ1962	WATTS	GT SYNGAS LOWER HEATING VA 1TSVJY1910	GT N2 FLOW 1N1TF1920A	GT CPRSR MAX INL FLANGE TE 1TMST1922M	AMBIENT BAR 1TMSP1909	PRESS
14-Jun-00 11:02:00		101.2865677		190.2307281		190.4582062	248.2934113	117.4201889	87.36346436		29.91567421
14-Jun-00 11:03:00		101.326561		190.1586914		190.3091583	248.293457	117.4390869	86.21305084		29.91576958
14-Jun-00 11:04:00		100.9244766		189.3572083		190.2688599	248.2935028	117.4579926	86.28038025		29.91586494
14-Jun-00 11:05:00		101.3790131		189.5386658		190.2285767	248.2935638	117.4768906	86.24958038		29.91596031
14-Jun-00 11:06:00		101.5132065		189.7367859		190.7490387	248.2936096	117.4957886	85.95211792		29.91605568
14-Jun-00 11:07:00		101.4110107		190.2343445		190.7917633	248.2936554	117.5146866	86.23418427		29.91615105
14-Jun-00 11:08:00		101.7962418		190.1785278		191.1198273	248.2937164	117.5335922	86.5524292		29.91624641
14-Jun-00 11:09:00		101.585556		191.0018921		191.1772919	248.2937622	117.5524902	85.9364624		29.91634178
14-Jun-00 11:10:00		101.5858078		190.0549316		190.9960022	248.2938232	117.5713882	86.85529327		29.91643715
14-Jun-00 11:11:00		101.5100555		190.6380768		191.2688293	248.2938669	117.5902939	86.72695923		29.91653252
14-Jun-00 11:12:00		101.9885101		190.9232635		191.7362518	248.2939148	117.6091919	86.57296753		29.91662788
14-Jun-00 11:13:00		101.189537		190.4351807		191.010849	248.2939758	117.6280899	86.59349823		29.91672325
14-Jun-00 11:14:00		100.6897736		189.820694		190.5089569	248.2940216	117.6469879	86.28551483		29.91681862
14-Jun-00 11:15:00		101.1502151		189.9343872		190.9488678	248.2940674	117.6658936	86.65766144		29.91691399
14-Jun-00 11:16:00		101.4194183		190.1138458		190.9095306	248.2941284	117.6847916	87.11964417		29.91700935
14-Jun-00 11:17:00		100.9561462		190.5460815		190.9417267	248.2941742	117.7036896	87.91955566		29.91710663
14-Jun-00 11:18:00		101.2604141		190.2927246		191.1540985	248.2942352	117.7225952	87.56878662		29.917202
14-Jun-00 11:19:00		101.6219101		190.6934814		191.3664703	248.294281	117.7414932	87.26080322		29.91729736
14-Jun-00 11:20:00		101.2962952		190.6349335		191.5788574	248.2943268	117.7603912	86.95281982		29.91739273
14-Jun-00 11:21:00		101.2058716		190.6089325		191.4790039	248.2943878	117.7792892	87.10871887		29.9174881
14-Jun-00 11:22:00		100.9687347		190.3309937		191.2453613	248.2944336	117.7981949	87.41925049		29.91758347
14-Jun-00 11:23:00		101.4425201		189.9707794		191.0117188	248.2944794	117.8170929	87.11495972		29.91767883
14-Jun-00 11:24:00		100.946991		189.7186279		191.0656891	248.2945404	117.8359909	87.01173401		29.91777742
14-Jun-00 11:25:00		101.5787201		190.4333649		191.2429504	248.2945862	117.8548965	86.9085083		29.91786957
14-Jun-00 11:26:00		101.4692307		190.1766052		191.4201965	248.2946472	117.8737946	87.30374908		29.91796494
14-Jun-00 11:27:00		101.2720108		190.0900269		191.3154602	248.294693	117.8926926	86.9852829		29.91806003
14-Jun-00 11:28:00		100.3859558		190.0034485		191.0898743	248.2947388	117.9115906	86.67980194		29.91815567
14-Jun-00 11:29:00		101.0183258		190.0560303		190.8642731	248.2947998	117.9304962	87.32239532		29.91825104
14-Jun-00 11:30:00		100.9524536		190.2676697		191.1011353	248.2948456	117.9493942	87.75324249		29.91834641
14-Jun-00 11:31:00		100.8970947		190.4561615		191.0286255	248.2948914	117.9682922	87.65001678		29.91844177
14-Jun-00 11:32:00		101.4817047		190.6143951		191.1051788	248.2949524	117.9871979	87.54679108		29.91853714
14-Jun-00 11:33:00		101.4294891		190.7726135		191.3388214	248.2949982	118.0060959	87.76384735		29.91863441
14-Jun-00 11:34:00		101.4354401		190.9668274		191.572464	248.2950592	118.0249939	88.22583008		29.91872978
14-Jun-00 11:35:00		101.1445923		190.9950867		191.3992615	248.295105	118.0438919	88.04683685		29.91882515
14-Jun-00 11:36:00		100.9950562		189.7748413		191.0516815	248.2951508	118.0627975	87.89409637		29.91892052
14-Jun-00 11:37:00		100.6540833		189.2524414		190.3635406	248.2952118	118.0816956	87.96652222		29.91901588
14-Jun-00 11:38:00		101.3132095		189.9417114		190.343399	248.2952576	118.1005936	88.05447388		29.91911125
14-Jun-00 11:39:00		100.7201385		189.5917969		190.7059479	248.2953033	118.1194992	87.9017334		29.91920662
14-Jun-00 11:40:00		101.3501434		190.6070862		191.068512	248.2953644	118.1383972	87.46121979		29.91930199
14-Jun-00 11:41:00		101.2986984		190.6428223		191.431076	248.2954102	118.1572952	86.64437866		29.91939735
14-Jun-00 11:42:00		100.8475494		190.5777435		191.1711426	248.2954712	118.1761932	85.82754517		29.91949272
14-Jun-00 11:43:00		100.785202		190.1094666		190.6227264	248.295517	118.1950989	85.25328827		29.91958809
14-Jun-00 11:44:00		100.5554123		189.4392853		190.3947601	248.2955627	118.2139969	85.09802246		29.91968346
14-Jun-00 11:45:00		100.8765259		189.7693634		190.3041229	248.2956238	118.2328949	84.93855286		29.91977882
14-Jun-00 11:46:00		100.6071854		189.2576447		190.2134705	248.2956696	118.2518005	85.70225525		29.91987419
14-Jun-00 11:47:00		101.047699		189.5324554		190.1228333	248.2957153	118.2706985	86.46596527		29.91996956
14-Jun-00 11:48:00		100.6603775		189.6877136		189.9278412	248.2957764	118.2895966	87.22966766		29.92006683
14-Jun-00 11:49:00		100.3746262		189.4219055		189.6881409	248.2958221	118.3084946	87.77864838		29.9201622
14-Jun-00 11:50:00		101.0079498		189.6776428		189.4856567	248.2958832	118.3274002	87.62208557		29.92025757
14-Jun-00 11:51:00		100.5593033		189.283905		190.6006317	248.295929	118.3462982	87.63336945		29.92035294
14-Jun-00 11:52:00		100.5752182		190.6306458		190.2171021	248.2959747	118.3651962	86.82363892		29.9204483
14-Jun-00 11:53:00		100.612114		189.5817413		190.3170929	248.2960358	118.3841019	86.71669006		29.92054367
14-Jun-00 11:54:00		100.8192596		189.1432037		190.6411743	248.2960815	118.4029999	87.54788208		29.92063904
14-Jun-00 11:55:00		101.0154266		189.415741		190.9652405	248.2961273	118.4218979	87.85337067		29.92073441
14-Jun-00 11:56:00		101.3187027		190.3356018		190.9953461	248.2961884	118.4407959	88.0667038		29.92082977
14-Jun-00 11:57:00		100.9744568		189.7954254		190.8994751	248.2962341	118.4597015	87.52772522		29.92092514
14-Jun-00 11:58:00		100.9598083		189.7370758		190.2910309	248.2962952	118.4785995	87.83571625		29.92102051
14-Jun-00 11:59:00		100.2770844		189.861145		190.3864899	248.2963409	118.4974976	88.17670441		29.92111588
14-Jun-00 12:00:00		100.6613388		189.0432434		190.4773712	248.2963867	118.5164032	89.12573242		29.92121124
14-Jun-00 12:01:00		100.7856979		189.3665161		190.3639526	248.2964478	118.5353012	88.95676422		29.92118645
14-Jun-00 12:02:00		100.7391586		189.5251312		190.2505188	248.2964935	118.5541992	88.78780365		29.92102432

Record#	DATE	TIME	PC1CO211	PC1NOX12	PC1GEN13	PC1NOX14	PC1PRS15	PC1TMP16
1	06/14/2000	110200	7.818	27.611	188.973	0.097	29.932	316.661
2	06/14/2000	110300	7.813	27.658	188.844	0.098	29.935	316.652
3	06/14/2000	110400	7.806	27.49	188.802	0.097	29.93	316.652
4	06/14/2000	110500	7.811	27.816	189.023	0.098	29.931	316.674
5	06/14/2000	110600	7.806	27.866	188.978	0.098	29.932	316.655
6	06/14/2000	110700	7.798	27.631	189.013	0.098	29.932	316.597
7	06/14/2000	110800	7.808	27.846	188.897	0.098	29.932	316.584
8	06/14/2000	110900	7.81	27.684	189.342	0.098	29.932	316.579
9	06/14/2000	111000	7.812	27.658	189.362	0.098	29.932	316.597
10	06/14/2000	111100	7.81	27.647	188.768	0.098	29.933	316.555
11	06/14/2000	111200	7.81	28.066	188.978	0.099	29.93	316.579
12	06/14/2000	111300	7.803	28.316	189.599	0.1	29.932	316.61
13	06/14/2000	111400	7.806	28.405	189.756	0.1	29.931	316.656
14	06/14/2000	111500	7.807	28.391	188.953	0.1	29.93	316.681
15	06/14/2000	111600	7.8	28.146	188.607	0.1	29.929	316.681
16	06/14/2000	111700	7.8	27.391	188.369	0.097	29.93	316.671
17	06/14/2000	111800	7.794	27.191	188.433	0.096	29.93	316.677
18	06/14/2000	111900	7.793	27.712	188.82	0.098	29.93	316.617
19	06/14/2000	112000	7.792	27.73	188.746	0.098	29.93	316.597
20	06/14/2000	112100	7.798	27.84	188.922	0.098	29.933	316.583
21	06/14/2000	112200	7.798	27.668	189.357	0.098	29.93	316.539
22	06/14/2000	112300	7.804	27.718	190.111	0.098	29.93	316.584
23	06/14/2000	112400	7.807	27.856	189.801	0.098	29.931	316.608
24	06/14/2000	112500	7.809	28.03	189.749	0.099	29.931	316.612
25	06/14/2000	112600	7.808	27.74	189.655	0.098	29.929	316.586
26	06/14/2000	112700	7.812	28.022	190.198	0.099	29.927	316.635
27	06/14/2000	112800	7.808	28.118	190.161	0.099	29.926	316.666
28	06/14/2000	112900	7.811	28.418	189.798	0.1	29.924	316.684
29	06/14/2000	113000	7.803	28.432	189.958	0.101	29.923	316.665
30	06/14/2000	113100	7.794	28.202	189.769	0.1	29.924	316.658
31	06/14/2000	113200	7.797	28.358	189.971	0.1	29.924	316.607
32	06/14/2000	113300	7.799	28.132	188.868	0.099	29.927	316.586
33	06/14/2000	113400	7.798	27.946	188.88	0.099	29.925	316.604
34	06/14/2000	113500	7.796	28.13	188.89	0.1	29.924	316.582
35	06/14/2000	113600	7.793	28.05	188.87	0.099	29.922	316.598
36	06/14/2000	113700	7.79	28.274	189.102	0.1	29.925	316.609
37	06/14/2000	113800	7.804	28.475	190.143	0.101	29.927	316.608
38	06/14/2000	113900	7.812	28.508	190.236	0.101	29.923	316.627
39	06/14/2000	114000	7.807	28.249	189.603	0.1	29.924	316.674
40	06/14/2000	114100	7.808	27.923	189.545	0.099	29.922	316.67
41	06/14/2000	114200	7.798	27.874	189.348	0.099	29.922	316.655
42	06/14/2000	114300	7.802	27.783	189.717	0.098	29.923	316.651
43	06/14/2000	114400	7.806	28.224	189.79	0.1	29.92	316.66
44	06/14/2000	114500	7.807	28.362	190.142	0.1	29.922	316.582
45	06/14/2000	114600	7.81	28.049	190.206	0.099	29.923	316.62
46	06/14/2000	114700	7.805	28	190.375	0.099	29.922	316.605
47	06/14/2000	114800	7.802	27.864	189.963	0.098	29.924	316.591
48	06/14/2000	114900	7.804	27.774	189.929	0.098	29.923	316.587
49	06/14/2000	115000	7.8	27.714	189.379	0.098	29.924	316.593
50	06/14/2000	115100	7.809	27.611	188.967	0.098	29.925	316.578
51	06/14/2000	115200	7.814	27.64	189.041	0.098	29.924	316.608
52	06/14/2000	115300	7.812	27.631	188.698	0.098	29.925	316.674
53	06/14/2000	115400	7.804	27.549	188.716	0.097	29.919	316.706
54	06/14/2000	115500	7.807	27.801	189.264	0.098	29.918	316.722
55	06/14/2000	115600	7.802	27.95	189.288	0.099	29.92	316.72
56	06/14/2000	115700	7.802	27.824	188.981	0.098	29.923	316.691
57	06/14/2000	115800	7.806	27.702	188.786	0.098	29.917	316.649
58	06/14/2000	115900	7.803	27.715	188.902	0.098	29.918	316.703
59	06/14/2000	120000	7.8	27.932	189.614	0.099	29.916	316.683
60	06/14/2000	120100	7.804	28.019	190.016	0.099	29.917	316.693
61	06/14/2000	120200	7.804	28.053	189.785	0.099	29.918	316.693
62	/ /							
63	/ /	AVE	7.804	27.925	189.357	0.099	29.926	316.633

All values are averages for time period given

TEST PERIOD 2

START TIME 06/14/2000 12:12  
END TIME 06/14/2000 13:12

1TSYFI910	GT SYNGAS	MASS FLOW	LB/SEC	100.936348
1PWRJI900	GT GEN LOAD	WATTS	MW	190.0282288
1GMLJI962	GT GENERATOR	WATTS	MW	190.5310822
1TSYJYI910	GT SYNGAS LOWER HEATING VA	BTU/LB		248.2975006
1NITFI920A	GT N2 FLOW	LB/SEC		118.3711548
1TMSTI922M	GT CPRSR MAX INL FLANGE TE	F		89.1245575
1TMSPI909	AMBIENT BAR	PRESS	IN HGA	29.91452789

Record#	DATE	TIME	PC1CO211	PC1NOX12	PC1GEN13	PC1NOX14	PC1PRS15	PC1TMP16
1	06/14/2000	121200	7.536	26.521	188.567	0.097	29.918	316.694
2	06/14/2000	121300	7.571	26.809	188.961	0.098	29.916	316.675
3	06/14/2000	121400	7.593	26.923	188.594	0.098	29.915	316.683
4	06/14/2000	121500	7.613	26.939	189.321	0.098	29.915	316.73
5	06/14/2000	121600	7.638	27.08	189.213	0.098	29.917	316.685
6	06/14/2000	121700	7.65	26.825	188.418	0.097	29.916	316.682
7	06/14/2000	121800	7.669	26.6	188.302	0.096	29.913	316.715
8	06/14/2000	121900	7.677	26.877	189.14	0.097	29.912	316.795
9	06/14/2000	122000	7.695	26.773	189.581	0.096	29.913	316.801
10	06/14/2000	122100	7.698	26.783	190.183	0.096	29.912	316.785
11	06/14/2000	122200	7.708	26.731	189.54	0.096	29.914	316.726
12	06/14/2000	122300	7.716	26.703	189.526	0.095	29.915	316.731
13	06/14/2000	122400	7.715	26.568	189.748	0.095	29.913	316.671
14	06/14/2000	122500	7.718	26.647	189.328	0.095	29.914	316.742
15	06/14/2000	122600	7.72	26.789	189.318	0.096	29.915	316.685
16	06/14/2000	122700	7.723	26.786	189.127	0.096	29.912	316.721
17	06/14/2000	122800	7.724	26.932	190.3	0.096	29.91	316.704
18	06/14/2000	122900	7.731	26.932	189.643	0.096	29.91	316.695
19	06/14/2000	123000	7.748	26.898	190.296	0.096	29.912	316.707
20	06/14/2000	123100	7.756	27.075	189.702	0.096	29.911	316.686
21	06/14/2000	123200	7.749	26.846	188.458	0.096	29.911	316.755
22	06/14/2000	123300	7.771	26.811	188.748	0.095	29.914	316.835
23	06/14/2000	123400	7.767	27.074	189.229	0.096	29.913	316.796
24	06/14/2000	123500	7.769	27.322	189.324	0.097	29.913	316.754
25	06/14/2000	123600	7.766	27.271	189.481	0.097	29.912	316.754
26	06/14/2000	123700	7.768	26.881	189.218	0.095	29.909	316.688
27	06/14/2000	123800	7.77	26.952	189.757	0.096	29.912	316.653
28	06/14/2000	123900	7.773	27.276	190.434	0.097	29.909	316.664
29	06/14/2000	124000	7.76	27.108	189.574	0.096	29.91	316.7
30	06/14/2000	124100	7.77	26.724	189.399	0.095	29.91	316.72
31	06/14/2000	124200	7.772	26.982	189.702	0.096	29.912	316.719
32	06/14/2000	124300	7.776	26.826	189.774	0.095	29.911	316.713
33	06/14/2000	124400	7.77	26.497	189.926	0.094	29.908	316.679
34	06/14/2000	124500	7.767	26.699	190.115	0.095	29.911	316.739
35	06/14/2000	124600	7.769	26.636	189.973	0.095	29.909	316.768
36	06/14/2000	124700	7.763	26.812	189.563	0.095	29.91	316.818
37	06/14/2000	124800	7.761	26.703	189.448	0.095	29.908	316.79
38	06/14/2000	124900	7.761	26.881	189.745	0.096	29.91	316.776
39	06/14/2000	125000	7.752	26.788	189.892	0.095	29.908	316.763
40	06/14/2000	125100	7.758	26.577	189.955	0.094	29.909	316.675
41	06/14/2000	125200	7.76	26.508	190.011	0.094	29.908	316.672
42	06/14/2000	125300	7.758	26.621	189.621	0.095	29.907	316.7
43	06/14/2000	125400	7.749	26.494	189.16	0.094	29.907	316.722
44	06/14/2000	125500	7.749	26.694	189.119	0.095	29.908	316.718
45	06/14/2000	125600	7.747	27.08	189.384	0.096	29.91	316.677
46	06/14/2000	125700	7.752	27.198	189.255	0.097	29.909	316.724
47	06/14/2000	125800	7.76	27.268	189.75	0.097	29.907	316.714
48	06/14/2000	125900	7.76	27.229	190.105	0.097	29.906	316.695
49	06/14/2000	130000	7.76	27.352	189.866	0.097	29.906	316.811
50	06/14/2000	130100	7.759	27.06	190.084	0.096	29.904	316.81
51	06/14/2000	130200	7.745	27.039	190.127	0.096	29.907	316.788
52	06/14/2000	130300	7.744	26.937	189.188	0.096	29.907	316.77
53	06/14/2000	130400	7.739	26.909	189.451	0.096	29.907	316.68
54	06/14/2000	130500	7.746	26.592	189.135	0.095	29.905	316.7
55	06/14/2000	130600	7.748	26.433	189.28	0.094	29.905	316.668
56	06/14/2000	130700	7.744	26.447	189.101	0.094	29.903	316.697
57	06/14/2000	130800	7.736	26.646	189.052	0.095	29.9	316.698
58	06/14/2000	130900	7.733	26.837	188.325	0.096	29.902	316.682
59	06/14/2000	131000	7.74	27.146	189.304	0.097	29.901	316.708
60	06/14/2000	131100	7.745	27.031	188.725	0.096	29.901	316.673
61	06/14/2000	131200	7.746	26.937	188.89	0.096	29.902	316.658
62	/ /							
63	/ /	AVE	7.732	26.858	189.434	0.096	29.910	316.722

All values are averages for time period given

TEST PERIOD 3

START TIME 06/14/2000 13:24  
END TIME 06/14/2000 14:24

1TSYFI910	GT SYNGAS	MASS FLOW	LB/SEC	100.9199677
1PWRJI900	GT GEN LOAD	WATTS	MW	190.10112
1GMLJI962	GT GENERATOR	WATTS	MW	190.3572083
1TSYJY1910	GT SYNGAS LOWER HEATING VA	BTU/LB		248.2943268
1NITFI920A	GT N2 FLOW		LB/SEC	117.9627991
1TMSTI922M	GT CPRSR MAX INL FLANGE TE		F	91.48574066
1TMSP1909	AMBIENT BAR	PRESS	IN HGA	29.90283394

## 1 MINUTE AVERAGES

TEST PERIOD 3  
06/14/2000 13:24  
06/14/2000 14:24

	GT SYNGAS 1TSYF1910	MASS FLOW	GT GEN LOAD 1PWRJ1900	WATTS	GT GENERATOR 1GMLJ1962	WATTS	GT SYNGAS LOWER HEATING VA 1TSYJ1910	GT N2 FLOW 1NITF1920A	GT CPRSR MAX INL FLANGE TE 1TMST1922M	AMBIENT BAR 1TMSP1909	PRESS
14-Jun-00 13:24:00		101.0293884		190.1835022		191.0695801	248.2958679	118.1329498	89.65770721		29.90770721
14-Jun-00 13:25:00		101.2683334		190.3696136		191.0004272	248.2958221	118.1272812	89.56472778		29.90754509
14-Jun-00 13:26:00		101.3412781		190.5557098		190.6620483	248.2957611	118.1216049	90.02620697		29.90738297
14-Jun-00 13:27:00		101.0849304		190.741806		190.687027	248.2957153	118.1159363	90.13106537		29.90721893
14-Jun-00 13:28:00		101.2590408		190.8951569		190.8803864	248.2956696	118.11026	90.24101257		29.90705681
14-Jun-00 13:29:00		101.1859512		190.4262238		190.7764587	248.2956085	118.1045914	89.80301666		29.90689468
14-Jun-00 13:30:00		101.130249		189.9572754		190.5347443	248.2955627	118.0989227	90.11354828		29.90673256
14-Jun-00 13:31:00		101.1371002		190.3279572		190.7448578	248.295517	118.0932465	90.10095215		29.90657043
14-Jun-00 13:32:00		101.7307053		190.6986389		191.1643524	248.2954559	118.0875778	90.41407776		29.90640831
14-Jun-00 13:33:00		101.5091553		190.5589142		191.1335602	248.2954102	118.0819016	90.39296722		29.90624619
14-Jun-00 13:34:00		101.3870621		190.3923187		190.8776398	248.2953491	118.0762329	90.59941864		29.90608215
14-Jun-00 13:35:00		101.4113922		190.4670563		190.8956909	248.2953033	118.0705643	90.80587769		29.90592003
14-Jun-00 13:36:00		100.7643204		189.9744415		190.4874115	248.2952576	118.064888	91.05820465		29.9057579
14-Jun-00 13:37:00		100.539566		189.481842		189.8227081	248.2951965	118.0592194	91.93622589		29.90559578
14-Jun-00 13:38:00		101.0221634		189.9667358		190.0251465	248.2951508	118.0535507	91.8341217		29.90543365
14-Jun-00 13:39:00		100.9250183		189.7986145		189.96875	248.295105	118.0478745	91.73200989		29.90527153
14-Jun-00 13:40:00		101.131012		190.2192535		190.3824768	248.2950439	118.0422058	91.6299057		29.90510941
14-Jun-00 13:41:00		101.2488251		190.8091125		191.1559296	248.2949982	118.0365295	91.91739655		29.90494537
14-Jun-00 13:42:00		100.7913437		190.5690765		190.8227844	248.2949371	118.0308609	91.50674438		29.90478325
14-Jun-00 13:43:00		100.6914444		190.8774109		190.636795	248.2948914	118.0251923	91.04476166		29.90462112
14-Jun-00 13:44:00		101.5193634		190.9445648		190.7566528	248.2948456	118.019516	92.10731506		29.904459
14-Jun-00 13:45:00		100.9940796		190.1527863		190.2487335	248.2947845	118.0138474	92.51870728		29.90429688
14-Jun-00 13:46:00		101.3424759		190.0513763		190.0016479	248.2947388	118.0081711	92.43218994		29.90413475
14-Jun-00 13:47:00		100.3654785		189.8736877		190.0419312	248.294693	118.0025024	92.27692413		29.90397072
14-Jun-00 13:48:00		100.8859558		189.6569672		190.0822144	248.294632	117.9968338	91.25701141		29.90380859
14-Jun-00 13:49:00		100.6305466		189.5329132		189.7733612	248.2945862	117.9911575	90.75730896		29.90364647
14-Jun-00 13:50:00		100.9135361		189.7187653		189.9345093	248.2945251	117.9854889	90.92156982		29.90348434
14-Jun-00 13:51:00		100.3780899		189.2437439		189.8055878	248.2944794	117.9798126	91.9225235		29.90332222
14-Jun-00 13:52:00		100.5743179		189.7070313		189.031189	248.2944336	117.974144	92.02142334		29.9031601
14-Jun-00 13:53:00		100.5889053		189.3224945		190.0150757	248.2943726	117.9684753	91.40763855		29.90299797
14-Jun-00 13:54:00		100.5309372		189.526001		189.7129364	248.2943268	117.9627991	91.80545044		29.90283394
14-Jun-00 13:55:00		101.0110779		189.8430939		190.3373413	248.294281	117.9571304	92.52803802		29.90267181
14-Jun-00 13:56:00		101.0245895		189.6789551		190.5108643	248.29422	117.9514618	93.25061798		29.90250969
14-Jun-00 13:57:00		100.7905807		189.0805969		190.2272949	248.2941742	117.9457855	93.38546753		29.90234756
14-Jun-00 13:58:00		101.0825882		189.1253204		189.9437408	248.2941132	117.9401169	93.31359863		29.90218544
14-Jun-00 13:59:00		101.1094589		190.1609039		190.266861	248.2940674	117.9344406	92.45124054		29.90202332
14-Jun-00 14:00:00		100.8877029		190.6460724		190.8711243	248.2940216	117.928772	92.16306305		29.90186119
14-Jun-00 14:01:00		100.4145279		190.2737579		190.1689453	248.2939606	117.9231033	92.00779724		29.90169716
14-Jun-00 14:02:00		101.3360977		190.3631287		190.6343536	248.2939148	117.9174271	92.33454132		29.90153503
14-Jun-00 14:03:00		101.5100555		190.5273132		190.897995	248.293869	117.9117584	92.49110413		29.90137291
14-Jun-00 14:04:00		101.546257		190.8847351		190.6572876	248.293808	117.9060822	92.4794693		29.90121078
14-Jun-00 14:05:00		100.8915939		190.3410339		190.4165802	248.2937622	117.9004135	91.70950317		29.90104866
14-Jun-00 14:06:00		100.5445938		190.2789001		190.1758728	248.2937012	117.8947449	91.29080963		29.90088654
14-Jun-00 14:07:00		100.7149429		190.1387329		190.3332977	248.2936554	117.8890686	91.45027924		29.9007225
14-Jun-00 14:08:00		100.7590866		190.6975098		190.6897736	248.2936096	117.8834	91.55807495		29.90056038
14-Jun-00 14:09:00		101.0471649		190.6067047		191.0462646	248.2935486	117.8777237	91.40407562		29.90039825
14-Jun-00 14:10:00		100.9668274		190.3373718		190.6058502	248.2935028	117.8720551	91.62480164		29.90023613
14-Jun-00 14:11:00		100.8668454		189.4582977		189.7961273	248.293457	117.8663864	91.96923065		29.90007401
14-Jun-00 14:12:00		100.2751541		189.8146882		189.6652527	248.293396	117.8607101	92.09066772		29.89991188
14-Jun-00 14:13:00		100.6809692		190.0552826		189.848938	248.2933502	117.8550415	91.63243866		29.89974976
14-Jun-00 14:14:00		100.8723145		189.6230164		190.0326385	248.2932892	117.8493729	91.31168365		29.89958572
14-Jun-00 14:15:00		100.572464		190.0802765		190.2163391	248.2932434	117.8436966	91.13424683		29.8994236
14-Jun-00 14:16:00		100.7472153		189.6885376		190.4000397	248.2931976	117.838028	91.02579498		29.89926147
14-Jun-00 14:17:00		100.2488785		189.3349304		189.880127	248.2931366	117.8323517	91.12789917		29.89909935
14-Jun-00 14:18:00		100.4880676		189.7056122		189.8159332	248.2930908	117.826683	91.23000336		29.89893723
14-Jun-00 14:19:00		100.8317795		190.0762939		190.1140442	248.293045	117.8210144	91.12689209		29.8987751
14-Jun-00 14:20:00		100.7814407		190.1205902		190.4121399	248.292984	117.8153381	90.51233673		29.89861298
14-Jun-00 14:21:00		101.3631516		190.835907		190.3028412	248.2929382	117.8096695	91.27604675		29.89844894
14-Jun-00 14:22:00		100.6302109		189.8986816		190.0047302	248.2928772	117.8039932	91.94819641		29.89828682
14-Jun-00 14:23:00		100.800705		189.9887238		189.7066345	248.2928314	117.7983246	92.02519226		29.89812469
14-Jun-00 14:24:00		100.6222763		189.7379303		189.6122284	248.2927856	117.7926559	92.10218811		29.89796257

Record#	DATE	TIME	PC1CO211	PC1NOX12	PC1GEN13	PC1NOX14	PC1PRS15	C1TMP16
1	06/14/2000	132400	7.763	27.502	189.454	0.098	29.896	316.721
2	06/14/2000	132500	7.754	27.806	189.812	0.099	29.893	316.713
3	06/14/2000	132600	7.752	27.835	190.145	0.099	29.894	316.739
4	06/14/2000	132700	7.77	27.914	190.067	0.099	29.893	316.858
5	06/14/2000	132800	7.783	27.954	189.23	0.099	29.889	316.772
6	06/14/2000	132900	7.768	27.288	189.143	0.097	29.89	316.792
7	06/14/2000	133000	7.767	27.634	189.432	0.098	29.891	316.713
8	06/14/2000	133100	7.78	27.685	189.129	0.098	29.889	316.708
9	06/14/2000	133200	7.791	27.727	189.249	0.098	29.888	316.686
10	06/14/2000	133300	7.8	27.678	189.298	0.098	29.891	316.706
11	06/14/2000	133400	7.802	27.608	188.881	0.098	29.891	316.721
12	06/14/2000	133500	7.791	27.584	188.943	0.098	29.891	316.726
13	06/14/2000	133600	7.79	27.695	189.369	0.098	29.892	316.691
14	06/14/2000	133700	7.8	27.744	189.538	0.098	29.892	316.731
15	06/14/2000	133800	7.789	27.653	189.908	0.098	29.892	316.683
16	06/14/2000	133900	7.79	27.794	189.842	0.098	29.892	316.731
17	06/14/2000	134000	7.781	27.661	189.439	0.098	29.892	316.677
18	06/14/2000	134100	7.783	27.553	189.33	0.098	29.892	316.827
19	06/14/2000	134200	7.782	27.482	189.118	0.097	29.892	316.789
20	06/14/2000	134300	7.781	27.462	189.181	0.097	29.889	316.77
21	06/14/2000	134400	7.782	27.386	189.54	0.097	29.889	316.754
22	06/14/2000	134500	7.784	27.402	189.523	0.097	29.888	316.674
23	06/14/2000	134600	7.788	27.435	189.445	0.097	29.888	316.69
24	06/14/2000	134700	7.796	27.17	189.113	0.096	29.891	316.695
25	06/14/2000	134800	7.799	27.17	188.825	0.096	29.889	316.693
26	06/14/2000	134900	7.791	27.563	189.116	0.098	29.89	316.723
27	06/14/2000	135000	7.78	27.098	189.341	0.096	29.888	316.697
28	06/14/2000	135100	7.801	27.402	190.003	0.097	29.886	316.747
29	06/14/2000	135200	7.795	27.919	189.982	0.099	29.885	316.706
30	06/14/2000	135300	7.802	27.859	189.981	0.098	29.887	316.69
31	06/14/2000	135400	7.796	27.597	189.965	0.098	29.884	316.701
32	06/14/2000	135500	7.8	27.415	189.7	0.097	29.884	316.821
33	06/14/2000	135600	7.795	27.451	189.205	0.097	29.883	316.814
34	06/14/2000	135700	7.788	27.391	189.755	0.097	29.881	316.768
35	06/14/2000	135800	7.791	27.653	189.524	0.098	29.88	316.771
36	06/14/2000	135900	7.777	27.815	189.309	0.099	29.881	316.713
37	06/14/2000	140000	7.766	27.506	189.507	0.098	29.881	316.687
38	06/14/2000	140100	7.767	27.66	188.88	0.098	29.882	316.713
39	06/14/2000	140200	7.77	27.683	188.721	0.098	29.881	316.718
40	06/14/2000	140300	7.782	28.033	190.445	0.099	29.88	316.71
41	06/14/2000	140400	7.785	28.416	190.195	0.101	29.882	316.686
42	06/14/2000	140500	7.794	28.306	189.143	0.1	29.88	316.729
43	06/14/2000	140600	7.79	27.979	189.105	0.099	29.884	316.74
44	06/14/2000	140700	7.785	27.891	189.121	0.099	29.881	316.73
45	06/14/2000	140800	7.78	27.676	189.737	0.098	29.88	316.723
46	06/14/2000	140900	7.774	27.728	189.585	0.098	29.878	316.748
47	06/14/2000	141000	7.75	27.471	188.98	0.098	29.88	316.853
48	06/14/2000	141100	7.736	27.57	188.883	0.098	29.878	316.815
49	06/14/2000	141200	7.727	27.49	189.061	0.098	29.878	316.79
50	06/14/2000	141300	7.724	27.667	188.798	0.099	29.876	316.773
51	06/14/2000	141400	7.718	27.559	188.686	0.098	29.874	316.677
52	06/14/2000	141500	7.704	27.459	188.498	0.098	29.873	316.692
53	06/14/2000	141600	7.693	27.577	188.435	0.099	29.874	316.775
54	06/14/2000	141700	7.697	28.036	188.903	0.1	29.873	316.752
55	06/14/2000	141800	7.703	28.084	189.429	0.101	29.874	316.672
56	06/14/2000	141900	7.705	28.378	189.547	0.102	29.874	316.75
57	06/14/2000	142000	7.709	27.984	188.423	0.1	29.875	316.752
58	06/14/2000	142100	7.714	27.685	188.075	0.099	29.871	316.711
59	06/14/2000	142200	7.717	28.053	187.605	0.1	29.872	316.706
60	06/14/2000	142300	7.718	28.063	187.002	0.1	29.873	316.717
61	06/14/2000	142400	7.717	27.915	187.055	0.1	29.87	316.839
62	/ /							
63	/ /	AVE	7.767	27.686	189.224	0.098	29.884	316.736

**APPENDIX C**

**UNCORRECTED REFERENCE METHOD DATA SHEETS**



POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

06-14-2000

CHAN 3

STACK

TIME	%O <sub>2</sub>
09:42	11.67
09:43	11.67
09:44	11.68
09:45	11.68
09:46	11.69
09:47	11.68
09:48	11.66
09:49	11.68
09:50	11.70
09:51	11.69
09:52	11.68
09:53	11.68

AVERAGE VALUES FOR THE LAST 12 MINUTES

09:53 11.68

COMMENTS: O2 TRAVERSE EAST PORT

## POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

06-14-2000

CHAN 3

STACK

TIME	%O2
09:59	11.69
10:00	11.69
10:01	11.67
10:02	11.69
10:03	11.68
10:04	11.69
10:05	11.70
10:06	11.70
10:07	11.68
10:08	11.67
10:09	11.68
10:10	11.99

AVERAGE VALUES FOR THE LAST 12 MINUTES

10:10 11.71

COMMENTS: O2 TRAVERSE SOUTH PORT

POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

06-14-2000

CHAN 3  
STACK

TIME	%O2
10:20	11.70
10:21	11.70
10:22	11.68
10:23	11.67
10:24	11.68
10:25	11.70
10:26	11.69
10:27	11.69
10:28	11.67
10:29	11.69
10:30	11.70
10:31	11.69

AVERAGE VALUES FOR THE LAST 12 MINUTES

10:31 11.69

COMMENTS: O2 TRAVERSE WEST PORT

POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

06-14-2000

CHAN 3  
STACK

TIME	%O <sub>2</sub>
10:35	11.69
10:36	11.70
10:37	11.69
10:38	11.69
10:39	11.67
10:40	11.63
10:41	11.64
10:42	11.65
10:43	11.65
10:44	11.66
10:45	11.66
10:46	11.65

AVERAGE VALUES FOR THE LAST 12 MINUTES

10:46 11.66

COMMENTS: O2 TRAVERSE NORTH PORT

## POLK UNIT NO.1 SYNGAS COMPLIANCE TEST 06-14-2000

TIME	CHAN 3 STACK %O2	CHAN 4 STACK ppmCO	CHAN 6 STACK ppmNOX	STACK ppmNOX @15%O2
11:03	11.67	4.1	27.7	17.7
11:04	11.66	4.3	27.3	17.4
11:05	11.68	4.2	27.6	17.7
11:06	11.70	4.2	28.0	17.9
11:07	11.69	4.0	27.8	17.8
11:08	11.67	4.2	27.6	17.6
11:09	11.66	4.2	27.5	17.6
11:10	11.67	4.3	27.5	17.5
11:11	11.67	4.2	27.6	17.6
11:12	11.68	4.2	28.0	17.9
11:13	11.68	4.0	27.6	17.7
11:14	11.68	4.3	27.8	17.8
11:15	11.67	4.1	27.8	17.8
11:16	11.67	4.3	27.9	17.8
11:17	11.68	4.0	28.0	17.9
11:18	11.69	4.3	28.1	18.0
11:19	11.67	4.2	27.7	17.7
11:20	11.68	4.3	28.0	17.9
11:21	11.68	4.2	28.2	18.1
11:22	11.69	4.1	28.4	18.2
11:23	11.70	4.1	28.6	18.4
11:24	11.70	4.1	28.6	18.3
11:25	11.70	4.1	28.3	18.1
11:26	11.68	4.3	28.1	18.0
11:27	11.68	4.2	28.0	17.9
11:28	11.69	4.3	28.2	18.1
11:29	11.69	4.1	28.4	18.2
11:30	11.70	4.2	28.5	18.3
11:31	11.71	4.0	28.6	18.3
11:32	11.70	4.2	28.5	18.3
11:33	11.69	4.1	28.6	18.3
11:34	11.67	4.5	28.1	17.9
11:35	11.65	4.4	28.1	17.9
11:36	11.67	4.5	28.3	18.1
11:37	11.68	4.2	28.3	18.1
11:38	11.70	4.3	28.5	18.3
11:39	11.70	4.3	28.2	18.1
11:40	11.71	4.3	28.3	18.2
11:41	11.70	4.2	28.3	18.1
11:42	11.69	4.3	27.9	17.9
11:43	11.69	4.3	27.9	17.9
11:44	11.69	4.3	28.2	18.1
11:45	11.71	4.2	28.3	18.2
11:46	11.72	4.1	28.5	18.3
11:47	11.72	4.2	28.4	18.2
11:48	11.71	4.1	28.1	18.1
11:49	11.70	4.4	28.1	18.0
11:50	11.70	4.2	28.1	18.0
11:51	11.70	4.4	28.2	18.1
11:52	11.70	4.2	28.1	18.0
11:53	11.71	4.3	28.4	18.3
11:54	11.70	4.1	28.3	18.1
11:55	11.71	4.3	28.2	18.1
11:56	11.70	4.2	28.4	18.2
11:57	11.69	4.4	28.0	17.9

POLK UNIT NO.1 SYNGAS COMPLIANCE TEST 06-14-2000

	CHAN 3	CHAN 4	CHAN 6	STACK
	STACK	STACK	STACK	ppmNOX
TIME	%O2	ppmCO	ppmNOX	@15%O2
11:58	11.69	4.2	28.0	17.9
11:59	11.67	4.4	27.9	17.9
12:00	11.69	4.2	28.5	18.2
12:01	11.69	4.3	28.6	18.4
12:02	11.70	4.1	28.8	18.5

-----  
 AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA  
 12:02 11.69 4.2 28.1 18.0  
 -----

COMMENTS: END RUN ONE

## POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

06-14-2000

TIME	CHAN 3 STACK %O2	CHAN 4 STACK ppmCO	CHAN 6 STACK ppmNOX	STACK ppmNOX @15%O2
12:13	11.63	4.3	28.6	18.2
12:14	11.64	4.6	28.4	18.1
12:15	11.66	4.4	28.7	18.3
12:16	11.67	4.4	28.9	18.5
12:17	11.67	4.3	29.1	18.6
12:18	11.68	4.3	29.1	18.6
12:19	11.68	4.3	28.9	18.5
12:20	11.68	4.3	29.3	18.7
12:21	11.67	4.3	28.8	18.4
12:22	11.67	4.3	28.9	18.4
12:23	11.68	4.4	29.0	18.6
12:24	11.68	4.2	29.0	18.6
12:25	11.69	4.4	29.3	18.8
12:26	11.70	4.1	29.4	18.8
12:27	11.69	4.3	29.3	18.8
12:28	11.69	4.1	29.1	18.6
12:29	11.68	4.4	28.8	18.5
12:30	11.69	4.2	28.8	18.5
12:31	11.67	4.3	28.7	18.4
12:32	11.69	4.3	29.2	18.7
12:33	11.70	4.2	29.2	18.7
12:34	11.68	4.3	28.9	18.5
12:35	11.69	4.3	28.9	18.5
12:36	11.68	4.4	28.7	18.4
12:37	11.68	4.3	28.7	18.4
12:38	11.68	4.4	28.5	18.2
12:39	11.68	4.3	28.6	18.3
12:40	11.68	4.5	28.6	18.3
12:41	11.68	4.2	28.7	18.4
12:42	11.67	4.4	28.6	18.3
12:43	11.68	4.2	29.0	18.6
12:44	11.69	4.3	29.1	18.6
12:45	11.68	4.2	28.9	18.5
12:46	11.67	4.3	28.9	18.5
12:47	11.67	4.4	28.9	18.5
12:48	11.68	4.2	29.1	18.6
12:49	11.68	4.4	29.2	18.7
12:50	11.68	4.3	29.3	18.7
12:51	11.67	4.4	29.2	18.7
12:52	11.67	4.2	29.0	18.6
12:53	11.66	4.5	28.7	18.3
12:54	11.65	4.4	28.5	18.2
12:55	11.66	4.4	28.7	18.3
12:56	11.66	4.5	28.8	18.4
12:57	11.66	4.4	28.8	18.4
12:58	11.67	4.5	29.1	18.6
12:59	11.67	4.2	28.9	18.5
13:00	11.68	4.4	28.9	18.5
13:01	11.69	4.2	29.2	18.7
13:02	11.69	4.4	29.1	18.6
13:03	11.68	4.4	29.2	18.7
13:04	11.67	4.3	29.1	18.6
13:05	11.66	4.5	28.7	18.3
13:06	11.64	4.3	28.7	18.3
13:07	11.66	4.5	29.0	18.5

POLK UNIT NO.1 SYNGAS COMPLIANCE TEST 06-14-2000

	CHAN 3	CHAN 4	CHAN 6	STACK
	STACK	STACK	STACK	ppmNOX
TIME	%O2	ppmCO	ppmNOX	@15%O2
13:08	11.65	4.3	28.9	18.4
13:09	11.65	4.5	28.7	18.3
13:10	11.65	4.4	28.9	18.4
13:11	11.64	4.5	28.8	18.3
13:12	11.65	4.5	28.7	18.3

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

13:12	11.67	4.3	28.9	18.5
-------	-------	-----	------	------

COMMENTS: END RUN TWO



## Best Available Copy

POLK UNIT NO.1 SYNGAS COMPLIANCE TEST				06-14-2000
TIME	CHAN 3	CHAN 4	CHAN 6	STACK
	STACK	STACK	STACK	ppmNOX
	%O2	ppmCO	ppmNOX	@15%O2
13:25	11.64	4.5	29.6	18.9
13:26	11.65	4.5	30.1	19.2
13:27	11.65	4.3	30.4	19.4
13:28	11.64	4.5	30.2	19.2
13:29	11.64	4.5	29.8	19.0
13:30	11.64	4.6	30.0	19.1
13:31	11.63	4.6	29.8	18.9
13:32	11.62	4.6	29.6	18.8
13:33	11.63	4.7	29.8	19.0
13:34	11.63	4.6	29.8	19.0
13:35	11.64	4.7	29.9	19.0
13:36	11.64	4.6	29.9	19.1
13:37	11.65	4.5	30.1	19.2
13:38	11.65	4.7	30.1	19.2
13:39	11.64	4.4	29.8	19.0
13:40	11.65	4.7	29.8	19.0
13:41	11.64	4.6	29.8	19.0
13:42	11.64	4.6	29.7	18.9
13:43	11.65	4.7	29.9	19.1
13:44	11.67	4.4	30.4	19.4
13:45	11.66	4.6	30.3	19.3
13:46	11.67	4.5	30.5	19.5
13:47	11.67	4.4	30.5	19.5
13:48	11.67	4.6	30.6	19.6
13:49	11.66	4.5	30.2	19.3
13:50	11.67	4.7	30.3	19.4
13:51	11.67	4.6	30.2	19.3
13:52	11.67	4.5	30.2	19.3
13:53	11.66	4.7	30.0	19.1
13:54	11.65	4.7	29.8	19.0
13:55	11.65	4.6	29.9	19.1
13:56	11.66	4.8	30.3	19.3
13:57	11.66	4.6	30.3	19.3
13:58	11.65	4.6	30.6	19.5
13:59	11.65	4.7	30.4	19.4
14:00	11.64	4.6	30.4	19.3
14:01	11.65	4.8	30.7	19.6
14:02	11.66	4.6	30.7	19.6
14:03	11.66	4.7	30.7	19.6
14:04	11.66	4.5	30.6	19.5
14:05	11.65	4.6	30.8	19.6
14:06	11.66	4.8	30.7	19.6
14:07	11.66	4.6	30.7	19.6
14:08	11.66	4.7	31.0	19.8
14:09	11.67	4.6	30.9	19.8
14:10	11.66	4.8	30.8	19.7
14:11	11.65	4.7	30.6	19.5
14:12	11.65	4.9	30.7	19.6
14:13	11.67	4.7	31.0	19.8
14:14	11.67	4.6	31.1	19.9
14:15	11.67	4.8	31.3	20.0
14:16	11.66	4.6	31.1	19.9
14:17	11.65	4.9	30.6	19.5
14:18	11.66	4.9	31.1	19.8
14:19	11.67	4.6	31.2	19.9

POLK UNIT NO.1 SYNGAS COMPLIANCE TEST 06-14-2000

	CHAN 3	CHAN 4	CHAN 6	STACK
	STACK	STACK	STACK	ppmNOX
TIME	%O2	ppmCO	ppmNOX	@15%O2
14:20	11.66	4.7	31.1	19.8
14:21	11.66	4.8	31.2	19.9
14:22	11.66	4.7	31.1	19.9
14:23	11.66	4.7	31.0	19.8
14:24	11.67	4.7	31.3	20.0

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

14:24	11.65	4.6	30.4	19.4
-------	-------	-----	------	------

END RUN THREE

**APPENDIX D**

**SAMPLING EQUIPMENT CALIBRATIONS**

**APPENDIX D-1           LINEARITY CALIBRATIONS**

**APPENDIX D-2       DRIFT ASSESSMENT CALS**

**APPENDIX D-3       CYLINDER GAS CERTIFICATION**

**APPENDIX D-4       CONVERTER EFFICIENCY RESULTS**

**APPENDIX D-1**

**LINEARITY CALIBRATIONS**

CALIBRATION SUMMARY

SOURCE: POLK POWER STATION UNIT NO.1 SYNGAS COMPLIANCE TEST

REASON: DAILY DIRECT CALIBRATION

DATE : 06-14-2000      TIME: 07:38 - 08:05

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	-0.01
3	STACK	%O2	11.96	12.18
3	STACK	%O2	20.90	20.87
4	STACK	ppmCO	0.0	0.1
4	STACK	ppmCO	3.0	3.0
4	STACK	ppmCO	6.1	6.0
6	STACK	ppmNOX	0.0	-0.0
6	STACK	ppmNOX	24.9	24.8
6	STACK	ppmNOX	49.5	49.4
6	STACK	ppmNOX	81.8	82.1

CALIBRATION SUMMARY

SOURCE: POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

REASON: INITIAL SYSTEM CALIBRATION

DATE : 06-14-2000      TIME: 09:11 - 09:31

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	STACK	ppmNOX	0.0	0.2
6	STACK	ppmNOX	24.9	24.3
6	STACK	ppmNOX	49.5	49.1
6	STACK	ppmNOX	81.8	81.7
3	STACK	%O2	0.00	0.02
3	STACK	%O2	11.96	11.86
3	STACK	%O2	20.90	20.93
4	STACK	ppmCO	0.0	-0.0
4	STACK	ppmCO	3.0	3.1
4	STACK	ppmCO	6.1	6.0

**APPENDIX D-2**

**DRIFT ASSESSMENT CALS**

CALIBRATION SUMMARY

SOURCE: POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

REASON: INITIAL BIAS CAL

DATE : 06-14-2000      TIME: 10:50 - 10:58

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.00
3	STACK	%O2	11.96	11.86
4	STACK	ppmCO	0.0	0.1
4	STACK	ppmCO	3.0	3.0
6	STACK	ppmNOX	0.0	0.7
6	STACK	ppmNOX	49.5	48.4



CALIBRATION SUMMARY

SOURCE: POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

REASON: RUN ONE BIAS CAL

DATE : 06-14-2000      TIME: 12:02 - 12:10

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.04
3	STACK	%O2	11.96	11.86
4	STACK	ppmCO	0.0	0.2
4	STACK	ppmCO	3.0	3.0
6	STACK	ppmNOX	0.0	1.9
6	STACK	ppmNOX	49.5	48.7

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT NO.1

TEST DATE: 06/14/00

RUN NUMBER: 1

SPAN VALUES: 100 ppm NOx  
25 % Oxygen

	-----INITIAL VALUES-----			-----FINAL VALUES-----		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	0.7	0.00	1.9	1.20	1.20
NOx UP-SCALE	48.4	48.4	0.00	48.7	0.30	0.30
O2 LOW GAS	0.00	0.00	0.00	0.04	0.16	0.16
O2 UP-SCALE	11.86	11.86	0.00	11.86	0.00	0.00

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1

TEST DATE: 06/14/00

RUN NUMBER: 1

SPAN VALUE: 25 % Oxygen

	-----INITIAL VALUES-----			-----FINAL VALUES-----		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.00	0.00	0.00	0.04	0.16	0.16
O2 UP-SCALE	11.86	11.86	0.00	11.86	0.00	0.00

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

CALIBRATION SUMMARY

SOURCE: POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

REASON: RUN TWO BIAS CAL

DATE : 06-14-2000      TIME: 13:12 - 13:21

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.01
3	STACK	%O2	11.96	11.86
4	STACK	ppmCO	0.0	0.2
4	STACK	ppmCO	3.0	3.0
6	STACK	ppmNOX	0.0	3.5
6	STACK	ppmNOX	49.5	50.5

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT NO.1

TEST DATE: 06/14/00

RUN NUMBER: 2

SPAN VALUES: 100 ppm NOx  
25 % Oxygen

	-----INITIAL VALUES-----			-----FINAL VALUES-----		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	1.9	1.20	3.5	2.80	1.60
NOx UP-SCALE	48.4	48.7	0.30	50.5	2.10	1.80
O2 LOW GAS	0.00	0.04	0.16	0.01	0.04	-0.12
O2 UP-SCALE	11.86	11.86	0.00	11.86	0.00	0.00

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1

TEST DATE: 06/14/00

RUN NUMBER: 2

SPAN VALUE: 25 % Oxygen

	-----INITIAL VALUES-----			-----FINAL VALUES-----		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.00	0.04	0.16	0.01	0.04	-0.12
O2 UP-SCALE	11.86	11.86	0.00	11.86	0.00	0.00

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

BEST AVAILABLE COPY

CALIBRATION SUMMARY

SOURCE: POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

REASON: RUN THREE BIAS CAL

DATE : 06-14-2000 TIME: 14:24 - 14:32

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.03
3	STACK	%O2	11.96	11.85
4	STACK	ppmCO	0.0	0.0
4	STACK	ppmCO	3.0	3.0
6	STACK	ppmNOX	0.0	0.7
6	STACK	ppmNOX	49.5	52.3

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT NO.1

TEST DATE: 06/14/00

RUN NUMBER: 3

SPAN VALUES: 100 ppm NOx  
25 % Oxygen

	-----INITIAL VALUES-----			-----FINAL VALUES-----		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	3.5	2.80	3.7	3.00	0.20
NOx UP-SCALE	48.4	50.5	2.10	52.3	3.90	1.80
O2 LOW GAS	0.00	0.01	0.04	0.03	0.12	0.08
O2 UP-SCALE	11.86	11.86	0.00	11.85	-0.04	-0.04

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$



SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1

TEST DATE: 06/14/00

RUN NUMBER: 3

SPAN VALUE: 25 % Oxygen

	-----INITIAL VALUES-----			-----FINAL VALUES-----		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.00	0.01	0.04	0.03	0.12	0.08
O2 UP-SCALE	11.86	11.86	0.00	11.85	-0.04	-0.04

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

**APPENDIX D-3**

**CYLINDER GAS CERTIFICATION**

## RATA CLASS



Scott Specialty Gases

Dual-Analyzed Calibration Standard

1750 EAST CLUB BLVD, DURHAM, NC 27704

Phone: 919-220-0803

Fax: 919-220-0808

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay LaboratorySCOTT SPECIALTY GASES  
1750 EAST CLUB BLVD  
DURHAM, NC 27704

P.O. No.: E-N31293

Project No.: 12-32332-014

CustomerTAMPA ELECTRIC CO  
RAY MCDARBY  
5010 CAUSEWAY BLVD  
TAMPA FL 33619

## ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay &amp; Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM045301 Certification Date: 2/08/99 Exp. Date: 2/07/2001  
Cylinder Pressure\*\*\*: 1940 PSIG

COMPONENT	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	24.0 PPM	+/- 1%	NIST
NITROGEN - OXYGEN FREE	BALANCE		
NOX	24.9 BALANCE		Reference Value Only

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

## REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	4/09/99	ALM067006	21.48 PPM	NITRIC OXIDE

## INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/CLA53A/850658093	02/08/99	CHEMILUMINESCENT

## ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

## NITRIC OXIDE

Date: 02/01/99	Response Unit: PPM		
Z1 = 0.0500	R1 = 21.580	T1 = 24.100	
R2 = 21.510	Z2 = 0.0300	T2 = 23.990	
Z3 = 0.0300	T3 = 24.010	R3 = 21.520	
Avg. Concentration:		23.97	PPM

Date: 02/08/99	Response Unit: PPM		
Z1 = 0.1900	R1 = 21.400	T1 = 24.050	
R2 = 21.410	Z2 = 0.1600	T2 = 24.040	
Z3 = 0.1600	T3 = 24.010	R3 = 21.410	
Avg. Concentration:		24.09	PPM

Concentration = A + Bx + Cx <sup>2</sup> + Dx <sup>3</sup> + Ex <sup>4</sup>	
r = 0.999990	
Constants:	A = 0.000000
B = 1.000000	C = 0.000000
D = 0.000000	E = 0.000000

Special Notes:

APPROVED BY:

  
 G BARTLETT



Scott Specialty Gases

1750 EAST CLUB BLVD, DURHAM, NC 27704

Phone: 919-220-0803

Fax: 919-220-0808

Dual-Analyzed Calibration Standard

CERTIFICATE OF ACCURACY: Interference Free <sup>TM</sup> EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES  
1750 EAST CLUB BLVD  
DURHAM, NC 27704

P.O. No.: N75516  
Project No.: 12-36341-002

Customer

TAMPA ELECTRIC CO  
RAY MCDARBY  
5010 CAUSEWAY BLVD  
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM017813      Certification Date: 10/29/99      Exp. Date: 10/28/2001  
Cylinder Pressure\*\*\*: 1912 PSIG

ANALYTICAL

<u>COMPONENT</u>	<u>CERTIFIED CONCENTRATION (Moles)</u>	<u>ACCURACY**</u>	<u>TRACEABILITY</u>
NITRIC OXIDE	48.56 PPM	+/- 1%	Direct NIST and NMI
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	49.47 PPM		Reference Value Only

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is based on the requirements of EPA Protocol procedure G1, September 1997.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

<u>TYPE/SRM NO.</u>	<u>EXPIRATION DATE</u>	<u>CYLINDER NUMBER</u>	<u>CONCENTRATION</u>	<u>COMPONENT</u>
NTRM1683	4/03/03	ALM020566	48.90 PPM	NO/N2

INSTRUMENTATION

<u>INSTRUMENT/MODEL/SERIAL#</u>	<u>DATE LAST CALIBRATED</u>	<u>ANALYTICAL PRINCIPLE</u>
FTIR System/8220/AAB9400252	10/22/99	Scott Enhanced FTIR

ANALYZER READINGS

(Z = Zero Gas    R = Reference Gas    T = Test Gas    r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

NITRIC OXIDE

Date: 10/22/99	Response Unit: PPM	
Z1 = -0.01310	R1 = 48.79556	T1 = 48.39187
R2 = 48.89616	Z2 = 0.16660	T2 = 48.61919
Z3 = 0.08300	T3 = 48.62870	R3 = 49.00827
Avg. Concentration:	48.55	PPM

Date: 10/29/99	Response Unit: PPM	
Z1 = 0.14850	R1 = 49.06593	T1 = 48.55658
R2 = 48.76309	Z2 = 0.12020	T2 = 48.59997
Z3 = 0.04920	T3 = 48.54071	R3 = 48.87097
Avg. Concentration:	48.57	PPM

Concentration = A + Bx + Cx <sup>2</sup> + Dx <sup>3</sup> + Ex <sup>4</sup>	
r = 0.999990	
Constants:	A = 0.000000
B = 1.000000	C = 0.000000
D = 0.000000	E = 0.000000

APPROVED BY:

*B.M. Becton*

B.M. Becton



**CERTIFICATE OF ACCURACY: Interference Free <sup>TM</sup> EPA Protocol Gas**

Assay Laboratory

SCOTT SPECIALTY GASES  
1750 EAST CLUB BLVD  
DURHAM, NC 27704

P.O. No.: N31923  
Project No.: 12-35046-001

Customer

TAMPA ELECTRIC CO  
5010 CAUSEWAY BLVD  
TAMPA FL 33619

**ANALYTICAL INFORMATION**

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM019127      Certification Date: 7/19/99      Exp. Date: 7/18/2001  
Cylinder Pressure\*\*\*: 1994 PSIG

**ANALYTICAL**

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
NITRIC OXIDE	81.13 PPM	+/- 1%	Direct NIST and NMI
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	81.82 PPM		Reference Value Only

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is based on the requirements of EPA Protocol procedure G1, September 1997.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

**REFERENCE STANDARD**

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM1683	4/03/03	ALM020566	48.90 PPM	NO/N2

**INSTRUMENTATION**

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400252	07/15/99	Scott Enhanced FTIR

**ANALYZER READINGS**

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

**NITRIC OXIDE**

Date: 07/12/99	Response Unit: PPM	
Z1 = 0.1222	R1 = 48.911	T1 = 80.909
R2 = 48.792	Z2 = -0.077	T2 = 81.157
Z3 = 0.1565	T3 = 81.343	R3 = 48.996
Avg. Concentration:	81.14	PPM

Date: 07/19/99	Response Unit: PPM	
Z1 = 0.2335	R1 = 48.805	T1 = 81.051
R2 = 48.938	Z2 = -0.005	T2 = 81.173
Z3 = 0.1145	T3 = 81.120	R3 = 48.957
Avg. Concentration:	81.11	PPM

Concentration = A + Bx + Cx <sup>2</sup> + Dx <sup>3</sup> + Ex <sup>4</sup>	
r = 0.999990	
Constants:	A = 0.000000
B = 1.000000	C = 0.000000
D = 0.000000	E = 0.000000

APPROVED BY:

B.M. Becton

RATA CLASS



Scott Specialty Gases

Dual-Analyzed Calibration Standard

1750 EAST CLUB BLVD, DURHAM, NC 27704

Phone: 919-220-0803

Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES  
1750 EAST CLUB BLVD  
DURHAM, NC 27704

P.O. No.: N31923  
Project No.: 12-33126-001

Customer

TAMPA ELECTRIC CO  
RAY MCDARBY  
5010 CAUSEWAY BLVD  
TAMPA FL 33619,

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM020393 Certification Date: 3/11/99 Exp. Date: 3/11/2002  
Cylinder Pressure\*\*\*: 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	11.96 %	+/- 1%	NIST
NITROGEN	BALANCE		

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2658	1/02/01	ALM031884	9.680 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/3400/16804-02	02/22/99	GC / TCD

ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

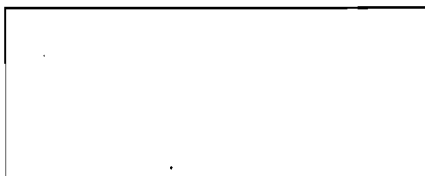
First Triad Analysis

Second Triad Analysis

Calibration Curve

OXYGEN

Date: 03/11/99	Response Unit: AREA	
Z1 = 0.0000	R1 = 247696	T1 = 306452
R2 = 248148	Z2 = 0.0000	T2 = 306564
Z3 = 0.0000	T3 = 306567	R3 = 248251
Avg. Concentration:	11.96	%



Concentration = A + Bx + Cx <sup>2</sup> + Dx <sup>3</sup> + Ex <sup>4</sup>	
r = 0.99999	
Constants:	A = 0.00
B = 1.00	C = 0.00
D = 0.00	E = 0.00

Special Notes:

APPROVED BY: B. M. Becton  
B.M. BECTON

**APPENDIX D-4**

**CONVERTER EFFICIENCY RESULTS**

TO: Quality Assurance File

FROM: R.A. Mc Darby

DATE: 15, June, 2000

SUBJECT: NO<sub>2</sub> to NO Converter Efficiency Test  
40 CFR 60, Appendix A, Method 20  
Section 5.6  
Analyzer S/N 10A/R-22525-205

---

The following results detail the performance of the converter efficiency test on analyzer S/N 10A/R-22525-205:

Highest value recorded during the 30 minute test run =	28.2 ppm
Value recorded at the end of the 30 minute test run =	28.2 ppm
Percent of decrease =	0.0 %

These results indicate that the converter currently installed in the referenced analyzer meets the requirements of 40 CFR 60, Appendix A, Reference Method 20, § 5.6.

In accordance with the instructions contained in 40 CFR 60, Appendix A, Reference Method 20, sub-section 5.6.1; A sample was prepared using gas cylinder S/N ALM-017813 (certificate attached), diluted approximately 1:1 with 20.9% purified air. The sample was introduced into the analyzer through the sample port, and allowed to run for 30 minutes (08:23 – 08:53). The results from this run are attached for reference.

  
Raymond A. Mc Darby  
Senior Environmental Technician  
Environmental Affairs-Causeway  
Air Services





**CERTIFICATE OF ACCURACY: Interference Free <sup>TM</sup> EPA Protocol Gas**

Assay Laboratory

SCOTT SPECIALTY GASES  
1750 EAST CLUB BLVD  
DURHAM, NC 27704

P.O. No.: N75516  
Project No.: 12-36341-002

Customer

TAMPA ELECTRIC CO  
RAY MCDARBY  
5010 CAUSEWAY BLVD  
TAMPA FL 33619

**ANALYTICAL INFORMATION**

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM017813      Certification Date: 10/29/99      Exp. Date: 10/28/2001  
Cylinder Pressure\*\*\*: 1912 PSIG

**ANALYTICAL**

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ACCURACY**	TRACEABILITY
NITRIC OXIDE	48.56 PPM	+/- 1%	Direct NIST and NMI
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	49.47 PPM		Reference Value Only

\*\*\* Do not use when cylinder pressure is below 150 psig.

\*\* Analytical accuracy is based on the requirements of EPA Protocol procedure G1, September 1997.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

**REFERENCE STANDARD**

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM1683	4/03/03	ALM020566	48.90 PPM	NO/N2

**INSTRUMENTATION**

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400252	10/22/99	Scott Enhanced FTIR

**ANALYZER READINGS**

(Z = Zero Gas    R = Reference Gas    T = Test Gas    r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

**NITRIC OXIDE**

Date: 10/22/99	Response Unit: PPM	
Z1 = -0.01310	R1 = 48.79556	T1 = 48.39187
R2 = 48.89616	Z2 = 0.16660	T2 = 48.61919
Z3 = 0.08300	T3 = 48.62870	R3 = 49.00827
Avg. Concentration:	48.55	PPM

Date: 10/29/99	Response Unit: PPM	
Z1 = 0.14850	R1 = 49.06593	T1 = 48.55658
R2 = 48.76309	Z2 = 0.12020	T2 = 48.59997
Z3 = 0.04920	T3 = 48.54071	R3 = 48.87097
Avg. Concentration:	48.57	PPM

Concentration = A + Bx + Cx <sup>2</sup> + Dx <sup>3</sup> + Ex <sup>4</sup>	
r = 0.999990	
Constants:	A = 0.000000
B = 1.000000	C = 0.000000
D = 0.000000	E = 0.000000

APPROVED BY:

B.M. Becton

## POLK UNIT NO.1 SYNGAS COMPLIANCE TEST

06-14-2000

CHAN 6  
STACK  
TIME ppmNOX

08:24	27.1
08:25	27.2
08:26	27.3
08:27	27.3
08:28	27.4
08:29	27.4
08:30	27.4
08:31	27.5
08:32	27.6
08:33	27.6
08:34	27.6
08:35	27.7
08:36	27.7
08:37	27.7
08:38	27.8
08:39	27.8
08:40	27.8
08:41	27.8
08:42	27.9
08:43	27.9
08:44	27.9
08:45	27.9
08:46	27.9
08:47	28.0
08:48	28.0
08:49	28.0
08:50	28.0
08:51	28.1
08:52	28.1
08:53	28.2

AVERAGE VALUES FOR THE LAST 30 MINUTES  
08:53 27.7

COMMENTS: NOX CONVERTER EFFICIENCY TEST

**APPENDIX E**

**PROJECT PARTICIPANTS**

## **PROJECT PARTICIPANTS**

---

### **Environmental Affairs**

Robert Barthelette Jr.	Environmental Technician Test Team Leader
Craig Coronado	Technician
Raymond McDarby	Senior Environmental Technician
David Smith	Coordinator, Air Services
James Werner	Technician

### **Polk Power Station**

Michael Perkins	Environmental Coordinator
Thomas Cross	IGCC Process Specialist