GULF POWER
A SOUTHERN COMPANY

CERTIFICATION BY RESPONSIBLE OFFICIAL

"I, the undersigned, am the responsible official, as defined in Chapter 62-210.200, F.A.C., for the Title V source for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate and complete."

Responsible Official Signature:

Michael L. Burroughs

Feb. 19 2013

Michael L. Burroughs
Vice-President and Senior Production Officer

Date:

Crist Common Stack (FGD) CEMS Relative Accuracy Test Audit Report

January 16, 2013
January 17, 2013

Gulf Power Company

Plant Crist
Common Stack
Stack ID: CS1FGD

Report by:

GULF POWER
A SOUTHERN COMPANY

Gulf Power Company
Plant Crist
Common Stack
Stack ID: CS1FGD

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Gulf Power Company
Plant Crist
FGD CEMS
Stack ID: CS1FGD

Introduction

Gulf Power Company performed all necessary reference method tests required for RATA testing of the Crist common stack continuous emission monitoring system. The tests were performed on the continuous emission monitoring system that measures emissions from the stack for the Plant Crist FGD. The sulfur dioxide monitor, the carbon dioxide monitor, and the nitrogen oxide monitoring system were tested on January 16, 2013 in accordance with the regulations set forth in the Code of Federal Regulations, Title 40, Part 60 and 75. John Rampulla with Gulf Power performed the reference method testing for the gas monitors. During this testing, Spectrum Systems was on-site and performed the reference method testing for the common stack flow monitors on January 17, 2013.

Summary of Results

Results of the certification testing performed on Gulf Power Plant Crist, CSIFGD, common stack are presented in the following tables. The complete report of the flow RATA conducted by Spectrum Systems is included as Appendix G of this report. These results are based on test data obtained from the facility during normal operation of units 4, 5, 6, and 7. These test results show the Continuous Emission Monitoring Systems installed on the Plant Crist, CS1FGD, common stack are in compliance with the requirements of 40 CFR 60 and 75.

Table I. RATA Results Flow

MONITOR/LOAD	RELATIVE ACCURACY	BAF
LOW	5.93	1.052
MONITOR/LOAD	RELATIVE ACCURACY	BAF
MID	7.05	1.067

Bias applied to system = 1.067

Table II. RATA Results CEMS

MONITOR	RELATIVE ACCURACY	BAF
NO_X	0.59	1.000
CO_2	1.74	NA
SO_2	12.36	1.111

Default SO_2 BAF =1.111 40CFR75 7.6.5(b)

2.3.1.2 Reduced RATA Frequencies

Relative accuracy test audits of primary and redundant backup SO2 pollutant concentration monitors, CO2 pollutant concentration monitors (including O2 monitors used to determine CO2 emissions), CO2 or O2 diluent monitors used to determine heat input, moisture monitoring systems, NOX concentration monitoring systems, flow monitors, NOX-diluent monitoring systems or SO2-diluent monitoring systems may be performed annually (i.e., once every four successive QA operating quarters, rather than once every two successive QA operating quarters) if any of the following conditions are met for the specific monitoring system involved:

a) The relative accuracy during the audit of an SO2 or CO2 pollutant concentration monitor (including an O2 pollutant monitor used to measure CO2 using the procedures in appendix F to this part), or of a CO2 or O2 diluent monitor used to determine heat input, or of a NOX concentration monitoring system, or of a NOX-diluent monitoring system, or of an SO2-diluent continuous emissions monitoring system is ≤ 7.5 percent;

e) For low SO2 or NOX emitting units (average SO2 or NOX reference method concentrations ≤ 250 ppm) during the RATA, when an SO2 pollutant concentration monitor or NOX concentration monitoring system fails to achieve a relative accuracy ≤ 7.5 percent during the audit, but the monitor mean value from the RATA is within ±12 ppm of the reference method mean value;

(f) For units with low NOX emission rates (average NOX emission rate measured by the reference method during the RATA ≤ 0.200 lb/mmBtu), when a NOX-diluent continuous emission monitoring system fails to achieve a relative accuracy ≤ 7.5 percent, but the monitoring system mean value from the RATA, calculated using Equation A–7 in appendix A to this part, is within ±0.015 lb/mmBtu of the reference method mean value.

System Summary

CEMS

The Model 300 is a dedicated continuous emission monitoring system using dilution sampling technology and low level pollutant analyzers to measure NO_X, SO_2, CO_2, volumetric flow, and opacity in accordance with the established regulations (Figure 3-1). Each phase of the sampling and analysis process is performed to maintain source compliance, while maximizing sensor reliability and equipment accuracy. The Model 300 network is composed of four subsystems -- sample acquisition, sample analysis, sample control, and sample support.

The sample acquisition subsystem includes the dilution probe, probe controller, sample transport and dilution air clean-up equipment. The stack dilution probe is an M & C SP2000H (there are also existing EPM dilution probes on the ducts). Constructed of stainless steel, the probe is mounted externally to a flange on the side of the common stack. This configuration is designed to withstand high operating temperatures. A filter for coarse particulate is mounted in the heated, "out-of-stack" dilution unit.

The sample transport umbilical contains Teflon lines that are either 1/4" or 3/8" in diameter. They include diluted sample, calibration/backpurge, vacuum, dilution air and bypass eductor air lines, as well as spare lines. All umbilical lines are encased in an outer polyurethane or PVC jacket for protection. All umbilical compression fittings and interconnects are of either Swagelok or Parker construction. The umbilical should be periodically checked for cracking and particulate contamination and cleaned as necessary with water and air-dried.

The dilution air clean-up system uses dual Parker Filtration FT-IR 75-62 Purge Gas Generators. Using the plant compressed air supply, the dryers remove CO_2, NO_X, H_2O, hydrocarbons, and particulate to provide dry, purified air for dilution. Backup air in the event of a plant air supply failure is provided by a Powerex Scroll Enclosure Air Compressor. The dilution air supply is routed and stored in a 10.5 gallon clean air storage tank mounted in the CEMS shelter.

Spectrum Systems' WM364 Probe Controller panel monitors operation of the dilution probe, using a system of gauges, regulators, flowmeters and control devices. The SpectraPak™ data acquisition and control module handles sampling, purging, and calibration cycles for the dilution system. The dilution air clean-up system provides scrubbed, dry air for the dilution and purging cycles. Calibration gas cylinders are connected to the CEMS system to provide the gases needed for daily zero and span calibration checks.

The sample analysis subsystem of the Model 300 uses proven low level measurement technology to monitor NO_x, SO_2, CO_2, volumetric flow, and opacity. The Thermo Environmental Model 42 (C or i-level) measures NO_x, the Thermo Environmental Model 43 (C or i-level) measures SO_2, and the Siemens Ultramat 6E measures CO_2. The Monitor Labs Ultraflow 150 measures volumetric gas flow.

Sample control subsystem functions for the Model 300 Dilution System are handled by SpectraPak data acquisition and control modules. The SpectraPak microprocessor integrates controls and monitors all system functions including automatic calibrations and purges, fault/status monitoring, and cycle sequencing. The SpectraPak also interfaces with the data acquisition and handling system used in conjunction with the Model 300. The configuration software in the SpectraPak allows set-up of the sequence tables from an external personal computer when required.

The sample support subsystem of the Model 300 includes an aluminum CEMS shelter, environmental controls, electrical distribution, uninterruptible power supply (UPS), and other components that provide the necessary operational environment for the system. The CEMS equipment is mounted in an analysis rack inside the CEMS shelter.

An Uninterruptible Power Supply (UPS) provides backup power to support the CEMS equipment for a minimum of 30 minutes in the event of a primary power failure.

THERMO ENVIRONMENTAL INSTRUMENTS MODEL 42 NO_X ANALYZERS (C- or i-level)

The Model 42 NO_X Analyzer, from Thermo Environmental Instruments, Inc., and modified by Spectrum Systems, uses chemiluminescence to provide continuous, real-time measurement of nitrogen oxides.

Principle of Operation: The gas phase reaction of NO and ozone (O_3) produces a characteristic luminescence with intensity proportional to the concentration of NO according to the following:

$$NO + O_3 \rightarrow NO_2 + O_2 + h\nu$$

Light emission occurs when electronically excited NO_2 molecules decay to lower energy states.

Sample gas enters the Model 42 through a single flow capillary and is directed to a solenoid valve. One part of the sample is combined with O_3 in the reaction chamber to measure NO. The other part of the sample is directed through a converter, because NO_2 must first be converted to NO before it can be measured.

Nitrogen dioxide (NO_2) must first be transformed into NO before it can be measured using the chemiluminescent reaction. NO_2 is converted to NO by a molybdenum NO_2-to-NO converter heated to about 325 °C (the optional stainless steel converter is heated to 625 °C). When sample is flowing through the converter, the reaction chemiluminescence in the reaction chamber represents the NO_X concentration in the sample (NO_x mode). When the sample is flowing around the converter, only NO is measured (NO mode). The signals measured in both modes are stored and held in memory where the difference between the two can be used to calculate the NO_2 concentration in the sample.

THERMO ENVIRONMENTAL INSTRUMENTS MODEL 43 SO_2 ANALYZERS (C- or i-level)

The Model 43 SO_2 Analyzer, from Thermo Environmental Instruments, Inc., and modified by Spectrum Systems, is an EPA-designated Equivalent Method, using pulsed fluorescence to provide continuous, real-time measurements of SO_2.

Principle of Operation: Pulsating UV (ultraviolet) light is bandpass-filtered and focused into a fluorescent chamber containing the sample gas. SO_2 molecules in the sample are excited into higher energy states. As the states decay, the SO_2 molecules emit a characteristic radiation. A second filter allows only that radiation to fall on a photomultiplier tube (PMT) that converts the radiation into an electrical signal. The filtered and amplified signal is linearly proportional to the SO_2 concentration in the sample.

SIEMENS ULTRAMAT 6E CO_2 ANALYZER

The Ultramat 6E channel operates using nondispersive infrared (NDIR) radiation and a double-beam, alternating-light principle of operation. A chopper rotates between the beam divider and the sample and reference cells, interrupting the two beams alternately and periodically. If absorption takes place in either cell, a pulsating current is generated and is converted by the microflow sensor into an electric current. An optical coupler lengthens the receiver chamber optically, and the infrared absorption in the second detector layer is varied by changing the position of an adjustable slider. This allows for minimization of the influence of interfering compounds.

Principle of Operation: The radiation from a heated IR (infrared) source is divided into two beams -- a measuring beam and a reference beam. The measuring beam passes through the sample cell where the radiation is reduced to a lower energy state dependent on the concentration of the sample gas in the cell. The reference beam passes through the reference cell which is filled with N_2. The difference between these two beams is used to determine the CO or CO_2 concentration in the sample gas.

MONITOR LABS ULTRAFLOW 150 VOLUMETRIC FLOW MONITOR

The Ultraflow Model 150, from Monitor Labs, is a non-contacting, ultrasonic flow and temperature monitor that features digital signal processing, high resolution, automatic in-stack zero and span checks, plus a microprocessor based remote panel. The system is made up of four basic assemblies - the transducers, stack electronics, purge system, and the remote panel.

Principle of Operation: The two transducers in the system are mounted across a stack or duct from one another, with one mounted upstream of the other. Each transducer acts alternately as a transmitter or receiver. When a tone burst is sent between the transducers, the movement of the gas stream alters the time required to cross the distance. If the tone is traveling with the stream, the crossing time is reduced. if the tone is traveling against the stream, the crossing time is increased. If there is no gas flow (stream), the time required to cross between transducers is the same in either direction. The Ultraflow 150 measures the time required by the tone bursts to cross the gas stream in both directions. Flow velocity is directly related to the difference in time required for the bursts to travel with and against the gas stream. Based on the cross sectional area of the stack or duct, flow velocity is converted to volumetric flow.

Because the speed of sound is influenced by temperature, the temperature of the gas stream can be calculated from the time it takes the tone bursts to cross the stack or duct. Stack-mounted electric ring compressors are used as purge air blowers for the flow monitors.

Source Description

Plant Crist Units 4, 5, 6 and 7 are coal fired boilers that produces steam used to generate electricity. Bituminous coal is the primary fuel for the boiler. The exhaust gas passes through a superheater and economizer section and exits the boiler in separate ducts. The gases then pass through an air preheater, and through an electrostatic precipitator which removes the particulates. The gas streams are directed to a common stack header that delivers the gas to the flue gas desulfurization system. The gas then vents to atmosphere via the CS1FGD stack. The CEM system gas probes and flow transducers are located on the FGD stack. The probe locations meet all of the siting criteria specified in 40 CFR Part 75, Appendix A. The CEM system monitors, controllers, and data acquisition system are located in an environmentally controlled shelter located near the base of the stack

Reference Method Equipment

The reference method testing equipment is housed in a mobile continuous emission monitoring system. This trailer utilizes dilution extractive technology to analyze the stack emission concentrations.

A Thermo Environmental Model 42C Nitrogen Oxides Gas Analyzer determines the NO_x levels in the gas stream. The monitor operates on the principle of chemiluminescence. This monitor has a converter that converts NO_2 to NO to enable it to accurately measure the NO_x in the sample stream. The serial number for the NO_x monitor is 42C-70201-365.Any additional information regarding instrument operation or capabilities can be obtained from the manufacturer or from Gulf Power Company by request.

The CO_2 is measured using a Siemens Ultramat 6 Analyzer. This monitor is a selective nondispersive infrared radiation (NDIR) gas analyzer that operates on the infrared double-beam, alternating light principle. The serial number for the CO_2 analyzer is N5-672.

The SO_2 is determined by a Thermo Environmental Model 43C Analyzer. This monitor works on the principle of pulsed fluorescence. . The serial number for the SO_2 monitor is 43C-72790-372.

PARAMETER	SPAN CONCENTRATION
NO_X	55.15 PPM
CO_2	10.43 %
SO_2	55.31 PPM

The in-stack dilution probe is an EPM Environmental Model 797, and is constructed of Inconel, with a 316L stainless steel extension. The probe length is 10 feet. The probe extracts and dilutes the sample from the duct by creating an internal vacuum with respect to the flue gas. The sample is drawn through a glass critical orifice and mixed with clean dilution air that is provided by the trailer. This mixture is then delivered to the trailer to be analyzed by each instrument. The dilution ratio for this system is 100:1.

The sample system is controlled via personal computer using the Spectrum Systems SpectraTest Software to interface with a SpectraPak Ioplexer controller. This interface enables the tester to manually initiate calibration gases to the probe, blowback of the system, and start all data collection.

The trailer is equipped with two separate data collection systems. Each system is totally independent. Both systems contain the identical gas measuring instruments and data collection systems.

All calibration gases that are used in the certification process are Certified Protocol 1 Calibration Gases. All certificates are included in Appendix E.

Test Procedures

All tests used in the certification process are performed in accordance with EPA Methods 1, 2, 3A, 6C, and 7E. The Methods are found in 40 CFR Part 60.

The volumetric flow is determined using EPA Methods 1, 2 and Method 4 stack gas moisture determination. The diluent concentrations are determined by Method 3A. These methods determine the location of the sample ports and the sample traverse depths, volumetric flow rates, and the fractional moisture content of the stack gas.

The CO_2, SO_2, and NO_X pollutant concentrations were determined by EPA Methods 3A, 6C, and 7E. These methods require that the tester: 1) select appropriate apparatus meeting the applicable equipment specifications of the methods; 2) conduct an interference response test prior to the testing program; and 3) conduct various measurements during the testing program to demonstrate conformance with the measurement system performance specifications. One variance from the standard Method 6C steps occurs when using a dilution extractive reference method testing system. There is no direct analyzer calibration step available when using this system because the calibration gases must be diluted before being introduced to the ambient level analyzers. Therefore, the system bias check doubles as the system calibration. The system calibration error is limited to +/- 2%.

The following is a brief outline of the procedures followed during the gas testing. Initially, the measurement system was calibrated. Next, a zero, mid, and high level gas was introduced to determine the system calibration error. After allowing twice the system response time, twenty-one (21) minutes of stack gas data was collected. At the conclusion of the run data collection, a zero and upscale calibration gas for each analyzer was introduced. The upscale gas that most closely approximated the stack gas was used to perform the system bias checks and system drifts. As long as no significant drifts occurred, the calibration checks between runs served as both the post check for the previous run and the pre check for the next run. A summary of the drifts and biases are included in the appendices. The gas averages for each run were adjusted to correct for any drift that occurred. The data comparison to determine the relative accuracy and bias for each pollutant monitor or monitoring system was performed according to 40 CFR 75, Appendix A, paragraphs 3.4, 6.5, and 7.6. This data is summarized in Appendix A. The system response time was checked during the setup to insure that it has not changed from its initial certified values. The system's recovery time was set to be in excess of twice the established response time for the slowest instrument. This data is summarized in Appendix G.

A stratification test was performed before sampling began. Results for the stratification study are located in Appendix D.

The CEM system data used to compare with the reference method data was taken from the one-minute averages produced from the Data Acquisition System.

The engineering units for data collection are as follows: the SO_2 and NO_x are in parts per million (ppm) and the CO_2 is in percent (%). The flow rate is captured in thousand standard cubic feet per minute (KCFM) and converted to standard cubic feet per hour (SCFH). The times presented in the appendices should be interpreted as hour-minute-second format. The format is varied from appendix to appendix due to some times being collected either by the reference method data collection system or manually recorded by the testing personnel. The relative accuracy determination for the NO_x emissions is in pounds per million Btu (lbs/mmBtu) or (#/mmBtu). The times for both the CEM system and the reference method tests are in Central Standard Time.

All data used to compile this report is supplied in the applicable appendix. Any questions should be forwarded to Gulf Power Environmental Affairs Department.

Figure I. Sample Traverse Points and Sample Location

Circular Duct Traverse Point Location
Gulf Power Company
Plant Crist
FGD Stack
Wednesday, January 16, 2013

# of ports	4	
Diameter	420.00	inches
# of points/port	8	
Port Extension	13.00	inches
AREA	**962.113**	**Square Feet**

	distance from	Percent	Probe	number of points											
Traverse point #	stack wall (in.)	of diameter	Markings (in.)	2	4	6	8	10	12	14	16	18	20	22	24
1	13.44	3.2	26.44	14.6	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	44.10	10.5	57.10	85.4	25	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3	81.48	19.4	94.48		75	29.3	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6	5.5
4	135.24	32.2	148.24		93.3	70.4	32.2	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5	284.34	67.7	297.34			85.4	67.7	34.2	25	20.1	16.9	14.6	12.9	11.6	10.5

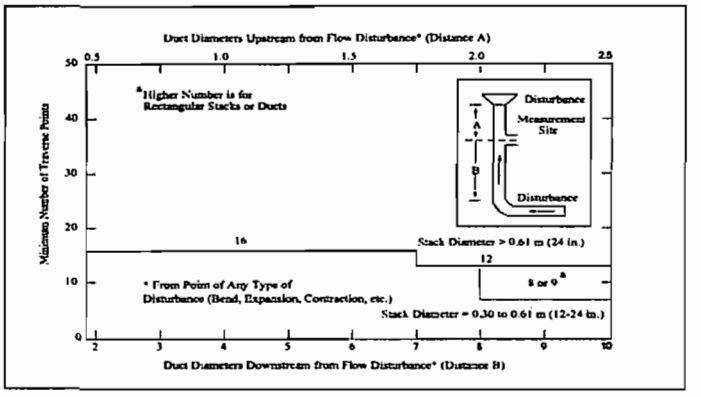
Distance from sample ports to disturbances

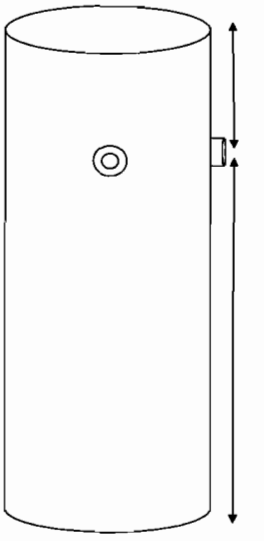
Distance upstream (A) =	1200	inches
Diameters upstream (A_d) =	2.86	
Distance downstream (B) =	3600	inches
Diameters downstream (Bd) =	8.57	

Minimum number of traverse points

Calculated from upstream duct diameters distance=	12
Calculated from downstream duct diameters distance=	12
number of sample traverse points =	12

Figure 1-2. Minimum number of traverse points for velocity (non-particulate)

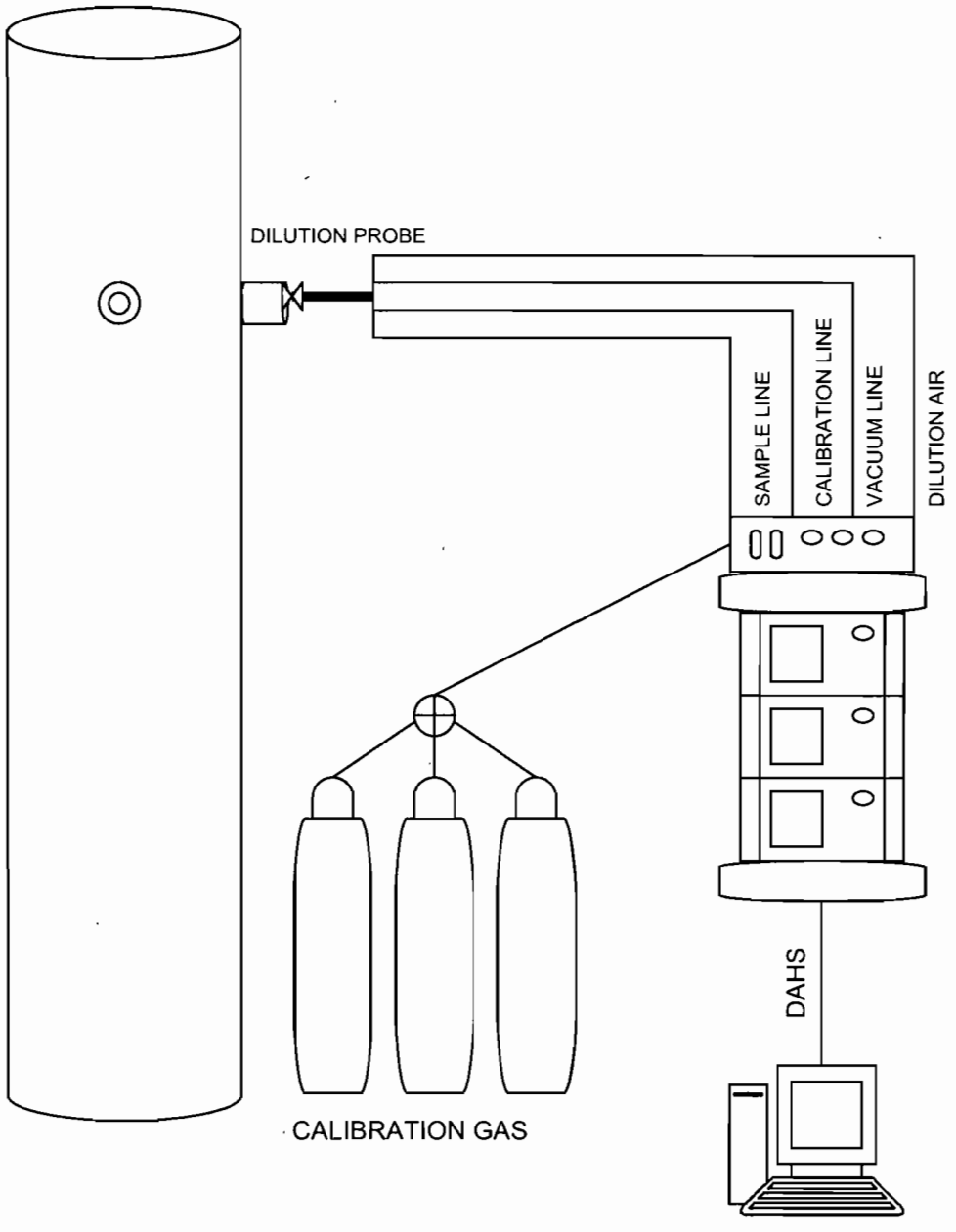




Upstream
1200.00 inches
100.00 Feet

Down Stream
3600.00 inches
300.00 Feet

Figure II. Sample System Configuration



Sample Calculations

SAMPLE CALCULATIONS, RUN 1
Gulf Power Company
Plant Crist
FGD Stack
Wednesday, January 16, 2013

Corrected effluent gas concentration NO_X emissions

$$C_{gas} = (\overline{C} - C_o)\frac{C_{ma}}{C_m - C_o}$$

Cgas = effluent concentration, ppm		=	42.93
$\overline{C}$ =Avearge gas concentration indicated by gas analyzer, ppm		=	43.04
Co = Average of initial and final system calibration bias response for the zero gas, ppm		=	0.06
Cm = Average of initial and final system calibration bias check response for the upscale calibration gas, ppm		=	25.75
Cma = Actual concentration of the upscale calibration gas ,ppm		=	25.66
Mean refrence method value for NOx from run 1	C	=	43.04

Corrected effluent gas concentration SO_2 emissions

$$C_{gas} = (\overline{C} - C_o)\frac{C_{ma}}{C_m - C_o}$$

Cgas = effluent concentration, ppm		=	18.83
$\overline{C}$ =Avearge gas concentration indicated by gas analyzer, ppm		=	18.15
Co = Average of initial and final system calibration bias response for the zero gas, ppm		=	0.07
Cm = Average of initial and final system calibration bias check response for the upscale calibration gas, ppm		=	24.71
Cma = Actual concentration of the upscale calibration gas ,ppm		=	25.66
Mean refrence method value for SO2 from run 1	C	=	18.15

Corrected effluent gas concentration CO_2 emissions

$$C_{gas} = (\overline{C} - C_o)\frac{C_{ma}}{C_m - C_o}$$

Cgas = effluent concentration, %		=	8.83
$\overline{C}$ =Avearge gas concentration indicated by gas analyzer, %		=	8.73
Co = Average of initial and final system calibration bias response for the zero gas, %		=	0.07
Cm = Average of initial and final system calibration bias check response for the upscale calibration gas, %		=	5.00
Cma = Actual concentration of the upscale calibration gas ,%		=	5.03
Mean refrence method value for CO2 from run 1	C	=	8.73

Nitrogen Oxides Emissions Pounds Per Million Btu
(EPA Carbon Dioxide F Factor)

$$E_{CO2x} = \frac{MW_x}{385,000,000} C_{ppm_x} F_{CO2}\left(\frac{100}{\%CO_2}\right)$$

x = Compound of interest (SO2 NOx CO VOC TRS etc) =	NOx
MWx = Molecular weight of compound (lb/lb mole) =	46.01
Cppmx = Pollutant Concentration (parts per million, WET basis) =	42.93
F_{CO2} = Carbon Dioxide based F factor (SDCF/mmBtu) =	1,800
$\%CO_2$ = Number percent by volume (WET basis from gas analysis) =	8.83
E_{CO2} =	0.104

Statement of Authenticity

All field data collection and subsequent data reduction was done by the following personnel. We certify that the details and results presented in this report are authentic and accurate to the best of our knowledge.

Date: 2-20-13 Signature:

John B. Rampulla
QSTI: I, III Application No. 2008-120
Expire: 05-27-2013
AETB: Gulf Power Field Services

Date: 2-20-13 Digital Signature:

Appendix A. Relative Accuracy Determination

RELATIVE ACCURACY TESTS

Relative accuracy tests were conducted in accordance with 40CFR75, Appendix A, paragraph 6.5 for the SO_2, NO_x, CO_2, and volumetric flow monitors

Relative accuracy is defined in the Federal Register as "the degree of correctness with which the CEMS or pollutant analyzer yields the value of a sample relative to the value given by a defined reference method." The defined reference methods used in conducting these RATA's are as follows:

Sulfur Dioxide	RM 6C
Nitrogen Oxides	RM 7E
Carbon Dioxides	RM 3A and RM 3
Volumetric Flow	RM 1 and RM 2
Moisture	Wet Bulb / Dry Bulb

The relative accuracy is calculated as follows:

$$RA = \frac{(A)+(B)}{(C)} * 100$$

Where,
A = The absolute value of the mean difference between the Reference Method values and the CEM values
B = The absolute value of the confidence coefficient
C = The arithmetic mean of the Reference Method values

40 CFR Part 75 limits the relative accuracy of the SO_2 and NO_x monitors to ten percent at each required operating load. Unless, the RATA is to be done on an annual basis rather than every two successive QA operation quarters in which case the relative accuracy is limited to 7.5%.

The relative accuracy of the flow monitor was conducted at the required operating loads as prescribed in 40CFR75, Appendix A, paragraph 6.5.2 (d)

BIAS TEST

The bias test was applied to all sets of relative accuracy data in accordance with 40 CFR75, Appendix A, paragraph 3.4. The bias was calculated using the criteria of 40 CFR75, Appendix A, paragraph 7.6. It states that if the mean difference of the reference method and monitor or system is greater than the confidence coefficient, then the monitor system has failed the bias test.

If a monitor fails the bias test and the mean of the monitor data is greater than the mean of the reference method data, then the bias is positive and no bias factor will be applied. However, corrective action may be taken to correct the positive bias and the relative accuracy test repeated. If the mean of the monitor data is less than the reference method data, then the problem is to be corrected and the relative accuracy test repeated, or a bias adjustment factor should be applied to all subsequent data as defined below:

$$BAF = 1 + \frac{d}{(CEM)}$$

Where,
BAF= Bias Adjustment Factor
d= Absolute value of the arithmetic mean of the difference between the reference method and CEM data
CEM= Mean of the data provided from the monitor or system

CEM adjusted = CEM measured * BAF

Where,
CEM adjusted = data adjusted for the bias factor
CEM measured = measured value from the monitor

The bias adjustment factors are found on the same pages as the relative accuracy.

Relative Accuracy and Bias Test Results

Relative Accuracy and Bias Determination

Performed By: **Gulf Power Company**
Pensacola, Florida

Date Performed: 16-Jan-2013
Test Number: 1

Performed For: **Gulf Power Company**
Crist, Unit CSFGD
Pensacola, Florida

NOx CEMS LBS/MMBTU **NOx/A DILUTION**

Run Number	Time Started	Time Stopped	Unit Load	RM-7E lbs/mmBtu	CEMS lbs/mmBtu	Difference lbs/mmBtu
1	1/16 09:52	1/16 10:13	584	0.104	0.105	-0.001
2	1/16 10:34	1/16 10:55	586	0.104	0.104	0.000
3	1/16 11:16	1/16 11:36	592	0.109	0.108	0.001
4	1/16 11:57	1/16 12:18	596	0.109	0.108	0.001
5	1/16 12:40	1/16 13:01	599	0.108	0.109	-0.001
6	1/16 13:22	1/16 13:43	579	0.109	0.110	-0.001
7	1/16 14:03	1/16 14:24	577	0.116	0.116	0.000
8	1/16 14:45	1/16 15:06	582	0.125	0.125	0.000
9	1/16 15:27	1/16 15:48	582	0.125	0.124	0.001

Average	586	0.112	0.112	0.000
Standard Deviation				0.001
Confidence Coefficient:				0.001
Relative Accuracy:				0.59

T-Factor: 2.306

Bias Test (pass/fail): Passed
Bias Adjustment Factor: 1.000

Relative Accuracy and Bias Determination

Performed By: **Gulf Power Company**
Pensacola, Florida

Date Performed: 16-Jan-2013
Test Number: 1

Performed For: **Gulf Power Company**
Crist, Unit CSFGD
Pensacola, Florida

CO2 Monitor **CO2/A DILUTION**

Run Number	Time Started	Time Stopped	Unit Load	RM-3A %	CEMS %	Difference %
1	1/16 09:52	1/16 10:13	584	8.830	9.050	-0.220
2	1/16 10:34	1/16 10:55	586	8.870	9.010	-0.140
3	1/16 11:16	1/16 11:36	592	8.910	9.010	-0.100
4	1/16 11:57	1/16 12:18	596	8.910	9.030	-0.120
5	1/16 12:40	1/16 13:01	599	8.960	9.010	-0.050
6	1/16 13:22	1/16 13:43	579	8.860	8.960	-0.100
7	1/16 14:03	1/16 14:24	577	8.890	9.010	-0.120
8	1/16 14:45	1/16 15:06	582	8.820	8.930	-0.110
9	1/16 15:27	1/16 15:48	582	8.780	8.900	-0.120

Average	586	8.870	8.990	-0.120
Standard Deviation				0.045
Confidence Coefficient:				0.035
Relative Accuracy:				1.74

T-Factor: 2.306

Relative Accuracy and Bias Determination

Performed By: **Gulf Power Company**
Pensacola, Florida

Date Performed: 16-Jan-2013
Test Number: 1

Performed For: **Gulf Power Company**
Crist, Unit CSFGD
Pensacola, Florida

SO2 Monitor PPM **SO2/A DILUTION**

Run Number	Time Started	Time Stopped	Unit Load	RM-6C ppm	CEMS ppm	Difference ppm
1	1/16 09:52	1/16 10:13	584	18.830	17.920	0.910
2	1/16 10:34	1/16 10:55	586	17.900	16.480	1.420
3	1/16 11:16	1/16 11:36	592	17.550	15.400	2.150
4	1/16 11:57	1/16 12:18	596	16.790	14.770	2.020
5	1/16 12:40	1/16 13:01	599	15.970	14.250	1.720
6	1/16 13:22	1/16 13:43	579	17.030	14.890	2.140
7	1/16 14:03	1/16 14:24	577	17.940	16.040	1.900
8	1/16 14:45	1/16 15:06	582	17.890	15.960	1.930
9	1/16 15:27	1/16 15:48	582	14.560	12.480	2.080
Average			586	17.162	15.354	1.808
Standard Deviation						0.408
Confidence Coefficient:						0.314
Relative Accuracy:						12.36

T-Factor: 2.306

Bias Test (pass/fail): Failed
Bias Adjustment Factor: 1.118

Calibration Error Results

Analyzer Calibration Error

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	1 9:52:00 10:13:00

Sulfur Dioxide Monitor

SO2/A DILUTION

Span: 55.31

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference (ppm SO2)	Calibration Error
ZERO AIR	0.00	0.07	-0.07	-0.13%
CC331719	25.66	25.42	0.24	0.43%
CC325676	55.31	55.85	-0.54	-0.97%

Nitrogen Oxides Monitor

NOx/A DILUTION

Span: 55.15

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference (ppm NOx)	Calibration Error
ZERO AIR	0.00	0.00	0.00	0.00%
CC331719	25.66	26.11	-0.45	-0.81%
CC325676	55.15	55.70	-0.55	-1.00%

Carbon Dioxide Monitor

CO2/A DILUTION

Span: 10.43

Cylinder Number	Reference Gas Concentration	Analyzer Response	Difference (% CO2)	Calibration Error
ZERO AIR	0.00	0.02	-0.02	-0.23%
CC366506	5.03	5.02	0.01	0.05%
CC110594	10.43	10.48	-0.05	-0.45%

Calibration error is for runs 1-9.

Calculation of Average Emissions

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	1 9:52:00 10:13:00

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.07	0.07	0.07
MID	25.66 ppm	25.42	24.00	24.71
NOx/A DILUTION				
ZERO	0.00 ppm	0.00	0.12	0.06
MID	25.66 ppm	26.11	25.40	25.75
CO2				
ZERO	0.00 percent	0.02	0.11	0.07
MID	5.03 percent	5.02	4.99	5.00

Mean Reference Values:

18.15 ppm SO2/A DILUTION
43.04 ppm NOx/A DILUTION
8.73 percent CO2

Corrected Results:

18.83 ppm SO2/A DILUTION
42.93 ppm NOx/A DILUTION
8.83 percent CO2

Emission Calculations

0.064 lbs/mmBtu SO2/A DILUTION
0.104 lbs/mmBtu NOx/A DILUTION

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	2 10:34:00 10:55:00

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.07	0.37	0.22
MID	25.66 ppm	24.00	24.98	24.49
NOx/A DILUTION				
ZERO	0.00 ppm	0.12	0.00	0.06
MID	25.66 ppm	25.40	25.37	25.38
CO2				
ZERO	0.00 percent	0.11	0.16	0.14
MID	5.03 percent	4.99	4.99	4.99

Mean Reference Values:

17.15 ppm SO2/A DILUTION
42.54 ppm NOx/A DILUTION
8.70 percent CO2

Corrected Results:

17.90 ppm SO2/A DILUTION
43.05 ppm NOx/A DILUTION
8.87 percent CO2

Emission Calculations

0.060 lbs/mmBtu SO2/A DILUTION
0.104 lbs/mmBtu NOx/A DILUTION

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	3 11:16:00 11:36:40

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.37	0.46	0.42
MID	25.66 ppm	24.98	24.44	24.71
NOx/A DILUTION				
ZERO	0.00 ppm	0.00	-0.05	-0.02
MID	25.66 ppm	25.37	24.71	25.04
CO2				
ZERO	0.00 percent	0.16	0.13	0.14
MID	5.03 percent	4.99	4.99	4.99

Mean Reference Values:

17.03 ppm SO2/A DILUTION
44.07 ppm NOx/A DILUTION
8.74 percent CO2

Corrected Results:

17.55 ppm SO2/A DILUTION
45.15 ppm NOx/A DILUTION
8.91 percent CO2

Emission Calculations

0.059 lbs/mmBtu SO2/A DILUTION
0.109 lbs/mmBtu NOx/A DILUTION

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	4 11:57:00 12:18:00

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.46	0.46	0.46
MID	25.66 ppm	24.44	25.45	24.95
NOx/A DILUTION				
ZERO	0.00 ppm	-0.05	-0.02	-0.04
MID	25.66 ppm	24.71	25.15	24.93
CO2				
ZERO	0.00 percent	0.13	0.12	0.12
MID	5.03 percent	4.99	4.99	4.99

Mean Reference Values:

16.48 ppm SO2/A DILUTION
43.90 ppm NOx/A DILUTION
8.75 percent CO2

Corrected Results:

16.79 ppm SO2/A DILUTION
45.15 ppm NOx/A DILUTION
8.91 percent CO2

Emission Calculations

0.056 lbs/mmBtu SO2/A DILUTION
0.109 lbs/mmBtu NOx/A DILUTION

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	5 12:40:00 13:01:00

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.46	0.07	0.27
MID	25.66 ppm	25.45	24.69	25.07
NOx/A DILUTION				
ZERO	0.00 ppm	-0.02	-0.12	-0.07
MID	25.66 ppm	25.15	25.18	25.16
CO2				
ZERO	0.00 percent	0.12	0.12	0.12
MID	5.03 percent	4.99	5.02	5.00

Mean Reference Values:

15.70 ppm SO2/A DILUTION
44.09 ppm NOx/A DILUTION
8.82 percent CO2

Corrected Results:

15.97 ppm SO2/A DILUTION
44.91 ppm NOx/A DILUTION
8.96 percent CO2

Emission Calculations

0.053 lbs/mmBtu SO2/A DILUTION
0.108 lbs/mmBtu NOx/A DILUTION

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	6 13:22:00 13:43:00

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.07	0.02	0.05
MID	25.66 ppm	24.69	24.91	24.80
NOx/A DILUTION				
ZERO	0.00 ppm	-0.12	-0.07	-0.10
MID	25.66 ppm	25.18	25.18	25.18
CO2				
ZERO	0.00 percent	0.12	0.13	0.12
MID	5.03 percent	5.02	5.03	5.02

Mean Reference Values:

16.48 ppm SO2/A DILUTION
44.31 ppm NOx/A DILUTION
8.76 percent CO2

Corrected Results:

17.03 ppm SO2/A DILUTION
45.08 ppm NOx/A DILUTION
8.86 percent CO2

Emission Calculations

0.057 lbs/mmBtu SO2/A DILUTION
0.109 lbs/mmBtu NOx/A DILUTION

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	7 14:03:00 14:24:00

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.02	0.27	0.15
MID	25.66 ppm	24.91	25.54	25.23
NOx/A DILUTION				
ZERO	0.00 ppm	-0.07	0.00	-0.04
MID	25.66 ppm	25.18	25.20	25.19
CO2				
ZERO	0.00 percent	0.13	0.17	0.15
MID	5.03 percent	5.03	5.04	5.04

Mean Reference Values:

17.68 ppm SO2/A DILUTION
46.98 ppm NOx/A DILUTION
8.80 percent CO2

Corrected Results:

17.94 ppm SO2/A DILUTION
47.82 ppm NOx/A DILUTION
8.89 percent CO2

Emission Calculations

0.060 lbs/mmBtu SO2/A DILUTION
0.116 lbs/mmBtu NOx/A DILUTION

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	8 14:45:00 15:06:00

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.27	0.20	0.23
MID	25.66 ppm	25.54	25.42	25.48
NOx/A DILUTION				
ZERO	0.00 ppm	0.00	-0.12	-0.06
MID	25.66 ppm	25.20	25.13	25.16
CO2				
ZERO	0.00 percent	0.17	0.13	0.15
MID	5.03 percent	5.04	5.05	5.05

Mean Reference Values:

17.83 ppm SO2/A DILUTION
50.30 ppm NOx/A DILUTION
8.75 percent CO2

Corrected Results:

17.89 ppm SO2/A DILUTION
51.24 ppm NOx/A DILUTION
8.82 percent CO2

Emission Calculations

0.061 lbs/mmBtu SO2/A DILUTION
0.125 lbs/mmBtu NOx/A DILUTION

Calculation of Average Emissions

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	9 15:27:00 15:48:00

Calibration Gas Value		Initial Calibration	Final Calibration	Average
SO2/A DILUTION				
ZERO	0.00 ppm	0.20	0.12	0.16
MID	25.66 ppm	25.42	25.42	25.42
NOx/A DILUTION				
ZERO	0.00 ppm	-0.12	-0.05	-0.09
MID	25.66 ppm	25.13	24.84	24.98
CO2				
ZERO	0.00 percent	0.13	0.14	0.13
MID	5.03 percent	5.05	5.02	5.04

Mean Reference Values:

14.49 ppm SO2/A DILUTION
49.79 ppm NOx/A DILUTION
8.71 percent CO2

Corrected Results:

14.56 ppm SO2/A DILUTION
51.05 ppm NOx/A DILUTION
8.78 percent CO2

Emission Calculations

0.050 lbs/mmBtu SO2/A DILUTION
0.125 lbs/mmBtu NOx/A DILUTION

Sampling System Bias and Drift

Sampling System Bias and Drift

Performed By:	**Gulf Power Company**	Date Performed:	16-Jan-2013
	Pensacola, Florida	Test Number:	1
Performed For:	**Gulf Power Company**	Run Number:	1
	Crist, Unit CSFGD	Start Time:	9:52:00
	Pensacola, Florida	Stop Time:	10:13:00

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.07	0.00	0.07	0.00	0.00%
MID	25.42	25.42	0.00	24.00	-0.03	2.56%
NOx/A DILUTION						
ZERO	0.00	0.00	0.00	0.12	0.00	-0.22%
MID	26.11	26.11	0.00	25.40	-0.01	1.28%
CO2/A DILUTION						
ZERO	0.02	0.02	0.00	0.11	0.01	-0.84%
MID	5.02	5.02	0.00	4.99	0.00	0.33%

Sampling System Bias and Drift

Performed By:	**Gulf Power Company**	Date Performed:	16-Jan-2013
	Pensacola, Florida	Test Number:	1
Performed For:	**Gulf Power Company**	Run Number:	2
	Crist, Unit CSFGD	Start Time:	10:34:00
	Pensacola, Florida	Stop Time:	10:55:00

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.07	0.00	0.37	0.01	-0.53%
MID	25.42	24.00	-0.03	24.98	-0.01	-1.77%
NOx/A DILUTION						
ZERO	0.00	0.12	0.00	0.00	0.00	0.22%
MID	26.11	25.40	-0.01	25.37	-0.01	0.04%
CO2/A DILUTION						
ZERO	0.02	0.11	0.01	0.16	0.01	-0.47%
MID	5.02	4.99	0.00	4.99	0.00	-0.05%

Sampling System Bias and Drift

Performed By:	**Gulf Power Company**	Date Performed:	16-Jan-2013
	Pensacola, Florida	Test Number:	1
Performed For:	**Gulf Power Company**	Run Number:	3
	Crist, Unit CSFGD	Start Time:	11:16:00
	Pensacola, Florida	Stop Time:	11:36:40

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.37	0.01	0.46	0.01	-0.18%
MID	25.42	24.98	-0.01	24.44	-0.02	0.97%
NOx/A DILUTION						
ZERO	0.00	0.00	0.00	-0.05	0.00	0.09%
MID	26.11	25.37	-0.01	24.71	-0.03	1.20%
CO2/A DILUTION						
ZERO	0.02	0.16	0.01	0.13	0.01	0.33%
MID	5.02	4.99	0.00	4.99	0.00	0.05%

Sampling System Bias and Drift

Performed By:	**Gulf Power Company**	Date Performed:	16-Jan-2013
	Pensacola, Florida	Test Number:	1
Performed For:	**Gulf Power Company**	Run Number:	4
	Crist, Unit CSFGD	Start Time:	11:57:00
	Pensacola, Florida	Stop Time:	12:18:00

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.46	0.01	0.46	0.01	0.00%
MID	25.42	24.44	-0.02	25.45	0.00	-1.81%
NOx/A DILUTION						
ZERO	0.00	-0.05	0.00	-0.02	0.00	-0.04%
MID	26.11	24.71	-0.03	25.15	-0.02	-0.80%
CO2/A DILUTION						
ZERO	0.02	0.13	0.01	0.12	0.01	0.05%
MID	5.02	4.99	0.00	4.99	0.00	0.00%

Sampling System Bias and Drift

Performed By:	**Gulf Power Company**	Date Performed:	16-Jan-2013
	Pensacola, Florida	Test Number:	1
Performed For:	**Gulf Power Company**	Run Number:	5
	Crist, Unit CSFGD	Start Time:	12:40:00
	Pensacola, Florida	Stop Time:	13:01:00

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.46	0.01	0.07	0.00	0.71%
MID	25.42	25.45	0.00	24.69	-0.01	1.37%
NOx/A DILUTION						
ZERO	0.00	-0.02	0.00	-0.12	0.00	0.18%
MID	26.11	25.15	-0.02	25.18	-0.02	-0.04%
CO2/A DILUTION						
ZERO	0.02	0.12	0.01	0.12	0.01	0.00%
MID	5.02	4.99	0.00	5.02	0.00	-0.28%

Sampling System Bias and Drift

Performed By:	**Gulf Power Company**	Date Performed:	16-Jan-2013
	Pensacola, Florida	Test Number:	1
Performed For:	**Gulf Power Company**	Run Number:	6
	Crist, Unit CSFGD	Start Time:	13:22:00
	Pensacola, Florida	Stop Time:	13:43:00

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.07	0.00	0.02	0.00	0.09%
MID	25.42	24.69	-0.01	24.91	-0.01	-0.40%
NOx/A DILUTION						
ZERO	0.00	-0.12	0.00	-0.07	0.00	-0.09%
MID	26.11	25.18	-0.02	25.18	-0.02	0.00%
CO2/A DILUTION						
ZERO	0.02	0.12	0.01	0.13	0.01	-0.05%
MID	5.02	5.02	0.00	5.03	0.00	-0.14%

Sampling System Bias and Drift

Performed By:	**Gulf Power Company**	Date Performed:	16-Jan-2013
	Pensacola, Florida	Test Number:	1
Performed For:	**Gulf Power Company**	Run Number:	7
	Crist, Unit CSFGD	Start Time:	14:03:00
	Pensacola, Florida	Stop Time:	14:24:00

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.02	0.00	0.27	0.00	-0.44%
MID	25.42	24.91	-0.01	25.54	0.00	-1.15%
NOx/A DILUTION						
ZERO	0.00	-0.07	0.00	0.00	0.00	-0.13%
MID	26.11	25.18	-0.02	25.20	-0.02	-0.04%
CO2/A DILUTION						
ZERO	0.02	0.13	0.01	0.17	0.01	-0.37%
MID	5.02	5.03	0.00	5.04	0.00	-0.09%

Sampling System Bias and Drift

Performed By:	**Gulf Power Company**	Date Performed:	16-Jan-2013
	Pensacola, Florida	Test Number:	1
Performed For:	**Gulf Power Company**	Run Number:	8
	Crist, Unit CSFGD	Start Time:	14:45:00
	Pensacola, Florida	Stop Time:	15:06:00

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.27	0.00	0.20	0.00	0.13%
MID	25.42	25.54	0.00	25.42	0.00	0.22%
NOx/A DILUTION						
ZERO	0.00	0.00	0.00	-0.12	0.00	0.22%
MID	26.11	25.20	-0.02	25.13	-0.02	0.13%
CO2/A DILUTION						
ZERO	0.02	0.17	0.01	0.13	0.01	0.37%
MID	5.02	5.04	0.00	5.05	0.00	-0.14%

Sampling System Bias and Drift

Performed By:	**Gulf Power Company** Pensacola, Florida	Date Performed: Test Number:	16-Jan-2013 1
Performed For:	**Gulf Power Company** Crist, Unit CSFGD Pensacola, Florida	Run Number: Start Time: Stop Time:	9 15:27:00 15:48:00

Monitor Type	Analyzer Cal Response	Initial Cal Value	Calculated Bias	Final Cal Value	Calculated Bias	Calculated Drift
SO2/A DILUTION						
ZERO	0.07	0.20	0.00	0.12	0.00	0.13%
MID	25.42	25.42	0.00	25.42	0.00	0.00%
NOx/A DILUTION						
ZERO	0.00	-0.12	0.00	-0.05	0.00	-0.13%
MID	26.11	25.13	-0.02	24.84	-0.02	0.53%
CO2/A DILUTION						
ZERO	0.02	0.13	0.01	0.14	0.01	-0.14%
MID	5.02	5.05	0.00	5.02	0.00	0.37%

One Minute Averages

Run #1

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 9:52	8.654	43.37	18.32
2	1/16/2013 9:53	8.663	44.28	18.56
3	1/16/2013 9:54	8.611	43.61	18.17
4	1/16/2013 9:55	8.593	42.73	18.09
5	1/16/2013 9:56	8.628	41.88	18.48
6	1/16/2013 9:57	8.678	42.83	18.19
7	1/16/2013 9:58	8.713	43.74	18.44
8	1/16/2013 9:59	8.770	43.90	18.42
9	1/16/2013 10:00	8.744	43.68	18.36
10	1/16/2013 10:01	8.738	43.45	18.27
11	1/16/2013 10:02	8.738	42.60	18.38
12	1/16/2013 10:03	8.739	42.17	18.07
13	1/16/2013 10:04	8.733	41.78	17.91
14	1/16/2013 10:05	8.727	42.51	17.96
15	1/16/2013 10:06	8.759	42.69	17.87
16	1/16/2013 10:07	8.773	42.50	18.00
17	1/16/2013 10:08	8.811	42.70	18.25
18	1/16/2013 10:09	8.813	43.05	17.99
19	1/16/2013 10:10	8.807	43.37	17.66
20	1/16/2013 10:11	8.846	43.74	17.77
21	1/16/2013 10:12	8.841	43.30	18.04
Average		**8.732**	**43.04**	**18.15**

Run #2

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 10:34	8.414	40.84	17.20
2	1/16/2013 10:35	8.482	41.72	17.38
3	1/16/2013 10:36	8.524	41.92	17.33
4	1/16/2013 10:37	8.567	41.92	17.31
5	1/16/2013 10:38	8.613	42.42	17.23
6	1/16/2013 10:39	8.650	42.51	17.25
7	1/16/2013 10:40	8.641	43.02	17.39
8	1/16/2013 10:41	8.681	42.78	17.26
9	1/16/2013 10:42	8.702	43.43	17.22
10	1/16/2013 10:43	8.736	43.76	17.29
11	1/16/2013 10:44	8.766	44.23	17.07
12	1/16/2013 10:45	8.788	44.22	17.04
13	1/16/2013 10:46	8.797	42.43	17.16
14	1/16/2013 10:47	8.769	42.37	17.03
15	1/16/2013 10:48	8.744	42.63	17.05
16	1/16/2013 10:49	8.737	42.33	16.70
17	1/16/2013 10:50	8.790	42.35	17.31
18	1/16/2013 10:51	8.779	42.12	16.77
19	1/16/2013 10:52	8.792	42.25	17.05
20	1/16/2013 10:53	8.834	42.67	17.05
21	1/16/2013 10:54	8.838	41.46	17.09
Average		**8.697**	**42.54**	**17.15**

Run #3

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 11:16	8.435	41.59	16.75
2	1/16/2013 11:17	8.494	43.14	16.91
3	1/16/2013 11:18	8.557	43.12	16.94
4	1/16/2013 11:19	8.595	43.23	16.82
5	1/16/2013 11:20	8.634	43.68	16.83
6	1/16/2013 11:21	8.677	44.41	17.06
7	1/16/2013 11:22	8.728	45.14	17.30
8	1/16/2013 11:23	8.742	45.33	17.13
9	1/16/2013 11:24	8.769	45.66	16.85
10	1/16/2013 11:25	8.794	45.36	17.05
11	1/16/2013 11:26	8.807	43.79	17.27
12	1/16/2013 11:27	8.834	43.68	17.07
13	1/16/2013 11:28	8.829	44.77	17.39
14	1/16/2013 11:29	8.848	44.83	17.32
15	1/16/2013 11:30	8.858	44.74	17.23
16	1/16/2013 11:31	8.825	44.30	17.13
17	1/16/2013 11:32	8.827	44.00	17.18
18	1/16/2013 11:33	8.826	43.60	17.11
19	1/16/2013 11:34	8.817	43.30	16.84
20	1/16/2013 11:35	8.821	44.10	16.46
21	1/16/2013 11:34	8.806	44.49	16.43
22	1/16/2013 11:35	8.816	43.92	16.67
23	1/16/2013 11:36	8.867	43.54	16.72
Average		**8.748**	**44.07**	**16.98**

Run #4

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 11:57	8.477	42.87	15.30
2	1/16/2013 11:58	8.523	42.51	15.41
3	1/16/2013 11:59	8.528	41.94	15.78
4	1/16/2013 12:00	8.609	42.01	16.00
5	1/16/2013 12:01	8.668	42.06	16.31
6	1/16/2013 12:02	8.680	43.55	16.45
7	1/16/2013 12:03	8.729	44.49	16.41
8	1/16/2013 12:04	8.732	45.19	16.48
9	1/16/2013 12:05	8.747	44.22	16.57
10	1/16/2013 12:06	8.758	44.33	16.83
11	1/16/2013 12:07	8.795	44.68	16.85
12	1/16/2013 12:08	8.799	45.01	16.91
13	1/16/2013 12:09	8.807	44.76	17.12
14	1/16/2013 12:10	8.821	43.29	17.31
15	1/16/2013 12:11	8.826	44.52	17.35
16	1/16/2013 12:12	8.797	44.70	17.40
17	1/16/2013 12:13	8.847	43.71	16.99
18	1/16/2013 12:14	8.858	44.44	16.45
19	1/16/2013 12:15	8.874	45.37	15.85
20	1/16/2013 12:16	8.891	45.14	16.13
21	1/16/2013 12:17	8.906	43.16	16.12
Average		**8.746**	**43.90**	**16.48**

Run #5

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 12:40	8.558	43.17	15.08
2	1/16/2013 12:41	8.652	43.16	15.10
3	1/16/2013 12:42	8.724	43.90	15.23
4	1/16/2013 12:43	8.781	43.33	15.45
5	1/16/2013 12:44	8.822	43.70	15.68
6	1/16/2013 12:45	8.836	44.19	15.94
7	1/16/2013 12:46	8.834	43.66	15.51
8	1/16/2013 12:47	8.821	44.52	15.60
9	1/16/2013 12:48	8.841	44.52	15.81
10	1/16/2013 12:49	8.873	44.62	15.62
11	1/16/2013 12:50	8.882	44.64	16.05
12	1/16/2013 12:51	8.870	43.32	16.18
13	1/16/2013 12:52	8.870	43.56	15.84
14	1/16/2013 12:53	8.813	44.74	15.44
15	1/16/2013 12:54	8.805	44.30	16.02
16	1/16/2013 12:55	8.807	44.31	15.56
17	1/16/2013 12:56	8.834	44.22	15.62
18	1/16/2013 12:57	8.904	44.73	16.08
19	1/16/2013 12:58	8.925	44.87	15.84
20	1/16/2013 12:59	8.941	44.00	16.07
21	1/16/2013 13:00	8.927	44.51	15.89
Average		**8.825**	**44.09**	**15.70**

Run #6

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 13:22	8.457	41.10	15.77
2	1/16/2013 13:23	8.547	42.67	15.99
3	1/16/2013 13:24	8.578	43.71	15.91
4	1/16/2013 13:25	8.657	43.55	16.27
5	1/16/2013 13:26	8.708	43.95	16.54
6	1/16/2013 13:27	8.710	45.50	16.43
7	1/16/2013 13:28	8.712	45.54	16.18
8	1/16/2013 13:29	8.748	44.31	16.04
9	1/16/2013 13:30	8.790	44.32	16.37
10	1/16/2013 13:31	8.794	43.45	16.16
11	1/16/2013 13:32	8.807	42.98	16.50
12	1/16/2013 13:33	8.835	43.63	16.70
13	1/16/2013 13:34	8.824	43.49	16.78
14	1/16/2013 13:35	8.847	44.29	16.66
15	1/16/2013 13:36	8.851	43.79	16.58
16	1/16/2013 13:37	8.858	44.93	16.98
17	1/16/2013 13:38	8.881	46.19	16.75
18	1/16/2013 13:39	8.844	45.94	16.86
19	1/16/2013 13:40	8.838	44.55	16.78
20	1/16/2013 13:41	8.847	46.08	16.68
21	1/16/2013 13:42	8.822	46.62	17.15
Average		**8.760**	**44.31**	**16.48**

Run #7

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 14:03	8.567	44.62	17.90
2	1/16/2013 14:04	8.659	44.34	17.95
3	1/16/2013 14:05	8.685	44.66	18.24
4	1/16/2013 14:06	8.693	44.74	18.05
5	1/16/2013 14:07	8.730	45.97	18.05
6	1/16/2013 14:08	8.751	45.88	18.07
7	1/16/2013 14:09	8.744	45.40	17.91
8	1/16/2013 14:10	8.767	45.25	18.04
9	1/16/2013 14:11	8.783	45.05	18.07
10	1/16/2013 14:12	8.808	46.35	17.60
11	1/16/2013 14:13	8.834	47.59	17.63
12	1/16/2013 14:14	8.838	46.63	17.34
13	1/16/2013 14:15	8.812	47.02	17.31
14	1/16/2013 14:16	8.826	47.95	17.25
15	1/16/2013 14:17	8.870	48.36	17.37
16	1/16/2013 14:18	8.899	48.73	17.27
17	1/16/2013 14:19	8.895	48.84	17.29
18	1/16/2013 14:20	8.920	50.09	17.39
19	1/16/2013 14:21	8.949	50.90	17.59
20	1/16/2013 14:22	8.908	49.90	17.51
21	1/16/2013 14:23	8.887	48.29	17.55
Average		**8.801**	**46.98**	**17.68**

Run #8

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 14:45	8.479	49.10	17.23
2	1/16/2013 14:46	8.550	49.32	17.76
3	1/16/2013 14:47	8.575	49.07	17.64
4	1/16/2013 14:48	8.618	49.90	17.93
5	1/16/2013 14:49	8.681	50.26	17.92
6	1/16/2013 14:50	8.724	49.82	17.81
7	1/16/2013 14:51	8.753	50.29	17.66
8	1/16/2013 14:52	8.794	50.36	17.88
9	1/16/2013 14:53	8.782	50.70	17.52
10	1/16/2013 14:54	8.778	51.45	17.84
11	1/16/2013 14:55	8.788	50.81	17.64
12	1/16/2013 14:56	8.798	50.98	17.52
13	1/16/2013 14:57	8.841	50.19	17.79
14	1/16/2013 14:58	8.886	51.31	17.81
15	1/16/2013 14:59	8.841	51.06	17.91
16	1/16/2013 15:00	8.830	50.26	18.21
17	1/16/2013 15:01	8.808	49.60	17.90
18	1/16/2013 15:02	8.803	49.75	18.27
19	1/16/2013 15:03	8.813	51.97	17.99
20	1/16/2013 15:04	8.844	50.55	18.14
21	1/16/2013 15:05	8.828	49.62	18.13
Average		**8.753**	**50.30**	**17.83**

Run #9

#	Date/Time	CO2/A DILUTION	NOx/A DILUTION	SO2/A DILUTION
1	1/16/2013 15:27	8.449	48.52	14.86
2	1/16/2013 15:28	8.530	48.38	14.78
3	1/16/2013 15:29	8.592	48.68	15.08
4	1/16/2013 15:30	8.617	49.44	14.78
5	1/16/2013 15:31	8.622	48.79	14.38
6	1/16/2013 15:32	8.649	49.77	14.37
7	1/16/2013 15:33	8.675	50.53	14.31
8	1/16/2013 15:34	8.707	50.11	14.26
9	1/16/2013 15:35	8.733	49.56	14.26
10	1/16/2013 15:36	8.755	49.72	14.18
11	1/16/2013 15:37	8.770	49.28	14.17
12	1/16/2013 15:38	8.754	50.54	14.44
13	1/16/2013 15:39	8.766	50.52	14.25
14	1/16/2013 15:40	8.780	49.49	14.51
15	1/16/2013 15:41	8.783	50.71	14.28
16	1/16/2013 15:42	8.785	50.45	14.60
17	1/16/2013 15:43	8.794	49.37	14.41
18	1/16/2013 15:44	8.763	50.21	14.68
19	1/16/2013 15:45	8.806	50.48	14.54
20	1/16/2013 15:46	8.829	50.51	14.46
21	1/16/2013 15:47	8.834	50.61	14.63
Average		**8.714**	**49.79**	**14.49**

Appendix B. Relative Accuracy Test Audit for the Flow Monitors

Plant CRIST Unit FGD Annual Flow Relative Accuracy Test Audit RATA

Plant	CRIST	Test Number:	1
Unit	FGD	System ID:	FLO1
Load	L	Reason for Test:	Q

Results: 5.93 % Relative Accuracy
1.052 Bias Adjustment Factor
2.14 Flow to load ratio

RUN#	LOAD gross MW	START DATE mm/dd/yy	START TIME hh:mm	END DATE mm/dd/yy	END TIME hh:mm	RM SCFM	CEM SCFM	DIFF SCFM	DIFF %	RATA STATUS FLAG *
1	417.0	01/17/13	09:19	01/17/13	09:24	1504450	1435050.000	69400.0	4.61%	1
2	416.4	01/17/13	09:25	01/17/13	09:30	1476216.667	1437466.667	38750.0	2.62%	1
3	412.4	01/17/13	09:31	01/17/13	09:36	1480966.667	1411766.667	69200.0	4.67%	1
4	412.0	01/17/13	09:37	01/17/13	09:42	1497966.667	1407350.000	90616.7	6.05%	1
5	410.5	01/17/13	09:43	01/17/13	09:48	1451800	1395833.333	55966.7	3.85%	1
6	411.0	01/17/13	09:49	01/17/13	09:54	1463100	1372483.333	90616.7	6.19%	1
7	410.5	01/17/13	09:55	01/17/13	10:00	1473450	1370483.333	102966.7	6.99%	0
8	410.8	01/17/13	10:01	01/17/13	10:06	1458000	1367700.000	90300.0	6.19%	1
9	411.1	01/17/13	10:07	01/17/13	10:12	1431016.667	1368600.000	62416.7	4.36%	1
10	411.4	01/17/13	10:13	01/17/13	10:19	1453483.333	1365042.857	88440.5	6.08%	1
11								0		0
12								0		0
AVG	412					1469045	1393178	75867	5.2%	9 runs used

Note: Averages above include ALL test runs.

* 0=run not used, 1=run used, 9=RATA not used

Plant CRIST Unit FGD Annual Flow Relative Accuracy Test Audit RATA

Plant	CRIST	Test Number:	1
Unit	FGD	System ID:	
Load	M	Reason for Test:	C

Results:		
	7.05	% Relative Accuracy
	1.067	Bias Adjustment Factor
	1.92	Flow to load ratio

RUN#	LOAD gross MW	START DATE mm/dd/yy	START TIME hh:mm	END DATE mm/dd/yy	END TIME hh:mm	RM SCFM	CEM SCFM	DIFF SCFM	DIFF %	RATA STATUS FLAG *
1	581	01/17/13	13:17	01/17/13	13:22	1869233.333	1776483.333	92750	5.0%	1
2	581	01/17/13	13:23	01/17/13	13:28	1869400.000	1729816.667	139583.3333	7.5%	1
3	583	01/17/13	13:29	01/17/13	13:34	1872183.333	1708183.333	164000	8.8%	0
4	581	01/17/13	13:35	01/17/13	13:40	1832100.000	1722133.333	109966.6667	6.0%	1
5	579	01/17/13	13:41	01/17/13	13:46	1856366.667	1744416.667	111950	6.0%	1
6	579	01/17/13	13:47	01/17/13	13:52	1845600.000	1719600.000	126000	6.8%	1
7	580	01/17/13	13:53	01/17/13	13:58	1842666.667	1745733.333	96933.33333	5.3%	1
8	578	01/17/13	13:59	01/17/13	14:04	1875233.333	1729450.000	145783.3333	7.8%	1
9	577	01/17/13	14:05	01/17/13	14:10	1860583.333	1738216.667	122366.6667	6.6%	1
10	578	01/17/13	14:11	01/17/13	14:16	1856916.667	1750166.667	106750	5.7%	1
11								0		
12								0		
AVG	580					1858028	1736420	121608	6.5%	9 runs used

Note. Averages above include ALL test runs.

* 0=run not used, 1=run used, 9=RATA not used

Appendix C. Gas and Flow CEMS Data

CEMS Data – Gas RATA

CEMS Data – Mid Load Flow RATA

	Date Time	FLO3	GEN5	GEN7	
		1793.1	60.4	521.78	
	1/17/2013 13:18	1786.9	60.4	521.84	
	1/17/2013 13:19	1777.4	60.3	521.42	
	1/17/2013 13:20	1777.8	60.3	520.99	
	1/17/2013 13:21	1755	60.3	520.46	
		1768.7	60.2	520.17	
1/17/2013 13:17	1/17/2013 13:22	**1776.5**	**60.32**	**521.11**	**581.4267**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1749.8	60.2	520.1	
	1/17/2013 13:24	1742.2	60.4	520.32	
	1/17/2013 13:25	1733.6	60.5	520.49	
	1/17/2013 13:26	1725.1	60.4	520.81	
	1/17/2013 13:27	1717.6	60.5	520.92	
		1710.6	60.4	521.28	
1/17/2013 13:23	1/17/2013 13:28	**1729.8**	**60.4**	**520.65**	**581.0533**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1702.6	60.4	521.6	
	1/17/2013 13:30	1684.2	60.4	522.02	
	1/17/2013 13:31	1679.4	60.4	522.34	
	1/17/2013 13:32	1723.1	60.3	522.52	
	1/17/2013 13:33	1739.9	60.3	522.45	
		1719.9	60.5	522.02	
1/17/2013 13:29	1/17/2013 13:34	**1708.2**	**60.38**	**522.16**	**582.5417**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1699.2	60.2	521.63	
	1/17/2013 13:36	1715.7	60.5	521.56	
	1/17/2013 13:37	1742.8	60.2	521.27	
	1/17/2013 13:38	1735.5	60.1	520.96	
	1/17/2013 13:39	1727.7	60.3	520.71	
		1711.9	60.5	520.64	
1/17/2013 13:35	1/17/2013 13:40	**1722.1**	**60.3**	**521.13**	**581.4283**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1723.7	60.5	519.89	
	1/17/2013 13:42	1744.8	60.1	519.21	
	1/17/2013 13:43	1738.8	60.2	519.35	
	1/17/2013 13:44	1751.8	60.5	518.71	
	1/17/2013 13:45	1768.5	60.5	517.96	
		1738.9	60.2	518.28	
1/17/2013 13:41	1/17/2013 13:46	**1744.4**	**60.33**	**518.9**	**579.2333**

	Date Time	FLO3	GEN5	GEN7	
		1711.1	60.2	518.89	
	1/17/2013 13:48	1708.3	60.2	518.93	
	1/17/2013 13:49	1712.2	60.5	518.93	
	1/17/2013 13:50	1716.8	60.3	519	
	1/17/2013 13:51	1723.1	60.2	519.1	
		1746.1	60.4	519.78	
1/17/2013 13:47	1/17/2013 13:52	**1719.6**	**60.3**	**519.11**	**579.405**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1751.9	60.5	520.28	
	1/17/2013 13:54	1751.3	60.3	520.6	
	1/17/2013 13:55	1759.4	60.2	520.46	
	1/17/2013 13:56	1753.4	60.2	520.21	
	1/17/2013 13:57	1737.7	60.3	519.78	
		1720.7	60.2	519.14	
1/17/2013 13:53	1/17/2013 13:58	**1745.7**	**60.28**	**520.08**	**580.3617**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1712.2	60.3	519	
	1/17/2013 14:00	1757	60.3	518.61	
	1/17/2013 14:01	1724.6	60.3	518.14	
	1/17/2013 14:02	1718.1	60.3	517.79	
	1/17/2013 14:03	1729.8	60.3	517.15	
		1735	60.3	516.43	
1/17/2013 13:59	1/17/2013 14:04	**1729.5**	**60.3**	**517.85**	**578.1533**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1766.3	60.3	516.04	
	1/17/2013 14:06	1718.9	60.2	515.76	
	1/17/2013 14:07	1716.5	60.4	516.19	
	1/17/2013 14:08	1726.6	60.3	516.15	
	1/17/2013 14:09	1737.3	60.3	516.18	
		1763.7	60.5	516.68	
1/17/2013 14:05	1/17/2013 14:10	**1738.2**	**60.33**	**516.17**	**576.5**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1754.9	60.5	517	
	1/17/2013 14:12	1740.1	60.3	517.29	
	1/17/2013 14:13	1746.6	60.2	517.18	
	1/17/2013 14:14	1759.4	60.3	517.15	
	1/17/2013 14:15	1744.8	60.3	517.39	
		1755.2	60.2	517.5	
1/17/2013 14:11	1/17/2013 14:16	**1750.2**	**60.3**	**517.25**	**577.5517**

CEMS Data – Low Load Flow RATA

	Date Time	FLO3	GEN5	GEN7	
		1436.3	64.8	351.66	
	1/17/2013 9:20	1428.8	65.6	351.48	
	1/17/2013 9:21	1437.2	66.2	350.95	
	1/17/2013 9:22	1441.1	65.9	350.77	
	1/17/2013 9:23	1433.6	66.1	351.09	
		1433.3	66	351.45	
1/17/2013 9:19	1/17/2013 9:24	**1435.05**	**65.77**	**351.23**	**417.00**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1437.2	66	351.69	
	1/17/2013 9:26	1440.4	66.2	351.73	
	1/17/2013 9:27	1436.8	66.2	351.77	
	1/17/2013 9:28	1441.7	65.2	351.23	
	1/17/2013 9:29	1439.3	63.8	350.7	
		1429.4	63.1	350.77	
1/17/2013 9:25	1/17/2013 9:30	**1437.467**	**65.08**	**351.32**	**416.40**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1422.7	62.2	351.48	
	1/17/2013 9:32	1410	61.2	352.44	
	1/17/2013 9:33	1407.7	60.2	352.44	
	1/17/2013 9:34	1416.8	60.3	351.05	
	1/17/2013 9:35	1407.7	60.6	351.13	
		1405.7	60.1	351.37	
1/17/2013 9:31	1/17/2013 9:36	**1411.767**	**60.77**	**351.65**	**412.42**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1419.3	60.5	351.77	
	1/17/2013 9:38	1412.1	60.6	352.12	
	1/17/2013 9:39	1406.7	60.2	352.12	
	1/17/2013 9:40	1406.9	60.2	352.19	
	1/17/2013 9:41	1397.9	60.3	351.27	
		1401.2	60.4	350.59	
1/17/2013 9:37	1/17/2013 9:42	**1407.35**	**60.37**	**351.68**	**412.04**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1400.3	60.3	350.27	
	1/17/2013 9:44	1399.4	60.3	350.27	
	1/17/2013 9:45	1400.4	60.3	350.13	
	1/17/2013 9:46	1394.8	60.3	349.88	
	1/17/2013 9:47	1387.5	60.2	350.02	
		1392.6	60.3	350.77	
1/17/2013 9:43	1/17/2013 9:48	**1395.833**	**60.28**	**350.22**	**410.51**

	Date Time	FLO3	GEN5	GEN7	
		1397.6	60.3	351.02	
	1/17/2013 9:50	1386.9	60.4	350.66	
	1/17/2013 9:51	1378.2	60.4	350.91	
	1/17/2013 9:52	1372.9	60.3	350.52	
	1/17/2013 9:53	1357.2	60.3	350.31	
		1342.1	60.2	350.52	
1/17/2013 9:49	1/17/2013 9:54	**1372.483**	**60.32**	**350.66**	**410.97**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1348	60.3	350.2	
	1/17/2013 9:56	1355.9	60.2	350.45	
	1/17/2013 9:57	1370.8	60.3	350.52	
	1/17/2013 9:58	1389.2	60.3	350.23	
	1/17/2013 9:59	1383.8	60.3	349.77	
		1375.2	60.2	350.13	
1/17/2013 9:55	1/17/2013 10:00	**1370.483**	**60.27**	**350.22**	**410.48**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1376.8	60.4	350.91	
	1/17/2013 10:02	1378.4	60.5	350.91	
	1/17/2013 10:03	1380.5	60.5	350.59	
	1/17/2013 10:04	1370.5	60.5	349.84	
	1/17/2013 10:05	1351.9	60.2	350.09	
		1348.1	60.2	350.38	
1/17/2013 10:01	1/17/2013 10:06	**1367.7**	**60.38**	**350.45**	**410.84**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1355	60.2	350.13	
	1/17/2013 10:08	1359.6	60.3	349.98	
	1/17/2013 10:09	1363.8	60.3	350.52	
	1/17/2013 10:10	1376	60.3	350.98	
	1/17/2013 10:11	1383.5	60.3	351.48	
		1373.7	60.3	351.69	
1/17/2013 10:07	1/17/2013 10:12	**1368.6**	**60.28**	**350.80**	**411.08**
	Date Time	**FLO3**	**GEN5**	**GEN7**	
		1366.9	60.3	351.2	
	1/17/2013 10:14	1375	60.3	350.73	
	1/17/2013 10:15	1374.7	60.4	350.66	
	1/17/2013 10:16	1359.7	60.4	351.27	
	1/17/2013 10:17	1354	60.4	351.98	
	1/17/2013 10:18	1362.7	60.4	351.27	
		1362.3	60.4	350.38	
1/17/2013 10:13	1/17/2013 10:19	**1365.043**	**60.37**	**351.07**	**411.44**

Appendix D. Reference Method Analyzer Performance Results

INTERFERNCE RESPONSE TEST
AUDIT TRAILER INSTRUMENT BAY A
REPLACEMENT NO_X, RECHECKED SO_2 AND CO_2 ANALYZER

DATE 1/4/2006
PARAMETER NO_X
ANALYZER SER. NUMBER 525912431
ANALYST JOHN MCPHERSON

PARAMETER	CONCENTRATION	CYLINDER NUMBER	RESPONSE	% OF SPAN
CO	*504 PPM*	*ALM010287*	*0.00*	*0.00*
CO_2	*9.06%*	*ALM053933*	*0.20*	*0.05*
SO_2	*203.0 PPM*	*ALM034735*	*0.00*	*0.00*
O_2	*20.90%*	*AMBIENT*	*0.00*	*0.00*

DATE 1/4/2006
PARAMETER SO_2
ANALYZER SER. NUMBER 43C-72790-372
ANALYST JOHN MCPHERSON

PARAMETER	CONCENTRATION	CYLINDER NUMBER	RESPONSE	% OF SPAN
CO	*504 PPM*	*ALM010287*	*0.00*	*0.00*
CO_2	*9.06%*	*ALM053933*	*0.00*	*0.00*
SO_2	*203.0 PPM*	*ALM034735*	*NA*	*NA*
O_2	*20.90%*	*AMBIENT*	*0.00*	*0.00*

DATE 1/4/2006
PARAMETER CO_2
ANALYZER SER. NUMBER N5-672
ANALYST JOHN MCPHERSON

PARAMETER	CONCENTRATION	CYLINDER NUMBER	RESPONSE	% OF SPAN
CO	*504 PPM*	*ALM010287*	*0.055*	*0.010*
CO_2	*9.06%*	*ALM053933*	*NA*	*NA*
SO_2	*203.0 PPM*	*ALM034735*	*0.021*	*0.030*
O_2	*20.90%*	*AMBIENT*	*NA*	*NA*

#	Date/Time	NOx/A	SO2/A	CO2/A
1	1/4/2006 9:07	0.0	0.0	0.056
2	1/4/2006 9:08	0.0	0.0	0.056
3	1/4/2006 9:09	0.0	0.0	0.056
4	1/4/2006 9:10	0.0	0.0	0.056
5	1/4/2006 9:11	0.0	0.0	0.056
6	1/4/2006 9:12	0.0	0.0	0.055
7	1/4/2006 9:13	0.0	0.0	0.055
8	1/4/2006 9:14	0.0	0.0	0.055
9	1/4/2006 9:15	0.0	0.0	0.055
10	1/4/2006 9:16	0.0	0.0	0.055
11	1/4/2006 9:17	0.0	0.0	0.053
12	1/4/2006 9:18	0.0	0.0	0.053
13	1/4/2006 9:19	0.0	0.0	0.055
14	1/4/2006 9:20	0.0	0.0	0.054
15	1/4/2006 9:21	0.0	0.0	0.055
16	1/4/2006 9:22	0.0	0.0	0.056
17	1/4/2006 9:23	0.0	0.0	0.056
18	1/4/2006 9:24	0.0	0.0	0.054
19	1/4/2006 9:25	0.0	0.0	0.054
20	1/4/2006 9:26	0.0	0.0	0.055
21	1/4/2006 9:27	0.0	0.0	0.056
22	1/4/2006 9:28	0.0	0.0	0.056
23	1/4/2006 9:29	0.0	0.0	0.072
24	1/4/2006 9:30	0.0	0.0	0.082
25	1/4/2006 9:31	0.0	0.0	0.082
26	1/4/2006 9:32	0.0	0.0	0.082
27	1/4/2006 9:33	0.2	0.2	0.081
28	1/4/2006 9:34	2.0	4.4	0.058
29	1/4/2006 9:35	0.8	4.8	0.054
30	1/4/2006 9:36	0.0	3.7	0.045
31	1/4/2006 9:37	1.2	3.5	0.011
32	1/4/2006 9:38	2.1	4.8	0.015
33	1/4/2006 9:39	2.1	4.8	0.039
34	1/4/2006 9:40	0.7	4.8	0.021
35	1/4/2006 9:41	1.9	4.8	0.015
36	1/4/2006 9:42	1.7	4.8	0.043
37	1/4/2006 9:43	0.0	4.8	0.051
38	1/4/2006 9:44	0.1	2.8	0.037
39	1/4/2006 9:45	1.4	4.0	0.017
40	1/4/2006 9:46	1.9	4.8	0.047
41	1/4/2006 9:47	0.1	4.8	0.057
42	1/4/2006 9:48	0.0	3.8	0.053
43	1/4/2006 9:49	0.0	2.6	0.029
44	1/4/2006 9:50	0.0	4.8	0.025
45	1/4/2006 9:51	0.0	4.8	0.025
46	1/4/2006 9:52	0.0	4.8	0.025
	Average	0.4	1.8	0.050

20.9% O_2 to all analyzers

504 ppm CO to all analyzers

9.06 % CO_2 to NO_x and SO_2

203 ppm SO_2 to all analyzers

Purged regulator & reflowed SO_2

SO_2

Response Time Test

Analyzer Response Time
Gulf Power Company
Plant Crist
FGD Stack
Wednesday, January 16, 2013

Monitor : NO_x
Serial Number : 525912431
Span Gas Concentration : 55.15
Monitor Span : 55.15

	Upscale Response Time Seconds		Downscale Response Time Seconds
RUN 1	240	RUN 1	240
RUN 2	240	RUN 2	240
RUN 3	240	RUN 3	240
Average	240.0	**Average**	240.0

System Reponse Time 240.00 seconds
4.00 minutes

Monitor : SO_2
Serial Number : 43C-72790-372
Span Gas Concentration : 55.31
Monitor Span : 55.31

	Upscale Response Time Seconds		Downscale Response Time Seconds
RUN 1	240	RUN 1	240
RUN 2	240	RUN 2	240
RUN 3	240	RUN 3	240
Average	240.0	**Average**	240.0

System Reponse Time 240.00 seconds
4.00 minutes

Monitor : CO_2
Serial Number : N1-N5-0672
Span Gas Concentration : 10.4%
Monitor Span : 10.4%

	Upscale Response Time Seconds		Downscale Response Time Seconds
RUN 1	240	RUN 1	240
RUN 2	240	RUN 2	240
RUN 3	240	RUN 3	240
Average	240.0	**Average**	240.0

System Reponse Time 240.0 seconds
4.00 minutes
Slower Response Time 4.00 minutes

NO_x Converter Check

Gulf Power Company
Plant Crist
FGD Stack
Wednesday, January 16, 2013

Nox Converter Efficiency Check

8.2.4.1 Introduce a concentration of 40 to 60 ppmv NO_2 to the analyzer in direct calibration mode and record the Nox concentration displayed by the analyzer. If a dilution probe is used, introduce the NO_2 calibration gas at a point before the dilution takes place. Calculate the converter efficiency using equation 7E-7 in section 12.7. The specification for converter efficiency in section 13.5 must be met. The NO2 must be prepared according to the EPA Traceability Protocol and have an accuracy within 2.0 percent.

13.5 NO2 to NO Conversion Efficiency Test (as applicable).
The NO2 to NO conversion efficiency, calculated according to equation 7E-7 must be greater than or equal to 90 percent

$$Eff_{NO\ 2} = \frac{C_{Dir}}{C_v} \times 100$$

Eff_{NO2} = NO2 to NO converter efficiency, percent (%) = 90.7%

C_{dir} = Measured concentration a calibration gas = 45.1
(low, mid, high) when introduced in direct calibration mode, ppmv.
In this case the measured concentration of NO2, ppmv.

C_v = Manufacturer certified concentration of a calibration gas (low, mid, high), ppmv. = 49.8
In this case the certified concentration of NO2, ppmv.

Cylinder Number = CC317706
Expiration Date = 11/2/2015

NO_X Converter Check
Wednesday, January 16, 2013
Gulf Power Company
Plant Crist
FGD Stack

#	Date/Time	NOx/A DILUTION
1	1/16/2013 16:13	44
2	1/16/2013 16:13	44.4
3	1/16/2013 16:13	44.49
4	1/16/2013 16:13	44.66
5	1/16/2013 16:13	44.84
6	1/16/2013 16:13	44.93
7	1/16/2013 16:14	45.05
8	1/16/2013 16:14	45.2
9	1/16/2013 16:14	45.15
10	1/16/2013 16:14	45.2
11	1/16/2013 16:14	45.35
12	1/16/2013 16:14	45.47
13	1/16/2013 16:15	45.49
14	1/16/2013 16:15	45.47
15	1/16/2013 16:15	45.42
16	1/16/2013 16:15	45.52
17	1/16/2013 16:15	45.74
18	1/16/2013 16:15	45.71
	AVERAGE	**45.1**
	NO_2 CALIBRATION GAS CONCENTRATION	**49.8**
	Converter Efficiency	**90.7%**

Stratification Test Results

40 CFR Part 75 Stratification Test Results
Gulf Power Company
Plant Crist
FGD Stack
Tuesday, January 15, 2013

start time	stop time	point	polluant NO_x ppm	ppm dif. allowed +/- 5ppm		UNIT MW	% dif from mean allowed +/- 3%	
1/15/13 1:46 PM	1/15/13 1:48 PM	1	41.0	2.4	PASS	400.0	0.0%	PASS
1/15/13 1:49 PM	1/15/13 1:51 PM	2	43.2	0.2	PASS	400.0	0.0%	PASS
1/15/13 1:52 PM	1/15/13 1:54 PM	3	45.6	-2.2	PASS	400.0	0.0%	PASS
1/15/13 1:55 PM	1/15/13 1:57 PM	4	46.8	-3.4	PASS	400.0	0.0%	PASS
1/15/13 2:08 PM	1/15/13 2:10 PM	5	42.2	1.2	PASS	400.0	0.0%	PASS
1/15/13 2:11 PM	1/15/13 2:13 PM	6	41.2	2.2	PASS	400.0	0.0%	PASS
1/15/13 2:14 PM	1/15/13 2:16 PM	7	42.4	1.0	PASS	400.0	0.0%	PASS
1/15/13 2:17 PM	1/15/13 2:19 PM	8	43.7	-0.3	PASS	400.0	0.0%	PASS
1/15/13 2:28 PM	1/15/13 2:30 PM	9	43.8	-0.4	PASS	400.0	0.0%	PASS
1/15/13 2:31 PM	1/15/13 2:33 PM	10	43.7	-0.3	PASS	400.0	0.0%	PASS
1/15/13 2:34 PM	1/15/13 2:36 PM	11	43.4	0.0	PASS	400.0	0.0%	PASS
1/15/13 2:37 PM	1/15/13 2:39 PM	12	42.9	0.5	PASS	400.0	0.0%	PASS
1/15/13 2:48 PM	1/15/13 2:50 PM	13	43.5	-0.1	PASS	400.0	0.0%	PASS
1/15/13 2:51 PM	1/15/13 2:53 PM	14	44.1	-0.7	PASS	400.0	0.0%	PASS
1/15/13 2:54 PM	1/15/13 2:56 PM	15	43.7	-0.3	PASS	400.0	0.0%	PASS
1/15/13 2:57 PM	1/15/13 2:59 PM	16	43.1	0.3	PASS	400.0	0.0%	PASS
		average	43.4			400.00		

start time	stop time	point	diluent CO_2 %	ppm dif. allowed +/- 5%		UNIT MW	% dif from mean allowed +/- 3%	
1/15/13 1:46 PM	1/15/13 1:48 PM	1	7.5	0.4	PASS	400.0	0.0%	PASS
1/15/13 1:49 PM	1/15/13 1:51 PM	2	7.4	0.5	PASS	400.0	0.0%	PASS
1/15/13 1:52 PM	1/15/13 1:54 PM	3	7.4	0.5	PASS	400.0	0.0%	PASS
1/15/13 1:55 PM	1/15/13 1:57 PM	4	7.5	0.4	PASS	400.0	0.0%	PASS
1/15/13 2:08 PM	1/15/13 2:10 PM	5	7.6	0.2	PASS	400.0	0.0%	PASS
1/15/13 2:11 PM	1/15/13 2:13 PM	6	7.9	-0.1	PASS	400.0	0.0%	PASS
1/15/13 2:14 PM	1/15/13 2:16 PM	7	7.9	0.0	PASS	400.0	0.0%	PASS
1/15/13 2:17 PM	1/15/13 2:19 PM	8	8.0	-0.1	PASS	400.0	0.0%	PASS
1/15/13 2:28 PM	1/15/13 2:30 PM	9	8.1	-0.2	PASS	400.0	0.0%	PASS
1/15/13 2:31 PM	1/15/13 2:33 PM	10	8.1	-0.3	PASS	400.0	0.0%	PASS
1/15/13 2:34 PM	1/15/13 2:36 PM	11	8.1	-0.3	PASS	400.0	0.0%	PASS
1/15/13 2:37 PM	1/15/13 2:39 PM	12	8.1	-0.2	PASS	400.0	0.0%	PASS
1/15/13 2:48 PM	1/15/13 2:50 PM	13	8.1	-0.2	PASS	400.0	0.0%	PASS
1/15/13 2:51 PM	1/15/13 2:53 PM	14	8.1	-0.2	PASS	400.0	0.0%	PASS
1/15/13 2:54 PM	1/15/13 2:56 PM	15	8.0	-0.2	PASS	400.0	0.0%	PASS
1/15/13 2:57 PM	1/15/13 2:59 PM	16	8.1	-0.2	PASS	400.0	0.0%	PASS
		average	7.9			400.00		

start time	stop time	point	pollutant SO_2	ppm dif. allowed +/- 5ppm		UNIT MW	% dif from mean allowed +/- 3%	
1/16/12 12:02 PM	1/16/12 12:04 PM	1	13.5	4.9	PASS	400.0	0.0%	PASS
1/16/12 12:05 PM	1/16/12 12:07 PM	2	14.1	4.3	PASS	400.0	0.0%	PASS
1/16/12 12:08 PM	1/16/12 12:10 PM	3	14.6	3.8	PASS	400.0	0.0%	PASS
1/16/12 12:11 PM	1/16/12 12:13 PM	4	15.9	2.5	PASS	400.0	0.0%	PASS
1/16/12 12:33 PM	1/16/12 12:35 PM	5	19.5	-1.1	PASS	400.0	0.0%	PASS
1/16/12 12:36 PM	1/16/12 12:38 PM	6	20.8	-2.4	PASS	400.0	0.0%	PASS
1/16/12 12:39 PM	1/16/12 12:41 PM	7	21.1	-2.7	PASS	400.0	0.0%	PASS
1/16/12 12:42 PM	1/16/12 12:44 PM	8	21.6	-3.3	PASS	400.0	0.0%	PASS
1/16/12 1:05 PM	1/16/12 1:07 PM	9	20.0	-1.7	PASS	400.0	0.0%	PASS
1/16/12 1:08 PM	1/16/12 1:10 PM	10	20.0	-1.6	PASS	400.0	0.0%	PASS
1/16/12 1:11 PM	1/16/12 1:13 PM	11	20.0	-1.6	PASS	400.0	0.0%	PASS
1/16/12 1:14 PM	1/16/12 1:16 PM	12	19.5	-1.1	PASS	400.0	0.0%	PASS
1/16/12 1:37 PM	1/16/12 1:39 PM	13	18.6	-0.3	PASS	400.0	0.0%	PASS
1/16/12 1:40 PM	1/16/12 1:42 PM	14	18.4	0.0	PASS	400.0	0.0%	PASS
1/16/12 1:43 PM	1/16/12 1:45 PM	15	18.2	0.2	PASS	400.0	0.0%	PASS
1/16/12 1:46 PM	1/16/12 1:48 PM	16	18.3	0.1	PASS	400.0	0.0%	PASS
		average	18.4			400.00		

Appendix E. Protocol 1 Calibration Gas Certification

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI90E15AC5J4	Reference Number:	122-124285897-1
Cylinder Number:	CC110594	Cylinder Volume:	149.8 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22011	Valve Outlet:	580
Gas Code:	CO2	Analysis Date:	Oct 11, 2011

Expiration Date: Oct 11, 2019

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	10.00 %	10.43 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
090606	090606	CC262101	9.921 % CARBON DIOXIDE/NITROGEN	Apr 10, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 CO2	FTIR	Oct 06, 2011

Triad Data Available Upon Request

Notes:COMMODITY # CD1090GP

Signature on file

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI99E15AC4F2	Reference Number:	122-124339347-1
Cylinder Number:	CC325676	Cylinder Volume:	144.4 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22012	Valve Outlet:	660
Gas Code:	NO,SO2	Analysis Date:	Oct 10, 2012

Expiration Date: Oct 10, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NITRIC OXIDE	55.00 PPM	55.15 PPM	G1	+/- 1% NIST Traceable
SULFUR DIOXIDE	55.00 PPM	55.32 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		55.17 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
100611	100611	CC283834	49.73 PPM NITRIC OXIDE/NITROGEN	Jul 23, 2016
110602	110602	CC283912	49.67 PPM SULFUR DIOXIDE/NITROGEN	May 13, 2017

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801549 NO	FTIR	Oct 04, 2012
Nicolet 6700 AHR0801549 SO2	FTIR	Oct 04, 2012

Triad Data Available Upon Request

Permanent Notes:COMMODITY #_____

Notes:

Signature on file

_____

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI99E15AC3X0	Reference Number:	122-124334435-1
Cylinder Number:	CC331719	Cylinder Volume:	144.4 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22012	Valve Outlet:	660
Gas Code:	NO,SO2	Analysis Date:	Aug 28, 2012

Expiration Date: Aug 28, 2015

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA-600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOx	25.00 PPM	25.66 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	25.00 PPM	25.66 PPM	G1	+/- 1% NIST Traceable
SULFUR DIOXIDE	25.00 PPM	25.66 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	120616	CC344830	20.23 PPM NITRIC OXIDE/NITROGEN	Apr 11, 2015
NTRM	120616	CC344830 NOX	20.28 PPM NOx/NITROGEN	Apr 11, 2015
NTRM	100610	CC284538	14.82 PPM SULFUR DIOXIDE/NITROGEN	Jul 13, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801333 NO	FTIR	Aug 15, 2012
Nicolet 6700 AHR0801333 NO	FTIR	Aug 15, 2012
Nicolet 6700 AHR0801333 SO2	FTIR	Aug 15, 2012

Triad Data Available Upon Request

Permanent Notes:Georgia Power Commodity Number 1806282

Notes:COMMODITY # 1806282

Signature on file

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI95E15AC5J5	Reference Number:	122-124335397-1
Cylinder Number:	CC386506	Cylinder Volume:	146.9 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22012	Valve Outlet:	580
Gas Code:	CO2	Analysis Date:	Sep 11, 2012

Expiration Date: Sep 11, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	5.000 %	5.026 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
100601	100601	CC301675	5.027 % CARBON DIOXIDE/NITROGEN	Nov 01, 2015

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA510 CO2 J007KEB	Nondispersive Infrared (NDIR)	Aug 29, 2012

Triad Data Available Upon Request

Notes:GULF POWER COMMODITY # CD0595GP

Signature on file

Approved for Release

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02A99E15AC3X7	Reference Number:	122-124314566-4
Cylinder Number:	CC317706	Cylinder Volume:	130.4 CF
Laboratory:	ASG - Durham - NC	Cylinder Pressure:	1800 PSIG
PGVP Number:	B22012	Valve Outlet:	660
Gas Code:	NO2	Analysis Date:	May 02, 2012

Expiration Date: May 02, 2015

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NITROGEN DIOXIDE	50.00 PPM	48.09 PPM	G1	+/- 2%
AIR	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
GMIS	GMIS	CC343811	61.25 PPM NITROGEN DIOXIDE/NITROGEN	Dec 28, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
TECO 42CHL NOX (1-5000ppm)	Chemiluminescence	Apr 30, 2012

Triad Data Available Upon Request

Notes:

Signature on file

Approved for Release

Appendix F. Field Notes and Miscellaneous Information

Date/Time	Cylinder	Analyzer	Gas	Class	Type	Value	Expected	Status
1/16/2013 8:50	ZERO AIR	CO2/A DILUTION	CO2	BOTH	ZERO	0.024	0.000	PASS
1/16/2013 8:50	ZERO AIR	NOx/A DILUTION	NOx	BOTH	ZERO	0.00	0.00	PASS
1/16/2013 8:50	ZERO AIR	SO2/A DILUTION	SO2	BOTH	ZERO	0.07	0.00	PASS
1/16/2013 9:13	CC366506	CO2/A DILUTION	CO2	BOTH	MID	5.021	5.026	PASS
1/16/2013 9:22	CC110594	CO2/A DILUTION	CO2	BOTH	HIGH	10.476	10.429	PASS
1/16/2013 9:30	CC331719	NOx/A DILUTION	NOx	BOTH	MID	26.11	25.66	PASS
1/16/2013 9:30	CC331719	SO2/A DILUTION	SO2	BOTH	MID	25.42	25.66	PASS
1/16/2013 9:39	CC325676	NOx/A DILUTION	NOx	BOTH	HIGH	55.70	55.15	PASS
1/16/2013 9:39	CC325676	SO2/A DILUTION	SO2	BOTH	HIGH	55.85	55.31	PASS
1/16/2013 10:17	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	25.40	25.66	PASS
1/16/2013 10:17	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	24.00	25.66	PASS
1/16/2013 10:22	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	4.987	5.026	PASS
1/16/2013 10:27	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.112	0.000	PASS
1/16/2013 10:27	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	0.12	0.00	PASS
1/16/2013 10:27	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.07	0.00	PASS
1/16/2013 10:59	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	25.37	25.66	PASS
1/16/2013 10:59	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	24.98	25.66	PASS
1/16/2013 11:04	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	4.991	5.026	PASS
1/16/2013 11:09	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.161	0.000	PASS
1/16/2013 11:09	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	0.00	0.00	PASS
1/16/2013 11:09	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.37	0.00	PASS
1/16/2013 11:40	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	24.71	25.66	PASS
1/16/2013 11:40	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	24.44	25.66	PASS
1/16/2013 11:45	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	4.987	5.026	PASS
1/16/2013 11:50	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.127	0.000	PASS
1/16/2013 11:50	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	-0.05	0.00	PASS
1/16/2013 11:50	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.46	0.00	PASS
1/16/2013 12:22	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	25.15	25.66	PASS
1/16/2013 12:22	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	25.45	25.66	PASS
1/16/2013 12:27	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	4.987	5.026	PASS
1/16/2013 12:32	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.122	0.000	PASS
1/16/2013 12:32	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	-0.02	0.00	PASS
1/16/2013 12:32	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.46	0.00	PASS
1/16/2013 13:05	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	25.18	25.66	PASS
1/16/2013 13:05	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	24.69	25.66	PASS
1/16/2013 13:10	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	5.016	5.026	PASS
1/16/2013 13:15	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.122	0.000	PASS
1/16/2013 13:15	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	-0.12	0.00	PASS
1/16/2013 13:15	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.07	0.00	PASS
1/16/2013 13:47	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	25.18	25.66	PASS
1/16/2013 13:47	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	24.91	25.66	PASS
1/16/2013 13:52	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	5.031	5.026	PASS
1/16/2013 13:57	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.127	0.000	PASS
1/16/2013 13:57	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	-0.07	0.00	PASS
1/16/2013 13:57	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.02	0.00	PASS
1/16/2013 14:28	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	25.20	25.66	PASS
1/16/2013 14:28	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	25.54	25.66	PASS
1/16/2013 14:33	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	5.040	5.026	PASS
1/16/2013 14:38	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.166	0.000	PASS
1/16/2013 14:38	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	0.00	0.00	PASS
1/16/2013 14:38	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.27	0.00	PASS
1/16/2013 15:10	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	25.13	25.66	PASS
1/16/2013 15:10	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	25.42	25.66	PASS
1/16/2013 15:15	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	5.055	5.026	PASS
1/16/2013 15:20	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.127	0.000	PASS
1/16/2013 15:20	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	-0.12	0.00	PASS
1/16/2013 15:20	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.20	0.00	PASS
1/16/2013 15:52	CC331719	NOx/A DILUTION	NOx	BIAS AND DRIFT	MID	24.84	25.66	PASS
1/16/2013 15:52	CC331719	SO2/A DILUTION	SO2	BIAS AND DRIFT	MID	25.42	25.66	PASS
1/16/2013 15:57	CC366506	CO2/A DILUTION	CO2	BIAS AND DRIFT	MID	5.016	5.026	PASS
1/16/2013 16:02	ZERO AIR	CO2/A DILUTION	CO2	BIAS AND DRIFT	ZERO	0.142	0.000	PASS
1/16/2013 16:02	ZERO AIR	NOx/A DILUTION	NOx	BIAS AND DRIFT	ZERO	-0.05	0.00	PASS
1/16/2013 16:02	ZERO AIR	SO2/A DILUTION	SO2	BIAS AND DRIFT	ZERO	0.12	0.00	PASS

```
================================================================================
Load Range Analysis Report
Crist 4-7 FGD    Gulf Power Company
Date of Report: 01/31/2013     Report  Period: 04/01/2012 - 01/16/2013
================================================================================
Number of on Line Hours :6718

Low Range Hours  : 4862.0   Percent :  74.9    Bounds  220.0 to  485.2
Mid Range Hours  : 1446.0   Percent :  22.3    Bounds  485.2 to  750.4
High Range Hours :  181.0   Percent :   2.8    Bounds  750.4 to 1104.0
Hours In   Range : 6489
Hours Over Range :    0
Hours UnderRange :  229
     Upper Bound : 1104.0
     Lower Bound :  220.0
================================================================================
```

Appendix G. Spectrum Flow Report

Annual RATA Testing Report

in accordance with 40CFR75

Gulf Power Company

Plant Crist
Units 4-7 FGD Stack

Pensacola, Florida

January 2013

Prepared By:
Spectrum Systems, Inc.
Pensacola, Florida

Analyzers Tested:

Unit 4-7 FGD Stack

Teledyne UF150 Flow Monitor: 1501059

TABLE OF CONTENTS

I. INTRODUCTION

Gulf Power Company contracted Spectrum Systems, Inc. of Pensacola, Florida to conduct annual Relative Accuracy Testing on Plant Crist, Unit 4-7 FGD Stack. The Plant Crist facility is located in Pensacola, Florida. This report contains the results of that testing.

The tests were conducted according to the procedures outlined in the Code of Federal Regulations, Title 40, Part 75 (40CFR75). Reference Methods 1 and 2 as defined in 40CFR60, Appendix A, were utilized for the determination of Volumetric Flow.

Flow Relative Accuracy Testing was performed in January 2013 at the Plant Crist, Unit 4-7 FGD Stack.

Section II of this report, titled Installation and Source Description, gives a brief description of the Crist Facility.

Section III of this report, titled Summary of Results, presents a discussion of the test results.

Section IV of this report contains the certification of authenticity for the testing.

Actual test data, materials, and test results are presented in the different appendices of this report.

II. INSTALLATION and SOURCE DESCRIPTION

The Plant Crist facility is located in Pensacola, Florida. The flow monitors are installed on the common FGD Stack. Further installation information can be obtained from the affected facility or Gulf Power's Environmental Affairs Department located in Pensacola, Florida. The monitoring system is used for compliance with the Clean Air Act of 1990 by reporting mass emissions of Sulfur Dioxide, Carbon Dioxide, and heat rate emissions of Nitrogen Oxides released into the atmosphere. The monitoring system is also used to measure volumetric flow in the stacks.

Gulf Power Company's Crist Plant uses the Unit Four through Seven Coal Fired Boilers for the production of steam to generate electricity. The boilers burn coal as a primary fuel. Potential emissions include the products of complete and incomplete combustion of the fuels, as well as any extraneous material.

III. SUMMARY OF RESULTS

Gulf Power Company contracted Spectrum Systems, Inc. of Pensacola, Florida to conduct Relative Accuracy Testing on the Unit 4-7 FGD Stack at Gulf Power Company's Plant Crist facility located in Pensacola, Florida. Relative Accuracy testing was conducted on the Volumetric Flow Monitor. Flow testing was conducted at 2 loads for Units 4-7.

Testing was conducted according to the procedures in the Code of Federal Regulations, Title 40, Part 75 (40CFR75), Appendix A. Reference Method 1 and 2 as defined in 40 CFR 60 Appendix A, was used to determine wall effect Volumetric Flow.

The flow monitor Relative Accuracies were performed using 40CFR75 Appendix A Section 6.5. Flow Relative Accuracy results must meet the criteria of 40CFR75 Appendix A, Section 3.3 and shall not exceed 10.0% (or 7.5% to achieve reduced RATA frequency incentive for annual RATAs). Exceptions are as follows:

Low Flow units (≤10fps): the difference between the mean value of the flow monitor velocity measurements and the reference method mean value in fps at a particular load (or operating) level of the RATA shall not exceed ±2.0 fps, the Relative Accuracy is greater than 10% (or ±1.5fps for reduced RATA frequency).

All monitors tested for Relative Accuracy meet the required criteria.

This report contains a summary of all the testing performed and the supporting data for all tests. Detailed test material is presented in the different appendices of this report. Flow results are ordered from higher loads to lower loads. Refer to the header or footer information to pinpoint or sequence a group of data.

Test results are entered into the EPA's ECMPS Software. An electronic file consistent with EPA ECMPS guidelines is exported from this software and is made available for direct submittal to the EPA.

Appendix A of this report contains a printout of the detailed ECMPS testing results generated from the ECMPS software discussed above. This appendix includes summaries of the Relative Accuracy test data, as presented in the ECMPS-generated printout.

Appendix B of this report contains Flow Relative Accuracy reference method data. Flow reference method data include flow calculations, differential pressure and temperature, and (if applicable) supporting data for Wall Effect Factor calculations.

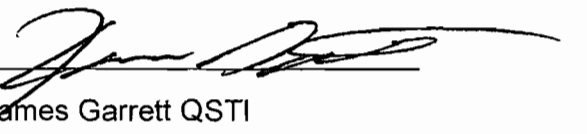
Appendix C of this report contains all plant CEMS data associated with RATA testing, including the Load Range Analysis performed by the plant.

Appendix D of this report contains Quality Assurance data for the flow reference methods.

IV. STATEMENT OF AUTHENTICITY

The sampling and analysis for this report was carried out under my direction. I have reviewed the testing details and results of this report and hereby certify that the data contained within is authentic and accurate to the best of my knowledge.

Date: January 31, 2013

Signature : 

James Garrett QSTI
Testing Department

V. MATHEMATICAL EXPLANATION

Relative Accuracy Comparison Calculations

The formulas used in calculating the relative accuracy comparisons are directly from 40CFR75, Appendix A and appear below:

Arithmetic Mean:

$$\bar{d} = \frac{1}{n} \sum_{i=1}^{n} d_i$$

Where:

n = Number of data points

d = Arithmetic Mean

di = The individual difference between the reference method and corresponding CEMS value for an individual data point.

Σ = The summation of all the individual differences di for all points

Standard Deviation:

$$S_d = \sqrt{\frac{\sum_{i=1}^{n} d_i^2 - \left[\frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}\right]}{n-1}}$$

Where,

n = Number of data points

di = The individual difference between the reference method and corresponding CEMS value for an individual data point.

Σ = The summation of all the individual differences di for all points

Confidence Coefficient:

$$CC = t_{0.025} \frac{S_d}{\sqrt{n}}$$

Where:

$t_{0.025}$ = T value from the table below:

n-1	$t_{0.025}$	n-1	$t_{0.025}$	n-1	$t_{0.025}$
1	12.706	12	2.179	23	2.069
2	4.303	13	2.160	24	2.064
3	3.182	14	2.145	25	2.060
4	2.776	15	2.131	26	2.056
5	2.571	16	2.120	27	2.052
6	2.447	17	2.110	28	2.048
7	2.365	18	2.101	29	2.045
8	2.306	19	2.093	30	2.042
9	2.262	20	2.086	40	2.021
10	2.228	21	2.080	60	2.000
11	2.201	22	2.074	>80	1.980

Relative Accuracy:

$$RA = \frac{|\overline{d}| + |\overline{cc}|}{\overline{RM}} \times 100$$

Where:

| d | = The absolute value of the mean difference between reference and monitor values

| cc | = The absolute value of the confidence coefficient

RM = The average reference method value or applicable standard

APPENDIX A

EPA Detailed Testing Report Printout

ECMPS Software

(Includes Relative Accuracy Test Summaries)

ECMPS Client Tool

Version 1.0 2012 Q4

QA/Cert Test Detail Report

February 4, 2013 09:30 AM

Facility Name: Crist Electric Generating Plant

Facility Details

Facility ID (ORISPL): 641
State: FL
County: Escambia

Unit/Stack/Pipe ID: CS1FGD

Relative Accuracy Test

System ID:	104	**System Parameter:**	FLOW	**Test Completion:**	01/17/2013 14:16
Test Number:	01-104-20130117	**Reason for Test:**	QA	**Reported Test Results:**	PASSED
# of Op. Levels:	2	**Grace Period Test?**		**EPA Calculated Result:**	PASSED
Evaluation Status:	No Errors			**Reported BAF:**	1.067
Submission Status:	Not Submitted			**EPA Calculated BAF:**	1.067
Submission Date:				**RATA Frequency:**	4QTRS

Air Emissions Testing Data

QI Name:	Garrett, James L	**AETB Name:**	Spectrum Systems, Inc.
Exam Date:	02/17/2011	**AETB Phone Number:**	850-944-3392
Provider Name:	Source Evaluation Society	**AETB Email:**	jimmy@spectrumsystems.com
Provider Email:	qstiprogram@gmail.com		

Operating Level: Mid
Reference Method Used: D2H: FLOW RM 2 with Default WAF from 2H
Summary Statistics:

	Reported	Recalculated		Reported	Recalculated
Mean of Monitoring System	104373444.444	104373444.444	**Relative Accuracy**	7.05	7.05
Mean of Reference Method Values	111387333.333	111387333.333	**Bias Adjustment Factor**	1.067	1.067
Mean of Difference	7013888.889	7013888.889	**APS Indicator**		
Standard Deviation of Difference	1085602.419	1085602.419	**T-Value**	2.306	2.306
Confidence Coefficient	834466.392	834466.392	**Gross Unit Load or Velocity**	579	579

Facility Name: **Crist Electric Generating Plant**

Facility ID (ORISPL): 641

QA/Cert Test Detail Report

February 4, 2013 09:30 AM

Run Data:

Run	Start Date	End Date	Run Status	Monitoring System Value	Reference Method Value	Gross Load or Velocity
1	01/17/2013 13:16	01/17/2013 13:22	RUNUSED	106589000.000	112154000.000	581
2	01/17/2013 13:22	01/17/2013 13:28	RUNUSED	103789000.000	112164000.000	581
3	01/17/2013 13:28	01/17/2013 13:34	NOTUSED	102491000.000	112331000.000	583
4	01/17/2013 13:34	01/17/2013 13:40	RUNUSED	103328000.000	109926000.000	581
5	01/17/2013 13:40	01/17/2013 13:46	RUNUSED	104665000.000	111382000.000	579
6	01/17/2013 13:46	01/17/2013 13:52	RUNUSED	103176000.000	110736000.000	579
7	01/17/2013 13:52	01/17/2013 13:58	RUNUSED	104744000.000	110560000.000	580
8	01/17/2013 13:58	01/17/2013 14:04	RUNUSED	103767000.000	112514000.000	578
9	01/17/2013 14:04	01/17/2013 14:10	RUNUSED	104293000.000	111635000.000	577
10	01/17/2013 14:10	01/17/2013 14:16	RUNUSED	105010000.000	111415000.000	578

Operating Level: Low

Reference Method Used: D2H: FLOW RM 2 with Default WAF from 2H

Summary Statistics:

	Reported	Recalculated		Reported	Recalculated
Mean of Monitoring System	83742000.000	83742000.000	**Relative Accuracy**	5.93	5.93
Mean of Reference Method Values	88113333.333	88113333.333	**Bias Adjustment Factor**	1.052	1.052
Mean of Difference	4371333.333	4371333.333	**APS Indicator**		
Standard Deviation of Difference	1114569.199	1114569.199	**T-Value**	2.306	2.306
Confidence Coefficient	856732.191	856732.191	**Gross Unit Load or Velocity**	412	412

Facility Name: Crist Electric Generating Plant

Facility ID (ORISPL): 641

QA/Cert Test Detail Report

February 4, 2013 09:30 AM

Run Data:

Run	Start Date	End Date	Run Status	Monitoring System Value	Reference Method Value	Gross Load or Velocity
1	01/17/2013 09:18	01/17/2013 09:24	RUNUSED	86103000.000	90267000.000	417
2	01/17/2013 09:24	01/17/2013 09:30	RUNUSED	86248000.000	88573000.000	416
3	01/17/2013 09:30	01/17/2013 09:36	RUNUSED	84706000.000	88858000.000	412
4	01/17/2013 09:36	01/17/2013 09:42	RUNUSED	84441000.000	89878000.000	412
5	01/17/2013 09:42	01/17/2013 09:48	RUNUSED	83750000.000	87108000.000	411
6	01/17/2013 09:48	01/17/2013 09:54	RUNUSED	82349000.000	87786000.000	411
7	01/17/2013 09:54	01/17/2013 10:00	NOTUSED	82229000.000	88407000.000	411
8	01/17/2013 10:00	01/17/2013 10:06	RUNUSED	82062000.000	87480000.000	411
9	01/17/2013 10:06	01/17/2013 10:12	RUNUSED	82116000.000	85861000.000	411
10	01/17/2013 10:12	01/17/2013 10:18	RUNUSED	81903000.000	87209000.000	411

Additional Information:

No comment.

*Performance Spec: RA <= 10% or Mean Difference <= +/- 2.0fps:
Reduced Frequency Spec: RA <= 7.5% or Mean Difference +/- 1.5 fps (Appendix A &3.3.4)

APPENDIX B

Flow Relative Accuracy

Reference Method Data

Appendix B, Section 1

Flow Calculations

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run One

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.405	118.0	37.60
2	0.476	118.0	40.76
3	0.415	118.0	38.06
4	0.313	118.0	33.05
5	0.406	119.0	37.67
6	0.349	119.0	34.93
7	0.377	119.0	36.30
8	0.254	120.0	29.82
9	0.387	118.0	36.75
10	0.412	118.0	37.92
11	0.316	119.0	33.24
12	0.272	119.0	30.84
13	0.437	118.0	39.05
14	0.366	118.0	35.74
15	0.361	118.0	35.49
16	0.331	118.0	33.99
Averages:	**0.367**	**118.4**	**35.70**

Run One Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	119.0
Wet Bulb Temperature	degrees F	119.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.112
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.92
Molecular Weight (Ms)		28.58
Flow	WSCFH	112717167.932
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	112154000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Two

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.382	118.0	36.51
2	0.388	119.0	36.83
3	0.401	118.0	37.41
4	0.346	118.0	34.75
5	0.406	118.0	37.64
6	0.362	118.0	35.54
7	0.351	118.0	35.00
8	0.323	118.0	33.57
9	0.399	118.0	37.32
10	0.361	119.0	35.52
11	0.331	119.0	34.02
12	0.276	118.0	31.04
13	0.423	118.0	38.42
14	0.354	118.0	35.15
15	0.406	118.0	37.64
16	0.344	118.0	34.65
Averages:	**0.366**	**118.2**	**35.69**

Run Two Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	119.0
Wet Bulb Temperature	degrees F	119.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.112
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.92
Molecular Weight (Ms)		28.58
Flow	WSCFH	112727224.569
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	112164000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Three

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.399	118.0	37.32
2	0.377	118.0	36.27
3	0.453	118.0	39.76
4	0.318	118.0	33.31
5	0.402	119.0	37.49
6	0.356	119.0	35.28
7	0.321	119.0	33.50
8	0.309	119.0	32.87
9	0.436	118.0	39.01
10	0.318	119.0	33.34
11	0.345	119.0	34.73
12	0.312	119.0	33.03
13	0.416	118.0	38.10
14	0.401	118.0	37.41
15	0.372	119.0	36.06
16	0.345	118.0	34.70
Averages:	**0.368**	**118.5**	**35.76**

Run Three Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	119.0
Wet Bulb Temperature	degrees F	119.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.112
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.92
Molecular Weight (Ms)		28.58
Flow	WSCFH	112895186.417
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	112331000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Four

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.437	118.0	39.05
2	0.467	118.0	40.37
3	0.295	118.0	32.09
4	0.291	118.0	31.87
5	0.372	118.0	36.03
6	0.342	118.0	34.55
7	0.291	118.0	31.87
8	0.293	118.0	31.98
9	0.380	118.0	36.42
10	0.343	118.0	34.60
11	0.375	118.0	36.18
12	0.308	118.0	32.79
13	0.347	118.0	34.80
14	0.405	118.0	37.60
15	0.364	118.0	35.64
16	0.324	118.0	33.63
Averages:	**0.352**	**118.0**	**34.96**

Run Four Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	119.0
Wet Bulb Temperature	degrees F	119.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.112
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.92
Molecular Weight (Ms)		28.58
Flow	WSCFH	110478219.630
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	109926000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Five

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.380	118.0	36.42
2	0.374	118.0	36.13
3	0.408	118.0	37.73
4	0.295	118.0	32.09
5	0.354	119.0	35.18
6	0.413	119.0	38.00
7	0.368	119.0	35.87
8	0.319	118.0	33.37
9	0.433	118.0	38.87
10	0.379	119.0	36.40
11	0.347	119.0	34.83
12	0.265	119.0	30.44
13	0.397	119.0	37.25
14	0.372	119.0	36.06
15	0.354	119.0	35.18
16	0.324	119.0	33.66
Averages:	**0.361**	**118.6**	**35.47**

Run Five Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	119.0
Wet Bulb Temperature	degrees F	119.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.112
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.92
Molecular Weight (Ms)		28.58
Flow	WSCFH	111942210.291
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	111382000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Six

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.457	119.0	40.04
2	0.390	119.0	36.99
3	0.353	119.0	35.19
4	0.313	119.0	33.14
5	0.393	118.0	37.10
6	0.296	119.0	32.22
7	0.330	119.0	34.03
8	0.299	119.0	32.39
9	0.389	118.0	36.91
10	0.342	119.0	34.64
11	0.361	118.0	35.56
12	0.287	118.0	31.70
13	0.348	118.0	34.91
14	0.426	119.0	38.66
15	0.380	118.0	36.48
16	0.333	118.0	34.15
Averages:	**0.356**	**118.6**	**35.26**

Run Six Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	121.0
Wet Bulb Temperature	degrees F	121.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	11.5
Moisture Fraction (wb/db)		0.119
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.90
Molecular Weight (Ms)		28.48
Flow	WSCFH	111292747.740
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	110736000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Seven

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.419	119.0	38.34
2	0.411	119.0	37.97
3	0.420	119.0	38.39
4	0.329	119.0	33.97
5	0.354	119.0	35.24
6	0.364	119.0	35.74
7	0.303	119.0	32.60
8	0.278	119.0	31.23
9	0.356	119.0	35.34
10	0.334	119.0	34.23
11	0.329	119.0	33.97
12	0.284	119.0	31.57
13	0.375	119.0	36.27
14	0.383	119.0	36.66
15	0.408	119.0	37.83
16	0.335	119.0	34.28
Averages:	**0.355**	**119.0**	**35.23**

Run Seven Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	121.0
Wet Bulb Temperature	degrees F	121.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	11.5
Moisture Fraction (wb/db)		0.119
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.90
Molecular Weight (Ms)		28.48
Flow	WSCFH	111115620.668
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	110560000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Eight

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.377	119.0	36.37
2	0.429	119.0	38.79
3	0.362	119.0	35.64
4	0.328	119.0	33.92
5	0.368	119.0	35.93
6	0.357	119.0	35.39
7	0.393	119.0	37.13
8	0.233	119.0	28.59
9	0.352	118.0	35.11
10	0.383	119.0	36.66
11	0.351	119.0	35.09
12	0.332	118.0	34.10
13	0.426	119.0	38.66
14	0.407	119.0	37.79
15	0.435	119.0	39.07
16	0.354	119.0	35.24
Averages:	**0.368**	**118.9**	**35.84**

Run Eight Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	121.0
Wet Bulb Temperature	degrees F	121.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	11.5
Moisture Fraction (wb/db)		0.119
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.90
Molecular Weight (Ms)		28.48
Flow	WSCFH	113079838.796
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	112514000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Nine

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.410	119.0	37.93
2	0.432	119.0	38.93
3	0.402	119.0	37.55
4	0.356	119.0	35.34
5	0.347	119.0	34.89
6	0.290	119.0	31.90
7	0.357	119.0	35.39
8	0.299	119.0	32.39
9	0.360	119.0	35.54
10	0.371	120.0	36.11
11	0.366	120.0	35.86
12	0.297	120.0	32.31
13	0.411	120.0	38.01
14	0.383	120.0	36.69
15	0.421	120.0	38.46
16	0.296	120.0	32.25
Averages:	**0.362**	**119.4**	**35.60**

Run Nine Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	121.0
Wet Bulb Temperature	degrees F	121.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	11.5
Moisture Fraction (wb/db)		0.119
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.90
Molecular Weight (Ms)		28.48
Flow	WSCFH	112195920.573
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	111635000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Ten

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.386	120.0	36.83
2	0.363	120.0	35.72
3	0.389	119.0	36.94
4	0.333	119.0	34.18
5	0.365	119.0	35.78
6	0.353	119.0	35.19
7	0.451	119.0	39.78
8	0.258	119.0	30.09
9	0.384	119.0	36.70
10	0.362	119.0	35.64
11	0.366	119.0	35.83
12	0.280	119.0	31.34
13	0.364	119.0	35.74
14	0.433	119.0	38.98
15	0.369	119.0	35.98
16	0.318	119.0	33.40
Averages:	**0.361**	**119.1**	**35.51**

Run Ten Data		
Load Condition		Mid
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	121.0
Wet Bulb Temperature	degrees F	121.0
Barometric Pressure	in. Hg	29.92
Static Pressure	in. water	-0.55
Percent CO2	percent	9
Percent O2	percent	11.5
Moisture Fraction (wb/db)		0.119
Total Pressure	in. Hg	29.88
Molecular Weight (Md)		29.90
Molecular Weight (Ms)		28.48
Flow	WSCFH	111974751.633
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	111415000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run One

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.208	116.0	26.94
2	0.262	116.0	30.23
3	0.243	117.0	29.14
4	0.190	117.0	25.77
5	0.280	116.0	31.25
6	0.274	116.0	30.92
7	0.233	116.0	28.51
8	0.181	116.0	25.13
9	0.285	117.0	31.56
10	0.261	117.0	30.20
11	0.220	117.0	27.73
12	0.187	117.0	25.56
13	0.255	117.0	29.85
14	0.237	117.0	28.78
15	0.252	117.0	29.67
16	0.213	116.0	27.26
Averages:	**0.236**	**116.6**	**28.66**

Run One Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	117.0
Wet Bulb Temperature	degrees F	117.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.36
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.106
Total Pressure	in. Hg	29.86
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.51
Flow	WSCFH	90720658.389
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	90267000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Two

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.306	117.0	32.70
2	0.272	117.0	30.83
3	0.215	116.0	27.39
4	0.209	116.0	27.00
5	0.206	117.0	26.83
6	0.201	117.0	26.50
7	0.240	117.0	28.96
8	0.169	117.0	24.30
9	0.235	116.0	28.63
10	0.215	116.0	27.39
11	0.277	116.0	31.08
12	0.127	116.0	21.05
13	0.257	116.0	29.94
14	0.225	116.0	28.02
15	0.269	117.0	30.66
16	0.233	116.0	28.51
Averages:	**0.229**	**116.4**	**28.11**

Run Two Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	117.0
Wet Bulb Temperature	degrees F	117.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.36
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.106
Total Pressure	in. Hg	29.86
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.51
Flow	WSCFH	89017836.182
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	88573000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Three

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.213	116.0	27.26
2	0.241	116.0	28.99
3	0.247	116.0	29.35
4	0.205	116.0	26.74
5	0.269	117.0	30.66
6	0.200	117.0	26.44
7	0.246	117.0	29.32
8	0.184	117.0	25.36
9	0.234	117.0	28.60
10	0.226	117.0	28.10
11	0.244	117.0	29.20
12	0.162	117.0	23.79
13	0.265	116.0	30.40
14	0.286	116.0	31.59
15	0.263	116.0	30.29
16	0.182	116.0	25.20
Averages:	**0.229**	**116.5**	**28.21**

Run Three Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	117.0
Wet Bulb Temperature	degrees F	117.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.36
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.106
Total Pressure	in. Hg	29.86
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.51
Flow	WSCFH	89304869.880
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	88858000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
Unit 4-7 FGD Stack
17-Jan-13

Run Four

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.244	116.0	29.17
2	0.256	116.0	29.88
3	0.225	116.0	28.02
4	0.199	116.0	26.35
5	0.263	116.0	30.29
6	0.251	117.0	29.62
7	0.242	116.0	29.05
8	0.178	116.0	24.92
9	0.231	116.0	28.39
10	0.221	116.0	27.77
11	0.268	116.0	30.58
12	0.194	116.0	26.01
13	0.255	116.0	29.83
14	0.264	116.0	30.35
15	0.255	116.0	29.83
16	0.195	116.0	26.08
Averages:	**0.234**	**116.1**	**28.51**

Run Four Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	117.0
Wet Bulb Temperature	degrees F	117.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.36
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.106
Total Pressure	in. Hg	29.86
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.51
Flow	WSCFH	90329859.676
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	89878000.000

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Run Five

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.252	116.0	29.65
2	0.250	116.0	29.53
3	0.230	116.0	28.33
4	0.163	116.0	23.85
5	0.218	117.0	27.60
6	0.243	117.0	29.14
7	0.241	117.0	29.02
8	0.147	117.0	22.66
9	0.222	117.0	27.85
10	0.223	117.0	27.92
11	0.218	117.0	27.60
12	0.189	116.0	25.68
13	0.294	116.0	32.02
14	0.221	116.0	27.77
15	0.211	116.0	27.13
16	0.203	116.0	26.61
Averages:	**0.220**	**116.4**	**27.65**

Run Five Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	117.0
Wet Bulb Temperature	degrees F	117.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.36
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.106
Total Pressure	in. Hg	29.86
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.51
Flow	WSCFH	87546218.973
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	87108000.000

SPECTRUM SYSTEMS, INC.

Gulf Power Company, Plant Crist FGD Stack
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Run Six

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.283	116.0	31.41
2	0.264	116.0	30.34
3	0.266	116.0	30.45
4	0.184	116.0	25.33
5	0.237	116.0	28.74
6	0.187	117.0	25.55
7	0.236	116.0	28.68
8	0.150	116.0	22.87
9	0.226	116.0	28.07
10	0.228	116.0	28.19
11	0.223	116.0	27.88
12	0.199	116.0	26.34
13	0.245	116.0	29.22
14	0.239	117.0	28.89
15	0.227	117.0	28.16
16	0.190	116.0	25.74
Averages:	**0.224**	**116.2**	**27.87**

Run Six Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	116.0
Wet Bulb Temperature	degrees F	116.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.6
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.103
Total Pressure	in. Hg	29.85
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.55
Flow	WSCFH	88227216.583
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	87786000.000

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Run Seven

Traverse Point Data			
Point	**Delta P**	**Temp**	**Velocity**
1	0.239	116.0	28.86
2	0.260	116.0	30.11
3	0.243	117.0	29.13
4	0.211	116.0	27.12
5	0.234	117.0	28.59
6	0.239	117.0	28.89
7	0.219	117.0	27.65
8	0.168	117.0	24.22
9	0.240	117.0	28.95
10	0.230	117.0	28.34
11	0.221	117.0	27.78
12	0.189	117.0	25.69
13	0.281	116.0	31.30
14	0.238	117.0	28.83
15	0.266	116.0	30.45
16	0.158	117.0	23.49
Averages:	**0.227**	**116.7**	**28.09**

Run Seven Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	116.0
Wet Bulb Temperature	degrees F	116.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.6
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.103
Total Pressure	in. Hg	29.85
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.55
Flow	WSCFH	88851456.585
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	88407000.000

SPECTRUM SYSTEMS, INC.

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Run Eight

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.254	117.0	29.78
2	0.261	116.0	30.16
3	0.284	117.0	31.49
4	0.169	117.0	24.29
5	0.231	117.0	28.40
6	0.195	117.0	26.10
7	0.190	117.0	25.76
8	0.190	117.0	25.76
9	0.221	117.0	27.78
10	0.214	117.0	27.34
11	0.204	117.0	26.69
12	0.208	116.0	26.93
13	0.211	116.0	27.12
14	0.262	116.0	30.22
15	0.272	117.0	30.82
16	0.195	117.0	26.10
Averages:	**0.223**	**116.8**	**27.80**

Run Eight Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	116.0
Wet Bulb Temperature	degrees F	116.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.6
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.103
Total Pressure	in. Hg	29.85
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.55
Flow	WSCFH	87919800.426
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	87480000.000

SPECTRUM SYSTEMS, INC.

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Run Nine

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.271	117.0	30.76
2	0.206	117.0	26.82
3	0.206	117.0	26.82
4	0.189	117.0	25.69
5	0.252	117.0	29.67
6	0.248	118.0	29.45
7	0.212	118.0	27.23
8	0.173	117.0	24.58
9	0.262	117.0	30.25
10	0.190	117.0	25.76
11	0.223	117.0	27.91
12	0.167	117.0	24.15
13	0.236	117.0	28.71
14	0.220	118.0	27.74
15	0.230	117.0	28.34
16	0.151	117.0	22.96
Averages:	**0.215**	**117.2**	**27.30**

Run Nine Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	116.0
Wet Bulb Temperature	degrees F	116.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.6
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.103
Total Pressure	in. Hg	29.85
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.55
Flow	WSCFH	86292895.819
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	85861000.000

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Gulf Power Company, Plant Crist FGD Stack
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Run Ten

Traverse Point Data			
Point	Delta P	Temp	Velocity
1	0.263	118.0	30.33
2	0.242	118.0	29.10
3	0.242	117.0	29.07
4	0.225	118.0	28.06
5	0.224	117.0	27.97
6	0.230	117.0	28.34
7	0.236	117.0	28.71
8	0.184	117.0	25.35
9	0.227	117.0	28.16
10	0.223	117.0	27.91
11	0.247	117.0	29.37
12	0.175	117.0	24.72
13	0.215	117.0	27.40
14	0.223	117.0	27.91
15	0.207	117.0	26.89
16	0.171	117.0	24.44
Averages:	**0.221**	**117.2**	**27.73**

Run Ten Data		
Load Condition		Low
Pitot Coefficeint		0.840
Duct Diameter	feet	35.00
Duct Area	square feet	962.1
Dry Bulb Temperature	degrees F	116.0
Wet Bulb Temperature	degrees F	116.0
Barometric Pressure	in. Hg	29.89
Static Pressure	in. water	-0.6
Percent CO2	percent	8
Percent O2	percent	12.0
Moisture Fraction (wb/db)		0.103
Total Pressure	in. Hg	29.85
Molecular Weight (Md)		29.76
Molecular Weight (Ms)		28.55
Flow	WSCFH	87647517.032
Wall Effect Factor		0.9950
Flow (with WEF applied)	WSCFH	87209000.000

Appendix B, Section 2

Method 1 Traverse Points

REFERENCE METHOD 2H TRAVERSE POINT DETERMINATION

$$d_{rem} = r - \sqrt{\left(\frac{p-1}{p}\right) r^2 - r d_{last} + \frac{1}{2} d_{last}^2}$$

Where:

r = stack radius in inches
p=number of method 1 traverse points on a diameter. For a 16 point traverse which is the minimum, p=8
dlast=the distance from the wall of the last 1inch wall effect traverse point. For a full wall effect traverse this =12
drem=distance from wall of the Vdrem traverse point

drem traverse point

Stack Diameter (feet)	(inches) Calculation	Total Number of Traverse Points	dlast (inches)	DREM inches	Stack Radius
35.00	210	16	12	20	ALL OF THESE NUMBERS ARE SELF CALCULATED

Method 1 traverse points

	Percent of Diameter (in)	Distance from wall inches	
Point 1	3.2	13 4/8	Traverse Point Closest to Wall
Point 2	10.5	44 1/8	
Point 3	19.4	81 4/8	
Point 4	32.3	135 5/8	Traverse Point Furthest from Wall

Wall effect traverse points

	Distance from wall inches	
Point 1	1	Try and make a measurement, if impossible, go to next point and use it for all readings you skipped. **Point closest to the wall.**
Point 2	2	Try and make a measurement, if impossible, go to next point and use it for all readings you skipped.
Point 3	3	Try and make a measurement, if impossible, go to next point and use it for all readings you skipped.
Point 4	4	Must make a measurement at this point
Point 5	5	Must make a measurement at this point
Point 6	6	Must make a measurement at this point
Point 7	7	Must make a measurement at this point
Point 8	8	Must make a measurement at this point
Point 9	9	Must make a measurement at this point
Point 10	10	Must make a measurement at this point
Point 11	11	Must make a measurement at this point
Point 12	12	Must make a measurement at this point

Please note that the last wall effect traverse point(dlast) can not be a larger number the db

db	28 1/8

db = the boundary of the outside method 1 equal area

So you end up with 17 traverse points to mark on the probe.
drem, the 4 method 1 traverse points, and the 12 wall effect traverse points
When you do the first run do them in order.

Use the temperature measurement taken at the outer METHOD 1 traverse point for all 12 of the wall effect traverse points.

Appendix B, Section 3

Differential Pressure and Temperature Raw Data

Point	Date	Time	DP	Temp
a1	1/17/2013	13:16:38	0.405	118
a2	1/17/2013	13:16:49	0.476	118
a3	1/17/2013	13:16:59	0.415	118
a4	1/17/2013	13:17:13	0.313	118
b1	1/17/2013	13:18:08	0.406	119
b2	1/17/2013	13:18:19	0.349	119
b3	1/17/2013	13:18:37	0.377	119
b4	1/17/2013	13:18:54	0.254	120
c1	1/17/2013	13:19:38	0.387	118
c2	1/17/2013	13:19:48	0.412	118
c3	1/17/2013	13:20:04	0.316	119
c4	1/17/2013	13:20:16	0.272	119
d1	1/17/2013	13:21:05	0.437	118
d2	1/17/2013	13:21:15	0.366	118
d3	1/17/2013	13:21:28	0.361	118
d4	1/17/2013	13:21:46	0.331	118
d1	1/17/2013	13:22:13	0.382	118
d2	1/17/2013	13:22:24	0.388	119
d3	1/17/2013	13:22:35	0.401	118
d4	1/17/2013	13:22:49	0.346	118
c1	1/17/2013	13:23:43	0.406	118
c2	1/17/2013	13:23:56	0.362	118
c3	1/17/2013	13:24:09	0.351	118
c4	1/17/2013	13:24:23	0.323	118
b1	1/17/2013	13:25:24	0.399	118
b2	1/17/2013	13:25:44	0.361	119
b3	1/17/2013	13:25:55	0.331	119
b4	1/17/2013	13:26:06	0.276	118
a1	1/17/2013	13:26:55	0.423	118
a2	1/17/2013	13:27:11	0.354	118
a3	1/17/2013	13:27:24	0.406	118
a4	1/17/2013	13:27:41	0.344	118

Plant Crist
Units 4-7 FGD Stack
Mid Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	13:28:11	0.399	118
a2	1/17/2013	13:28:23	0.377	118
a3	1/17/2013	13:28:49	0.453	118
a4	1/17/2013	13:29:03	0.318	118
b1	1/17/2013	13:30:05	0.402	119
b2	1/17/2013	13:30:20	0.356	119
b3	1/17/2013	13:30:31	0.321	119
b4	1/17/2013	13:30:42	0.309	119
c1	1/17/2013	13:31:30	0.436	118
c2	1/17/2013	13:31:45	0.318	119
c3	1/17/2013	13:31:59	0.345	119
c4	1/17/2013	13:32:16	0.312	119
d1	1/17/2013	13:33:08	0.416	118
d2	1/17/2013	13:33:21	0.401	118
d3	1/17/2013	13:33:36	0.372	119
d4	1/17/2013	13:33:53	0.345	118
d1	1/17/2013	13:34:17	0.437	118
d2	1/17/2013	13:34:29	0.467	118
d3	1/17/2013	13:34:43	0.295	118
d4	1/17/2013	13:34:59	0.291	118
c1	1/17/2013	13:35:51	0.372	118
c2	1/17/2013	13:36:06	0.342	118
c3	1/17/2013	13:36:24	0.291	118
c4	1/17/2013	13:36:38	0.293	118
b1	1/17/2013	13:37:22	0.380	118
b2	1/17/2013	13:37:40	0.343	118
b3	1/17/2013	13:37:54	0.375	118
b4	1/17/2013	13:38:04	0.308	118
a1	1/17/2013	13:39:04	0.347	118
a2	1/17/2013	13:39:16	0.405	118
a3	1/17/2013	13:39:31	0.364	118
a4	1/17/2013	13:39:46	0.324	118

Plant Crist
Units 4-7 FGD Stack
Mid Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	13:40:07	0.380	118
a2	1/17/2013	13:40:21	0.374	118
a3	1/17/2013	13:40:35	0.408	118
a4	1/17/2013	13:40:49	0.295	118
b1	1/17/2013	13:41:53	0.354	119
b2	1/17/2013	13:42:06	0.413	119
b3	1/17/2013	13:42:39	0.368	119
b4	1/17/2013	13:42:59	0.319	118
c1	1/17/2013	13:43:47	0.433	118
c2	1/17/2013	13:43:56	0.379	119
c3	1/17/2013	13:44:07	0.347	119
c4	1/17/2013	13:44:21	0.265	119
d1	1/17/2013	13:45:10	0.397	119
d2	1/17/2013	13:45:22	0.372	119
d3	1/17/2013	13:45:38	0.354	119
d4	1/17/2013	13:45:58	0.324	119
d1	1/17/2013	13:46:20	0.457	119
d2	1/17/2013	13:46:40	0.390	119
d3	1/17/2013	13:46:58	0.353	119
d4	1/17/2013	13:47:12	0.313	119
c1	1/17/2013	13:47:55	0.393	118
c2	1/17/2013	13:48:11	0.296	119
c3	1/17/2013	13:48:25	0.330	119
c4	1/17/2013	13:48:38	0.299	119
b1	1/17/2013	13:49:27	0.389	118
b2	1/17/2013	13:49:49	0.342	119
b3	1/17/2013	13:50:00	0.361	118
b4	1/17/2013	13:50:18	0.287	118
a1	1/17/2013	13:51:13	0.348	118
a2	1/17/2013	13:51:24	0.426	119
a3	1/17/2013	13:51:56	0.380	118
a4	1/17/2013	13:52:02	0.333	118

Plant Crist
Units 4-7 FGD Stack
Mid Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	13:52:23	0.419	119
a2	1/17/2013	13:52:34	0.411	119
a3	1/17/2013	13:52:44	0.420	119
a4	1/17/2013	13:53:03	0.329	119
b1	1/17/2013	13:53:46	0.354	119
b2	1/17/2013	13:54:02	0.364	119
b3	1/17/2013	13:54:16	0.303	119
b4	1/17/2013	13:54:34	0.278	119
c1	1/17/2013	13:55:30	0.356	119
c2	1/17/2013	13:55:53	0.334	119
c3	1/17/2013	13:56:04	0.329	119
c4	1/17/2013	13:56:20	0.284	119
d1	1/17/2013	13:57:14	0.375	119
d2	1/17/2013	13:57:29	0.383	119
d3	1/17/2013	13:57:41	0.408	119
d4	1/17/2013	13:57:56	0.335	119
d1	1/17/2013	13:58:16	0.377	119
d2	1/17/2013	13:58:26	0.429	119
d3	1/17/2013	13:58:43	0.362	119
d4	1/17/2013	13:59:01	0.328	119
c1	1/17/2013	13:59:52	0.368	119
c2	1/17/2013	14:00:03	0.357	119
c3	1/17/2013	14:00:22	0.393	119
c4	1/17/2013	14:00:37	0.233	119
b1	1/17/2013	14:01:38	0.352	118
b2	1/17/2013	14:01:48	0.383	119
b3	1/17/2013	14:02:01	0.351	119
b4	1/17/2013	14:02:16	0.332	118
a1	1/17/2013	14:03:17	0.426	119
a2	1/17/2013	14:03:28	0.407	119
a3	1/17/2013	14:03:40	0.435	119
a4	1/17/2013	14:03:52	0.354	119

Plant Crist
Units 4-7 FGD Stack
Mid Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	14:04:16	0.410	119
a2	1/17/2013	14:04:27	0.432	119
a3	1/17/2013	14:04:41	0.402	119
a4	1/17/2013	14:04:57	0.356	119
b1	1/17/2013	14:05:44	0.347	119
b2	1/17/2013	14:06:17	0.290	119
b3	1/17/2013	14:06:32	0.357	119
b4	1/17/2013	14:06:46	0.299	119
c1	1/17/2013	14:07:38	0.360	119
c2	1/17/2013	14:07:51	0.371	120
c3	1/17/2013	14:08:04	0.366	120
c4	1/17/2013	14:08:22	0.297	120
d1	1/17/2013	14:09:11	0.411	120
d2	1/17/2013	14:09:22	0.383	120
d3	1/17/2013	14:09:38	0.421	120
d4	1/17/2013	14:09:55	0.296	120
d1	1/17/2013	14:10:10	0.386	120
d2	1/17/2013	14:10:22	0.363	120
d3	1/17/2013	14:10:34	0.389	119
d4	1/17/2013	14:10:52	0.333	119
c1	1/17/2013	14:11:48	0.365	119
c2	1/17/2013	14:12:01	0.353	119
c3	1/17/2013	14:12:18	0.451	119
c4	1/17/2013	14:12:28	0.258	119
b1	1/17/2013	14:13:12	0.384	119
b2	1/17/2013	14:13:30	0.362	119
b3	1/17/2013	14:13:48	0.366	119
b4	1/17/2013	14:13:59	0.280	119
a1	1/17/2013	14:14:59	0.364	119
a2	1/17/2013	14:15:12	0.433	119
a3	1/17/2013	14:15:22	0.369	119
a4	1/17/2013	14:15:37	0.318	119

Plant Crist
Units 4-7 FGD Stack
Mid Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	9:18:15	0.208	116
a2	1/17/2013	9:18:31	0.262	116
a3	1/17/2013	9:18:48	0.243	117
a4	1/17/2013	9:19:13	0.190	117
b1	1/17/2013	9:19:56	0.280	116
b2	1/17/2013	9:20:21	0.274	116
b3	1/17/2013	9:20:35	0.233	116
b4	1/17/2013	9:20:46	0.181	116
c1	1/17/2013	9:21:27	0.285	117
c2	1/17/2013	9:21:38	0.261	117
c3	1/17/2013	9:21:50	0.220	117
c4	1/17/2013	9:22:05	0.187	117
d1	1/17/2013	9:23:07	0.255	117
d2	1/17/2013	9:23:23	0.237	117
d3	1/17/2013	9:23:32	0.252	117
d4	1/17/2013	9:23:45	0.213	116
d1	1/17/2013	9:24:08	0.306	117
d2	1/17/2013	9:24:19	0.272	117
d3	1/17/2013	9:24:35	0.215	116
d4	1/17/2013	9:24:53	0.209	116
c1	1/17/2013	9:25:49	0.206	117
c2	1/17/2013	9:26:03	0.201	117
c3	1/17/2013	9:26:14	0.240	117
c4	1/17/2013	9:26:27	0.169	117
b1	1/17/2013	9:27:12	0.235	116
b2	1/17/2013	9:27:30	0.215	116
b3	1/17/2013	9:27:44	0.277	116
b4	1/17/2013	9:27:57	0.127	116
a1	1/17/2013	9:29:00	0.257	116
a2	1/17/2013	9:29:13	0.225	116
a3	1/17/2013	9:29:24	0.269	117
a4	1/17/2013	9:29:43	0.233	116

Plant Crist
Units 4-7 FGD Stack
Low Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	9:30:05	0.213	116
a2	1/17/2013	9:30:17	0.241	116
a3	1/17/2013	9:30:30	0.247	116
a4	1/17/2013	9:30:44	0.205	116
b1	1/17/2013	9:31:40	0.269	117
b2	1/17/2013	9:31:54	0.200	117
b3	1/17/2013	9:32:07	0.246	117
b4	1/17/2013	9:32:21	0.184	117
c1	1/17/2013	9:33:50	0.234	117
c2	1/17/2013	9:34:01	0.226	117
c3	1/17/2013	9:34:18	0.244	117
c4	1/17/2013	9:34:35	0.162	117
d1	1/17/2013	9:35:15	0.265	116
d2	1/17/2013	9:35:24	0.286	116
d3	1/17/2013	9:35:36	0.263	116
d4	1/17/2013	9:35:56	0.182	116
d1	1/17/2013	9:36:13	0.244	116
d2	1/17/2013	9:36:29	0.256	116
d3	1/17/2013	9:36:45	0.225	116
d4	1/17/2013	9:36:59	0.199	116
c1	1/17/2013	9:37:48	0.263	116
c2	1/17/2013	9:38:04	0.251	117
c3	1/17/2013	9:38:23	0.242	116
c4	1/17/2013	9:38:35	0.178	116
b1	1/17/2013	9:39:22	0.231	116
b2	1/17/2013	9:39:33	0.221	116
b3	1/17/2013	9:39:49	0.268	116
b4	1/17/2013	9:40:07	0.194	116
a1	1/17/2013	9:41:16	0.255	116
a2	1/17/2013	9:41:31	0.264	116
a3	1/17/2013	9:41:45	0.255	116
a4	1/17/2013	9:41:59	0.195	116

Plant Crist
Units 4-7 FGD Stack
Low Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	9:42:24	0.252	116
a2	1/17/2013	9:42:36	0.250	116
a3	1/17/2013	9:42:53	0.230	116
a4	1/17/2013	9:43:06	0.163	116
b1	1/17/2013	9:44:08	0.218	117
b2	1/17/2013	9:44:22	0.243	117
b3	1/17/2013	9:44:33	0.241	117
b4	1/17/2013	9:44:47	0.147	117
c1	1/17/2013	9:45:44	0.222	117
c2	1/17/2013	9:45:57	0.223	117
c3	1/17/2013	9:46:14	0.218	117
c4	1/17/2013	9:46:29	0.189	116
d1	1/17/2013	9:47:19	0.294	116
d2	1/17/2013	9:47:33	0.221	116
d3	1/17/2013	9:47:43	0.211	116
d4	1/17/2013	9:47:55	0.203	116
d1	1/17/2013	9:48:43	0.283	116
d2	1/17/2013	9:48:58	0.264	116
d3	1/17/2013	9:49:12	0.266	116
d4	1/17/2013	9:49:27	0.184	116
c1	1/17/2013	9:50:19	0.237	116
c2	1/17/2013	9:50:32	0.187	117
c3	1/17/2013	9:50:47	0.236	116
c4	1/17/2013	9:51:05	0.150	116
b1	1/17/2013	9:51:52	0.226	116
b2	1/17/2013	9:52:07	0.228	116
b3	1/17/2013	9:52:22	0.223	116
b4	1/17/2013	9:52:36	0.199	116
a1	1/17/2013	9:53:24	0.245	116
a2	1/17/2013	9:53:37	0.239	117
a3	1/17/2013	9:53:50	0.227	117
a4	1/17/2013	9:54:00	0.190	116

Plant Crist
Units 4-7 FGD Stack
Low Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	9:54:20	0.239	116
a2	1/17/2013	9:54:33	0.260	116
a3	1/17/2013	9:54:49	0.243	117
a4	1/17/2013	9:55:05	0.211	116
b1	1/17/2013	9:55:51	0.234	117
b2	1/17/2013	9:56:02	0.239	117
b3	1/17/2013	9:56:18	0.219	117
b4	1/17/2013	9:56:34	0.168	117
c1	1/17/2013	9:57:25	0.240	117
c2	1/17/2013	9:57:41	0.230	117
c3	1/17/2013	9:57:52	0.221	117
c4	1/17/2013	9:58:08	0.189	117
d1	1/17/2013	9:58:55	0.281	116
d2	1/17/2013	9:59:17	0.238	117
d3	1/17/2013	9:59:31	0.266	116
d4	1/17/2013	9:59:44	0.158	117
d1	1/17/2013	10:00:06	0.254	117
d2	1/17/2013	10:00:19	0.261	116
d3	1/17/2013	10:00:35	0.284	117
d4	1/17/2013	10:00:49	0.169	117
c1	1/17/2013	10:01:44	0.231	117
c2	1/17/2013	10:01:58	0.195	117
c3	1/17/2013	10:02:12	0.190	117
c4	1/17/2013	10:02:27	0.190	117
b1	1/17/2013	10:03:17	0.221	117
b2	1/17/2013	10:03:29	0.214	117
b3	1/17/2013	10:03:41	0.204	117
b4	1/17/2013	10:03:55	0.208	116
a1	1/17/2013	10:04:47	0.211	116
a2	1/17/2013	10:05:06	0.262	116
a3	1/17/2013	10:05:30	0.272	117
a4	1/17/2013	10:05:51	0.195	117

Plant Crist
Units 4-7 FGD Stack
Low Load DP and Temp's

Point	Date	Time	DP	Temp
a1	1/17/2013	10:06:25	0.271	117
a2	1/17/2013	10:06:45	0.206	117
a3	1/17/2013	10:07:04	0.206	117
a4	1/17/2013	10:07:21	0.189	117
b1	1/17/2013	10:08:26	0.252	117
b2	1/17/2013	10:08:41	0.248	118
b3	1/17/2013	10:08:57	0.212	118
b4	1/17/2013	10:09:18	0.173	117
c1	1/17/2013	10:10:00	0.262	117
c2	1/17/2013	10:10:11	0.190	117
c3	1/17/2013	10:10:27	0.223	117
c4	1/17/2013	10:10:38	0.167	117
d1	1/17/2013	10:11:23	0.236	117
d2	1/17/2013	10:11:32	0.220	118
d3	1/17/2013	10:11:43	0.230	117
d4	1/17/2013	10:11:55	0.151	117
d1	1/17/2013	10:12:15	0.263	118
d2	1/17/2013	10:12:34	0.242	118
d3	1/17/2013	10:12:46	0.242	117
d4	1/17/2013	10:12:59	0.225	118
c1	1/17/2013	10:13:46	0.224	117
c2	1/17/2013	10:13:59	0.230	117
c3	1/17/2013	10:14:17	0.236	117
c4	1/17/2013	10:14:29	0.184	117
b1	1/17/2013	10:15:15	0.227	117
b2	1/17/2013	10:15:36	0.223	117
b3	1/17/2013	10:15:49	0.247	117
b4	1/17/2013	10:16:09	0.175	117
a1	1/17/2013	10:17:02	0.215	117
a2	1/17/2013	10:17:21	0.223	117
a3	1/17/2013	10:17:35	0.207	117
a4	1/17/2013	10:17:51	0.171	117

Plant Crist
Units 4-7 FGD Stack
Low Load DP and Temp's

APPENDIX C

Plant CEMS Data

Appendix C, Section 1

CEMS Flow Data

Date Time	FLO3	GEN5	GEN7	
1/17/2013 13:17	1793.100000	60	522	
1/17/2013 13:18	1786.900000	60	522	
1/17/2013 13:19	1777.400000	60	521	
1/17/2013 13:20	1777.800000	60	521	
1/17/2013 13:21	1755.000000	60	520	
1/17/2013 13:22	1768.700000	60	520	
Average	**1776.483333**	**60**	**521**	**581**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 13:23	1749.800000	60	520	
1/17/2013 13:24	1742.200000	60	520	
1/17/2013 13:25	1733.600000	61	520	
1/17/2013 13:26	1725.100000	60	521	
1/17/2013 13:27	1717.600000	61	521	
1/17/2013 13:28	1710.600000	60	521	
Average	**1729.816667**	**60**	**521**	**581**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 13:29	1702.600000	60	522	
1/17/2013 13:30	1684.200000	60	522	
1/17/2013 13:31	1679.400000	60	522	
1/17/2013 13:32	1723.100000	60	523	
1/17/2013 13:33	1739.900000	60	522	
1/17/2013 13:34	1719.900000	61	522	
Average	**1708.183333**	**60**	**522**	**583**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 13:35	1699.200000	60	522	
1/17/2013 13:36	1715.700000	61	522	
1/17/2013 13:37	1742.800000	60	521	
1/17/2013 13:38	1735.500000	60	521	
1/17/2013 13:39	1727.700000	60	521	
1/17/2013 13:40	1711.900000	61	521	
Average	**1722.133333**	**60**	**521**	**581**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 13:41	1723.700000	61	520	
1/17/2013 13:42	1744.800000	60	519	
1/17/2013 13:43	1738.800000	60	519	
1/17/2013 13:44	1751.800000	61	519	
1/17/2013 13:45	1768.500000	61	518	
1/17/2013 13:46	1738.900000	60	518	
Average	**1744.416667**	**60**	**519**	**579**

Plant Crist
Units 4-7 FGD Stack
Mid Load CEMS Data

Date Time	FLO3	GEN5	GEN7	
1/17/2013 13:47	1711.100000	60	519	
1/17/2013 13:48	1708.300000	60	519	
1/17/2013 13:49	1712.200000	61	519	
1/17/2013 13:50	1716.800000	60	519	
1/17/2013 13:51	1723.100000	60	519	
1/17/2013 13:52	1746.100000	60	520	
Average	**1719.600000**	**60**	**519**	**579**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 13:53	1751.900000	61	520	
1/17/2013 13:54	1751.300000	60	521	
1/17/2013 13:55	1759.400000	60	520	
1/17/2013 13:56	1753.400000	60	520	
1/17/2013 13:57	1737.700000	60	520	
1/17/2013 13:58	1720.700000	60	519	
Average	**1745.733333**	**60**	**520**	**580**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 13:59	1712.200000	60	519	
1/17/2013 14:00	1757.000000	60	519	
1/17/2013 14:01	1724.600000	60	518	
1/17/2013 14:02	1718.100000	60	518	
1/17/2013 14:03	1729.800000	60	517	
1/17/2013 14:04	1735.000000	60	516	
Average	**1729.450000**	**60**	**518**	**578**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 14:05	1766.300000	60	516	
1/17/2013 14:06	1718.900000	60	516	
1/17/2013 14:07	1716.500000	60	516	
1/17/2013 14:08	1726.600000	60	516	
1/17/2013 14:09	1737.300000	60	516	
1/17/2013 14:10	1763.700000	61	517	
Average	**1738.216667**	**60**	**516**	**577**

1/17/2013 14:11	1754.900000	61	517	
1/17/2013 14:12	1740.100000	60	517	
1/17/2013 14:13	1746.600000	60	517	
1/17/2013 14:14	1759.400000	60	517	
1/17/2013 14:15	1744.800000	60	517	
1/17/2013 14:16	1755.200000	60	518	
Average	**1750.166667**	**60**	**517**	**578**

Plant Crist
Units 4-7 FGD Stack
Mid Load CEMS Data

Date Time	FLO3	GEN5	GEN7	
1/17/2013 9:19	1436.3000000	65	352	
1/17/2013 9:20	1428.8000000	66	351	
1/17/2013 9:21	1437.2000000	66	351	
1/17/2013 9:22	1441.1000000	66	351	
1/17/2013 9:23	1433.6000000	66	351	
1/17/2013 9:24	1433.3000000	66	351	
Average	**1435.0500000**	**66**	**351**	**417**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 9:25	1437.2000000	66	352	
1/17/2013 9:26	1440.4000000	66	352	
1/17/2013 9:27	1436.8000000	66	352	
1/17/2013 9:28	1441.7000000	65	351	
1/17/2013 9:29	1439.3000000	64	351	
1/17/2013 9:30	1429.4000000	63	351	
Average	**1437.4666667**	**65**	**351**	**416**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 9:31	1422.7000000	62	351	
1/17/2013 9:32	1410.0000000	61	352	
1/17/2013 9:33	1407.7000000	60	352	
1/17/2013 9:34	1416.8000000	60	351	
1/17/2013 9:35	1407.7000000	61	351	
1/17/2013 9:36	1405.7000000	60	351	
Average	**1411.7666667**	**61**	**352**	**412**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 9:37	1419.3000000	61	352	
1/17/2013 9:38	1412.1000000	61	352	
1/17/2013 9:39	1406.7000000	60	352	
1/17/2013 9:40	1406.9000000	60	352	
1/17/2013 9:41	1397.9000000	60	351	
1/17/2013 9:42	1401.2000000	60	351	
Average	**1407.3500000**	**60**	**352**	**412**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 9:43	1400.3000000	60	350	
1/17/2013 9:44	1399.4000000	60	350	
1/17/2013 9:45	1400.4000000	60	350	
1/17/2013 9:46	1394.8000000	60	350	
1/17/2013 9:47	1387.5000000	60	350	
1/17/2013 9:48	1392.6000000	60	351	
Average	**1395.8333333**	**60**	**350**	**411**

Plant Crist
Units 4-7 FGD Stack
Low Load CEMS Data

Date Time	FLO3	GEN5	GEN7	
1/17/2013 9:49	1397.6000000	60	351	
1/17/2013 9:50	1386.9000000	60	351	
1/17/2013 9:51	1378.2000000	60	351	
1/17/2013 9:52	1372.9000000	60	351	
1/17/2013 9:53	1357.2000000	60	350	
1/17/2013 9:54	1342.1000000	60	351	
Average	**1372.4833333**	**60**	**351**	**411**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 9:55	1348.0000000	60	350	
1/17/2013 9:56	1355.9000000	60	350	
1/17/2013 9:57	1370.8000000	60	351	
1/17/2013 9:58	1389.2000000	60	350	
1/17/2013 9:59	1383.8000000	60	350	
1/17/2013 10:00	1375.2000000	60	350	
Average	**1370.4833333**	**60**	**350**	**410**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 10:01	1376.8000000	60	351	
1/17/2013 10:02	1378.4000000	61	351	
1/17/2013 10:03	1380.5000000	61	351	
1/17/2013 10:04	1370.5000000	61	350	
1/17/2013 10:05	1351.9000000	60	350	
1/17/2013 10:06	1348.1000000	60	350	
Average	**1367.7000000**	**60**	**350**	**411**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 10:07	1355.0000000	60	350	
1/17/2013 10:08	1359.6000000	60	350	
1/17/2013 10:09	1363.8000000	60	351	
1/17/2013 10:10	1376.0000000	60	351	
1/17/2013 10:11	1383.5000000	60	351	
1/17/2013 10:12	1373.7000000	60	352	
Average	**1368.6000000**	**60**	**351**	**411**

Date Time	FLO3	GEN5	GEN7	
1/17/2013 10:13	1366.9000000	60	351	
1/17/2013 10:14	1375.0000000	60	351	
1/17/2013 10:15	1374.7000000	60	351	
1/17/2013 10:16	1359.7000000	60	351	
1/17/2013 10:17	1354.0000000	60	352	
1/17/2013 10:18	1362.7000000	60	351	
1/17/2013 10:19	1362.3000000	60	350	
Average	**1365.0428571**	**60**	**351**	**411**

Plant Crist
Units 4-7 FGD Stack
Low Load CEMS Data

APPENDIX D

Reference Method Quality Assurance Data

Appendix D, Section 1

Flow Pitot tube Calibration

Pitot Calibrations

Source: **Crist**

Pitot Tube ID: **13001**

	Pitot Pre-test		Acceptance Criteria	Pitot Post-test	
Test Calibration Date:	15-Jan-13			18-Jan-13	
Performed By:	JLG			JLG	
Alignment Data, Degrees, a1 a2:	Pass	3.900	< 10 Degrees	3.800	Pass
Alignment Data, Degrees, b1 b2:	Pass	2.100	< 5 Degrees	2.150	Pass
Alignment Data, inches, z:	Pass	0.099	< 0.125 inches	0.102	Pass
Alignment Data, inches, w:	Pass	0.026	< 0.03125 inches	0.027	Pass
Pitot Opening to Center Line, Pa:	Pass	0.550	Pa =Pb AND	0.550	Pass
Pitot Opening to Center Line, Pb:	Pass	0.550	1.05" D t≤ Pa ≤1.5" Dt	0.550	Pass
Tubing Diameter, inches, Dt:	Pass	0.375	0.1875" ≤ Dt ≤ 0.375"	0.375	Pass
Pitot Opening to Thermocouple, Z:	Pass	2.065	≥2 inches	2.069	Pass
Pitot to Probe, Y:	Pass	3.290	≥ 3 inches	3.300	Pass
Thermocuple Bend, W:	N/A by SSI Design Choice: Straight tubing (NOT with bend)				

Pitot assigned value of .840

Appendix D, Section 2

Flow Electronic Pressure Transducer Calibration

Spectrum System Inc.
Electronic Transducer Calibration

Plant: Crist

Source: 4-7 FGD Stack

Plant: _____

Source: _____

Manometer ("H20)	Transducer ("H20)
0.14	0.139
0.22	0.221
0.56	0.563
0.98	0.982
1.75	1.753

Manometer ("H20)	Transducer ("H20)

Calibrated by: JLG

Date: 1/17/2013