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SEP 22 2003

BUREAU OF AIR REGULATION

September 19, 2003

Ms. Trina Vielhauer  
Chief Bureau of Air Regulation  
Florida Department of Environmental Protection  
111 South Magnolia Drive, Suite 4  
Tallahassee, Florida 32301

**Via FedEx**  
**Airbill No. 7916 7645 1040**

**Re: Tampa Electric Company  
Big Bend Station  
Permit No. 0570039-010-AV  
PM CEM Higher Grain Loading Test Protocol**

Dear Ms. Vielhauer:

Tampa Electric Company (TEC) is requesting authorization to conduct Particulate Matter (PM) testing at elevated grain loadings in order to evaluate the performance of the Particulate Matter Continuous Emissions Monitoring (PM CEM) at Big Bend Station in the first quarter of 2004. Pursuant to Paragraph 32.F of the Consent Decree, TEC is to determine if the PM CEM is feasible. Specifically Paragraph 32.F of the Consent Decree states:

*““Continuous operation” of the PM CEM shall mean operation at all times that Unit 4 operates, except for periods of malfunction of the PM CEM or routine maintenance performed on the PM CEM. If after Tampa Electric operates this PM CEM for at least two years, and if the parties then agree that it is infeasible to sustain continuous operation of the PM CEM, Tampa Electric shall submit an alternative PM monitoring plan for review and approval by EPA. The plan shall include an explanation of the basis for stopping operation of the PM CEM and a proposal for an alternative monitoring protocol. Until EPA approves such plan, Tampa Electric shall continue to operate the PM CEM.”*

In order to meet this requirement, TEC is planning a series of particulate emission tests, at a higher grain loading than previously tested, to evaluate the performance of the PM CEM. Simply stated, this evaluation will require TEC to reduce the collection efficiency of the electrostatic precipitator (ESP) on Big Bend Station Unit 3 (Unit 3) and bypass the Unit 3 flue gas around the flue gas desulfurization (FGD) system that services Unit 3 and Big Bend Station Unit 4 (Unit 4). During this test period, Unit 4 will be totally scrubbed and Unit 3 will be burning the unscrubbed compliance fuel with a sulfur content of no greater than 2.2 lb/mmmbtu. Because Unit 3 and Unit 4 gases are combined, the effect of bypassing will significantly lower the indicated removal efficiencies of both Unit 3 and Unit 4.

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TEC is sensitive to both the Consent Decree requirements and the Title V Permit requirements. The unscrubbed days and Unit 3's and Unit 4's removal efficiencies will be in jeopardy since Unit 3's flue gas will bypass the FGD system. TEC requests that during this test period, removal efficiencies not be included in the thirty (30) day average removal efficiency calculations, and that this testing will not result in TEC utilizing additional Unit 3 unscrubbed days to perform this test. Therefore, TEC is requesting a temporary variance with regard to the affected conditions of the Consent Decree and Title V Permit which may be directly attributed to this testing. Authorization of these tests is consistent with the Department's power and duty under Section 403.061(18), Florida Statutes, to "encourage and conduct studies, investigations, and research relating to pollution and its causes, effects, prevention, abatement, and control."

The specific equipment to be tested is the PM CEM, which will be compared to the PM data collected using EPA Method 5B. TEC will measure and record all other parameters required under Title V and the Consent Decree.

Provided in Attachment A is an authorization statement by Karen A. Sheffield, the Responsible Official outlining her approval of this temporary variance request. Provided in Attachment B is a statement by a professional engineer regarding the certification of the test protocol and schedule. Attachment C contains the PM CEM Higher Grain Loading Test Protocol.

Please note that we recently spoke with the staff at the EPA, DEP, and EPCHC to outline this request and TEC's proposed PM CEM test schedule. Mr. Gregory DeAngelo is being copied on this correspondence. If you have any questions or need further information regarding the test procedures for Big Bend Station, please feel free to contact Ms. Greer Briggs or me at (813) 641-5034.

Sincerely,



Laura Crouch  
Manager, Air Programs  
Environmental Affairs

EA/bmr/GMB106

Enclosure

# **Attachment A**

**CERTIFICATION BY RESPONSIBLE OFFICIAL  
BIG BEND STATION UNITS 3 & 4 PARTICULATE MATTER  
CONTINUOUS EMISSIONS MONITOR TEST TEMPORARY  
VARIANCE REQUEST**

“I, the undersigned, am the responsible official, as defined in Chapter 62-210.200, F.A.C., for the Big Bend Station for which this temporary variance is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this request are true, accurate and complete.”

Responsible Official Signature:

*Karen A. Sheffield*  
Karen A. Sheffield  
General Manager of Big Bend Station

9/19/03  
Date:

ATTACHMENT B

TAMPA ELECTRIC COMPANY  
BIG BEND STATION  
UNITS 3 & 4 PARTICULATE MATTER  
CONTINUOUS EMISSIONS MONITOR  
TEST PROTOCOL AND SCHEDULE

Professional Engineer Certification

Professional Engineer Statement:

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

*(1) To the best of my knowledge, the information provided in this submittal concerning particulate matter continuous emissions monitoring system (PM CEMS) higher grain loading tests at the Tampa Electric Company (TEC) Big Bend Station is true, accurate, and complete based on my review of material provided by TEC engineering and environmental staff; and*

*(2) To the best of my knowledge, any emission estimates reported or relied on in this submittal are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of air pollutants not regulated for an emissions unit, based solely upon the materials, information and calculations provided with this certification.*

*Thomas W. Quinn*  
\_\_\_\_\_  
Signature

9/16/03  
\_\_\_\_\_  
Date

(seal)

\* Certification is applicable to the Tampa Electric Company (TEC) request to conduct PM CEMS higher grain loading tests at its Big Bend Station.

# **Attachment C**

# Tampa Electric Company



## Big Bend Station Units 3 & 4 PM CEM Higher Grain Loading Test Plan

September 19, 2003

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## **1.0 INTRODUCTION**

Tampa Electric Company's Big Bend Station (ORIS Code No. 00645) has requested the authorization to conduct Particulate Matter Continuous Emissions Monitoring (PM CEM) testing in two of its steam generator units (Units 3 and 4). Particulate matter is produced as a by-product of combustion in coal-fired boilers. This request was forwarded to the Environmental Protection Agency (EPA) and Florida Department of Environmental Protection (Department) and is consistent with the Department's power and duty under Section 403.061(18), Florida Statutes, to "[e]ncourage and conduct studies, investigations, and research relating to pollution and its causes, effects, prevention, abatement, and control.

The purpose of this performance testing is to determine the dynamic linearity of the PM CEM equipment and its accuracy at higher grain loading in the range of 0.01 to 0.03 lb/mmbtu. The test for PM will be conducted using USEPA reference method 5B for "Determination of Particulate Matter Emissions from Stationary Sources" and the Sulfur Dioxide (SO<sub>2</sub>) removal efficiency and opacity will be monitored using data from the plant CEMS. The testing for PM will be conducted at the outlet of the flue gas desulfurization (FGD or scrubber) system that serves both Big Bend Station Units 3 and 4 in common stack 3 (CS003). Tampa Electric Company has contracted ENSR to perform the PM stack testing.

## **2.0 FACILITY DESCRIPTION**

### **2.1 Facility Location and Description**

Tampa Electric Company's Big Bend Station is located in Apollo Beach, Hillsborough County, Florida. Big Bend Station consists of four steam boilers (Units 1 through 4). Units 1, 2, 3, and 4 have a nominal maximum heat input of 4,037, 3,996, 4,115, and 4,330 million Btu/hour, respectively. Units 1 through 4 are each serviced by an electrostatic precipitator (ESP) for the control of flyash emissions and an FGD system for the control of SO<sub>2</sub> emissions. Opacity monitors are located in the ductwork downstream of the ESP and upstream of the FGD system. These units are fired with either bituminous coal or with a petcoke/coal mixture up to 20 percent petcoke and 80 percent coal (by weight).

### **2.2 Reference Methods Sampling Location**

The emission sampling location on the outlet downstream from the FGD system for Units 3 and 4 consists of four (4) ports spaced 90 degrees apart. Also, Units 3 and 4 share common stacks with test platforms located inside a stack annulus at the 250-foot level on each stack. The emission sampling location in the outlet downstream of the FGD system for CS003 consists of multiple ports accessed by a testing platform located inside the stack annulus. All of the sampling port locations meet EPA Reference Method 1 testing criteria.

### **3.0 REFERENCE METHOD TESTING**

Particulate Matter will be sampled and analyzed using USEPA test method 5B (40CFR60, Appendix A). SO<sub>2</sub> and Opacity will be monitored using the existing CEM.

Output megawatts, applicable boiler operating data, ESP operating data, FGD operating data, etc will be measured, documented, and recorded, to verify the various process conditions during testing.

### **3.1 QA/QC Operations**

#### Gas Emission Test and Gas Sample Strategy:

The data from approximately twenty runs will be used for the purposes of determining the feasibility of the PM CEM as specified in Paragraph 32.F of the Consent Decree. PM emission test runs will be a minimum of 1 hour in duration and will be performed with the Units operating at their daily load capabilities.

#### Unit Exhaust Gas for PM Measurements:

Each probe will be calibrated at the ENSR instrument laboratory and QA/QC procedures will be performed as required by each USEPA test methods. Following initial calibrations of the equipment, a sample of exhaust gas will be extracted from CS003 using paired trains as specified in the USEPA's proposed Performance Specification 11 (PS-11). The results of these measurements will be manually recorded and entered into a portable personal computer to document the sample analysis, calibrations and quality assurance activities conducted during the tests.

### **3.2 Instrumental Reference Methods - PM**

#### USEPA Proposed Performance Specification 11 for PM CEM:

PM will be measured by extracting an exhaust gas sample from CS003. The mass of the collected PM from the gas sample will be determined gravimetrically from the nozzle, probe, and filter holder and front half filter fraction. A heated, glass-lined probe with a glass nozzle and attached thermocouple and pitot tubes will be used to sample the gas from CS003. The sample gas passes through the probe to the heated glass fiber filter. The temperature of the probe and filter are heated to 320°F +/-25°F. Four impingers are located after the filter box. A pump, dry gas meter, and calibrated orifice follow the impingers. In addition, molecular weight will be determined using an integrated tedlar bag sample collected from the gas stream for O<sub>2</sub> and CO<sub>2</sub> analysis.

ENSR will perform an analysis of the PM samples and filters at the ENSR Air Toxics Laboratory, after the sample collection and recovery procedures have been completed for all twenty test runs.

#### 4.0 PROPOSED TESTING SCHEDULE

The dynamic linearity and high grain loading tests are tentatively scheduled to begin in the first quarter of 2004. Testing is planned for completion in one week or until twenty runs have been completed, based on the operating conditions of both Units. During the tests, emissions from CS003 will be evaluated while firing coal with a sulfur content of no more than 2.2 lb/mmbtu in Unit 3. Listed below is the proposed schedule for each day of testing. This is subject to change based on the daily operation of Units 3 and 4.

##### Day 1:

1. Reduce booster fans for the FGD system on A and B towers until approximately 80% of Unit 3's flue gas is bypassed.
2. Reduce power to Unit 3's ESP transformer/rectifier (T/R) sets until the opacity is between 16 and 20%.
3. Hold this condition for approximately 12 hours while 5 to 6 Reference Method 5B PM sample runs are performed in CS003.
4. Reset Unit 3's ESP T/R sets to their original power levels.
5. Reset the FGD system booster fans to their normal operation.
6. Check the grain loading recorded by the PM CEM.

##### Day 2:

1. If 12 to 20 mg/dscm was recorded by the PM CEM during the first day's testing, then repeat the procedures for day 1. If not, proceed with step 2.
2. Reduce booster fans for the FGD system on A and B towers until approximately 90 to 95% of Unit 3's flue gas is bypassed.
3. Reduce power to Unit 3's ESP T/R sets until the opacity is between 20 and 25%.
4. Hold this condition for approximately 12 hours while 5 to 6 Reference Method 5B PM sample runs are performed in CS003.
5. Reset Unit 3's ESP T/R sets to their original power levels.
6. Reset the FGD booster fans to their normal operation.
7. Check the grain loading recorded by the PM CEM.

##### Day 3:

1. If 12 to 20 mg/dscm was recorded by the PM CEM during the first day's testing, then repeat the procedures for day 1. If not, repeat the procedures for Day 2.

##### Day 4:

1. If 12 to 20 mg/dscm was recorded by the PM CEM during the first day's testing, then repeat the procedures for day 1. If not, repeat the procedures for Day 2.

Day 5:

1. If 12 to 20 mg/dscm was recorded by the PM CEM during the first day's testing, then repeat the procedures for day 1. If not, repeat the procedures for Day 2.

Day 6:

1. If 12 to 20 mg/dscm was recorded by the PM CEM during the first day's testing, then repeat the procedures for day 1. If not, repeat the procedures for Day 2.

Day 7:

1. If 12 to 20 mg/dscm was recorded by the PM CEM during the first day's testing, then repeat the procedures for day 1. If not, repeat the procedures for Day 2.