

4/6/04

Dear Mr. Burrows,

Thanks for the response....we'll take a look at the information and get back to you. Take care.

Bruce Mitchell

-----Original Message-----

From: Byron Burrows [mailto:btburrows@tecoenergy.com]

Sent: Tuesday, April 06, 2004 10:48 AM

To: Mitchell, Bruce; johnathan.holtom@dep.state.fl.us

Subject: Hardee Updated CAM Plan

Bruce & Jonathan:

Attached is the electronic version of the CAM plan requested by the 2/18/04 FDEP letter requesting additional information. I updated it to correct the typographic errors that you brought to my attention in January (let me know if I missed anything). Also, I made minor changes to correlate with our responses to your questions.

Once you've had a chance to review our responses, give us a call. Paul & I would be glad to come to your office to discuss in more detail.

Thanks,

Byron

Byron T. Burrows, P.E.

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Hardee Power Station

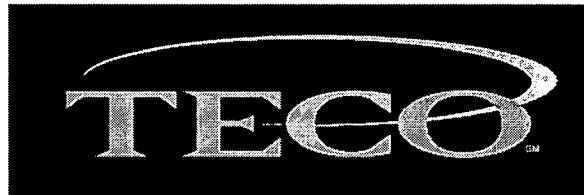
CT-1A, CT-1B, CT-2A

COMPLIANCE ASSURANCE MONITORING PLAN

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Revision 0: 12/17/03

Revision 1: 04/01/04

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2 Introduction

This Compliance Assurance Monitoring (CAM) Plan was prepared for Hardee Power Station (HPS) in accordance with submittal requirements outlined in 40 CFR 64.4. Pursuant to 40 CFR 64.2 (a), Nitrogen Oxides (NOx) is the only emission parameter using a control device to achieve compliance with any such emission limitation or standard and also meets the other applicability criteria. Therefore, NOx is the only parameter for which a CAM Plan is required.

The proposed monitoring is presumptively acceptable for NOx. Upon identification of an excursion or exceedance, the owner or operator will take corrective action to bring operations back within the appropriate ranges (or below the emission limit) as expeditiously as practicable. Corrective action includes both the initial inspection and any appropriate follow up activities to return the monitored indicators to within accepted ranges.

3 Emissions Units

3.1 Process/Emissions Units

- a. Three (3) Stationary 75 MW (nominal) General Electric PG7111 (7EA) combustion turbine generators (CT-1A, CT-1B, CT-2A);
- b. Two (2) unfired heat recovery steam generators (HRSG) associated with 1A and 1B;

3.2 Pollutants

Regulated: NOx, SO2, CO, VOC, PM, Opacity
With Control Device: NOx

3.3 Emissions Control Technique

- a. Water injection (NOx control)

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5 Applicable Requirements

The following summarizes the applicable requirements for NOx based on the permit (0490015-003-AV) and 40 CFR 60. The permit requirements are more stringent than 40 CFR 60 requirements. NOx is the only parameter subject to CAM requirements.

Table 3-1. Applicable Requirements

Pollutant	Load Range	When Firing Pipeline Quality Natural Gas	When Firing No. 2 Distillate Fuel Oil
NOx	All	42 ppmvd @ 15% O ₂ (215.9 lb/hr)	65 ppmvd @ 15% O ₂ (383.8 lb/hr)

6 Monitoring Approach

The following summarizes the monitoring approach required by the permit and 40 CFR 60. The Continuous Monitoring System (CMS) at this facility satisfies the monitoring requirements in 40 CFR 64.3.

Table 4-1. Monitoring Approach

Applicable Requirement	NOx limits
General Monitoring Approach	Continuous Monitoring System measuring water injection rate, fuel consumption, and water-to-fuel ratio.
Monitoring Methods and Location	Water Injection Rate: water flow meter Fuel consumption: fuel flow meter. Water-to-fuel ratio: fuel flow meter and water flow meter.
Indicator Range	Water-to-fuel ratio: Established During Compliance Test (Normal range = 0.4 to 0.8). If the ratio falls below the target during a 1-minute averaging period, an alarm notifies the operator.
Data Collection Frequency	Fuel consumption and water-to-fuel ratio: continuous.
Averaging Period	Fuel consumption and water-to-fuel ratio: CMS: 1-minute, Permit requires at least hourly.
Record keeping	Fuel consumption and water-to-fuel ratio: DAS stores 1-minute and hourly averages.
QA/QC	Flow meters have a minimum accuracy of 5 percent; annual calibration.

Typical Target Values for Water-to-Fuel Ratio

Load, percent	Water-to-Fuel Ratio Target Value When Firing Natural Gas			Water-to-Fuel Ratio Target Value When Firing Distillate Fuel Oil		
	CT-1A	CT-1B	CT-2A	CT-1A	CT-1B	CT-2A
50	0.45	0.43	0.31	0.55	0.36	0.37
75	0.58	0.56	0.50	0.60	0.40	0.40
90	0.66	0.64	0.59	0.65	0.52	0.55
100	0.71	0.69	0.69	0.69	0.63	0.68

7 Basis

The Continuous Monitoring System (CMS) for NO_x is installed and operated according to the requirements of 40 CFR 60, on all units at the plant. The CMS ensures that the plant operators are aware of parameters affecting emission levels of the plant and that the plant is operated in compliance with applicable standards.

The CMS continuously measures and reports water and fuel usage data at all load ranges and produces an alarm when a parameter is not in the expected range. The CMS is certified and operated according to 40 CFR 60 and permit requirements. Therefore, the Title V monitoring to show compliance with the NO_x limits is to operate the CMS in compliance with the permit and 40 CFR 60 requirements.

The NO_x control device at HPS is water injection. The following describes the processes and parameters monitored to ensure compliance with applicable requirements.

The injection of water into the combustor lowers the flame temperature and thereby reduces thermal NO_x formation. The water injection rate is described by a water-to-fuel ratio (lb/lb) recommended by the turbine manufacturer for optimum NO_x reduction without an increase in CO emissions. NO_x reduction efficiency increases as the water-to-fuel ratio increases. Subpart GG of 40 CFR 60 requires an initial performance test to determine the water-to-fuel ratio required to comply with the NO_x standard at four loads in the normal operating range, including minimum and maximum load. Therefore, measuring the flow of water and fuel to the turbine and maintaining the proper water-to-fuel ratio will assure that the turbine is operating in a manner that will achieve a reduction in NO_x emissions without an increase in CO emissions.

8 References/Information Source

1. Florida Department of Environmental Protection, Permit 0490015-003-AV.
2. 40 CFR 60, Subpart GG
3. Alternative Control Techniques Document – NO_x Emissions from Stationary Gas Turbines, EPA-453/R-93-007, January 1993.
4. General Electric, PG7111 (7EA) combustion turbine Operation & Maintenance Manual