



TAMPA ELECTRIC

March 7, 2003

Mr. David Lloyd
Environmental Scientist
U.S. Environmental Protection Agency, Region IV
61 Forsyth Street, S.E.
Atlanta, Georgia 30303

**Re: Tampa Electric Company
Consent Decree
Civil Action No. 99-2524 CIV-T-23F
Big Bend Station Unit 4
Additional NO_x Projects – Separated Over-Fired Air (SOFA), and Low NO_x
Burners, (LNB) Technologies**

Dear Mr. Lloyd:

Please find the enclosed information from Tampa Electric Company's (TEC) petition to receive approval for additional NO_x reduction projects, as specified in paragraph 52.C (1)(i) and 52.C (3) of the Consent Decree. The proposed NO_x control projects are targeted for Big Bend Unit 4 which include a Separated Overfire Air (SOFA), and Low NO_x Burners (LNB), inclusive of modified close coupled overfire air. The LNB system was identified in the update report sent in December 2001 and TEC has taken advantage of an earlier outage to install the modified close-coupled overfired air system and new LNB. The balancing and tuning necessary to reduce NO_x is scheduled to be completed following the systematic rebuild of the coal mills. The SOFA system is planned to be installed in the fall of 2003. This system involves the addition of new air injection ports above the existing windbox to stage the combustion process resulting in lower NO_x emissions.

RECEIVED

MAR 14 2003

BUREAU OF AIR REGULATION

Via FedEx
Airbill No. 7915 4889 5828

Greg
Mike
Cindy ✓

Mr. David Lloyd
March 7, 2003
Page 2 of 2

In summary, the key aspects of these projects are;

Technology	Cost	Schedule	Targeted NO _x lbs/mmbtu	Reduction %	Tons/yr Reduction ¹
Low NO _x Burners	\$805,000	Installation Complete, Final Tune-up 3 rd Qtr 03	0.38	15	1,024
Separated Overfired Air	\$3,230,000	October 4, 2003	0.30	33	2,252

¹ Based upon 1998 emissions of 6,826 tons of NO_x

The attached report provides specific information regarding scope, schedule, cost, and targeted NO_x reductions. Based upon the NO_x reduction benefits provided TEC believes that these projects qualify to satisfy the requirements of the aforementioned stipulations of the Consent Decree.

In anticipation of EPA approval, TEC is finalizing agreements with our various contractors to design and supply equipment for the SOFA system, which is expected to be complete by March 10, 2003. Accordingly, an expedited approval of these projects by EPA to coincide with our efforts, would be greatly appreciated

If you have any questions, please feel free to contact Shelly Castro or me at (813) 641-5033.

Sincerely,



Laura R. Crouch
Manager - Air Programs
Environmental Affairs

EA/bmr/SSC

Enclosure

c/enc: Ms. Cindy Phillips, FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Jerry Campbell- EPCHC

RECEIVED

MAR 14 2003

BUREAU OF AIR REGULATION

Tampa Electric's

Big Bend Unit #4 NO_x Reduction Plan

Submission Date: February 28, 2003

Prepared By:

Revision: 00

Background

Tampa Electric, (TEC) and the United States Environmental Protection Agency, (EPA) entered into certain agreements to reduce NOx emissions from the Big Bend coal generated facility as stipulated within the Consent Decree whose effective date was October 4, 2000. One of those stipulations as specified within section VII, paragraphs 50 and 52.C requires TEC to expend funds to "... (i) demonstrate innovative NOx control technologies on any of its units or boilers at Gannon or Big Bend not shutdown or on reserve/standby; and/or (ii) reduce the NOx emission rate for any Big Bend coal-combusting unit below the lowest rate otherwise applicable to it under this Consent Decree." TEC has already petitioned and received approval from the EPA for an innovative NOx control technology for Big Bend unit #2, which involves a neural network based intelligent sootblowing system. This NOx plan describes work for Big Bend unit #4 which can reduce its NOx emissions using commercially available techniques years in advance of future requirements. This will provide substantial reductions of NOx emissions to the environment. Accordingly, TEC herewith petitions the EPA for inclusion of this work as satisfaction of paragraph 52.C of the Consent Decree.

Introduction

Pursuant to the stipulations put forth within the Consent Decree entered into between TEC and the US EPA, TEC is required to perform work to either demonstrate innovative NOx control techniques, or reduce NOx emissions to levels below that required in the Consent Decree. Tampa Electric has already petitioned and received approval for a Neural Network Intelligent Sootblowing system for its Big Bend Unit #2, Riley Turbo coal fired unit. This NOx plan, describes work which targets Big Bend's unit #4 to reduce NOx emissions below that required by the Consent Decree.

Big Bend unit #4 is a fossil fired steam boiler electric generating system rated at 4330 MMBtu/hour. It has a Combustion Engineering "dry" bottom tangentially fired pulverized coal boiler designed for 486 MWe generation. The unit began operation in 1985. The unit is equipped with five (5) elevations of coal nozzles configured in such a manner that it creates a helical fireball, whereby the coal burners are aimed at the tangential intersection with the fireball. Between each coal nozzle assembly, there is an auxiliary air compartment, which provides the vast majority of combustion air. Big Bend unit #4 was also originally fitted with two (2) levels of close coupled over-fired air, (CCOFA) and a refuse burner, which are located above the upper most coal nozzle.

The most widely accepted and conventional methods for in-furnace NOx control involve staging of the combustion process to reduce NOx emissions. There are several trade names associated with these techniques, depending upon the manufacturer. However, they basically all include the same general principles. Level I primarily consist of replacement of the coal and auxiliary air nozzles designed specifically for NOx reduction, and the inclusion of CCOFA. The Level II systems use Level I techniques, but also include single or multiply levels of separated over-fired air, (SOFA) ports. The

latter Levels of NOx control can involve clustering of coal nozzles, and/or the addition of more SOFA ports. In all cases, the emphasis is to provide a physical separation of varying levels of combustion air from the main combustion zone. Theoretically, the greater the separation and greater quantities of air diverted from the combustion zone will reduce the level of NOx generated. There is however negative consequences associated with the implementation of these techniques, which must be managed as part of the control scheme. These include but are not limited to, water wall wastage, increased unburned carbon, slag formation patterns, and steam temperature impacts.

Scope of Work

Low NOx Burners with CCOFA – Big Bend unit #4 was originally fitted with a two level CCOFA system and conventional coal and air nozzles. This arrangement allowed for a NOx emission rate of 0.45lbs/MMBtu. The upgraded system petitioned herein includes, Foster Wheelers low NOx designed coal and air nozzles to be used in conjunction with modifications to be made to the CCOFA, which includes the addition of one (1) CCOFA port. The work also involved modifications to the lowest air compartment to provide for isolated tilt control, which is independent of the main tilt drive system. It is projected that an emission rate of 0.38lbs/MMBtu can be achieved using this system which provides for a 15.5% reduction as compared to the 0.45lbs/MMBtu rate.

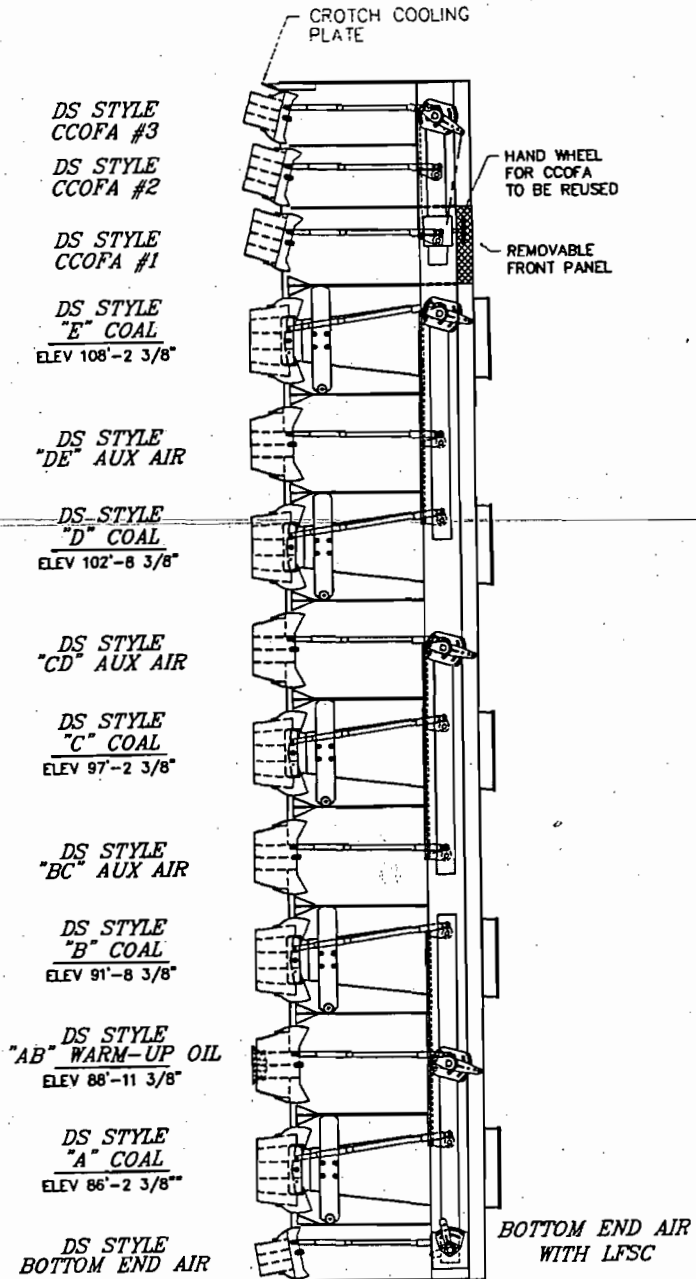
The specific material scope of supply provided by Foster Wheeler included,

- Twenty (20) FWEC Double Shroud, adjustable coal nozzles for CE T-fired unit complete with nozzle tip pins, seal plates and compartment restrictor plates.
- Windbox tilt kit. Which includes internal levers, pins and adjusting links.
- Thirty-two (32) air nozzle tips complete with nozzle tip pins, seal plates and restrictor plates.

This project was completed in the summer of 2001 for a cost of \$805,000 and was identified in prior reports to EPA as a candidate for inclusion in Tampa Electric's NOx compliance strategy.

The following sketch depicts the modified arrangement of the windbox following the work and illustrates a typical level I low NOx burner installation.

WINDBOX
PROPOSED
MODIFICATIONS



SKETCH #1
BIG BEND UNIT #4 LOW NO_x BURNER UPGRADE

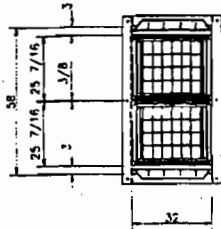
Separated Over Fired Air (SOFA) – As noted above Tampa Electric has already installed a level I NOx control system as part of its overall NOx control strategy in response to the Consent Decree requirements. The next logical step for Big Bend unit #4 is the installation of a two register SOFA system to allow for deeper staging of the combustion process and further reduction of NOx emissions. The work would involve penetrations into the existing secondary air (SA) duct assembly, the installation of four (4) new duct take-off sections to divert approximately 20% of the combustion air to the SOFA system. In addition, pressure part modifications are necessary to allow for the new air nozzles to be installed roughly twenty (20) feet above the existing Windbox. New Windbox assemblies would be attached to the new boiler tubes along with two air nozzles per corner. The work also involves new and upgraded drive assemblies to modulate air dampers, which regulate the quantity of air delivered to each compartment and additional restrictor plates to help regulate flow. Due to the fact that the level I system was supplied by Foster Wheeler, Tampa Electric has elected to use Foster Wheeler for the level II upgraded system. Foster Wheeler has offered Tampa Electric a guaranteed emission rate of 0.30lbs/MMBtu for this system. This provides for an additional 15% reduction from the level I system, or a combined reduction of NOx emissions from 0.45lbs/MMBtu of 33%.

Regarding project schedule, it is Tampa Electric's intent to issue a contract to Foster Wheeler by no later than April 4, 2003 to support our planned outage whose start date is October 4, 2003. That outage concludes November 7, 2003. Due to the specific timing of this project and other work that is being conducted, final tune-up and optimization of the unit is scheduled for Jan 2004, which should be completed within 3-4 weeks.

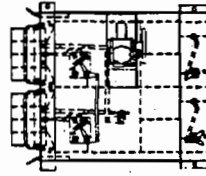
The cost of the project is projected to be \$3,230,000, which includes all material and labor costs associated with providing a fully functional and optimized system. It is further expected that approximately \$3,000,000 of this cost will be expended in 2003, and the balance in Jan 2004 for optimization and any punch list items that may require attention.

The following sketch #2, illustrates the proposed configuration of the level II SOFA system and primary components associated with this project.

NOx REDUCTION

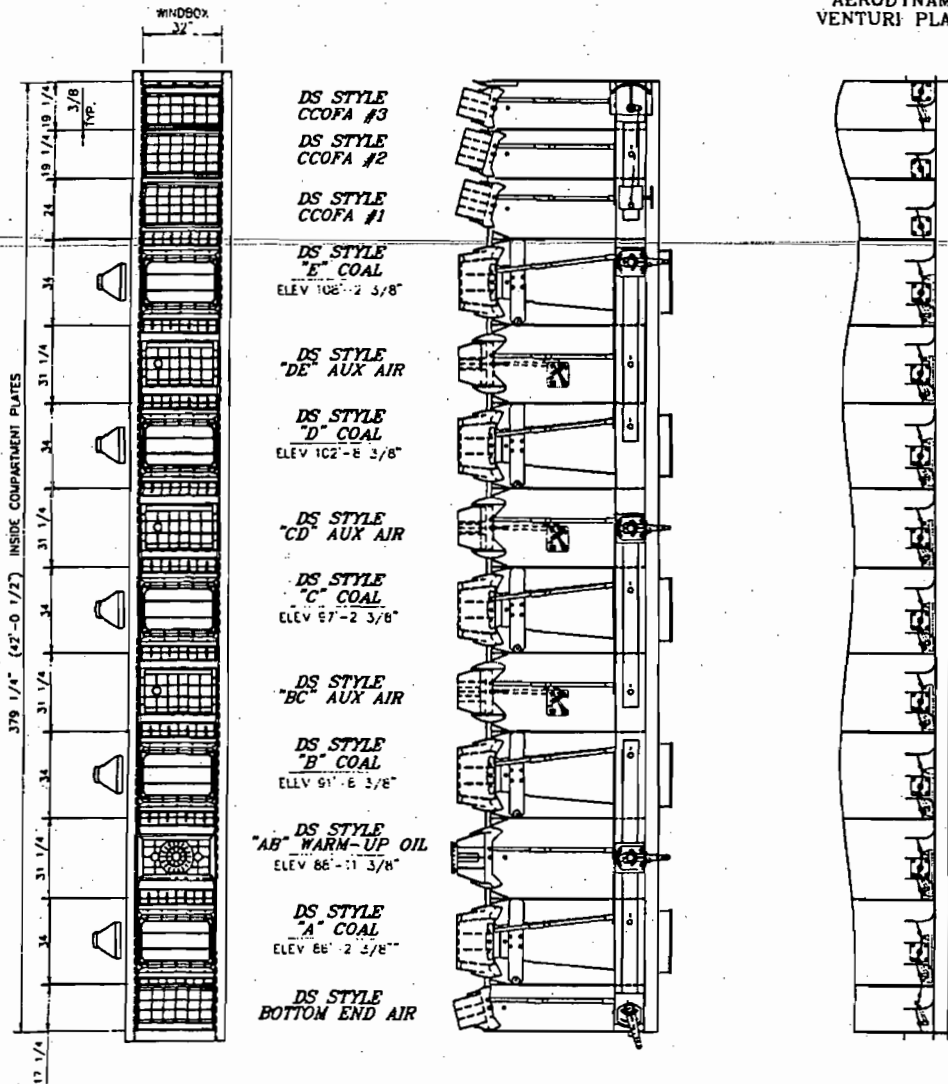


SOFA



(4) SOFA WINDBOXES WITH HORIZONTAL DIRECTION CONTROL

AERODYNAMIC VENTURI PLATES



SKETCH #2

BIG BEND UNIT #4 PROPOSED SOFA UPGRADE

Benefits and Conclusion

The foregoing projects comply with the stipulations of paragraph 52.C of the Consent Decree which allows for "...reduce the NOx emission rate for any Big Bend coal-combusting unit below the lowest rate otherwise applicable to it under this Consent Decree." This is supported by the amendment to the Consent Decree, which allows for the use of either Big Bend unit #3 or #4 for an early NOx reduction unit. Tampa Electric has elected to use Big Bend unit #3 as the early NOx compliance unit, thus allowing for Big Bend unit #4 to qualify. Additionally, Big Bend unit #4 is not required to achieve NOx reduction below its currently permitted level of 0.45lbs/MMBtu until June 1, 2007. The combined impact of these two projects will allow for 43% of the required NOx reductions to occur well in advance of the 2007 date.

In 1998 Big Bend unit #4 emitted 6,826.13 tons of NOx. If these projects are approved, they would provide for a reduction in annual NOx emissions of approximately 2,252 tons. Additionally, due to the timing of the projects the total emission reduction would be approximately 7,900 tons of NOx, which otherwise would be released to the environment.
