TAMPA ELECTRIC

November 22, 2002

Mr. Scott M. Sheplak, P.E.
Florida Department of Environmental Protection
Division of Air Resource Management
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7912 3799 8401

Re: Tampa Electric Company
Polk Power Station
Sulfuric Acid Plant (SAP)
Change of Test Method for Sulfur Dioxide
Permit No. 1050233-009-AV
AIRS #1050233, EU# 004

Dear Mr. Sheplak:

Tampa Electric Company (TEC) herewith submits four signed and sealed copies of a completed Title V Permit Revision Application requesting to modify the Title V Air Operating Permit No. 1050233-009-AV at Polk Power Station. TEC requests a change in the sulfur dioxide (SO_2) compliance test method used at the sulfuric acid plant (E.U. ID No. 004). This permit revision is submitted in accordance with the Florida Department of Protection's (FDEP) Permit Action Tree (PAT) guidance (dated 11/07/02).

Emission Performance tests conducted on August 22-23, 2002 demonstrated that results using EPA Method 6C (Instrumental Analyzer Procedure) were comparable to those using an adapted version of the currently permitted EPA Method 8. TEC submitted the results to Mr. Bill Proses of FDEP on October 3, 2002. As we indicated in this prior correspondence, EPA Method 8 is not suitable to measure emissions from the SAP stack due to specific design aspects of the stack. These issues were also discussed with Mr. Martin Costello of FDEP. On November 20, 2002, Mr. Costello contacted Mr. Alvaro Linero to support TEC's request to substitute EPA Method 6C for the current method required on the SAP to demonstrate SO_2 compliance. Since EPA Method 6C is the best option evaluated for demonstrating compliance with the SO_2 emissions limit, TEC requests that Condition C.14 of our Title V Permit be revised as follows:

From:

Acid Mist/Sulfur Dioxide. The test method for acid mist/sulfur dioxide shall be EPA Method 8, incorporated and adopted by reference in Chapter 62-297, F.A.C. The minimum sample volume shall be 40 dry standard cubic feet.

To:

"Acid Mist/Sulfur Dioxide. The test method for acid mist shall be EPA Method 8, incorporated and adopted by reference in Chapter 62-297, F.A.C., or alternative method approved by FDEP. The minimum sample volume for the EPA Method 8 test shall be 40 dry standard cubic feet. The test method for sulfur dioxide shall be EPA Method 6C, incorporated and adopted by reference in Chapter 62-297, F.A.C., or alternative method approved by FDEP."

In support of this request, TEC has also provided with this correspondence, as Attachment 1, the October 3, 2002 letter submitted to Mr. Bill Proses with the August 22-23, 2002 emission performance test results. Enclosed, as Attachment 2 is Mr. Costello's November 20, 2002 email copy to Mr. Linero approving the change of test method for SO_2 compliance.

TEC appreciates the cooperation and consideration in this matter. If you have any questions or comments pertaining to this application, please call Raiza Calderon or me at (813) 641-5261.

Sincerely,

Laura R. Crouch
Manager- Air Programs
Environmental Affairs

EA/bmr/RC148

Enclosures

c: Mr. Martin Costello - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Bill Proses - FDEP SW
Ms. Sheila Schneider - FDEP SW

Attachment 1

TECO SM

TAMPA ELECTRIC

October 3, 2002

Via FedEx
Airbill No. 7921 1285 2820

Mr. Bill Proses
Southwest District
Florida Department of
Environmental Protection
3804 Coconut Palm Drive
Tampa, Florida 33619-8318

Re: Tampa Electric Company (TEC)
Polk Power Station Sulfuric Acid Plant
Stack Emission Test
Permit No. 1050233-009-AV
AIRS #1050233, EU#004

Dear Mr. Proses:

According to Condition C.20 of the Title V Permit #1050233-009-AV, TEC is required to perform prior to renewal of the permit a formal compliance test demonstrating compliance for sulfuric acid mist (H_2SO_4) and sulfur dioxide (SO_2) at Polk Power Station for E.U. ID No. 004. As referenced in Condition C.14 and Chapter 62-297, F.A.C, EPA Method 8 is required to be used for sulfuric acid mist/sulfur dioxide compliance. Provided with this correspondence is the August 22 & 23, 2002 emission performance test. This emission performance test was performed in order to evaluate different methods for testing and to develop a recommended single method.

EPA Method 8 specifies that the stack velocity be determined by differential pressure using a manometer. Due to the very low velocity in the sulfuric acid plant stack at Polk Power Station, TEC testing personnel have found it impossible to register a differential pressure reading for the exit gas using a manometer. This, in turn, prevents the direct application of EPA Method 8. This problem was addressed on the April 26, 2000 letter to the Florida Department of Environmental Protection (FDEP), where TEC requested permission to use an alternative approach to determine the exit velocity of the sulfuric acid plant stack gas. Richard L. Davis of Davis & Associates Consulting, Inc developed an algorithm that allowed TEC to calculate the exit velocity of acid plant stack gas based on available plant operating data. TEC reviewed this algorithm and found it to be technically correct and precise, therefore TEC used it for the sulfuric acid plant initial compliance test and the August 22 & 23, 2002 emission performance test. Other than this adaptation, TEC strictly adhered to all requirements of EPA Method 8.

During the August 22 & 23, 2002 emission performance test, EPA Method 6C was simultaneously used along with the adapted EPA Method 8 for the determination of sulfur dioxide emissions from the sulfuric acid plant. This test method continuously extracts a gas sample from a stack, and a portion of the sample is conveyed to an instrumental analyzer for determination of SO_2 gas concentration. Since the H_2SO_4 and SO_2 emission limits are of 0.15 pounds per ton of 100 percent acid produced and 4 pounds per ton of 100 percent acid produced, respectively, the concentrations would need to be converted to a lb/ton number. The results of this test method are included in Appendix A of the performance test report enclosed. This test method is considered an accurate representation of the emissions from the sulfuric acid plant, but it only is applicable for determining SO_2 gas concentrations and not H_2SO_4 gas concentrations.

Presented below in Table 1 is a comparison of the emission rates using the EPA Method 6C and the adapted EPA Method 8 for the August 22 & 23, 2002 sulfuric acid plant emission performance test..

TABLE 1. EPA Method 6C and Adapted Method 8 Comparison for Sulfuric Acid Plant Emission Performance Test (August 22 & 23, 2002)

Sulfuric Acid Plant August 22 & 23, 2002	SO_2 Concentration [EPA Method 8]	Conversion Facor lbs/dscf to ppm	SO_2 Concentration		Difference
			EPA Method 6C	Adapted EPA Method 8	
	lbs/dscf	ppm	ppm	ppm	%
Run 1	2.380E-05	1.660E-07	135.03	143.37	-5.82
Run 2	2.564E-05	1.660E-07	147.72	154.46	-4.36
Run 3	2.756E-05	1.660E-07	161.13	166.02	-2.95
		Average	148.0	154.6	-4.38

The only other option at the present time to calculate the H_2SO_4 and SO_2 emissions from the sulfuric acid plant would be to use the following alternative equation for a source that processes "elemental sulfur or an ore that contains elemental sulfur" and uses air to supply oxygen as referenced in 60.84(d) :

$$E_S=(C_S\ S)/[\ 0.265-(0.126\%\ O_2)-(A\ \%\ CO_2)\ ]$$

At Polk, the source of the sulfur to the sulfuric acid plant is not "elemental sulfur or an ore containing elemental sulfur" as specified in 60.84. Rather, it is hydrogen sulfide (H_2S) in the acid gas stream from the solid fuel gasification plant's gas cleanup system. Also, the Polk Power Station sulfuric acid plant uses pure oxygen in addition to air to supply the oxygen for acid production. Consequently, the alternative equation above does not calculate an accurate emission rate for this process.

Presented below in Table 2 is a comparison of the emission rates using the alternative method referenced in 60.84(d) and the adapted EPA Method 8 for the sulfuric acid plant initial compliance test performed on June 25, 1999.

TABLE 2. Alternative Method and Adapted EPA Method 8 Comparison for Sulfuric Acid Plan Initial Compliance Test (June 25, 1999)

Sulfuric Acid Plant June 25, 1999	SO_2 Concentration [C_s]	H_2SO_4 Concentration [C_s]	SO_2 Emission Rate [E_s]		H_2SO_4 Emission Rate [E_s]	
			Alternative Method	Adapted EPA Method 8	Alternative Method	Adapted EPA Method 8
	lb/dscf	lb/dscf	lb/ton	lb/ton	lb/ton	lb/ton
Run 1	3.053E-05	7.873E-07	1.4035	2.107	0.0362	0.054
Run 2	2.755E-05	7.888E-07	1.2653	1.980	0.0362	0.057
Run 3	-	-	-	-	-	-
		Average	1.3344	2.0435	0.0362	0.0555

Presented below in Table 3 is a comparison of the emission rates using the alternative method referenced in 60.84(d) and the adapted EPA Method 8 for the August 22 & 23, 2002 sulfuric acid plant emission performance test.

TABLE 3. Alternative Method and Adapted EPA Method 8 Comparison for Sulfuric Acid Plant Emission Performance Test (August 22 & 23, 2002)

Sulfuric Acid Plant August 22 & 23, 2002	SO_2 Concentration [C_s]	H_2SO_4 Concentration [C_s]	SO_2 Emission Rate [E_s]		H_2SO_4 Emission Rate [E_s]	
			Alternative Method	Adapted EPA Method 8	Alternative Method	Adapted EPA Method 8
	lb/dscf	lb/dscf	lb/ton	lb/ton	lb/ton	lb/ton
Run 1	2.38017E-05	3.55016E-07	1.0883	2.2017	0.0162	0.0328
Run 2	2.56370E-05	3.58358E-07	1.1722	2.3426	0.0164	0.0327
Run 3	2.75575E-05	3.06610E-07	1.2600	2.5804	0.0140	0.0287
Average			1.1735	2.3749	0.0155	0.0314

Although the alternative method calculates the emission rate to be lower than the adapted EPA Method 8, it is not an accurate representation of the emissions from the sulfuric acid plant. TEC is planning on submitting an administrative amendment requesting for official permission from FDEP to use the adapted EPA Method 8 for future sulfuric acid plant compliance tests in Quarter IV, 2002.

Enclosed please find the emissions performance report for tests performed on August 22 & 23, 2002 at the Sulfuric Acid Plant. As stated in the Summary of Results, below is a list of results:

- sulfur dioxide - calculated average was 2 lbs/ton; permit limit 4 lbs/ton.
- sulfuric acid mist – calculated average was 0.03 lbs/ton; permit limit 0.15 lbs/ton.
- average opacity observed during the 30-minute test was 0 percent; permit limit 10 percent.

If you have any questions, please call Raiza Calderon or me at (813) 641-5261.

Sincerely,

Laura R. Crouch

Laura R. Crouch
Manager - Air Programs
Environmental Affairs

EA/bmr/RC139

c/enc: Mr. Jerry Kissel, FDEP SW

bc: R.L. Dorey
M.J. Hornick
J.E. McDaniel
M.R. Perkins (enc)
D.A. Smith
L.T. Webb
AP 6.0
AR 6.5 (enc)
C 2.1

r: R. Calderon
S.S. Castro
L.R. Crouch
D. Latchman
L.A. Pence

Attachment 2

From: Costello, Martin
Sent: Wednesday, November 20, 2002 10:34 AM
To: Linero, Alvaro
Cc: Riza Calderon (E-mail)
Subject: TEC Polk Unit 1

I expect you to receive a request form TEC to substitute Method 6C for the current method required in the PSD permit (Method 8) on the acid plant. I support this change since the current port location has very low flow rates and the annual compliance tests for SO2 have required very long run times.

Let me know if you have any questions on this issue.

Martin Costello, P.E.
Florida Department of Environmental Protection
Bureau of Air Monitoring and Mobile Sources
Emissions Monitoring Section
850/921-9578 or Suncom 291-9578