

SEMINOLE POWER PLANT, UNIT 1 PETROLEUM COKE TESTBURN REPORT

EXECUTIVE SUMMARY

In accordance with specific condition no 1 with the Department's permit amendment authorizing a Petroleum Coke Testburn for Unit 1 of the Seminole Power Plant, this submittal constitutes Seminole's petroleum coke testburn report. Included in this report is the following information:

- Actual testburn protocol
- Fuel analyses
- CEM data
- Stack test results
- Daily records of operation

Seminole began the testburn on November 28, 1995, with baseline coal, and concluded the test on January 9, 1996, with a 30% blend of petroleum coke. During this 43 day period, petroleum coke was burned at three different blend levels (10%, 20%, and 30%) for a total of 20 days (see actual testburn protocol). Unit load levels for the testburn were as scheduled in Seminole's proposed test protocol submittal of August 3, 1995, except for December 15 through December 19, which were load-following days. Unit load for all stack tests was a nominal 640 megawatts.

The compliance stack tests did not occur in the original, planned order of baseline coal, 10% petcoke, 20% petcoke, and 30% petcoke blends. More specifically, the baseline coal stack test, originally scheduled for November 29, had to be postponed due to problems that developed with the stack test contractor's equipment. By the time these problems were resolved, logistical considerations required proceeding with the incremental petcoke stack tests and re-scheduling the baseline coal tests for January the 4th. Accordingly, the 10% pet coke stack test was conducted on December 2, the 20% petcoke stack test was conducted on December 8, and a test at 30% petcoke blend was conducted on December 14 as originally scheduled. However, the December 14 stack test at 30% petcoke blend coincided with a malfunction of the Unit 1 flue gas desulfurization (FDG) system and was therefore invalid and of no value in determining PSD applicability (see December 18 Seminole correspondence to the Department, included with the stack test results). The 30% petcoke blend stack test therefore was repeated on January 8.

After the December 14 FDG system malfunction, and before additional stack testing was performed, three areas were given close attention. First, Seminole conducted a thorough inspection of the Unit 1 FGD system and made repairs as necessary to restore appropriate FGD operation. Note that the malfunction resulted in limestone carryover, and not any decrease in SO₂ removal efficiency. Second, an inspection of the stack test ports revealed corroded sleeves through the 17 inch stack wall that could lead to contaminated test samples if the probe tip touched a portion of the sleeve. New sleeve inserts were installed to eliminate this potential source of contamination. Third, Seminole provided a thorough evaluation of the stack test contractor's equipment and sampling techniques inside a pressurized stack, suggesting various improvements that were implemented during the January stack tests. The stack emission data obtained during the January compliance tests, reflecting the 3 improvements noted above, demonstrate the most accurate correlation of the data between the baseline coal and petcoke at a 30% blend. The results

of these stack tests, as well as the CEM data obtained during the testburn period, demonstrate compliance with Seminole's emissions limitations at all petroleum coke blend levels, as summarized in the following table.

Date	1/4/96	12/8/95	12/8/95	1/8/96	Emission Limit
Fuel Tested	Baseline Coal	10% Petcoke Blend	20% Petcoke Blend	30% Petcoke Blend	
Particulate Matter #/MMBTU	0.010	0.027	0.029	0.008	0.03
Sulfuric Acid Mist #/MMBTU	0.031	0.019	0.035	0.030	N/A
Carbon Monoxide #/MMBTU	0.066	0.003	0.006	0.009	N/A
Sulfur Dioxide #/MMBTU	0.78	0.74	0.76	0.68	1.2
Nitrogen Oxide #/MMBTU	0.55	0.42	0.44	0.58	0.6
Opacity %	3.21	3.19	2.79	2.85	20

As-burned fuel samples were collected daily during the testburn period, with weekly composites analyzed for sulfur, nitrogen, chromium, lead, mercury, nickel, beryllium, vanadium, and zinc. In addition, during the stack compliance tests, daily fuel samples were collected, with a daily composite sample analyzed for the above parameters (see fuel analyses).

Continuous Emission Monitoring (CEM) data for SO₂, NO_x, and opacity were recorded during the testburn period, and are provided in this report (see CEM data). We have provided actual printouts of the CEM raw data for SO₂, NO_x, and opacity, as well as the CEM data converted to 40 CFR 60 format. Also included in this report is the latest 40 CFR 60 RATA Assessment Report, and the most recent Cylinder Gas Audit.

Daily records of boiler operation are included in this report that provide information on heat input, steam production, pressures, temperatures, megawatt output, and fuel input rates. Daily records of FGD system operation are included in this report that provide information on the pH of the scrubbing medium, the mix ratio of water and medium (density), injection rates to the scrubber, and the pressure drop across the scrubber. Note that there were no alterations to the FGD operations between the baseline coal and petroleum coke blends.

Overall, during this petroleum coke testburn period Seminole experienced no detrimental operational effects, and from the test data obtained, we can foresee no detrimental environmental impacts. Based upon these good results, it is Seminole's intent to perform the analyses required to seek a modification to our PSD permit and Conditions of Certification that would allow us to permanently burn up to a 30% blend of petroleum coke.

Table E-7. Summary of Actual Emission Rate Changes
PSD Regulated Air Pollutants - Unit Nos . 1 and 2

Pollutant	Emission Rate Change Unit No. 1 (tpy)	Emission Rate Change Unit No. 2 (tpy)	Emission Rate Change Unit Nos. 1 and 2 (tpy)	PSD Significant Emission Rate (tpy)
CO	-1,255	-1,304	-2,560	100
NOx	-1,464	-1,522	-2,986	40
SO2	0	0	0	40
Ozone (as VOC)	-1	-1	-3	40
PM	-42	-43	-85	25
PM10	-42	-43	-85	15
Total Reduced Sulfur	Neg.	Neg.	Neg.	10
Reduced Sulfur Compounds	Neg.	Neg.	Neg.	10
Sulfuric Acid Mist	-63	-65	-128	7
Fluorides	-36	-37	-72	3
Vinyl Chloride	Neg.	Neg.	Neg.	1
Lead	-3.86	-4.01	-7.87	0.6
Mercury	-0.018	-0.019	-0.037	0.1
Asbestos	Neg.	Neg.	Neg.	0.007
Beryllium	-0.164	-0.170	-0.334	0.0004