



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

February 15, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. W. Jeffrey Pardue, C.E.P.
Director of Environmental Services
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33711

RE: Amendment to AC 61-11862, 61-11863, & 61-11864/PSD-FL-014(A)^B Permits
NSPS Custom Fuel Monitoring Schedule
Florida Power Corporation
Suwannee River Plant

Dear Mr. Pardue:

The Department has reviewed your September 10, 1997 letter requesting an NSPS Custom Fuel Monitoring Schedule, which was submitted to EPA, and natural gas analysis data received by the Department on January 20, 1998. The schedule would only apply to a monitoring schedule for sulfur dioxide (SO₂) and nitrogen oxide (NO_x) when natural gas is being fired at the subject facility (Refer to Attachments Nos. 1 & 4). The facility is required by the permit to comply with Subpart GG of the New Source Performance Standards (NSPS) 40 CFR 60. For sources utilizing pipeline quality natural gas, 40 CFR 60.334(b) and 60.334(b)(2) state that a custom fuel monitoring schedule, if supported by data which demonstrates compliance with NSPS emission limits, may be approved by the Administrator of EPA. This authority has been delegated to EPA's regional offices and, the EPA Region IV will provide their determination of this request to the Department. The Department received a letter, dated October 25, 1997, from EPA on November 3, 1997, stating that a custom fuel monitoring schedule for this facility was acceptable, since it complied with all items of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987 (Refer to Attachments Nos. 2 & 3). The results from a minimum of one sampling event each month for six months were provided by the permittee, which demonstrated consistent compliance with the allowable SO₂ emissions limits specified under 40 CFR 60.333 and this permit. Therefore, upon issuance of the amended permit, the permittee shall begin monitoring the sulfur content of natural gas once per quarter for six quarters as specified in 2.b. of the Custom Fuel Monitoring Schedule for Natural Gas. In accordance with the EPA and Department determination, the permit specific condition will be amended as follows:

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.

Mr. W. Jeffrey Pardue
AC 61-11862, 61-11863, & 61-11864/PSD-FL-014(A)
Suwannee River Permit Amendment
February 15, 1998
Page 2 of 5

I. Specific Condition Number;

From

Condition 3(b). The applicant shall record weekly the sulfur content, nitrogen content, and lower heating value of fuel being fired in the gas turbine.

To

Condition 3(b). The permittee shall monitor sulfur content and nitrogen content of the new No. 2 distillate fuel oil and sulfur content of natural gas. These values may be provided by the vendor and the frequency of determinations of these values shall be as follows:

A. New No. 2 Distillate Fuel Oil

The values, sulfur and nitrogen content, shall be determined on each occasion that fuel is transferred to the storage tanks from any other source. Records of these values shall be kept by the facility for a five year period for regulatory agency inspection purposes.

B. Natural Gas

Pursuant to 40 CFR 60.334(b)(2), a custom fuel monitoring schedule for the determination of these values shall be followed for the natural gas fired at this facility and shall be as follows:

Custom Fuel Monitoring Schedule for Natural Gas (NG)

1. Monitoring of fuel nitrogen content shall not be required if NG is the only fuel being fired in the gas turbines.
2. Sulfur Monitoring
 - a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are ASTM D1072-80, ASTM D3031-81, ASTM D3246-81, and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2), or the latest edition(s).

Mr. W. Jeffrey Pardue
AC 61-11862, 61-11863, & 61-11864/PSD-FL-014(A)
Suwannee River Permit Amendment
February 15, 1998
Page 3 of 5

- b. This custom fuel monitoring schedule shall become effective on the date this permit amendment becomes valid. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333 and the conditions of this permit, then sulfur monitoring shall be conducted once per quarter for six quarters. If monitoring data is provided by the applicant which demonstrates consistent compliance with the requirements herein the applicant may begin monitoring as per the requirements of 2.c.
 - c. If after the monitoring required in item 2.b. above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333 and the conditions of this permit, sample analysis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.
 - d. Should any sulfur analysis as required in items 2.b. or 2.c. above indicate noncompliance with 40 CFR 60.333 and the conditions of this permit, the owner or operator shall notify the Department of such excess emissions and the custom schedule shall be re-examined by the Environmental Protection Agency. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being re-examined.
3. If there is a change in fuel supply, the owner or operator must notify the Department of such change for re-examination of this custom schedule. A substantial change in fuel quality shall be considered as a change in fuel supply. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being re-examined.
4. Records of sample analysis and fuel supply pertinent to this custom schedule shall be retained for a period of five years, and be available for inspection by personnel of federal, state, and local air pollution control agencies.

II. Attachments to be Incorporated;

- FPC letter dated September 26, 1997
- EPA letter dated August 14, 1987
- EPA letter dated October 25, 1997
- Natural Gas Analysis Data received January 20, 1998

Mr. W. Jeffrey Pardue
AC 61-11862, 61-11863, & 61-11864/PSD-FL-014(A)
Suwannee River Permit Amendment
February 15, 1998
Page 4 of 5

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes (F.S.). The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department of Environmental Protection at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000 (Telephone: 850/488-9730; Fax: 850/487-4938). Petitions filed by the applicant of the amendment request/application and the parties listed below must be filed within 14 days of receipt of this amendment. Petitions filed by other persons must be filed within 14 days of the amendment issuance or within 14 days of their receipt of this amendment, whichever occurs first. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information:

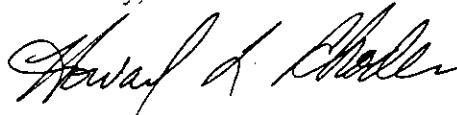
- (a) The name, address and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
- (d) A statement of the material facts disputed by Petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action;
- (g) A statement of the relief sought by petitioner, stating precisely the action the petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this amendment. Persons whose substantial interests will be affected by any decision of the Department with regard to the request/application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this amendment in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, Florida Administrative Code.

Mr. W. Jeffrey Pardue
AC 61-11862, 61-11863, & 61-11864/PSD-FL-014(A)
Suwannee River Permit Amendment
February 15, 1998
Page 5 of 5

This letter amendment must be attached to AC 61-11862, AC 61-11863, & AC 61-11864/
PSD-FL-014(A), and shall become part of the permits.

Sincerely,



Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/CSL

Attachments

cc: C. Kirts, NED
A. Linero, DEP
S. Osbourn, FPC
K. Kosky, P.E., Golder Associates, Inc.
G. Kamaras, LEAF

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this AMENDMENT was sent by certified mail to the person(s) listed below and all copies were sent by U.S. mail to the person(s) listed above before close of business on 02-16-98 :

Mr. W. Jeffrey Pardue, C.E.P., FPC

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED,
on this date, pursuant to Section 120.52(7),
Florida Statutes, with the designated agency
Clerk, receipt of which is hereby acknowledged.

Sandra Knight 02-16-98
(Clerk) (Date)

Attachment No. 2 - EPA Guidance Memorandum

Amendment to AC 61-11862, 61-11863, & 61-11864/PSD-FL-014(A) Permits
NSPS Custom Fuel Monitoring Schedule
Florida Power Corporation
Suwannee River Plant



bcc: J. M. Kennedy
J. L. Tillman
D. W. Sorrick
W. B. Hicks
M. V. Westbrook

File: DeBary/Air/Corresp.
Int. City/Air/Corresp.
Suwannee/Air/Corresp.

September 10, 1997

Mr. Clair Fancy, Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Magnolia Park Courtyard
Tallahassee, Florida 32301

Dear Mr. Fancy:

Re: Florida Power Corporation's Intercession City, DeBary and Suwannee Facilities
Customized Fuel Monitoring Schedules

Florida Power Corporation (FPC) has been permitted for the use of natural gas at the above-referenced three sites. Specifically, natural gas conversions have been permitted for DeBary combustion turbines (CTs) 7, 8, 9 and 10; Intercession City CTs 7, 8, 9, 10 and 11; and Suwannee CTs 1, 2 and 3. These CTs are subject to New Source Performance Standards (NSPS 40 CFR 60, Subpart GG). 40 CFR 60.334(b) requires the owner/operator of any CT to monitor the sulfur and nitrogen content of the fuel as follows: 1) If the turbine fuel is supplied by a bulk storage tank, then the sulfur and nitrogen content are to be determined whenever new fuel is transferred into the bulk storage tank, and 2) If the turbine fuel is supplied without an intermediate bulk storage tank, then daily monitoring of the sulfur and nitrogen content of the fuel is required.

Since the natural gas used by the CTs does not pass through an intermediate bulk storage tank, FPC is hereby requesting a customized fuel monitoring schedule as allowed by 40 CFR 60.334(b)(2). While firing natural gas, FPC requests the following customized fuel monitoring schedule which was developed based on an EPA guidance memorandum (Attachment A):

1. Monitoring of natural gas nitrogen content shall not be required in accordance with page 2 of the EPA guidance memorandum attached.
2. Sulfur Monitoring
 - a. Analysis for sulfur content of the natural gas shall be conducted using one of the EPA-approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternate method. The reference methods are: ASTM D1072-20; ASTM D3031-81; ASTM D3245-81; and ASTM D4048-82 as referenced in 40 CFR 60.335(b)(2).

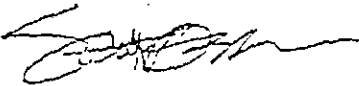
Mr. Fancy
September 10, 1997
Page 2

- b. Effective on the approval date of the customized fuel monitoring schedule, sulfur monitoring shall be conducted twice a month for six months. If this monitoring shows little variability in the sulfur content and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.
- c. If the monitoring required by 2(b) above, of the sulfur content of the natural gas shows little variability and the calculated sulfur dioxide emissions represent consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis shall be conducted twice per year. This monitoring shall be conducted during the first and third quarters of each calendar year.
- d. Should any sulfur analysis, as required by items 2(b) or 2(c) above, indicate noncompliance with 40 CFR 60.333, FPC will notify the Department of Environmental Protection (DEP) of such excess emission and the customized fuel monitoring schedule shall be reexamined. The sulfur content of the natural gas shall be monitored weekly during the interim period while this schedule is being reexamined.
3. FPC will notify the DEP of any change in natural gas supply for reexamination of this monitoring schedule. A substantial change in natural gas quality (i.e., sulfur content varying by more than 10 grains/1000 of gas) shall be considered as a change in natural gas supply. Sulfur content of the natural gas will be monitored weekly during the interim period when this monitoring schedule is being reexamined.
4. Records of sample analysis and natural gas supply pertinent to this monitoring schedule shall be retained by FPC for a period of three years, and be available for inspection by appropriate regulatory personnel.
5. FPC will obtain the sulfur content of the natural gas from Florida Gas Transmission Company at its Brooker Lab.

Data from natural gas at the Brooker Lab site is considered representative of the sulfur content of the natural gas at these three FPC sites (DeBary, Intercession City and Suwannee), since there is no additional entry point for sulfur or other elements/compounds which may affect the quality of the natural gas.

If you or your staff have any questions about this request, please do not hesitate to contact me at (813) 866-5159.

Sincerely,


Scott H. Osbourn
Senior Environmental Engineer

Attachments

cc/attach: Mike Harley, DEP
David McNeal, EPA Region IV
Ken Kosky, P.E., Golder Associates

05 07-92 11:45AM FROM EPA FPS/SSCD



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 14 1992

OFFICE OF
AIR AND SOIL QUALITYMEMORANDUM

SUBJECT: Authority for Approval of Custom Fuel Monitoring Schedules Under NSPS Subpart GG

FROM: John B. Rasmie, Chief *John B. Rasmie*
Compliance Monitoring Branch

TO: Air Compliance Branch Chiefs
Regions II, III, IV, V, VI and IX

Air Programs Branch Chiefs
Regions I-X

The NSPS for Stationary Gas Turbines (Subpart GG) at 40 CFR 60.334(b)(2) allows for the development of custom fuel monitoring schedules as an alternative to daily monitoring of the sulfur and nitrogen content of fuel fired in the turbines. Regional Offices have been forwarding custom fuel monitoring schedules to the Stationary Source Compliance Division (SSCD) for consideration since it was understood that authority for approval of these schedules was not delegated to the Regions. However, in consultation with the Emission Standards and Engineering Division, it has been determined that the Regional Offices do have the authority to approve Subpart GG custom fuel monitoring schedules. Therefore it is no longer necessary to forward these requests to Headquarters for approval.

Over the past few years, SSCD has issued over twenty custom schedules for sources using pipeline quality natural gas. In order to maintain national consistency, we recommend that any schedule Regional Offices issue for natural gas be no less stringent than the following: sulfur monitoring should

05 07-92 11:45AM FROM EPA PFS/SSCD

TO 09195413470

PG06/007

2

be bimonthly, followed by quarterly, then semiannual, given at least six months of data demonstrating little variability in sulfur content and compliance with 060.000 at each monitoring frequency; nitrogen monitoring can be waived for pipeline quality natural gas, since there is no fuel-bound nitrogen and since the free nitrogen does not contribute appreciably to NO_x emissions. Please see the attached sample custom schedule for details. Given the increasing trend in the use of pipeline quality natural gas, we are investigating the possibility of amending Subpart GG to allow for less frequent sulfur monitoring and a waiver of nitrogen monitoring requirements where natural gas is used.

Where sources using oil request custom fuel monitoring schedules, Regional Offices are encouraged to contact SSCD for consultation on the appropriate fuel monitoring schedule. However, Regions are not required to send the request itself to SSCD for approval.

If you have any questions, please contact Sally M. Farrell at PFS 362-2675.

Attachment

cc: John Quashnow
George Walsh
Robert Ajax
Earl Salo

05-07-92 11:45AM PROJ EPA FPS/SSCD

TO 89195413470

PO07/007

Enclosure

Conditions for Custom Fuel Sampling Schedule for Stationary Gas Turbines

1. Monitoring of fuel nitrogen content shall not be required while natural gas is the only fuel fired in the gas turbine.
2. Sulfur Monitoring
 - a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.333(b)(2).
 - b. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.
 - c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.
 - d. Should any sulfur analysis as required in items 2(b) or 2(c) above indicate noncompliance with 40 CFR 60.333, the owner or operator shall notify the State Air Control Board of such excess emissions and the custom schedule shall be re-examined by the Environmental Protection Agency. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being re-examined.
3. If there is a change in fuel supply, the owner or operator must notify the State of such change for re-examination of this custom schedule. A substantial change in fuel quality shall be considered as a change in fuel supply. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being re-examined.
4. Records of sample analysis and fuel supply pertinent to this custom schedule shall be retained for a period of three years, and be available for inspection by personnel of federal, state, and local air pollution control agencies.

Attachment No. 3 - EPA Determination

Amendment to AC 61-11862, 61-11863, & 61-11864/PSD-FL-014(A) Permits
NSPS Custom Fuel Monitoring Schedule
Florida Power Corporation
Suwannee River Plant



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

ATLANTA FEDERAL CENTER
100 ALABAMA STREET, S.W.
ATLANTA, GEORGIA 30303-3104

OCT 23 1997

RECEIVED

NOV 03 1997

BUREAU OF
AIR REGULATION

4APT-ARB

Mr. Michael M. Harley, P.E., DEE
P.E. Administrator
Emissions Monitoring Section
Bureau of Air Monitoring and Mobile Sources
Air Resources Management Division
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

SUBJECT: Custom Fuel Monitoring Schedule Proposed for
Stationary Gas Turbines at the Florida Power
Corporation Intercession City, DeBary, and Suwannee
Power Plants

Dear Mr. Harley:

This letter is in response to your September 26, 1997,
request for a determination regarding a custom fuel monitoring
schedule proposed for the following combustion turbines (CTs) at
the referenced power plants:

Intercession City: CTs 7, 8, 9, and 10

DeBary: CTs 7, 8, 9, and 10

Suwannee: CTs 1, 2, and 3

The natural gas fired turbines listed above are subject to
40 C.F.R. Part 60, Subpart GG (Standards of Performance for
Stationary Gas Turbines), and Region 4 has concluded that the
proposed custom fuel monitoring schedule is acceptable because it
is consistent with guidance that the U.S. Environmental
Protection Agency (EPA) previously issued regarding such
schedules. In addition, the Florida Power Corporation proposal
to use fuel analysis results from sampling conducted at the
Florida Gas Transmission Company Brooker Lab for all three plants
is acceptable since there are no additional entry points for
natural gas or other sulfur containing streams between the
proposed sampling site and the three plants in question.

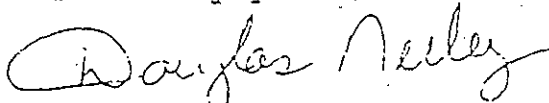
According to 40 C.F.R. §60.334(b)(2), owners and operators
of stationary gas turbines subject to Subpart GG are required to
monitor fuel nitrogen and sulfur content on a daily basis if a
company does not have intermediate bulk storage for its fuel.
40 C.F.R. §60.334(b)(2) also contains provisions allowing owners
and operators of turbines that do not have intermediate bulk
storage for their fuel to request approval of custom fuel

monitoring schedules that allow for less frequent monitoring of fuel nitrogen and sulfur content. In a memorandum dated August 14, 1987, the EPA Compliance Monitoring Branch provided guidance regarding acceptable custom fuel monitoring provisions for natural gas fired turbines, and this memorandum also gave EPA regional offices the authority to approve custom fuel monitoring schedules for Subpart GG turbines.

Under the EPA guidance issued in 1987, the requirement to monitor the nitrogen content of pipeline quality natural gas was waived entirely since the Agency determined that this type of fuel does not contain any fuel-bound nitrogen that can cause NO_x emissions. As an alternative to daily sulfur monitoring, the 1987 policy describes a three stage process under which owners and operators of natural gas fired turbines can obtain approval to conduct sampling on a semiannual basis. In the first step of this process the sulfur content of the fuel must be monitored on a bimonthly basis for at least six months. If the results of this bimonthly monitoring verify compliance with the applicable sulfur limit and indicate little variability in the sulfur content of the fuel, the fuel sampling and analysis frequency can be reduced from a bimonthly to a quarterly basis. If six quarters of fuel monitoring data verify compliance with the applicable sulfur standard and indicate little variability in the sulfur content of the fuel, the sampling and analysis frequency can be reduced to a semiannual basis. Since the custom fuel monitoring approach proposed by the Florida Power Corporation for the natural gas fired turbines at the Intercession City, DeBary, and Suwannee Plants is identical to that outlined in the policy issued by EPA in 1987, it is acceptable to Region 4.

If you have any questions about the determination provided in this letter, please contact Mr. David McNeal of my staff at 404/562-9102.

Sincerely yours,



R. Douglas Neeley
Chief

Air and Radiation Technology
Branch

Air, Pesticides and Toxics
Management Division

cc: Charles Logan, FL DEP

Attachment No. 4 - Natural Gas Sulfur Analysis

Amendment to AC 61-11862, 61-11863, & 61-11864/PSD-FL-014(A) Permits
NSPS Custom Fuel Monitoring Schedule
Florida Power Corporation
Suwannee River Plant

Southern Natural Gas Company
Post Office Box 147
Chalmette LA 70044
504 682 6200

SOUTHERN NATURAL GAS

To: Scott Osbourn
Subject: Sulfur and BTU data for Florida Power
Date: January 14, 1998

Dear Mr. Osbourn:

Captioned are the results that you requested concerning sulfur and BTU content sampled from Southern Natural Gas' pipeline. These results were based on "spot" samples and were taken with cylinders that comply to sulfur and BTU measurement standards.

Date Sampled	Sulfur Grains/100 cu ft	BTU @ 14.73 dry
7-1-97	0.00416	1024
7-14-97	0.00198	1025
8-14-97	0.0030	1025
8-28-97	0.0198	1025
9-23-97	0.00396	1026
10-9-97	0.00297	1024
10-21-97	0.00396	1019
10-24-97	0.00554	1026
11-14-97	0.00812	1029
12-19-97	0.00396	1028

Please feel free to call the lab with any further questions or concerns.

Respectfully,



Dwight J. Romig
Chemist

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JAN 20 1998

BUREAU OF
AIR REGULATION

Mr. Joseph W. Landers, Jr.
 August 11, 1978
 Page Four

BACT Determination by Florida Department of Environmental Regulation:

Nitrogen Dioxide: 75 ppm by volume at 15 percent oxygen on a dry basis, adjusted to ISO.

The proposed standard would be EPA's proposed New Source Performance Standard. NO_x emissions from gas turbines, therefore, would be limited according to the following equation:

$$STD = (.0075 E) + F$$

Where:

STD = allowable NO_x emission (percent by volume at 15 percent oxygen)

E = efficiency adjustment factor: $\frac{14.4 \text{ kilojoules/watt}\cdot\text{hr}}{\text{Actual ISO heat rate}}$

F = fuel-bound nitrogen allowance:

<u>Fuel-Bound Nitrogen</u> <u>percent by weight (N)</u>	<u>F</u> <u>(NO_x - percent by volume)</u>
(N) less than 0.015 percent	0
(N) between 0.015 and 0.1 percent	0.04 (N)
(N) between 0.1 and 0.25 percent	0.004 + 0.0067 (N-0.1)
(N) greater than 0.25 percent	0.005

During performance tests to determine compliance with the proposed standard, measured NO_x emission at 15 percent oxygen would be adjusted to ISO ambient atmospheric conditions by the following correction factor:

$$NO_x = (NO_{x_{obs}}) \left(\frac{P_{ref}}{P_{obs}} \right)^{0.5} e^{19 (H_{obs} - 0.00633)}$$

Where:

NO_x = Emissions of NO_x at 15 percent oxygen and ISO standard ambient conditions.

Mr. Joseph W. Landers, Jr.
August 11, 1978
Page Five

$NO_{x_{obs}}$ = Measured NO_x emission at 15 percent oxygen, ppmv.
 P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.
 P_{obs} = Measured combustor inlet absolute pressure.
 H_{obs} = Specific humidity of ambient air.
 e = Transcendental constant (2.718)

Sulfur Dioxide: 95 ppm by volume corrected to 15 percent oxygen in a dry basis, or 0.5% Sulfur by weight in fuel

Hydrocarbons: None

Carbon Monoxide: None

Particulates: None

Opacity: Less than 20%

Justification of DER Determination:

Nitrogen Dioxide

The proposed standard was selected after carefully examining the recommendations of the study group and the SSIIES document for EPA's proposed standard. The SSIIES document showed test data on 8 simple cycle peaking gas turbines. Of these, only 6 were fired with distillate fuel. Tests for controlled emissions were available for 4 of these 6 turbines. Test results showed a range in emission of 55 to 80 ppmv (after EPA's proposed upward correction for turbine efficiencies above 25%). Although three of these four turbines had emissions below or at the 60 ppmv level, the EPA's 75 ppmv standard was preferred because it allowed for the uncertain validity of the limited test data available.

SO₂

The only available and economically feasible technique for sulfur dioxide emission control is low sulfur oil. Other techniques for tail gas cleanup cost two to three times as much as the turbine itself.

In selecting the 0.5% S fuel by weight as the standard, the availability of this fuel and the relative economic advantage of its use were considered.

Mr. Joseph W. Landers, Jr.
August 11, 1978
Page Six

The lower 0.3% S by weight proposed by two members of the study group would result in an increase in fuel cost of 1.8% or about \$53,500/unit per year - a conservative estimate. Increases in ambient air concentrations expected to result from the operation of the turbines do not justify the need for the more stringent standard and increased cost of production.

HC, CO, Particulates:

The SSEIS document shows insignificant impact on ambient air from the limited gas turbines emissions of these pollutants.

Opacity:

The proposed standard is consistent with the SSEIS document and agrees with the recommendation of two of the three members of the group proposing an opacity standard.

Details of Analysis May be Obtained by Contacting:

Victoria Martinez
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301

Recommendation from: Bureau of Air Quality Management

by: J. P. Subramani
J. P. Subramani

DATE: AUGUST 11, 1978

Approved by: Victoria Landers, Jr.
J. W. Landers, Jr.
Secretary

DATE: August 16, 1978