

# Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

October 31, 1988

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. George L. Whitmer  
Environmental Compliance Manager  
Environmental Science and Engineering, Inc.  
Post Office Box 4943  
Jacksonville, Florida 32201

Dear Mr. Whitmer:

Re: Ft. Pierce Utility Authority - File No. AC 56-141460

The Department is in receipt of your letter dated October 6, 1988, on behalf of Ft. Pierce Utilities Authority, requesting changes in the specific conditions of permit No. AC 56-141460.

The Department has considered your request and determined that Specific Condition No. 3 regarding ASTM methods and No. 5 regarding steam to fuel ratio will be modified as per your letter of October 6, 1988.

The formula which includes the factor in Specific Condition No. 5 is an error. The correct formula must be used in determining the compliance status of this source. Please see the attached letter.

Please replace pages 6 and 7 of permit No. AC 56-141460 with the attached new pages.

Attachments to be Incorporated:

Mr. George L. Whitmer's letter of October 6, 1988.  
Mr. Eric A. Noble's letter of April 28, 1983.

PERMITTEE:  
Ft. Pierce Utilities  
Authority

Permit Number: AC 56-141460  
Expiration Date: December 1, 1989

SPECIFIC CONDITIONS:

Nitrogen oxides NSPS Standards =  $0.0075 \frac{(14.4)}{Y} + F$

or  
= 84 ppm NOx

and  
Sulfur dioxide NSPS Standard = 0.015% by volume at 15% oxygen  
on a dry basis

Visible Emission Not to exceed 15% opacity

Fuel oil No. 2 Not to exceed 0.5% sulfur  
content by weight

2. The combined cycle gas turbine shall be allowed to operate continuously (8736 hours per year). The gas turbine shall operate on natural gas at all times, except that No. 2 fuel oil with a maximum sulfur content of 0.5 percent by weight shall be allowed to be burned only as a emergency back-up fuel.

3. Before this construction permit expires, the 31.6 MW combined cycle gas turbine will be tested for sulfur dioxide, visible emissions, carbon monoxide and nitrogen oxides. Except as provided under 40 CFR 60.8(b), the performance tests shall be in accordance with the provisions of the following reference methods in Appendix A of 40 CFR 60.

- a. Method 1. Sample and Velocity Traverses
- b. Method 2. Volumetric Flow Rate
- c. Method 3. Gas Analysis
- d. Compliance with the opacity limitation will be determined by reference Method 9, Visual Determination of Opacity of Emission from Stationary Sources.
- e. Compliance with the sulfur dioxide emission limits will be determined by reference Method 20 or by calculations based on fuel analysis (ASTM D1552) for sulfur content.
- f. Compliance with the carbon monoxide emission limit will be determined by Method 10, Determination of Carbon Monoxide Emissions from Stationary Sources.

PERMITTEE:  
Ft. Pierce Utilities  
Authority

Permit Number: AC 56-141460  
Expiration Date: December 1, 1989

SPECIFIC CONDITIONS:

- g. Compliance with the allowable emissions limits for nitrogen oxides shall be conducted using EPA reference Method 20 subpart GG Section 60.335.

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

$$\text{NOx} = (\text{NOx obs}) \left( \frac{P_{\text{ref}}}{P_{\text{obs}}} \right)^{0.5} e^{19(H_{\text{obs}} - 0.00633)(288^{\circ}\text{K})} \frac{1.53}{T_{\text{AMB}}}$$

where:

NOx = Emissions of NOx at 15% oxygen and ISO standard ambient conditions.

NOx obs = Measured NOx emission at 15% oxygen, ppmv.

Pref = Reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure.

Pbs = Measured combustor inlet absolute pressure at test ambient pressure.

Hobs = Specific humidity of ambient air at test.

e = Transcendental constant (2.718)

TAMB = Temperature of ambient air at test.

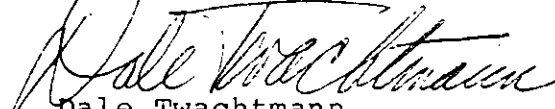
4. Test results will be the average of 3 valid runs. The Department's District office in West Palm Beach will be notified 15 days in advance of the compliance test. Tests shall be conducted operating between 90 and 100% of permitted capacity while using natural gas fuel.

5. A continuous monitoring system shall be installed to monitor and record the fuel consumption and the ratio of steam to fuel being fired in the turbine.

Mr. George L. Whitmer  
Page Two  
October 31, 1988

This letter must be attached to the above mentioned permit and shall become a part of the permit.

Sincerely,



Dale Twachtmann  
Secretary

DT/ks

cc: S. Brooks

**ESE**

*Environmental Science and Engineering, Inc.*

AN RSH COMPANY

**ENVIRONMENTAL SCIENCE  
AND ENGINEERING, INC.**

October 6, 1988  
87031-0000

**RECEIVED**

OCT 7 1988

C.H. Fancy, P.E., Deputy Chief  
Bureau of Air Quality Management  
Florida Department of Environmental Regulation **DER-BAQM**  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Subject: Permit No. AC56-141460  
Combined Cycle Gas Turbine  
Fort Pierce Utilities Authority  
Fort Pierce, Florida

Dear Mr. Fancy:

The enclosed letter was received from General Electric Company, vendor supplying the gas turbine for Fort Pierce Utilities Authority (FPUA). They bring three Specific Conditions of the subject permit to our attention. Two of the items are obvious typographical errors and should be corrected. These are:

- Specific Condition No. 3.e - "ASTM 1552" should read "ASTM D1552".
- Specific Condition No. 5 - "ratio of water to fuel" should read "ratio of steam to fuel".

The other item listed is not as readily apparent. General Electric contends that the formula listed in 40 CFR 60.335 for adjusting NO<sub>x</sub> emission levels measured by Reference Method 20 to ISO standard day conditions is in error in the Code of Federal Regulations (CFR) and, therefore, is in error in Specific Condition No. 3.g. in the permit. It is General Electric's contention that the formula as printed:

$$NO_x = (NO_{x_{obs}}) \left( \frac{P_{ref}}{P_{obs}} \right)^{0.5} e^{19(H_{obs} - 0.00633)} \left( \frac{T_{AMB}}{288^\circ K} \right)^{1.53}$$

should read:

$$NO_x = (NO_{x_{obs}}) \left( \frac{P_{ref}}{P_{obs}} \right)^{0.5} e^{19(H_{obs} - 0.00633)} \left( \frac{288^\circ K}{T_{AMB}} \right)^{1.53}$$

C.H. Fancy, P.E.  
Page 2  
October 6, 1988

General Electric refers to this as a "long standing error" in the CFR. In discussions with FDER Air Quality personnel, I was told they were not aware of this error and unless the CFR were corrected, FDER would continue to use the formula as it is presently printed.

We would appreciate your office looking into this matter and determining whether this formula is correct as written or whether it should be corrected as stated above. It is realized that either way the formula is written, the change in the resulting figure will be very slight and possibly insignificant. We would also appreciate the correction of the two typographical errors in Specific Conditions Number 3.e and 5.

Your cooperation in this matter is appreciated. Please feel free to call me if you need further information or have any questions.

Very truly yours,

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.  
A HUNTER COMPANY



George L. Whitmer  
Environmental Compliance Manager  
Industrial Environmental Division

GLW/cdb

Enclosure

cc: Bob Gambon - RS&H  
Harry Schindehette - FPUA  
L.E. Tandy - Metric Constructors

*copied: Sylvia Wilson  
D. Goldmann, SE Dist.  
CHP/ST*

FILE COPY

7 September 1988

Subject: Metric Constructors  
 Ft. Pierce, Fla.  
 GE Reqn. 340-000143  
 PO 86-508-100  
 Emissions Permit

Mr. LE Tandy  
 Construction Manager  
 Metric Constructors  
 Two South Executive Park  
 6135 Park Road  
 Charlotte, NC 28210-3294

ID No. & Drawing Number	
REYNOLDS, SMITH & HILLS	
ARCHITECTS-ENGINEERS-PLANNERS	
JACKSONVILLE, FLORIDA	
DEPARTMENTAL CHECK	
DEPT	REVIEWED
ARCH	
STRUC	
MECH	
ELEC	
SITE	
PLAN	
FINAL DISPOSITION	
PROJ	
MGR	

In the process of reviewing the EPA Permit for the emissions test criteria, the Engineering Dept. noticed some problems. You may wish to bring these to RS&H's attention to have the permit corrected.

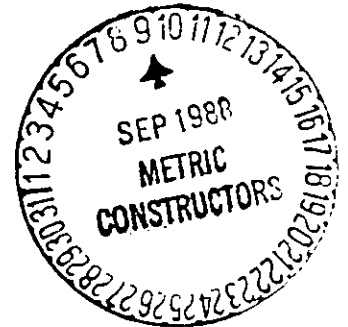
- Under Specific Condition 3.e., GE is interpreting "ASTM 1552" as meaning "ASTM D1552".
- In Specific Condition 3.g., the formula has one term inverted just as in the Federal Regulations. This long standing error has

$$\left(\frac{T_{AMB}}{288^{\circ}K}\right)^{1.53} \quad \text{and it should be} \quad \left(\frac{288^{\circ}K}{T_{AMB}}\right)^{1.53}$$

- In Specific Condition 5, "ratio of water to fuel" should read "ratio of steam to fuel".

VE Hoepfner  
 Contract Manager

cc: SF Ginter #36-605  
 BL Bailey #23-384B  
 RW Keith #53-401  
 J. Lowe Charlotte





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Office of Air Quality Planning and Standards  
Research Triangle Park, North Carolina 27711

APR 28 1983

DER

MBY 02 1983

BAQM

Ms. Teresa M. Heron  
Department of Environmental Regulation  
State of Florida  
2600 Blair Stone Road  
Tallahassee, Florida 32301

Dear Ms. Heron:

As you requested in our phone conversation of April 26, 1983, I am sending you this letter to confirm the correct ISO adjustment equation for the new source performance standard for stationary gas turbines. The equation as it appears in the Federal Register of September 10, 1979, (44 FR 52800) is incorrect. The correct equation is as follows:

$$NO_x = (NO_{xOBS}) \left( \frac{Pref.}{P_{OBS}} \right)^{0.5} e^{19(H_{OBS} - 0.00633)} \left( \frac{288^\circ K}{T_{amb.}} \right)^{1.53}$$

Also, as we discussed, the allowance for fuel  $NO_x$  in the standard must be based on the amount of bound nitrogen actually present in the fuel being burned in the gas turbine. There is no bound nitrogen in natural gas (the primary fuel for the Kissimee Utility gas turbine) and only a negligible amount in most #2 distillate (the emergency fuel). Thus, for most (if not all) of this gas turbine operating time, a fuel  $NO_x$  allowance will be inappropriate and allowable  $NO_x$  emissions will be 79 ppmv. However, the permit does require the fuel nitrogen to be measured (p.4 of 5), so the allowance for it can be applied when appropriate. It should be noted that the plant must file a report whenever the plant burns fuel with a nitrogen level giving a higher fuel  $NO_x$  allowance than that provided during compliance tests.

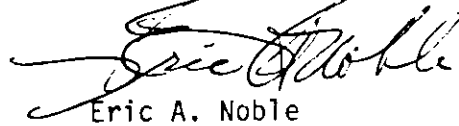
You commented that the proposed standards allowed only the gas turbine heat rate to be used in determining allowable  $NO_x$  emissions, but that this limitation does not appear in the promulgated standards (Part 60, Subpart GG). The limitation is defined in Part 60, Subpart GG as follows:

1. The standard is defined by the formula in 60.332(a)(1), when  $y$  = manufacturer heat rate ... for the affected facility.
2. The affected facility is, per 60.330, all stationary gas turbines.
3. And, in 60.331(a) "Stationary gas turbine" means any ... gas turbine portion of a combined cycle steam/electric generating system .... portability.



If you have any further questions, please contact me at (919) 541-5596,  
or call Doug Bell at (919) 541-5578.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Eric A. Noble".

Eric A. Noble  
Industrial Studies Branch  
Emission Standards and  
Engineering Division



State of Florida  
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To: _____	Location: _____
To: _____	Location: _____
To: _____	Location: _____
From: _____	Date: _____

# Interoffice Memorandum

TO: Dale Twachtmann

*for* FROM: Steve Smallwood *at Jmery*

SUBJ: Approval of Amendments to Construction Permit:  
AC 56-141460, Ft. Pierce Utilities Authority

DATE: October 31, 1988

Attached for your approval and signature is a letter authorizing changes in the specific conditions of the above referenced air construction permit. There are no controversies associated with these changes.

I recommend your approval and signature.

SS/TH/s

attachment

RECEIVED

NOV 2 1988

DER-BA *et al*

P 274 007 494

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED  
NOT FOR INTERNATIONAL MAIL  
(See Reverse)

PS Form 3800, June 1985

\* U.S.G.P.O. 1985-480-794

Sent to Mr. George L. Whitmer, ESE	
Street and No. P.O. Box 4943	
P.O., State and ZIP Code Jacksonville, FL 32201	
Postage	5
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
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Return Receipt showing to whom, Date, and Address of Delivery	
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Postmark or Date	
Permit: AC 56-141460	
Mailed: 11-4-88	

PS Form 3811, Mar. 1987

\* U.S.G.P.O. 1987-178-268

DOMESTIC RETURN RECEIPT

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Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult Postmaster for fees and check box(es) for additional service(s) requested.

Show to whom delivered, date, and addressee's address.  Restricted Delivery  
†(Extra charge)†

3. Article Addressed to: Mr. George L. Whitmer Environmental Compliance Manager Environmental Science & Eng. P. O. Box 4943 Jacksonville, FL 32201	4. Article Number P 274 007 494
5. Signature - Addressee X	Type of Service: <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Insured <input type="checkbox"/> COD <input type="checkbox"/> Express Mail
6. Signature - Agent X <i>M. Whitmer</i>	8. Addressee's Address (ONLY if requested and fee paid) Always obtain signature of addressee or agent and DATE DELIVERED.
7. Date of Delivery <i>11-7-88</i>	