

# Golder Associates Fax

To: Teresa Heron

Fax Number: (850)922-6978

Agency: Florida Department of  
Environmental Protection

Date: July 9, 1999

From: Kennard F. Kosky, P.E.

e-mail: ken\_kosky  
@golder.com

Our ref: 9737572Y/F1

Voice Mail: Ext 516

RE: FPL Fort Myers Plant – Foggers and EPA Letter of June 22, 1999

Total pages (including cover): 3

Hard copy to follow? Yes

## MESSAGE

Teresa: I am providing information related to your July 8, 1999 e-mail to Rich Piper and your request concerning the EPA letter dated June 22, 1999. First to clarify the heat input. The chart provided in my May 6, 1999 letter was for the peak operation mode of the Fort Myers turbines. The ISO rating using the high heating value is 717.8 mmBtu (LHV) and about 760 mmBtu/hr (HHV) when firing distillate oil, the only fuel currently used in these turbines. The 807 mmBtu/hr (HHV) is actually for natural gas, which was revised in the subsequent submittal. These values are not inconsistent with the 895 mmBtu/hr (HHV) which corresponds to a turbine inlet temperature of about 25 degrees F. The lowest ambient temperature recorded in Fort Myers over a 51-year period was 26 degrees F. With a turbine inlet of 0 degrees F, the rated heat input is 920 mmBtu/hr. However, such an ambient temperature would not occur in Fort Myers. The Title V application indicated 850 mmBtu/hr for 59 degrees F. This was mislabeled as the ISO condition when in fact it corresponds to about 32 degrees F a very low temperature for Fort Myers but not the lowest recorded. Therefore, the maximum 895 mmBtu/hr heat input is appropriate.

Second and more importantly, the operation of the foggers would not change the maximum heat input rated for the turbine at the low turbine inlet conditions. There are both engineering and scientific limitations as well as practical drawbacks. I have attached copy of a standard psychrometric chart that can be used in determining the amount of theoretical cooling available given the ambient (dry bulb) and relative humidity. As indicated in the application, using foggers when the ambient temperature is 80 degrees F and 80 percent relative humidity provides a theoretical cooling of 5 degrees F. When water is added to the air stream some of the air's sensible heat becomes latent by the evaporation of the water droplets. There is no heat transfer (except for minor differences in the water and air temperature) and no

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BUREAU OF AIR REGULATION  
Golder Associates

23rd St., Suite 500  
Gainesville, FL 32653  
U.S.A.  
Telephone: (352) 336-5600  
Fax: (352) 336-6603

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Golder Associates – Page 2  
Fax to Teresa Heron July 9, 1999

change in the total heat in the air. However, the dry bulb air temperature (the temperature the turbine sees) decreases and the relative humidity increases. This increases mass flow and more power output of the turbine.

At low ambient temperatures where the turbine has the maximum heat input and highest kilogram/hr emissions, using foggers would increase the turbine inlet temperature. This would actually decrease turbine performance. For example, at an ambient temperature of 32 degrees F the water temperature for the foggers would have to be greater than 32 degrees F or the pipes would freeze and the fogging system could not be operated. Given a more likely water temperature of 60 degrees F, the water would transfer heat to the air increasing its temperature.

I have drawn both examples on the attached psychrometric chart. You will also note that at the low ambient (i.e., dry bulb) temperatures, the amount of evaporative cooling is extremely small. In fact, for any cooling effect to occur, the temperature of the water must be at or less than the ambient temperature. In addition at temperatures below about 30 degrees F there would be no cooling. Therefore, the Department conclusion is correct that the maximum turbine capacity will not change with the installation of the foggers.

I hope this information is helpful. Please call if you have any questions.

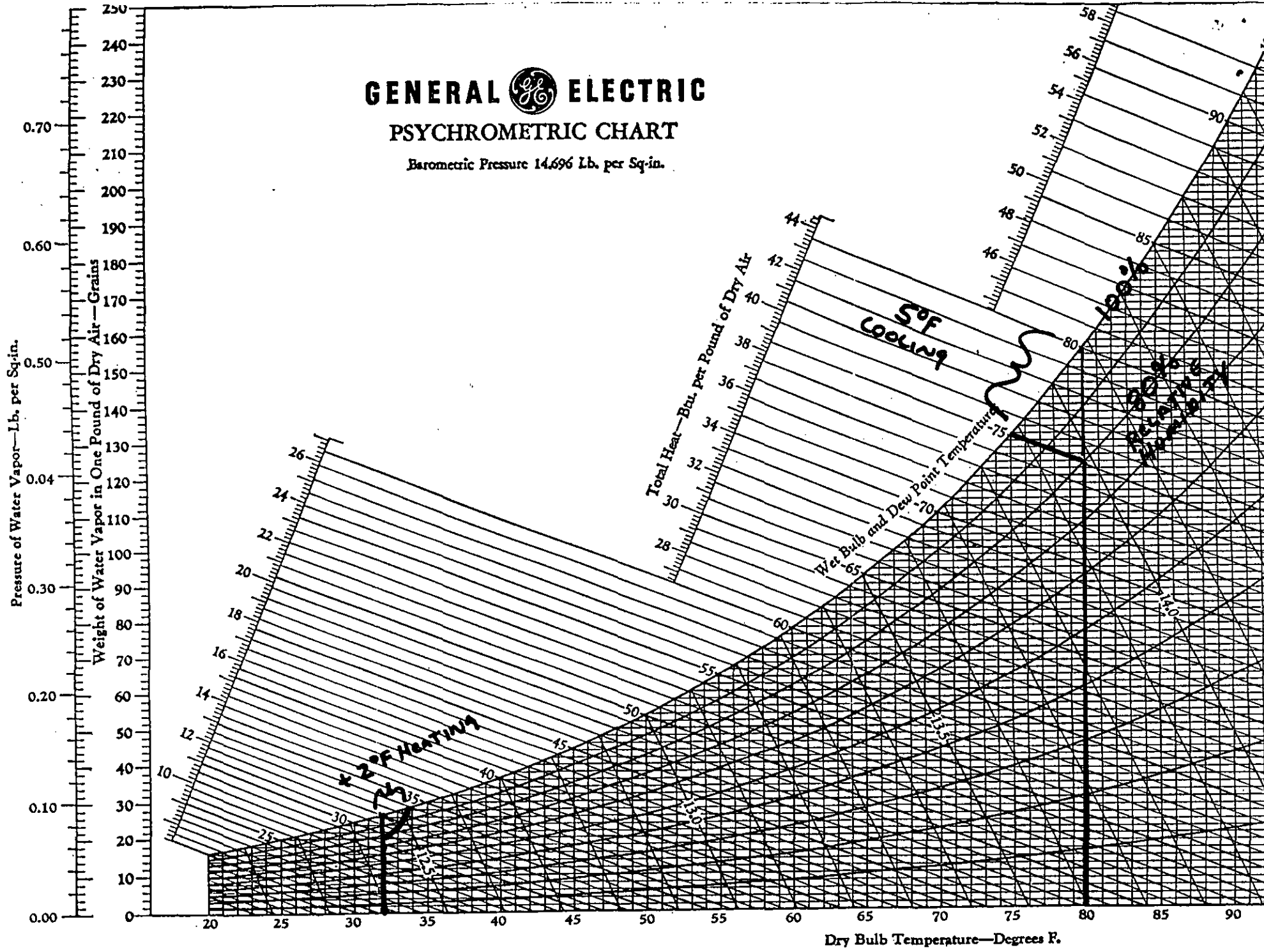
Regards, Ken



cc: Rich Piper

# GENERAL ELECTRIC PSYCHROMETRIC CHART

Barometric Pressure 14.696 Lb. per Sq.in.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

JUN 22 1999

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JUN 25 1999

BUREAU OF  
AIR REGULATION

4APT-ARB

Mr. A.A. Linero, P.E.  
Administrator  
New Source Review Section  
Department of Environmental Protection  
Division of Air Resource Management  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

SUBJ: New Source Performance Standard Applicability Determination for Existing Stationary Gas Turbines at the Florida Power and Light (FP&L) Fort Myers Plant

Dear Mr. Linero:

Thank you for your May 27, 1999, letter which requested a determination regarding whether the addition of inlet foggers to 12 exiting simple cycle combustion turbines at the referenced plant would make these units subject to 40 C.F.R. Part 60, Subpart GG (Standards of Performance for Stationary Gas Turbines). Since your letter did not provide specific details regarding the maximum heat input capacity, electrical output, or hourly nitrogen oxides (NO<sub>x</sub>) emissions for these turbines immediately before and after the addition of the foggers, we cannot conclusively determine whether or not the addition of the foggers will constitute a modification that will make the turbines subject to Subpart GG. We do, however, concur with your conclusion that the addition of the foggers will not constitute a modification if the maximum operating capacity for these turbines does not increase as a result of the fogger installation. The basis for this conclusion and additional information regarding New Source Performance Standard (NSPS) applicability issues for the FP&L turbines are contained in the remainder of this letter.

According to your letter, Units 3 - 14 at the Fort Myers Plant have a nominal capacity of 63 megawatts (MW) each, and they normally achieve their maximum rated output on cold days because the increased compressor inlet air density on these days allows greater throughput in the rotor or expansion sections of the turbines. In order to increase the capacity of the turbines on hot, dry days, FP&L is adding inlet foggers that use evaporative cooling to lower the temperature of the compressor inlet air, and the resulting increase in capacity is estimated to be between two to four MW per turbine. Because the inlet foggers use evaporative cooling to lower the temperature of the inlet air, they function best on hot, dry days, and will provide limited benefit on cold or humid days.

Based upon your review of FP&L's plans, you have concluded that the maximum turbine operating rate when the inlet foggers are in use will be lower than the maximum turbine capacity that can be achieved on cold days when the foggers cannot be used to increase the output of the units. If this conclusion about the relative capacity of the turbines under these operating scenarios is true, the addition of the inlet foggers would not be a modification as defined in 40 C.F.R. §60.14(a). This section of the rule defines a modification as any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies. 40 C.F.R. §60.14(b) clarifies that the emission rates before and after a physical or operational change are to be expressed in kilograms per hour when determining if an emission increase has occurred.

In the case of turbines at the Fort Myers Plant, potential emissions from the 12 turbines at the plant will increase on an annual basis as a result of the fogger installation since adding this equipment will allow the turbines to operate at a higher rate during the portion of the year when evaporative cooling is an effective means of increasing the turbine operating rate. When determining whether or not the addition of the inlet foggers constitutes a modification, however, emissions before and after the change must be evaluated on an hourly basis, rather than an annual basis. Since  $\text{NO}_x$  mass emissions from the turbines will tend to increase as heat input and the corresponding electrical output increase, the easiest way to determine whether the addition of the inlet foggers will be a modification is to compare the maximum operating capacity of the turbines before the addition of the foggers to the maximum turbine operating capacity following their installation.

Because the maximum operating rate for the turbines prior to the fogger installation was achieved under cold weather conditions, the applicability of Subpart GG would depend upon whether the maximum operating capacity of the units after the fogger installation exceeds their previous cold weather operating capacity. If there are any scenarios under which the foggers allow the turbines to operate at a capacity higher than they could have previously operated under cold weather conditions, the installation of the inlet foggers will constitute a modification. Conversely, if the maximum operating rate of the turbines still occurs under cold weather conditions when the foggers cannot be used to boost the capacity of these units, the installation of the foggers will not constitute a modification.

If you have any questions about the determination provided in this letter, please contact Mr. David McNeal of the EPA Region 4 staff at (404) 562-9102.

Sincerely,



R. Douglas Neeley  
Chief  
Air and Radiation Technology Branch  
Air, Pesticides and Toxics  
Management Division

CC: Teresa Derson, BAR  
Richard Piper, FPL  
SD  
NPS  
William Reichel  
Ken Kosky, Golder Assoc.



**FPL**

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**JUL 08 1999**

**BUREAU OF AIR REGULATION**

June 18, 1999

Ms. Teresa Heron, P.E.  
New Source Review Section  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
111 S. Magnolia Drive, Suite 4  
Tallahassee, Florida 32301

**RE: FPL Fort Myers Combustion Turbine Inlet Foggers  
Proposed Permit 0710002-005-AC**

Dear Teresa:

FPL offers the following comments on the proposed permit:

Specific Condition 20 should be revised as follows to reflect the total NOx produced by these turbines, rather than the incremental increase due to the fogger installation:

*"Inlet foggers may be installed at the compressor inlet to each of the twelve General Electric PG7821 combustion turbine-electric generators. The twelve foggers may operate up to 6,000 hours per year in aggregate (average 500 hours per unit per year). Maximum heat input shall not exceed 807 mmBtu / hr / unit and NOx emissions shall not exceed ~~11.60~~ 564 lb. / hr / unit at 59 °F. This maximum heat input rate will vary depending upon ambient conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other ambient conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing after the foggers are installed. Thereafter, compliance shall be demonstrated as required in Specific Condition 13."*

In addition, FPL requests that representative units only, be tested to assure initial and ongoing compliance with this Specific Condition. The Fort Myers peaking units, for which this permit is being considered, are identical machines, and as such, do not warrant individual testing. The Department has issued a previous permit to FPL's facility at Port Everglades which allowed for this type of representative testing for identical peaking units such as the ones at Fort Myers. Following is an example of the language from the Port Everglades Title V permit:

***"C.7. Nitrogen Oxides.** Nitrogen oxides emissions shall be determined by a stack test on one representative turbine. Testing shall be performed*

each federal fiscal year, no later than September 30<sup>th</sup>. [Rule 62-296.570(4)(a)3, and (4)(b)5., F.A.C.]”

Teresa, I appreciate your consideration of these comments. Should you have any questions, or wish to discuss any of these items further, please do not hesitate to contact me at (561) 691-7058.

Very truly yours,



Richard Piper  
Repowering Licensing Manager  
Florida Power and Light Company

CC: File  
SD  
NPS  
EPA





**FPL**

Florida Power & Light Company, Environmental Services Dept., P.O. Box 14000, Juno Beach, FL 33408

June 16, 1999

Ms. Teresa Heron, P.E.  
New Source Review Section  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
111 S. Magnolia Drive, Suite 4  
Tallahassee, Florida 32301

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JUN 21 1999

BUREAU OF  
AIR REGULATION

**RE: FPL Fort Myers Combustion Turbine Inlet Foggers  
Proposed Permit 0710002-005-AC**

Dear Teresa:

Enclosed pursuant to Clair Fancy's correspondence of May 25, 1999, please find one copy of the Proof of Publication for the subject inlet foggers at the Fort Myers facility. The Notice of Intent was published on June 8, 1999.

FPL does intend to offer comments on the proposed permit; these will be provided in the next few days.

Should you have any questions, please do not hesitate to contact me at (561) 691-7058.

Very truly yours,

Richard Piper  
Repowering Licensing Manager  
Florida Power and Light Company

cc: file  
SD  
EPA  
NPS

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JUN 21 1999

BUREAU OF AIR REGULATION

NEWS-PRESS

Published every morning — Daily and Sunday  
Fort Myers, Florida

Affidavit of Publication

STATE OF FLORIDA  
COUNTY OF LEE

Before the undersigned authority, personally appeared  
Brenda Leighton

who on oath says that he/she is the  
Legal Coordinator of the News-Press, a

daily newspaper, published at Fort Myers, in Lee County, Florida; that the  
attached copy of advertisement, being a  
public notice

in the matter of Air Construction Permit

in the \_\_\_\_\_ Court

was published in said newspaper in the issues of  
June 8, 1999

Affiant further says that the said News-Press is a paper of general circulation  
daily in Lee, Charlotte, Collier, Glades and Hendry Counties and published at  
Fort Myers, in said Lee County, Florida and that said newspaper has heretofore  
been continuously published in said Lee County, Florida, each day, and has  
been entered as a second class mail matter at the post office in Fort Myers in  
said Lee County, Florida, for a period of one year next preceding the first  
publication of the attached copy of the advertisement; and affiant further says  
that he/she has neither paid nor promised any person, firm or corporation any  
discount, rebate, commission or refund for the purpose of securing this  
advertisement for publication in the said newspaper.

*Brenda Leighton*

Sworn to and subscribed before me this  
8th day of \_\_\_\_\_

June, 19 99 by

Brenda Leighton

who is personally known to me or who has produced

as identification, and who did or did not take an oath

Notary Public Janet E Cobb

Print Name \_\_\_\_\_

My Commission Expires:

Janet E. Cobb  
MY COMMISSION # CC602535 EXPIRES  
November 19, 2000  
BONDED THRU TROY FAIR INSURANCE, INC.



CLASS-16

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DEP. File No. 0710002-005-AC  
Florida Power & Light Company  
Units 003-014 Inlet Fogger Project  
Lee County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Florida Power & Light (FPL). The permit is to install foggers at the compressor inlet of twelve 63-megawatt, No. 2 fuel oil-fired General Electric PG 7821

combustion turbine-electrical generators at the Fort Myers Plant in Lee County. A Best Available Control Technology (BACT) determination was not required pursuant to Rule 62-212.400, F.A.C. The applicant's name and address are Florida Power & Light Company, Post Office Box 430, Fort Myers, Florida 33905.

These units normally achieve their maximum rated output on cold days because the greater compressor inlet density allows greater throughput in the rotor or expansion section of the combustion turbine. The maximum power output is lower on hot days because of the lower compressor inlet density. The foggers increase hot-day power output by approximately 2-4 MW through evaporative cooling of the compressor inlet air. The foggers provide no benefit on very humid or cold days and will not be used under those conditions. Maximum power production and emissions will continue to occur at low temperature conditions with the foggers turned off. The result is that maximum hourly emissions will not increase although actual annual emissions will increase because more fuel will be used on hot, relatively dry days.

The number of days during which the foggers can economically operate probably limits emissions increases to levels below significance for the purposes of PSD applicability. FPL, however, proposes enforceable conditions to insure non-applicability. Each unit is already allowed to operate continuously (8760 per year) but typically operates less than 300 hours. The foggers may not be used more than 500 hours at each unit, but will typically operate for fewer hours than allowed. The units are not presently subject to 40CFR60, Subpart GG, Standards of Performance for Stationary Gas Turbines. The Department has preliminarily determined that the project will not trigger applicability of Subpart GG, but has requested that EPA make the final determination on the matter.

The maximum increase in annual emissions caused by this project in tons per year is summarized below along with PSD-significant levels. Annual Emission Increase PSD Significant Levels

PM/PMI 25/15  
 SO2 24 40  
 NOX 34 40  
 VOC 31 40  
 CO 3 100

An air quality impact analysis was not required or conducted. No significant impacts are expected to occur as a result of this project. It will not cause or contribute to a violation of any ambient air quality standard or increment.

The Department will issue the FINAL permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or a significant change of terms or conditions.

The Department will accept written comments concerning the proposed permit issuance action for a period of thirty (30) days from the date of publication of Public Notice of Intent to Issue Air Construction Permit. Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions, unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S. before the deadline for filing a petition. The procedures for a petitioning for a hearing are set forth below. Mediation is not available in the proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under Sections 120.569 and

120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen (14) days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3) of the Florida Statute must be filed within fourteen days of publication of the public notice, or within fourteen days of receipt of this notice of intent, whichever occurs first. Under Section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen (14) days of receipt of that notice, regardless of the date of publication.

A petitioner shall mail a copy of the petition to the applicant at the address indicated above the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Section 120.569 and 120.57 F.S. or to intervene in this proceeding and participate as a party to it. Any compliance with Rule 28-106.205 of the Florida Administrative Code.

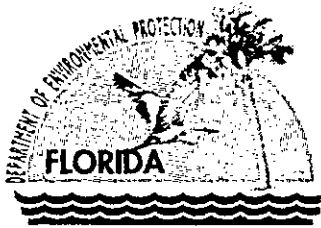
A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner; (c) The name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the determination; (d) A statement of how, and when, notice of the agency action or proposed action was received; (e) A statement of the disputed issues of material fact, if there are none, the petition must so indicate; (f) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and (g) A demand for relief.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it. In this notice, persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:  
 Department of Environmental Protection, Bureau of Air Regulation, 111 S. Magnolia Drive, Suite 4, Tallahassee, Florida, 32301. Telephone: 850/488-0114, Fax: 850/922-6979.  
 Department of Environmental Protection, South District Office, 2295 Victoria Avenue, Suite 364, Ft. Myers, FL 33902-2549. Telephone: 941/332-6969, Fax: 941/332-5963.

The complete project file includes the application, technical evaluation, Drafts, Permit and the information submitted by the responsible official. Exclusive of confidential records under Section 403.111, F.S., interested persons may contact the Administrator, New Resource Review, Section 2111, South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114 for additional information.  
 Jun 8 No. 27334



# Department of Environmental Protection

Jeb Bush  
Governor

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

David B. Struhs  
Secretary

May 27, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. R. Douglas Neeley, Chief  
Air, Radiation Technology Branch  
US EPA Region IV  
61 Forsyth Street  
Atlanta, Georgia 30303

Re: DEP File No. 0710002-005-AC  
Fort Myers Plant Units 3-14, Inlet Foggers  
Subpart GG Non-Applicability


Dear Mr. Neeley:

Enclosed is a copy of our Intent to Issue a permit to Florida Power and Light (FP&L) for the installation of inlet foggers for use during the summer season on the simple cycle peaking units at the Ft Myers Plant. We request your concurrence with our preliminary determination or your own separate determination regarding the non-applicability of the 40CFR 60, NSPS Subpart GG for these units.

There are presently 12 GE PG7821 combustion turbines on the site. Each has a nominal capacity of 63 megawatts. The units are permitted to operate continuously, but have historically operated 300 hours per year or less. These units normally achieve their maximum rated output on cold days because the greater compressor inlet air density allows greater throughput in the rotor or expansion section of the combustion turbine. The maximum power output is lower on hot days because of the lower compressor inlet density. The foggers increase hot-day power output by approximately 2-4 MW through evaporative cooling of the compressor inlet air. The foggers provide little or no benefit on humid or cold days and will not be used under those conditions.

The foggers will not increase the maximum short-term emission rates for the units, as these are already achieved under natural conditions of low ambient temperatures without the use of the foggers. Therefore the Department believes that Subpart GG is not triggered by the project.

We would appreciate your early review and concurrence. If you have any questions on these matters please call me at 850/921-9523.

Sincerely,  
  
A. A. Linero, P.E., Administrator  
New Source Review Section

AAL/aal

Enclosures

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- The Return Receipt will show to whom the article was delivered and the date delivered.

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Consult postmaster for fee.

3. Article Addressed to:  
 Doug Neeley, Chief  
 Air Branch  
 UE EPA Region IV  
 61 Forsyth St.  
 Atlanta, GA 30303

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 Z 333 618 155

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 Bruce Aho

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**Receipt for Certified Mail**  
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		0710002-005-AC
		Inlet Foggers

PS Form 3800 April 1995