



FPL

January 09, 2003

Florida Power & Light Company, 950 S. Hwy. 17-92, DeBary, FL 32713

RECEIVED
JAN 15 2003
BUREAU OF AIR REGULATION

Mr. Bruce Mitchell
State of Florida
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Draft Title V Permit [incorporating the Re-powering Action for Unit 5] 1270009-007-AV/1270009-008-AC/PSD-FI-270(A)

Dear Mr. Mitchell:

First we would like to thank you for the time you set aside to discuss the comments on the above permits. After reviewing the subject *draft* Title V permit 1270009-007-AV on 01/09/03 the following issues which may need resolution in the operating and construction permits were identified. Modifications are requested for both re-powered units (Unit 5 and Unit 4) in all applicable permits. Each revision is described as follows:

The first item concerns the **Facility wide condition #14**. FPL requests the formula involving calculation of the facility cap for PM be corrected for all gas calculations of PM to 0.006 lb/mmBtu. This item results from a typographical error involving the emissions factor listed for PM₄.

The second item concerns **Specific condition B.13** that addresses Excess Emissions: Please see suggested changes as indicated in the permit condition below:

B.13. Excess emissions resulting from startup, shutdown, or malfunction of the *combustion turbines (CTs) and associated heat recovery steam generators (HRSGs)* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two **(2)** hours in any 24-hour period except during both "cold startup" to or "shutdowns" from combined cycle operation [CT and associated HRSG]. During cold startup to combined cycle operation, up to four **(4)** hours of excess emissions are allowed for. During shutdowns from combined cycle operation, up to three **(3)** hours of excess emissions are allowed. Cold startup is defined as a startup to combined cycle operation when the heat recovery steam generator high-pressure drum is below 450 psig for at least one **(1)** hour.

Excess emissions from the CTs resulting from startup of the *steam turbines system* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed 12 hours per CT per cold startup of the steam turbines system [CT(s) and associated HRSG(s), Steam Turbine and Generator]. **Cold startup of the steam turbine system shall be completed within twelve (12) hours.**
(see Permitting Note, below).

~~{Permitting Note: FPL estimates that, on average, there will be approximately 12 startups to a combined cycle operation per year. The "12 hours per cold startup"~~

allowed is the total time from all of the CTs and their associated heat recovery steam generators.

[Rules 62-210.700(1) and 62-4.130, F.A.C.; G.E. Combined Cycle Startup Curves Data; 1270009-004-AC/PSD-FL-270; and, 1270009-008-AC]

The third item concerns **Specific condition B.30** that addresses "permitted capacity is defined as 95-100% of the maximum heat input...". FPL requests the capacity be changed to agree with the current Department policy as stated in DARM guidance Memo –OGG-07 published 3/01/00.

Suggested changes:

B.30. Operating Rate During Testing. Testing of emissions shall be conducted with the CT operating at permitted capacity. Permitted capacity is defined as **90-100** percent of the maximum heat input rate allowed by the permit, corrected for the average compressor inlet temperature during the test (with 100 percent represented by a curve depicting heat input vs. compressor inlet temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. In this case, subsequent operation is limited by adjusting the entire heat input vs. compressor inlet temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for compressor inlet temperature) and **110** percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Test procedures shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapters 62-204 and 62-297, F.A.C.

[Rule 62-297.310(2), F.A.C.; and, 1270009-004-AC/PSD-FL-270]

Thank you for your prompt attention to the issues raised in this correspondence. Please do not hesitate to contact me at (352) 575-5211 if I may be of further assistance.

Sincerely,



Roxane Kennedy
General Plant Manager
Sanford Power Plant
Florida Power & Light Company

cc: Scott Sheplak - FDEP



Kathryn S. Salvador, P.E.
Florida P.E. No. 54725

1/14/2003
Date

Mitchell, Bruce

To: Mary_Archer@fpl.com
Cc: Sheplak, Scott
Subject: Appendix U: Unregulated Emissions Units/Activities: List Evaluation for T-5 revision: 1270009-007-AV..

1/14/03

Dear Mary,

Thanks for all of your help in expediting the processing of this permitting action. I do need some help in editing the above referenced appendix (attached). Please identify what storage tanks should be deleted and retained in the appendix or any edits that you deem necessary. Again, many thanks for your help. Take care.

Bruce Mitchell
850/413-9198
bruce.mitchell@dep.state.fl.us



1270009.007AV.Ap
pU.doc

Mitchell, Bruce

To: Mary_Archer@fpl.com
Cc: Sheplak, Scott
Subject: RE: Appendix U: Unregulated Emissions Units/Activities: List Evaluation forT-5 revision: 1270009-007-AV..

1/15/03

Dear Mary,

Thanks for the update on the appendix....I'll make the appropriate changes. Take care.

Bruce

-----Original Message-----

From: Mary_Archer@fpl.com [mailto:Mary_Archer@fpl.com]
Sent: Wednesday, January 15, 2003 8:08 AM
To: Mitchell, Bruce
Cc: Mary_Archer@fpl.com
Subject: Re: Appendix U: Unregulated Emissions Units/Activities: List Evaluation forT-5 revision: 1270009-007-AV..

Bruce, please see Randy's note for the changes to Appx. U.

Please let me know if you have additional needs for the permitting.
Thanks, Mary

----- Forwarded by Mary Archer/GC/FPL on 01/15/2003 08:04 AM -----

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|                                     |
|                                     | Randy Hopkins                       |
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|                                     | 01/15/2003 06:57                 |
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|       |
|       | To:      Mary Archer/GC/FPL@FPL
|       |
|       | cc:      Roxane Kennedy/PGBU/FPL@FPL
|       |
|       | Subject: Re: Appendix U: Unregulated Emissions Units/Activities: List Evaluation
for T-5 revision: 1270009-007-AV..
|       | (Document link: Mary Archer)
|       |
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On the Appendix U-1 list..... these are the changes.....

- Item 1(b) - we no longer have the mobile Detroit diesel emergency generator.
- Item 3 - Tank "B" is now a water tank
- Item 4 - Tank "C" no longer exists
- Item 5 - Tank "D" no longer exists
- Item 8 - Tank 4M no longer contains oil - currently empty awaiting final

Mitchell, Bruce

From: Mary_Archer@fpl.com
Sent: Tuesday, January 07, 2003 11:02 AM
To: Mitchell, Bruce
Cc: Mary_Archer@fpl.com
Subject: Number for conference call - FPL Sanford Plant

Bruce

I will be in a meeting room for the conference call on Thursday 1/9/03 at 9am. The number is 561-691-7071.

If you have any problem reaching me my beeper number is 1-800-447-2433 pager # 8495 or cell no. 772-285-4651.

Talk to you soon, Mary

Kevin Washington - Air Group
Mary Archer - "
John Hempp - "
Roxanne Kennedy - Plant Mgr
Randy Hopkins - Environ.
John Walser - Air
Shiela Wilkenson - Power Generation
Angie Elavega - test group

DRAFT COMMENTS for DISCUSSION PURPOSES SANFORD POWER PLANT 9/08/03

CONDITION NO.

COMMENT

A.3 Please add no. 6 fuel to the startup list of fuels . This is consistent with the previous Title V permit for unit 3. *verbatim of 1270009-001-AY*

14. Facility-Wide Emissions Caps. This condition appears to have some typographical errors.

B.3.a Refers to "Pipeline" natural gas. Suggest the reference to "pipeline" be omitted to avoid the perception that the fuel must conform to the new EPA definition of "Pipeline Quality Natural Gas" for sulfur content. This will make the permit more consistent with the recent wordings of PFM and PMT in regard to gas. *switched to i:c (slp - stopped because of "a" presentation order PFM/PMT 10 NOx SO2)*

No - can add a Permitting Note

B.13 Total start time for cold start is 12 hours for all CTs. Could there be a situation where 2 of the CTs were started cold and the remainder left off for a later start that would fall out of the 12 hour window. Suggest that the reference to all CTs be omitted.

B.16 Should the word "avoidable" be changed to "unavoidable"? *yes OK!*

B.24.a Same comment as B.3.a above. [REMOVE PIPELINE] *No - see B.3.a. response*

B22 & B.23 Add Permit note under Compliance Determination: Specific Conditions: B22 & B. 23

Compliance with the NO_x emission limit
{Permitting Note: If testing is performed at 95% - 100% of rated capacity then the requirements to correct to ISO conditions for NO_x testing are not applicable. The annual calibration RATA associated with the NO_x CEMS in use on these units may be used in lieu of the required annual EPA Reference Method 20, as long as all of the requirements of Rule 62-297.310, F.A.C., are met (i.e., prior test notification, proper test result submittal, etc.).}

see Note under B.7. Maybe B.3.a?

B.45 Refers to "Pipeline" natural gas. Suggest the reference to "pipeline" be omitted to avoid the perception that the fuel must conform to the new EPA definition of "Pipeline Quality Natural Gas" for sulfur content. *No - see B.3.a. response*

B.50 Please insert at the beginning of the condition "If a test method change is requested by" the owner or operator..... *No - N905 language*

Fin Wyn Division 4

B.52

We request this condition be deleted as applicable conflicting requirements are covered in B.48 & B.53

insured: See SO B.53 and/or
use of a
The NO & CEMS satisfies this
requirement.

June 12, 2000

Resolution of “Natural Gas” and “Pipeline Natural Gas” Definition Issues

Question: The definition of “natural gas” in §72.2 of the May 26, 1999 revisions to 40 CFR Parts 72 and 75 states that in order for a gaseous fuel to qualify as natural gas, the fuel must either be $\geq 70\%$ methane by volume or must have a gross calorific value (GCV) between 950 and 1100 Btu/scf. The definitions of “natural gas” and “pipeline natural gas” in § 72.2 also limit the hydrogen sulfide (H_2S) content of these fuels to ≤ 1.0 gr/100 scf (for natural gas) and ≤ 0.3 gr/100 scf (for pipeline natural gas). Further, the “natural gas” definition specifies that H_2S must constitute more than 50% (by weight) of the total sulfur in the fuel, and the “pipeline natural gas” definition specifies that H_2S must constitute at least 50% (by weight) of the total sulfur in the fuel. What must I do to demonstrate that the gaseous fuel combusted at my unit complies with these requirements?

Answer: Sections 2.3.1.4 and 2.3.2.4 in Appendix D of revised Part 75 provide that compliance with the specifications for grains of H_2S in the revised definitions must be documented through one of five identified sources of information. These sources are: a fuel purchase or pipeline transportation contract; vendor certification based on fuel sampling; one year of monthly sampling; one year of sampling of each shipment or lot if the fuel is delivered in shipments or lots; or a 720-hour demonstration. Further, although the revised rule does not expressly identify a particular method for demonstrating compliance with the specifications for GCV in gaseous fuel, Sections 2.3.4.1 and 2.3.4.2 of Appendix D require monthly sampling of the GCV of natural gas or pipeline natural gas, which sampling should be used to demonstrate compliance with the GCV specifications in the definitions. In short, demonstration of compliance with the H_2S grains and GCV specifications in the revised definitions should be made using the methods identified in Appendix D.

With respect to the requirements in the revised definitions that H_2S constitute more than or at least 50% of total sulfur, revised Part 75 does not identify a particular method for demonstrating compliance. The preamble to the May 26, 1999 final rule states that “[t]he Agency believes that, in general, any ‘natural gas’ with ≤ 1.0 grain of H_2S / 100 scf will also meet the requirement that hydrogen sulfide must account for $\geq 50\%$ of the total sulfur in the fuel. However, the Agency reserves the right to request that the owner or operator provide data to demonstrate compliance with this latter requirement” (64 Fed. Reg. 28564, 28579 (1999)). Questions have been raised by a utility group concerning the method of demonstrating compliance with the requirements that H_2S constitute more than or at least 50% of total sulfur. In addition, one member of that

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group submitted a petition on June 6, 2000 under §§75.66(a) and (l) requesting that EPA allow the use of alternatives to the requirements that H₂S constitute more than or at least 50% of total sulfur. Questions have also been raised concerning the deadline for demonstrating compliance with those requirements, as well as with the H₂S grains and GCV requirements in the revised definitions.

In October 1999, EPA issued guidelines for implementing the revisions to Part 75. See Acid Rain Program Policy Manual, Question 1.12 at pages 1-4 through 1-14 (October 14, 1999). These guidelines state that the revised “natural gas” and “pipeline natural gas” definitions should be used when the owner or operator begins reporting quarterly emission data in Electronic Data Report (EDR) version 2.1. The guidelines further provide that EDR version 2.1 may be used starting with first quarter 2000 and must be used for second quarter 2000 and thereafter. Id. at pages 1-5 and 1-13; see also 64 Fed. Reg. 28564 (making June 25, 1999 the effective date of the part 75 revisions). Consistent with the guidelines, the owner or operator should have documentation of compliance with the revised “natural gas” and “pipeline natural gas” definitions on or before the deadline (i.e., July 30, 2000) for submission of emission data for the second quarter of 2000.

In view of the lack of specificity in revised Part 75 concerning the method of compliance with the requirements in the revised definitions that H₂S constitute more than or at least 50% of total sulfur, EPA intends to apply the rule, and is approving generic alternatives to the H₂S-percent-of-total-sulfur requirements in the rule, in order to allow all owners and operators to demonstrate compliance and report data as follows. On or before the July 30, 2000 deadline for submitting second quarter 2000 emission data, the owner or operator of a unit should take at least one sample of the gaseous fuel currently combusted in the unit and analyze the sample for total sulfur content. If a sample is taken before the addition of an odorant, then the total sulfur value used should be increased to account for the sulfur in the odorant. Sample analysis results provided by the fuel supplier that are representative of the unit’s currently combusted fuel may be used. Where the owner or operator has results from analysis of more than one sample of the currently combusted fuel, the owner or operator may use the average of the results of analysis of those samples. The results of analysis of a sample or samples taken before the issuance of today’s guidance and representative of the unit’s currently combusted fuel may be used in lieu of taking a new sample or samples. A new sample or samples should be used whenever the sample or samples on which the owner or operator is relying to demonstrate compliance with the H₂S-percent-of-total-sulfur requirements in the rule are no longer representative of the unit’s currently combusted fuel. The owner or operator should keep -- on site and in a

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format suitable for inspection -- the results of all fuel sample analyses used in the demonstration of compliance.

If the results of the fuel sample analysis show that the total sulfur content of the gaseous fuel is less than twice the applicable grains of H₂S limit (i.e., less than 2.0 gr sulfur/100 scf for natural gas or less than 0.6 gr sulfur/100 scf for pipeline natural gas) and if the fuel satisfies the H₂S grains requirement, then the fuel meets both the H₂S-grains and H₂S-percent-of-total-sulfur requirements in the applicable revised definition. In that case, the fuel is classified as "natural gas" or "pipeline natural gas" respectively so long as the fuel meets the other requirements in the revised definition. In taking this approach to the H₂S-percent-of-total-sulfur requirements, EPA is approving, as discussed herein, the June 6, 2000 petition and is allowing the submitting company and all other owners and operators to apply to any Acid Rain unit the approved alternatives to the H₂S-percent-of-total-sulfur requirements in the rule.

EPA is approving the generic alternatives to the H₂S-percent-of-total-sulfur requirements in the "natural gas" and "pipeline natural gas" definitions for the following reasons. First, the respective definitions already allow gaseous fuel with a total sulfur content of less than 2.0 gr/ 100 scf to be classified as "natural gas" or with total sulfur content of less than 0.6 gr/ 100 scf to be classified as "pipeline natural gas." For example, a gaseous fuel with 0.3 gr/ 100 scf of H₂S and a total sulfur content of less than 0.6 gr/ 100 scf meets both the H₂S grains and H₂S-percent-of-total-sulfur requirements in the "pipeline natural gas" definition. Second, the definitions can result, under some circumstances, in anomalies in the classification of gaseous fuels. For example, a gaseous fuel with low H₂S and total sulfur content, e.g., 0.1 gr/100scf of H₂S and 0.3 gr/100 scf of total sulfur, would not meet the H₂S-percent-of-total-sulfur requirement in the definition and so would not qualify as pipeline natural gas. Third, for purposes of determining SO₂ emissions from combusting natural gas or pipeline natural gas, it makes no difference whether the sulfur originated in the fuel as H₂S or in some other form.

Consequently, EPA maintains that no useful purpose would be served by requiring fuel with total sulfur less than twice the applicable grains of the H₂S limit to also meet requirements that H₂S constitute more than or at least 50% of total sulfur. In approving alternatives to the revised definitions with respect to the latter requirements, EPA is exercising its authority under §§75.66(a) and (l) to approve an alternative to the rule where the alternative is consistent with the purpose of requirement in the rule and with the purposes of Part 75 and section 412 of the Act and any adverse effect of the alternative is de minimis. EPA finds that, in this case, the alternatives will result in a de

June 12, 2000

de minimis or no increase in reported SO₂ emissions and thus will have a de minimis or no effect on the number of allowances needed for compliance and on the environment. Although the petition under §§75.66(a) and (l) was submitted by one company, a number of owners and operators have raised the same, generic issues, and therefore EPA sees no purpose in requiring, in this case, that each owner or operator submit a separate petition.

However, if the results of fuel sample analysis shows that the total sulfur content of the gaseous fuel equals or exceeds 2.0 gr/ 100 scf (for natural gas) or 0.6 gr/100 scf (for pipeline natural gas), then the fuel should be re-classified as follows:

- (1) If a fuel does not qualify as pipeline natural gas because the total sulfur content equals or exceeds 0.6 gr/ 100 scf but the fuel can still qualify as natural gas based on, among other things, its total sulfur content being less than 2.0 gr/100 scf, then the fuel should be classified as “natural gas.” The owner or operator should use Equation D-1h in section 2.3.2.1 of Appendix D to calculate the appropriate default SO₂ emission rate for the fuel. You should determine a new default SO₂ emission rate whenever: the samples on which you are relying to demonstrate compliance with the H₂S grains requirements in the rule are no longer representative of the unit’s currently combusted fuel; or, if a purchase or pipeline transportation contract value is used in Equation D-1h to calculate a default rate, whenever the contract value changes. You should use the default SO₂ emission rate calculated under Equation D-1h to report emission data starting with second quarter 2000, which data must be submitted by July 30, 2000.
- (2) If a fuel does not qualify as natural gas because the total sulfur content equals or exceeds 2.0 gr/ 100 scf, then the fuel should be reclassified as “gaseous fuel” and the provisions in section 2.3.3 of Appendix D apply. Section 2.3.3 requires periodic sampling of the total sulfur content of the gas, at the frequency specified in Table D-5 of Appendix D. As an alternative to implementing the provisions of section 2.3.3, the owner or operator may petition the Administrator under §§75.66(a) and (l) to implement the following procedure: use the equation below to calculate a default SO₂ emission rate based on the results of the total sulfur sampling; sample the fuel periodically for total sulfur at a frequency less than the daily or hourly sampling specified in Table D-5 of Appendix D; and recalculate the default SO₂ emission rate as necessary based on the results of periodic fuel sample analysis.

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$$E = [2.0 / 7000] \times [10^6] \times [S_{\text{tot}} / \text{GCV}]$$

Where:

- E = Default SO₂ emission rate (lb/mmBtu)
- S_{tot} = Highest total sulfur content of the gaseous fuel, based on results of fuel sample analysis (gr/100scf)
- GCV = Lowest gross calorific value for the fuel, based on all historical data from the previous 12 months (Btu/100scf)
- 7000 = Conversion of grains/100scf to lb/100scf
- 2.0 = Ratio of lb SO₂ / lb S
- 10⁶ = Conversion factor (Btu/ mmBtu)

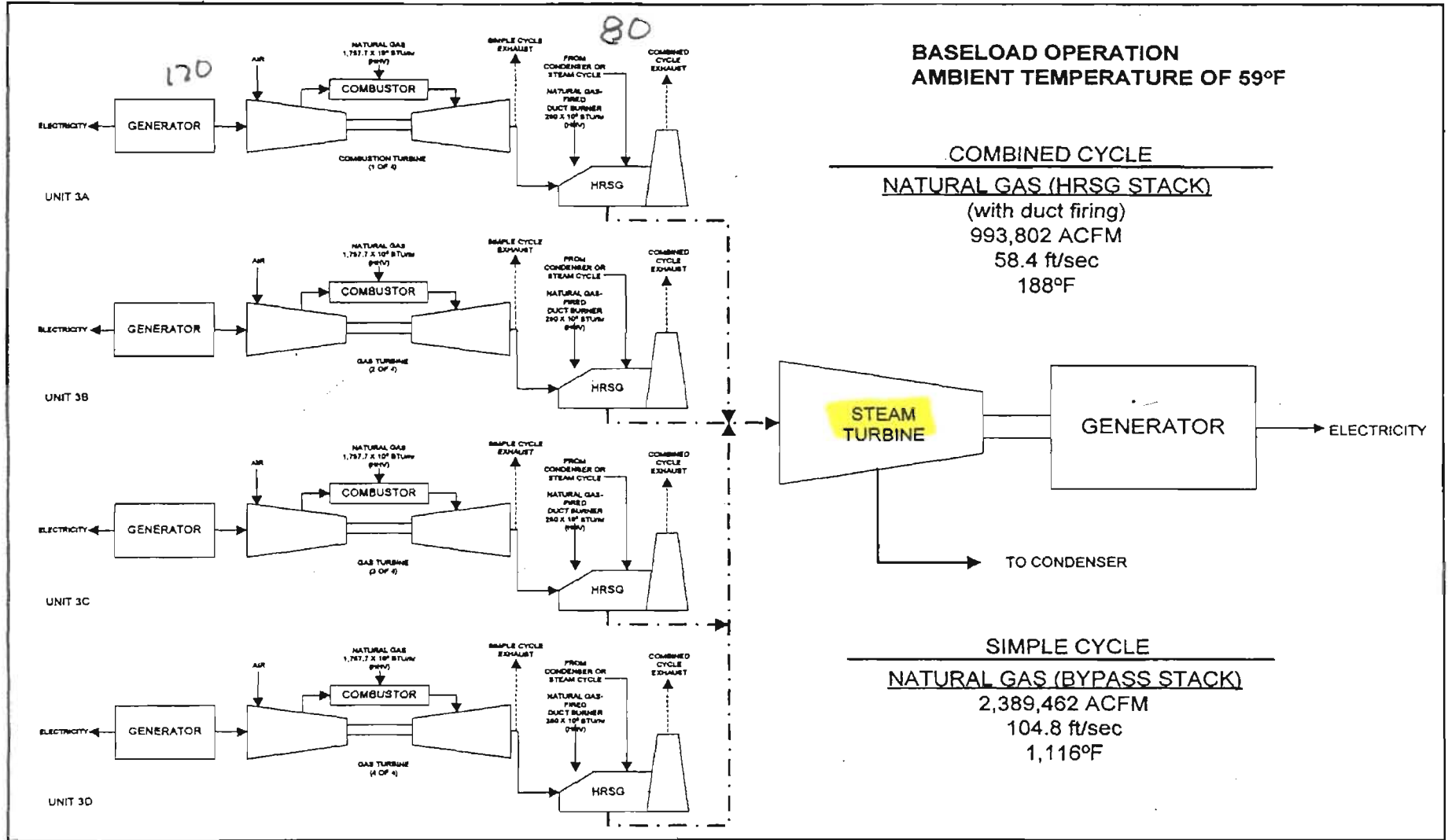
As soon as practicable after determining that the results of fuel sample analysis show total sulfur content equal to or exceeding 2.0 gr/ 100 scf, you should either begin implementing section 2.3.3 of Appendix D or submit a petition to the Administrator, as described above. If you elect to implement section 2.3.3 of Appendix D, we suggest that you contact EPA to discuss the particulars. Whether you elect to implement section 2.3.3 or to submit a petition, you should use a default SO₂ emission rate calculated using the results of fuel sample analysis and the equation in this paragraph (2) to report emission data starting with second quarter 2000, which data must be submitted by July 30, 2000. If you elect to implement section 2.3.3 or if you elect to submit a petition and the Administrator denies your petition, you should continue using this default SO₂ emission rate, adjusted as necessary based on the results of subsequent fuel sample analysis, until an appropriate SO₂ emission rate value can be determined in accordance with section 2.3.3. If you elect to submit a petition and the Administrator approves your petition, you should continue using this default SO₂ emission rate, adjusted as necessary based on the results of subsequent fuel sample analysis and consistent with the Administrator's approval.

Manatee / Martin

13. Excess Emissions Allowed: As specified in this condition, excess emissions resulting from startup, shutdown, and documented malfunctions are allowed provided that operators employ the best operational practices to minimize the amount and duration of emissions during such incidents. A “documented malfunction” means a malfunction that is documented within one working day of detection by contacting the Compliance Authority by telephone, facsimile transmittal, or electronic mail. For each gas turbine/HRSG system, excess emissions resulting from startup, shutdown, or documented malfunctions shall not exceed two hours in any 24-hour period except for the following specific cases.
- a. For cold startup of the steam turbine system, excess emissions from any gas turbine/HRSG system shall not exceed six hours in any 24-hour period. Cold startup of the steam turbine system shall be completed within twelve hours. A cold “startup of the steam turbine system” is defined as startup of the 4-on-1 combined cycle system following a shutdown of the steam turbine lasting at least 48 hours. *{Permitting Note: During a cold startup of the steam turbine system, each gas turbine/HRSG system is sequentially brought on line at low load to gradually increase the temperature of the steam-electrical turbine and prevent thermal metal fatigue. Note that shutdowns and documented malfunctions are separately regulated in accordance with the requirements of this condition.}*
 - b. For shutdown of the steam turbine system, excess emissions from any gas turbine/HRSG system shall not exceed three hours in any 24-hour period.
 - c. For cold startup of a gas turbine/HRSG system, excess emissions shall not exceed four hours in any 24-hour period. “Cold startup of a gas turbine/HRSG system” is defined as a startup after the pressure in the high-pressure (HP) steam drum falls below 450 psig for at least a one-hour period.

Ammonia injection shall begin as soon as operation of the gas turbine/HRSG system achieves the operating parameters specified by the manufacturer. As authorized by Rule 62-210.700(5), F.A.C., the above conditions allow excess emissions only for specifically defined periods of startup, shutdown, and documented malfunction of the gas turbines. [Design; Rules 62-212.400(BACT) and 62-210.700, F.A.C.]

FPL Manatee



Process Flow Diagram
 Baseload Operation, Ambient Temperature of 59°F, Natural Gas
 HRSG = Heat Recovery Steam Generator

Process Flow Legend

- Solid/Liquid
- Gas
- Steam



FPL
 Manatee Unit 3

Sanford

As discussed in Section 6.0, the air modeling analyses that address compliance with ambient standards were based on modeling the CTs for the operating load and ambient temperature which produced the maximum impacts from the load impact analysis that was performed. Although the highest emission rates occur with low turbine inlet temperatures (e.g., 35°F) and base load conditions, the lowest exhaust gas flow rates occur with a turbine inlet temperature of 95°F and 50 percent operating load. Since this low exhaust flow condition can result in potentially higher impacts due to lower plume rise (i.e., due to lower exit velocity and temperature), the load analysis included modeling the CTs for the following six scenarios designed to determine the maximum impacts for the project:

- Scenarios 1-3 A base operating load for a turbine inlet temperature of 35°F (gas) and 32°F (oil), 59°F, and 95°F;
- Scenarios 3a-6 A 75 percent operating load for a turbine inlet temperature of 35°F (gas) and 32°F (oil), 59°F, and 95°F; and
- Scenarios 7-9 A 50 percent operating load for a turbine inlet temperature of 35°F (gas) and 32°F (oil), 59°F, and 95°F.

The combined-cycle units will begin operation by December 2002. The CTs for repowered Unit 4 will operate in simple-cycle mode including following their installation and prior to completion of the combined-cycle configuration. Bypass stacks will be installed to allow simple-cycle operation when the units are installed. Simple-cycle operation may occur with the first CT in early 2002 with about one additional CT capable of simple-cycle operation each month. During this period, the CTs in simple-cycle mode will be able to provide power to the FPL system and maintain system reliability. Operation of the CTs and Units 4 and/or 5 during high-power demand periods could be possible. In 2001, the steam generators for Units 4 and 5 will be taken out of service to allow for the integration of the existing steam turbine generator units with the HRSGs. After the combined-cycle plant begins operation, the steam generators and stacks for Units 4 and 5 will be dismantled after the combined-cycle plant begins operation.

During cold startup of the combined-cycle plant, the steam must be regulated from the HRSG to the steam turbine to allow gradual increases in temperatures. This incremental temperature increase must be carefully regulated from combined-cycle plants since the CT, even at low loads, can produce high

temperatures and exhaust flow through the HRSG. For the Sanford Repowering Project, an exception from the allowable excess emissions in Rule 62-210.700(1) is requested. A condition similar to that approved by FDEP for FPL's Fort Myers Repowering Air Construction Permit (refer to Permit No. 0710002-004-AC; Condition 24) is requested. The requested condition is as follows:

- Excess emissions resulting from startup, shutdown, or malfunction of the *combustion turbines and heat recovery steam generators* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period except during both "cold startup" to, or shutdowns from, combined cycle operation. During cold startup to combined cycle operation, up to four hours of excess emissions are allowed. During shutdowns from combined cycle operation, up to three hours of excess emissions are allowed. Cold startup is defined as a startup to combined cycle operation following a complete shutdown lasting at least 48 hours.
- Excess emissions from the combustion turbines resulting from startup of the *steam turbines system* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed 12 hours per cold startup of the steam turbine system."

The Sanford Repowering Project may also include the installation of a cooling tower for reducing the discharge temperature of the pond cooling system used for the electric steam generators. The cooling tower will be of a once-through counterflow design. Particulate matter in the form of drift will result from the operation of the tower. The tower will be equipped with a high-efficiency drift eliminator that will reduce drift to 0.001 percent of the circulating water flow rate. Since the drift will contain dissolved solids, particulate matter will be formed when the drift aerosols evaporate in the atmosphere. Table 2-11 presents the physical, performance, and emissions data for the cooling tower proposed for the project. For the purposes of regulatory applicability and impact analysis, it was assumed that all drift was PM and that 50 percent of the drift was PM₁₀. The latter assumption is conservative, since representative data of cooling tower particle size indicate that 50 percent of the drift is 0 to 50 μm in diameter.

The natural gas must be heated to about 300°F for the dry low-NO_x combustors to operate effectively. This will be accomplished, during simple-cycle operation in Unit 4 and during cold starts, by installing 3 direct-fired natural gas heaters. Table 2-12 presents the performance, stack parameters, and emissions data for a steam boiler that takes into account those factors for direct-fired heaters. The



April 19, 2002

Mr. Lynn Haynes
Air and Radiation Technology Branch
Air, Pesticides and Toxics Management
USEPA Region IV
61 Forsyth Street, SW
Atlanta, GA 30303-8909

RECEIVED

AUG 25 2003

BUREAU OF AIR REGULATION

Re: **Florida Power & Light Company (FPL)**
Sanford Combined Cycle Plant
Notification of Performance / Emission Testing

Dear Mr. Haynes:

Pursuant to the requirements of 40 CFR Part 60 & 75, summarized below are the actual/expected dates of **Commercial Operation, Performance/Emission and Continuous Emission Monitor (CEM) Certification Testing** for the Sanford Combined Cycle Plant Re-powering Project. Also included, per the requirements of this Facility's Air Construction Permit, Section III, Item No. 9, Emission Unit(s) Specific Conditions, are Manufacturer's curves based on varying compressor inlet temperatures conditions.

Units	Commercial Operation (Note 1)	Performance/ Emission Test	Opacity Observations	CEM Certification
SNCT5A	February 21, 2002	April 26 – 28,2002	April 26 – 28, 2002	May 6, 2002
SNCT5B	February 25, 2002	April 21 – 23, 2002	April 21 – 23, 2002	May 7, 2002
SNCT5C	March 4, 2002	May 2 – 4, 2002	May 2 – 4, 2002	May 8, 2002
SNCT5D	March 11, 2002	May 8 – 10, 2002	May 8 – 10, 2002	May 13, 2002
40 CFR Part 60 & 75 Req.	75.61(a),(2),(i)	60.8 (d)	60.7(a)(6)& 60.11(b)	75.61(a)(1)(i) & 60.7(a)(5)

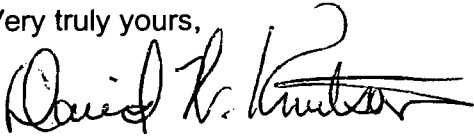
Note # 1 – Commercial Operation is defined in 40 CFR 75 72.2, Subpart A as, "beginning to generate electricity for sale including the sale of test generation".

Pursuant to the requirements of 40 CFR 75.62(a), a complete **(CEM) Monitoring Plan, version 2.1**, for this re-powering project at the Sanford facility was transmitted to the Florida Department of Environmental Protection (FDEP) on December 7, 2001. An electronic copy was also forwarded to EPA at the following email address: **mp-reg4@epa.gov** per EPA instructions.

Please note that the dates provided above are subject to change. As the start-up activities occur, FPL will update EPA and FDEP if and when a different certification test date is required. Please also note that this notice is one of many notifications for the Sanford facility. Eight (8) combustion turbines (CT's) will be installed and commissioned in combined-cycle mode during February 2002 through December 2002.

If you should have any questions regarding this notification, please do not hesitate to contact me at (561) 691-2438 or Michael Szybinski at (561) 691-2898.

Very truly yours,



David W. Knutson
Designated Representative
Florida Power & Light Company

cc:

Joseph Kahn, P.E., Administrator - FDEP Division of Air Resource Management
Leonard T. Kozlov, Manager - FDEP Central Florida District
John B. Turner - FDEP Central District Office
Garry Kuberski - FDEP Central District Office
Roxane Kennedy - Plant General Manager
Ken Simmons - JES/FPL
Randy Hopkins - Plant Environmental Specialist
Mike Cooney - Project Construction
Augie de la Vega - PGD Emission Crew Supervisor
Bill Poppell - Construction Site Manager
Brian Hill - Black & Veatch
File

General Electric Model PG7241(FA) Gas Turbine

Estimated Performance - Configuration: DLN Combustor

Compressor Inlet Conditions 59 F (15 C), 60% Relative Humidity

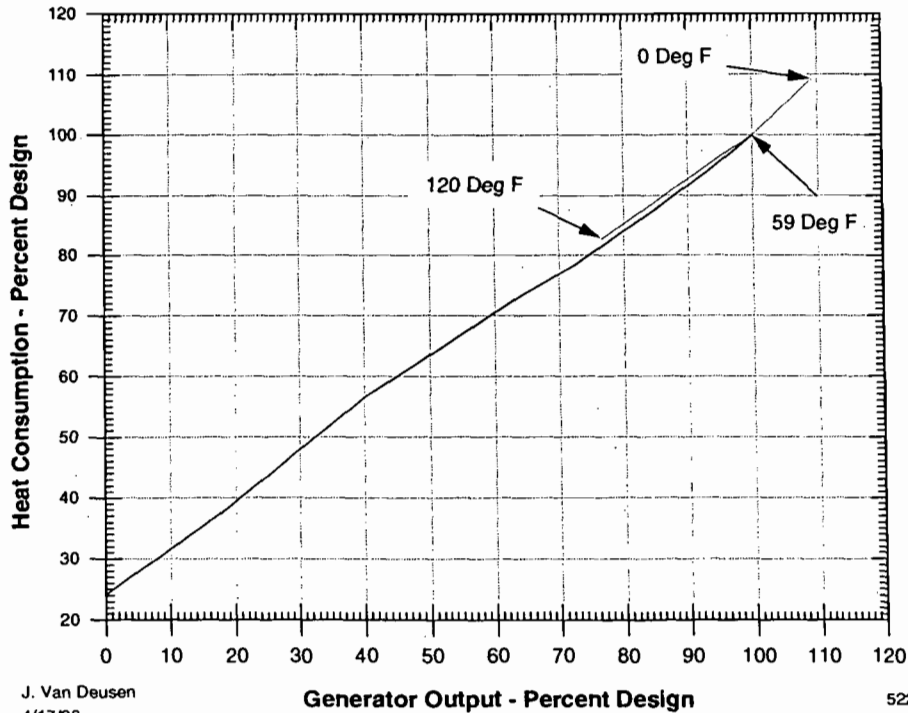
Atmospheric Pressure 14.7 psia (1.013 bar)

Fuel:		Natural Gas
Design Output	kW	171700
Design Heat Rate (LHV)	Btu/kWh (kJ/kWh)	9360 (9870)
Design Heat Cons (LHV)	Btu/h (kJ/h)x10 ⁶	1607.1 (1695.2)
Design Exhaust Flow	lb/h (kg/h)x10 ³	3542.0 (1607)
Exhaust Temperature	deg. F (deg. C)	1116 (602.2)
Load		Base

Notes:

- Altitude correction on curve 416HA662 Rev A.
- Ambient temperature correction on curve 522HA852 Rev A.
- Effect of modulating IGV's on exhaust temperature and flow on curve 522HA853 Rev A.
- Humidity effects on curve 498HA697 Rev. B - all performance calculated with a constant specific humidity of .0064 or less as not to exceed 100% relative humidity.
- Plant Performance is measured at the generator terminals and includes allowances for the effects of inlet bleed heating, excitation power, shaft driven auxiliaries, and 3.04 in H₂O (6.33 mbar) inlet and 5.5 in H₂O (13.70 mbar) exhaust pressure drops and a DLN Combustor.
- Additional inlet and exhaust pressure loss effects:

	% Effect on		Effect on	
	Output	Heat Rate	Exhaust Temp.	
4 in Water (10.0 mbar) Inlet	-1.54	0.56	3.0F (1.7C)	
4 in Water (10.0 mbar) exhaust	-0.56	0.56	3.0F (1.7C)	



J. Van Deusen
4/17/98

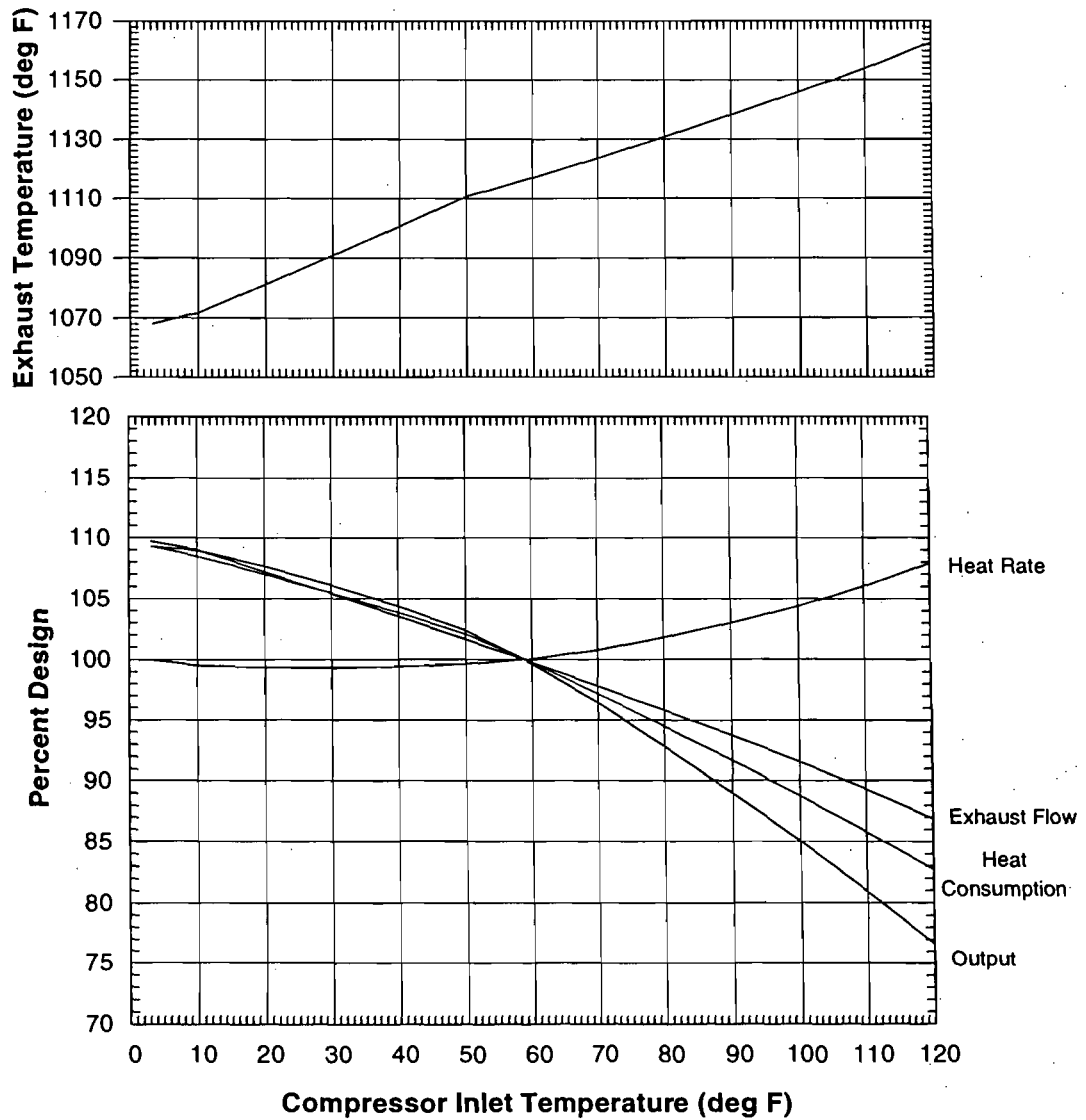
Generator Output - Percent Design

522HA851
Rev - A

GENERAL ELECTRIC MODEL PG7241(FA) GAS TURBINE

Effect of Compressor Inlet Temperature on Output, Heat Rate, Heat Consumption, Exhaust Flow And Exhaust Temperature at Baseload

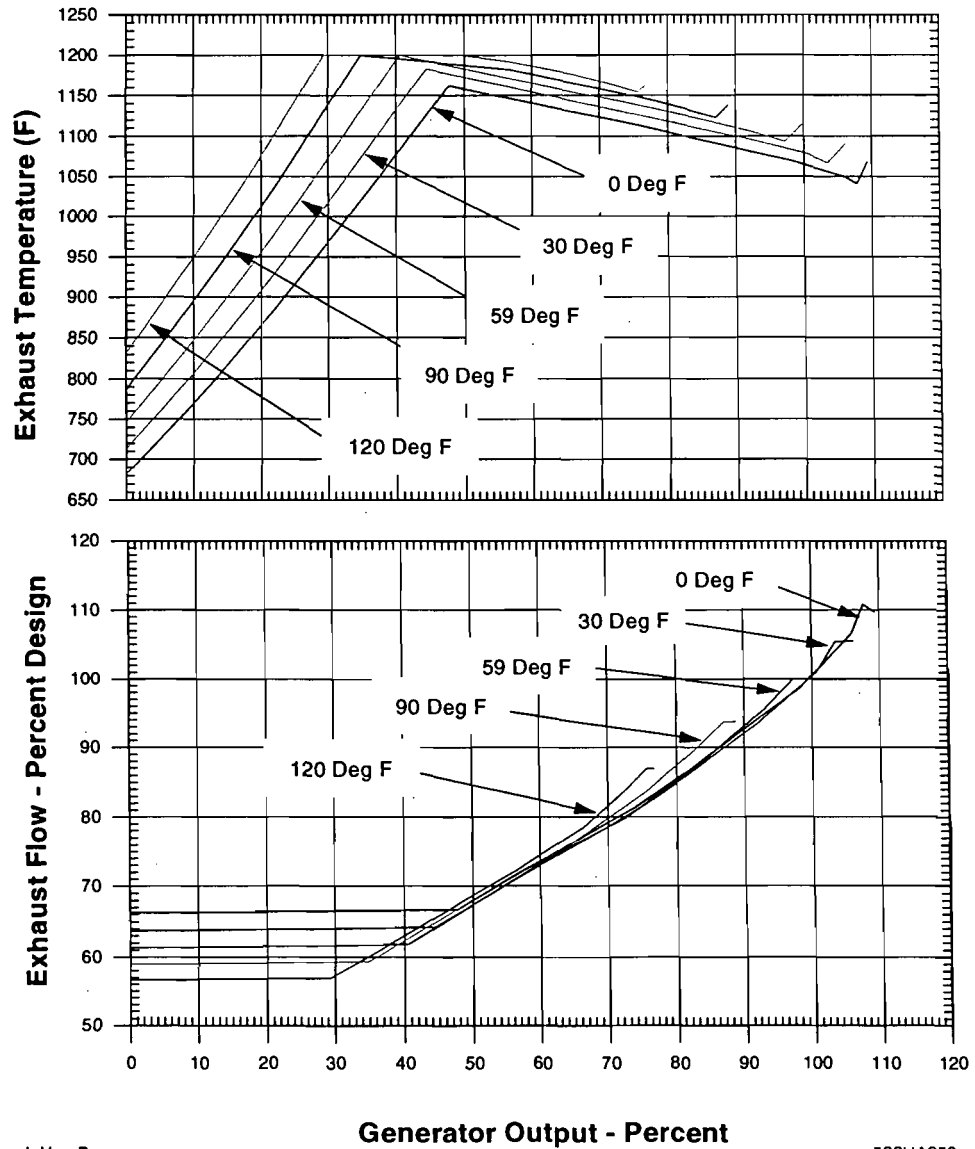
Fuel: Natural Gas
Design Values on Curve 522HA851 Rev A
DLN Combustor



GENERAL ELECTRIC MODEL PG7241(FA) GAS TURBINE

Effect of Inlet Guide Vane on Exhaust Flow and Temperature As a Function of Output and Compressor Inlet Temperature

Fuel: Natural Gas
Design Values on Curve 522HA851 Rev A
DLN Combustor



J. Van Deusen
4/17/98

522HA853
Rev - A

Mitchell, Bruce

To: Mary_Archer@fpl.com
Subject: Draft B.13 regarding Excess Emissions.

1/9/03

Dear Mary,

My apology for any confusion in the first e-mail. I meant to reference Specific Condition B.13., not B.39. If there are any questions, please give me a call.

Bruce
850/413-9198



Excess.Emissions.dr
aft.doc

Mitchell, Bruce

To: Mary_Archer@fpl.com
Cc: Sheplak, Scott
Subject: Draft of B.39. regarding Excess Emissions.

1/9/03

Dear Mary,

Thanks for coordinating the teleconference call this morning. I felt it was very productive. I have spoken with Teresa Heron about the above referenced Specific Condition (SC) B.39. and we have changed the language of the SC....it is in the attached document. Please forward the proposed SC language to Roxane Kennedy for review. I look forward to hearing from you regarding acceptability of the proposed language. Take care.

Bruce
850/413-9198



Excess.Emissions.dr
aft.doc

Mitchell, Bruce

To: mary.archer@FPL.com
Cc: Sheplak, Scott
Subject: Draft of the DRAFT T-5 Permit for the requested revision.

12/20/02

Dear Mary,

I have attached a copy of the draft of the DRAFT Title V Permit for the requested revision. Please look at Section III. Subsection B. for the Description and Specific Conditions related to Repowered Unit 5. I will give you a call when I get back in the office to discuss or set up a teleconference call to discuss the draft permit. I would like to put the Intent package out for Public Notice in the first week of next year, due to the permitting clock. Take care and wishing you a safe and Happy Holidays.

Bruce Mitchell
850/413-9198

1270009d.007AV.doc

B.13. Excess emissions resulting from startup, shutdown, or malfunction of the *combustion turbines (CTs) and associated heat recovery steam generators (HRSGs)* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two (2) hours in any 24-hour period except during both “cold startup” to or “shutdowns” from combined cycle operation [CT and associated HRSG] . During cold startup to combined cycle operation, up to four (4) hours of excess emissions are allowed for. During shutdowns from combined cycle operation, up to three (3) hours of excess emissions are allowed. Cold startup is defined as a startup to combined cycle operation when the heat recovery steam generator high-pressure drum is below 450 psig for at least one (1) hour.

Excess emissions from the CTs resulting from startup of the *steam turbine system* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed 12 hours per CT per cold startup of the steam turbine system [CT(s) and associated HRSG(s), Steam Turbine and Generator]. Cold startup of the steam turbine system shall be completed within twelve (12) hours.



FPL

October 24, 2002

RECEIVED

OCT 31 2002

Mr. A.A. Linero, P. E.
State of Florida
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

BUREAU OF AIR REGULATION

Re: Response to Department Request dated Oct. 10, 2002: Title V Permit Revision Request to incorporate the Repowering Action for Unit 5 1270009-007-AV/1270009-008-AC/PSD-FI-270(A)

Dear Mr. Linero:

Pursuant to your October 10, 2002, letter additional information items were requested for the above listed revision.

The first item concerns the request for a Compliance Plan pursuant to Rule 62-213.440(2). [Please see Attachment 1.]

The second item concerns the supporting information regarding the proposed excess emissions language for the cold startup of the CT/HRSG systems. The Foster Wheeler requirement for cold start is found as paragraph, 6.3.3 Cold Start. In addition, the heat soak requirement specified by Foster Wheeler is found in paragraph 6.3.3.7. The HP Drum Temperature and Pressure During Cold Startup is shown as Figure 6-2. This information is attached [Attachment 2]

Thank you for your prompt attention to the issues raised in this correspondence. Please do not hesitate to contact me at (561) 691-7057 if I may be of further assistance.

Sincerely,

Roxane Kennedy
General Plant Manager
Sanford Power Plant
Florida Power & Light Company

ATTACHMENT PSNFS_14a**COMPLIANCE REPORT AND PLAN**

The facility and emissions units identified in this application are in compliance with the Applicable Requirements identified in Sections II.B. and III.D. of the application form and attachments referenced in Section III.L. 12 (if included). Compliance is certified as of the date this application is submitted to the Florida Department of Environmental Regulation as required in Rule 62-213.420(1)(a) F.A.C.

COMPLIANCE PLAN FOR DISTILLATE OIL FIRING

Sanford Combustion Turbines 5A through 5D are equipped with dual fuel combustors for firing natural gas and distillate fuel oil. Compliance has been demonstrated for natural gas firing. When firing fuel oil, the combustion turbine will be operated according to the manufacturer specifications for NO_x control. Water injection is used to control NO_x with the amount of water based on the manufacturer requirements to achieve 42 ppmvd corrected to 15 percent oxygen. The amount of water is automatically regulated by the manufacturer's control system. This compliance plan, for distillate oil firing, follows the requirements of the air construction permit 1270009-004-AC and PSD-FL-270.

- The Department will be notified of the actual date of initial operation using distillate oil within 15 days of such date.
- Emission limiting standards for NO_x, CO, VOC, SO₂ and PM/Visibility as identified in Specific Condition III. 18 will be demonstrated on each unit within 60 days of achieving the maximum production rate when firing distillate fuel oil, but no later than 180 days of initial operation on distillate fuel oil.
- Initial performance tests for NO_x, CO, VOC, and PM/Visibility will be conducted using the methods identified in Specific Condition III. 28.
- Compliance with SO₂ emission requirements will be demonstrated through fuel analyses (i.e., 0.05% sulfur or less) as identified in Specific Condition III. 30.
- The Department's Central District will be notified in writing at least 30 days prior to the initial compliance tests.
- Compliance test results will be submitted to the Department's Central District no later than 45 days after the last test run.
- Continuous compliance for NO_x emissions when firing distillate oil will be demonstrated using CEM systems and based on a 24-hour block average as described in Specific Condition III. 30.



6.3.3 COLD START-UP

Whenever the HP drum pressure is below 400 PSIG, or if it has been below 450 PSIG for over 1 hour, the cold start-up procedures is to be followed.

NOTE

THE FIRST THREE HRSG'S TO BE PLACED INTO SERVICE ARE TO BE DONE SO WITH THE LP SECTION ISOLATED. THIS IS DUE TO THE FACT THAT THE HP STEAM TURBINE IS REQUIRED TO BE BROUGHT ON LINE BEFORE THE LP STEAM TURBINE.

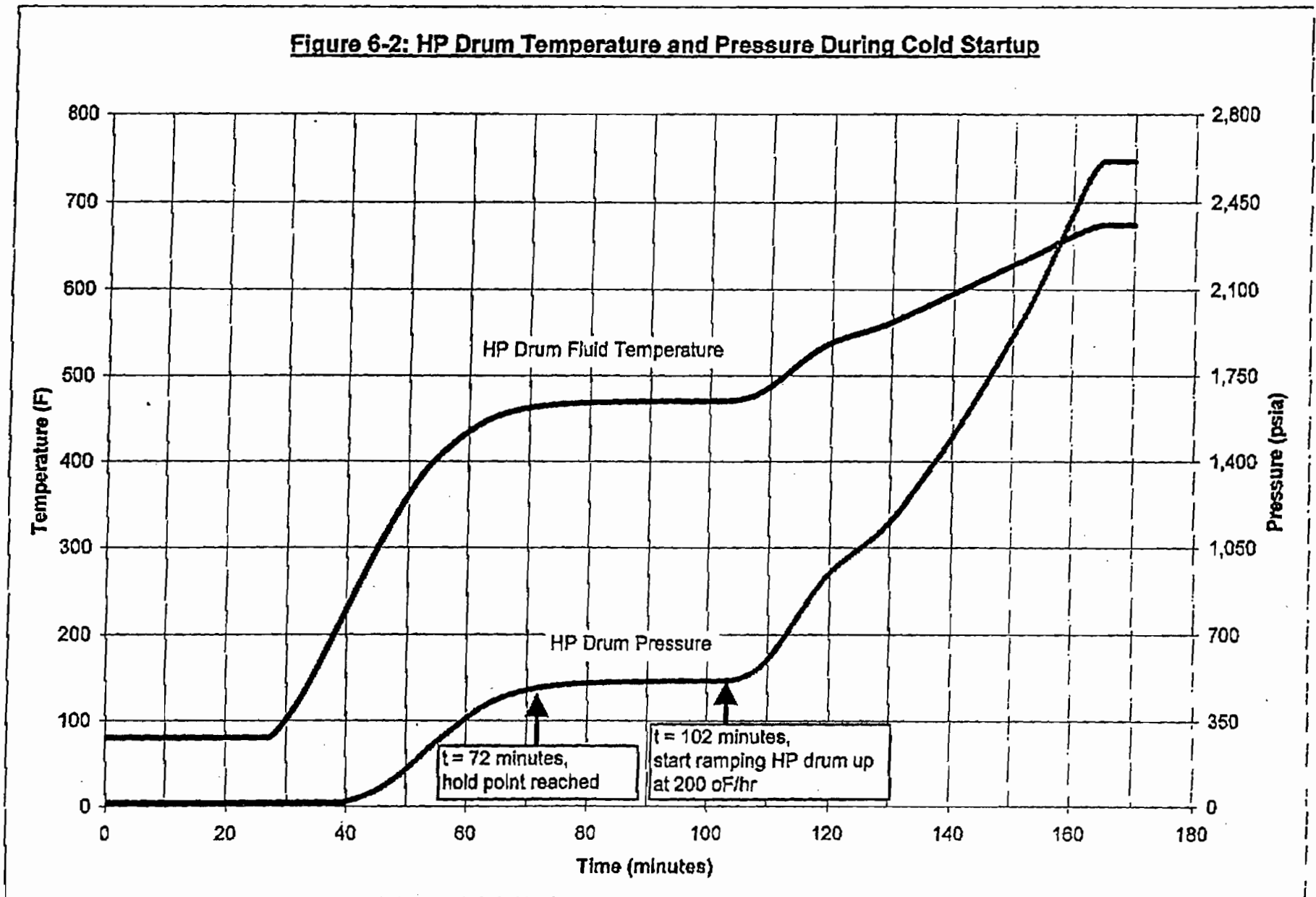
TO ISOLATE THE LP SYSTEM THE MAIN STEAM STOP (MBV-246) SHOULD BE CLOSED AND THE ECONOMIZER BYPASSED VIA THE CLOSURE OF MBV-239 AND THE OPENING OF MBV-240

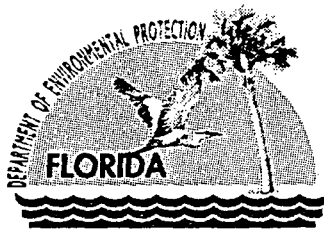
THE LP ECONOMIZER IS BYPASSED TO PREVENT THE ECONOMIZER SAFETY VALVE FROM LIFTING DURING THIS PERIOD.

- 6.3.3.1 Refer to Figures 6-1 through 6-7 for the suggested start-up curves.
- 6.3.3.2 Start the condensate and feedwater pump(s); maintain drum level slightly above the low-level alarm. Monitor the drum levels closely as the feedwater control valves may leak through.
- 6.3.3.3 Start the LP Economizer recirculation pump.
- 6.3.3.4 Initiate the Combustion Turbine (CT) ignition and bring CT to full speed, no load or sync idle condition.
- 6.3.3.5 Make sure that Figures 6-1 through Figure 6-7 are followed at all times. The pressure on the HP, IP and LP drums can be controlled by the production of steam from each of the boiler systems. The steam of each pressure system can be vented through the superheater start-up vent (motorized valves MBV-253, MBV-347, MBV-460 and MBV-515) or run through a steam turbine bypass station (by others), or a combination of both.
- 6.3.3.6 Until the HP steam turbine is operational, the HP steam outlet should be run through a pressure reducing valve and desuperheater station (by others), it is then fed to the re-heater to cool the re-heater tubes.
- 6.3.3.7 It is imperative that the HP drum pressure be held at 450 PSI for a minimum of 30 minutes in a "soak period" to allow for the equalization of thermal stresses on the unit, as shown in Figure 6-2.
- 6.3.3.8 The HP steam drum is furnished with thermocouples located at the top and bottom of the drum. Always make sure there is not more than 210°F difference between the top and the bottom of the drum.

Florida Power and Light
Fort Myers Repowering Project

Figure 6-2: HP Drum Temperature and Pressure During Cold Startup





Jeb Bush
Governor

Department of Environmental Protection

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

David B. Struhs
Secretary

October 10, 2002

CERTIFIED MAIL – Return Receipt Requested

Ms. Roxane Kennedy
Plant General Manager and Responsible Official
FPL Sanford Plant
950 South Highway 17-92
DeBary, Florida 32713

RE: Title V Air Operation Permit Revision Request to Incorporate the Repowering Action for Unit 5
1270009-007-AV/1270009-008-AC/PSD-FL-270(A)

Dear Ms. Kennedy:

On August 21, 2002, the Department received a revision request to incorporate the repowering action for Unit 5. Based on our review of the proposed project, we have determined that the following additional information is needed in order to continue processing this application package. Please provide all assumptions, calculations, and reference material(s), that are used or reflected in any of your responses to the following issues:

1. Please provide a Compliance Plan pursuant to Rule 62-213.440(2), F.A.C., to address the firing of fuel oil, which is a method of operation allowed by air construction permit, No. 1270009-004-AC/PSD-FL-270.
2. Please provide the supporting information regarding the proposed excess emissions language change for the cold startup of the CT/HRSG systems.

The Department will resume processing this application after receipt of the requested information. If you have any questions regarding this matter, please call Bruce Mitchell at (850)413-9198.

Sincerely,

A. A. Linero, P.E.
Bureau of Air Regulation

CHF/bm

cc: Kay Prince, U.S. EPA, Region 4
Chris Kirts, DEP - NED
David A. Buff, P.E., GAI
Mary Archer, Application Contact, FPL



Jeb Bush
Governor

Department of Environmental Protection

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

David B. Struhs
Secretary

October 10, 2002

CERTIFIED MAIL – Return Receipt Requested

Ms. Roxane Kennedy
Plant General Manager and Responsible Official
FPL Sanford Plant
950 South Highway 17-92
DeBary, Florida 32713

RE: Title V Air Operation Permit Revision Request to Incorporate the Repowering Action for Unit 5
1270009-007-AV/1270009-008-AC/PSD-FL-270(A)

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1. Please provide a Compliance Plan pursuant to Rule 62-213.440(2), F.A.C., to address the firing of fuel oil, which is a method of operation allowed by air construction permit, No. 1270009-004-AC/PSD-FL-270.
2. Please provide the supporting information regarding the proposed excess emissions language change for the cold startup of the CT/HRSG systems.

The Department will resume processing this application after receipt of the requested information. If you have any questions regarding this matter, please call Bruce Mitchell at (850)413-9198.

Sincerely,

A. A. Linero, P.E.
Bureau of Air Regulation

CHF/bm

cc: Kay Prince, U.S. EPA, Region 4
Chris Kirts, DEP - NED
David A. Buff, P.E., GAI
Mary Archer, Application Contact, FPL

"More Protection, Less Process"

Printed on recycled paper.

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603



RECEIVED

August 20, 2002

AUG 21 2002

0237560

BUREAU OF AIR REGULATION

Mr. C. H. Fancy, P.E., Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

RE: FPL SANFORD PLANT
Title V Revision to Include Repowered Unit 5
DEP File No. 0270009-001-AC (PSD-FL-328)

Attention: Mr. Scott M. Sheplak, P.E. Administrator, Title V Section

Dear Scott:

On behalf of Ms. Roxane Kennedy of Florida Power & Light Company's Sanford Plant, I am submitting a Title V permit revision to include the repowered Unit 5. This unit was part of the Sanford Repowering Project that included Units 4 and 5 (Air Construction Permit 1270009-004-AC and PSD-FL-270). Unit 5 is in operation and the application reflects the applicable requirements contained in the air construction and PSD permit issued for the Project.

Unit 5 was repowered using four General Electric Frame 7FA combustion turbines and associated heat recovery steam generators. The fuel used in Unit 5 is natural gas and compliance has been demonstrated on this fuel. Each gas turbine has the capability to fire oil. While fuel oil firing has not yet occurred, compliance will be demonstrated within 60 days after achieving the maximum production rate when firing oil on each unit, but no later than 180 days following initial oil operation of each unit.

FPL is requesting a minor change to the Air Construction Permit regarding excess emissions for the cold startup of the combustion turbine and heat recovery steam generator (HRSG) systems. Rather than a specific time being used as a criterion for determining a cold startup of the CT/HRSG, it is more appropriate to use the pressure in the HP steam drum. Information regarding change in criteria was submitted to the Department for the Fort Myers Repowering Project. The proposed condition change, described below, was approved for the Fort Myers Repowering Project that uses the same equipment (CT/HRSG) as the Sanford Repowering Project.

Change First Bullet From:

24. Excess Emissions Requirements:

- Excess emissions resulting from startup, shutdown, or malfunction of the *combustion turbines and heat recovery steam generators* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period except during both "cold start-up" to or shutdowns from combined cycle operation. During cold start-up to combined cycle operation up to four hours of excess emissions are allowed. During shutdowns from combined cycle operation up to three hours of excess emissions are allowed. Cold start-up is defined as a startup to combined cycle operation following a complete shutdown lasting at least 48 hours.

To:

24. Excess Emissions Requirements:

- Excess emissions resulting from startup, shutdown, or malfunction of the *combustion turbines and heat recovery steam generators* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period except during "cold start-up" to or shutdowns from combined cycle operation. During cold start-up to combined cycle operation, up to four hours of excess emissions are allowed. During shutdowns from combined cycle operation, up to three hours of excess emissions are allowed. Cold start-up is defined as a startup to combined cycle operation when the heat recovery steam generator high-pressure drum is below 450 psig for at least one hour.

No change is required for the cold startup of steam turbine system.

Please contact either Ms. Mary Archer, the FPL application contact [phone (561) 691-7057], or myself if there are any questions.

Sincerely,

GOLDER ASSOCIATES INC.



Kennard F. Kosky, P.E.

Principal

KFK/arz

Enclosures

cc: Ms. Roxane Kennedy, FPL Sanford Plant
Ms. Mary Archer, FPL Environmental Services
Mr. Randy Hopkins, FPL Sanford Plant

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603



TRANSMITTAL LETTER

**To: Scott M. Sheplak, P.E.
FDEP, Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399**

**Date: August 20, 2002
Project No.: 0237560-0100**

Sent by: ARZ

- Mail
- Air Freight
- Hand Carried

- UPS
- Federal Express

Per: Kennard F. Kosky, P.E.

Quantity	Item	Description
4	Application for Title V Revision to include Repowered Unit 5 (DEP File No. 0270009-001-AC and PSD-FL-328)	FPL Sanford Plant

**cc: L. Koslov, FDEP Central District
R. Kennedy, FPL Sanford
R. Hopkins, FPL Sanford
M. Archer, FPL Env. Services**

RECEIVED
AUG 21 2002
BUREAU OF AIR REGULATION

(FOR INTERNAL USE ONLY)

State of Florida summary checklist for Title V permit applications (cont'd)

II. Application logging.

1270009 - 006-AC

*Bartum, Nels
an AC also*

ARMS Permit Number assigned 1270009-005-AV

logged into ARMS by initials BJA date 8/22/09

III. Initial distribution of application.

a. Disposition of 4 paper/electronic copies submitted:

1- Clean originals to file? Y___ N___

1- ___ District Y___ N___

1- ___ County [affected local program]? Y___ N___

1- Permit engineer(s) _____, _____

b. Disposition of electronic files submitted:

copy placed onto PC? Y___ N___

c. Disposition of ELSA submitted:

version used [circle]: 1.0 1.1 1.2.1 1.3 1.3a 1.3b

Uploaded to EARS? Y___ N___

by _____ date ___/___/___

d. Electronic information submitted previewed? Y___ N___ N/A___

Comment(s): _____

{this checklist was developed from Rule 62-213.420(1)(b)2., F.A.C. and DARM policy}

State of Florida summary checklist for Title V permit applications

Facility Owner/Operator Name: FPL
Facility ID No.: 1270009 Site Name: Sanford Plant
County: Volusia
application receipt date 08/21/02

I. Preliminary scanning of application submitted.

- a. Was application submitted to correct permitting authority? Y N
- b. Was an application filed? Y* N
- c. Was the application filed timely? Y* N
- d. Application format filed [check one].
Hard copy of official version of form? ELSA?
A facsimile of official version of form? Some combination?
e. 4 copies (paper/electronic) submitted? Y N
- f. Electronic diskettes protected/virus scanned/marked? Y N N/A
by _____ date ____/____/____
- g. Entire hard copy of Section I. provided (Pages 1-11 of form)? Y N
Facility identified (Page 1)? [if not complete a Page 1] Y* [Attached _____]
R.O. certification signed and dated (Page 2)? Y* N
P.E. certification signed and dated (Page 7)? Y* N
- h. Any confidential information submitted? Y N
If yes, R.O. provided hard copy to us and EPA? Y* N
If yes, hard copy locked up and note filed with application? Y* N
- i. Type of application filed.
TV renewal application only? Y N
Initial TV application only? AC modification also Y N
All units demonstrated initial compliance? Y N
If, not included compliance plan? Y N
Any units subject to acid rain? Y N
- j. CAM Plan submitted? Y N

Note(s): [*] = mandatory.

Comment(s): _____

Reviewer's initials JWS date 08/22/02 Concurrence initials _____ date ____/____/____

PERMITTEE:

Florida Power & Light Company
Sanford Power Plant
950 South Highway 17-92
DeBary, Florida 32713

Permit No.	1270009-004-AC (PSD-FL-270)
Project:	2200 MW Repowering Project
SIC No.	4911
Expires:	December 31, 2003

Authorized Representative:

Roxane Kennedy
Plant General Manager

PROJECT AND LOCATION:

Permit to install eight (8) combined cycle units to replace two (2) residual oil-fired and gas-fired steam boiler generating units. Each combined cycle unit is a 170 megawatt General Electric MS7241FA gas-fired combustion turbine-generator with an unfired heat recovery steam generator (HRSG) that will capture sufficient waste heat to produce another 80 MW via the existing steam-driven electrical generators. The boilers and the tall stacks associated with two existing residual oil-fired and gas-fired units (872 MW total capacity for Units 4 and 5) will be dismantled and replaced by relatively short stacks per unit for simple cycle (Repowered Unit 4 only) and combined cycle operation. The project also includes a helper cooling tower for once-through cooling pond water and small heaters with individual 10-foot stack to heat the natural gas prior to use during simple cycle operation and cold start-ups.

This facility is located at 950 South Highway 17-92, DeBary, Volusia County. UTM coordinates are: Zone 17; 468.3 km E and 3,190.3 km N.

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

ATTACHED APPENDIX MADE A PART OF THIS PERMIT:

Appendix GC

Construction Permit General Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

AIR CONSTRUCTION PERMIT 1270009-004-AC and PSD-FL-270

SECTION I. FACILITY INFORMATION

FACILITY DESCRIPTION

Currently, this facility generates electric power from three residual fuel oil-fired and gas-fired steam units with a combined generating capacity of 1,028 megawatts (MW).

This permitting action (approximately 2,200 MW Repowering Project) is to install eight (8) combined cycle units to replace two (2) residual oil-fired and gas-fired steam generating boiler units; existing steam turbines will remain. Each combined cycle unit is a 170 megawatt General Electric MS7241FA gas-fired combustion turbine-generator with an unfired heat recovery steam generator (HRSG) that will capture sufficient waste heat to produce another 80 MW via the existing steam-driven electrical generators. The boilers and the tall stacks associated with two existing residual oil-fired and gas-fired units (872 MW total capacity) will be dismantled and replaced by relatively short stacks per unit for simple cycle and combined cycle operation. The project also includes a helper cooling tower for once-through cooling pond water and small heaters with individual 10-foot stacks to heat the natural gas prior to use during simple cycle operation and cold start-ups.

This Project is exempt from the requirements of Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) as stated in the Technical Evaluation and Preliminary Determination dated July 30, 1999, for all pollutants except Volatile Organic Compounds (VOCs).

EMISSION UNITS

This permit addresses the following emission units:

EMISSION UNIT NO.	SYSTEM	EMISSION UNIT DESCRIPTION
004-011	Power Generation	Eight (8) Combined Cycle Combustion Turbine-Generators with Unfired Heat Recovery Steam Generators
012-019	Fuel Heating	Natural Gas Heater(s)
020	Water Cooling	Mechanical Draft Cooling Tower

REGULATORY CLASSIFICATION

This facility, FPL Sanford Power Plant, is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM₁₀), sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

AIR CONSTRUCTION PERMIT 1270009-004-AC and PSD-FL-270

SECTION I. FACILITY INFORMATION

This facility is a major source of hazardous air pollutants (HAPs) and is also subject to the provisions of Title IV, Acid Rain, Clean Air Act as amended in 1990.

PERMIT SCHEDULE

- 8/5/99 Notice of Intent published in the News Journal
- 7/30/99 Distributed Intent to Issue Permit
- 6/15/99 Received Application

RELEVANT DOCUMENTS:

The documents listed below are the basis of the permit. They are specifically related to this permitting action, but not all are incorporated into this permit. These documents are on file with the Department.

- Application received on June 15, 1999
- U.S. Fish and Wildlife Service comments dated June 22, 1999
- Department's Intent to Issue and Public Notice Package dated July 30, 1999.
- FPL's comments dated August 17, 1999.

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SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (DEP), at 2600 Blairstone Road, Tallahassee, Florida 32399-2400 and phone number (850)488-0114. All documents related to reports, tests, and notifications should be submitted to the DEP Central District office, 3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803-3767 and phone number (407) 894-7555.(F-wCs11 & 12)
2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.](TV-4)
3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
4. Forms and Application Procedures: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
5. Modifications: The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change. [Chapters 62-210 and 62-212](SCB.62.)
6. Permit Extension: *This permit expires on December 31, 2003.* The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rule 62-4.080, F.A.C.].
7. Application for Title V Permit: An application for a Title V operating permit, pursuant to Chapter 62-213, F.A.C., must be submitted to the DEP's Bureau of Air Regulation, and a copy sent to the Department's Central District office. [Chapter 62-213, F.A.C.] The application shall reflect the plant-wide emission caps requested in this proposed repowering project. [Applicant's Request]
8. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.](TV-4)

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9. Annual Reports: Pursuant to Rule 62-210.370(2), F.A.C., Annual Operation Reports, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. Annual operating reports shall be sent to the DEP's Central District office by March 1st of each year. **(TV-4)**
10. Stack Testing Facilities: Stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C. **(SCB.B.37.)**
11. Quarterly Reports: Quarterly excess emission reports, in accordance with 40 CFR 60.7 (a)(7) (c) (1998 version), shall be submitted to the DEP's Central District office. **(SCB.B.59.)**

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SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

APPLICABLE STANDARDS AND REGULATIONS:

1. Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-214, 62-296, and 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Parts 60, 72, 73, and 75.
2. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.] (TV-4)
3. These emission units shall comply with all applicable requirements of 40 CFR 60, Subpart A, General Provisions including:
 - 40 CFR 60.7, Notification and Recordkeeping
 - 40 CFR 60.8, Performance Tests
 - 40 CFR 60.11, Compliance with Standards and Maintenance Requirements.(SCB.18.)
 - 40 CFR 60.12, Circumvention(SCB.7.)
 - 40 CFR 60.13, Monitoring Requirements
 - 40 CFR 60.19, General Notification and Reporting requirements
4. ARMS Emission Units 004 through 011, Power Generation, consisting of eight ((nominal) 170 MW combustion turbines (250 MW in combined cycle operation)(Description of Section I, Subsection B.)), shall comply with all applicable provisions of 40CFR60, Subpart GG, Standards of Performance for Stationary Gas Turbines, adopted by reference in Rule 62-204.800(7)(b), F.A.C. ("Permitting Note:" under Description. Section III, Subsection B.) The Subpart GG requirement to correct test data to ISO conditions applies. However, such correction is not required to demonstrate compliance with non-NSPS permit standard(s).("NOTE:" under SCB.7.)
5. ARMS Emission Unit 012-019, Fuel Heating, shall comply with all applicable provisions in this permit.(Obsolete)
6. ARMS Emission Unit 020, Cooling Tower, is an unregulated emission unit.
7. All notifications and reports required by the above specific conditions shall be submitted to the DEP's Central District office.(F-wC 11.)

GENERAL OPERATION REQUIREMENTS

8. Fuels: Pipeline natural gas shall be the primary fuel fired in these units. When gas is not available, up to 28,600,000 gallons per year of distillate oil (0.05% sulfur) is authorized for repowered Unit 5; (ARMS emission units ~~008009-011~~012). [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)](ID change and SCB.3.)

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SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

9. Turbine Capacity: The design heat input rates for natural gas firing, based on the high heating value (HHV) of the fuel to *each* combustion turbine at compressor inlet conditions of 59°F, 60% relative humidity, 100% load, and 14.7 psia is 1,776 million Btu per hour (MMBtu/hr). The design heat input for oil firing is 1,930 MMBtu/hr (HHV, 60% relative humidity, 100% load, 59°F compressor inlet and 14.7 psia). This design heat input rate will vary depending upon turbine inlet conditions and the combustion turbine characteristics. Manufacturer's curves corrected for site conditions or equations for correction to other compressor inlet conditions shall be provided to the Department of Environmental Protection (DEP) within 45 days of completing the initial compliance testing. [Design, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)](SCB.1.)
10. Gas Heaters (GHs): The design heat input rate, based on the lower heating value (LHV) of the fuel to the GHs at ambient conditions of 59°F, 60% relative humidity, 100% load, and 14.7 psia is 176 MMBtu per hour (Obsolete)
11. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary.(F-wC 8.)
12. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the DEP Central District office as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.](TV-4)
13. Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]
14. Circumvention: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.](TV-4)
15. Maximum Annual Allowable Hours of operation for each of the eight combustion turbines, the cooling tower, and the gas heaters (ARMS Emission Units 004-020) are 8,760. [Applicant Request, Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)](SCB.4. and Obsolete)

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SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

16. Dry Low NO_x (DLN) combustors shall be installed on each stationary CT to control nitrogen oxides (NO_x) emissions. Water injection shall be installed in each CT for Repowered Unit 5 to control NO_x when firing distillate oil. [Design, Rule 62-4.070(3), F.A.C.](SCB.5.)
17. The permittee shall provide manufacturer's emissions performance versus load diagrams for the DLN systems prior to their installation. DLN systems shall each be tuned upon initial operation to optimize emissions reductions, consistent with normal operation and maintenance practices, and shall be maintained to minimize NO_x emissions and CO emissions, consistent with normal operation and maintenance practices. [Rules 62-4.070(3) and 62-210.650, F.A.C.](SCB.6.)

EMISSION LIMITS AND STANDARDS

18. Following are the emission limits determined for this project assuming full load. Values for NO_x are corrected to 15% O₂ on a dry basis. These limits or their equivalents in terms of pounds per hour, as well as the applicable averaging times, are followed by the applicable specific conditions. [Applicant Requests, Rules 62-204.800(7)(b) (Subparts GG), 62-210.200 (Definitions-Potential Emissions), F.A.C.].

Emission Unit	NO _x	CO	VOC	PM/Visibility (% Opacity)	Technology and Comments
Combustion Turbines (each)	9 ppm (30 day) - gas 42 ppm - oil 75/110 ppm (NSPS)	12 ppmvd - gas 20 ppmvd - oil	1.4 ppmvd 7 ppmvw	10 - gas 20 - oil	Dry Low NO _x Combustors Natural Gas or 0.05% S Fuel Oil Good Combustion Water Injection on Fuel Oil
Gas Heaters	0.10 lb/mmBtu	0.15 lb/mmBtu		10	Low NO _x Burners

(SCB.8.)

19. Nitrogen Oxides Emissions Limits:

- Natural Gas Firing: The NO_x concentrations in the exhaust gas of each CT shall not exceed 9 ppmvd at 15% O₂ on a 30-day rolling average basis when firing natural gas as measured by the CEMS (maintained in accordance with 40 CFR 75). Based on CEMS data at the end of each operating day, a new 30-day average rate is calculated from the arithmetic average of all valid hourly emission rates during the previous 30 operating days. Valid hourly emission rates shall not include periods of startup, shutdown or malfunction. In addition, NO_x emissions calculated as NO₂ shall exceed neither 9 ppmvd at 15% O₂ nor 65 lb/hr (at ISO conditions) to be demonstrated by initial performance test.(SCB.9.)
- Distillate Oil Firing - The NO_x concentrations in the exhaust gas of each CT shall not exceed 42 ppmvd at 15% O₂ on a 24-hour block average basis when firing distillate oil as measured by the CEMS (maintained in accordance with 40 CFR 75). Based on CEMS data at the end of each operating day, a new 24-hour average rate is calculated from the arithmetic average of all valid hourly emission rates during the previous day. Valid hourly emission rates shall not include periods of startup, shutdown or malfunction. In addition, NO_x emissions calculated as NO₂

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shall exceed neither 42 ppm at 15% O₂ nor 355 lb/hr (at ISO conditions) to be demonstrated by initial distillate oil-firing performance test. (SCB.9.)

- When NO_x monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate the 30 day rolling average or 24-hour block average emission rates. (SCB.9.)
 - NO_x emission limit from the gas heaters shall not exceed 0.10 lb/mmBtu (at ISO conditions) to be demonstrated by representative stack test on one unit. The permittee may construct one heater within the heat input limit specified in Specific Condition 10. If the unit is classified as a “steam generating unit” in 40 CFR 60.41b, than the requirements of 40 CFR Subpart Db apply. (Obsolete)
20. Visible Emissions (VE): VE emissions from the combustion turbines shall not exceed 10 percent opacity during gas firing and 20 percent opacity during oil firing. Visible emissions from the gas heaters shall not exceed 10 percent opacity. (SCB.10.)
21. Carbon Monoxide (CO) emissions: The concentration of CO (@15% O₂ in the exhaust gas shall not exceed 12 ppmvd when firing natural gas and 20 ppmvd when firing distillate oil as measured by EPA Method 10 at full-load conditions. CO emissions (at ISO conditions) shall not exceed 43 lb/hr (per CT) when firing natural gas and 71.6 lb/hr (per CT) when firing distillate oil to be demonstrated by stack test. (SCB.11.)
22. Volatile Organic Compounds (VOC) Emissions: The concentration of VOC in the exhaust gas shall not exceed 1.4 ppmvd when firing natural gas and 7 ppmvw when firing distillate oil as determined by EPA Methods 18 or 25 A. VOC emissions (at ISO conditions) shall not exceed 2.9 lb/hr per CT when firing natural gas and 16.1 lb/hr when firing distillate oil to be demonstrated by initial stack test. (SCB.12.)
23. Sulfur Dioxide (SO₂) emissions: As per Condition 8. (SCB.13.)

EXCESS EMISSIONS

24. Excess Emissions Requirements:
- Excess emissions resulting from startup, shutdown, or malfunction of the *combustion turbines and heat recovery steam generators* shall be permitted provided that best operational practices are adhered to and the duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed two hours in any 24-hour period except during both “cold start-up” to or shutdowns from combined cycle operation. During cold start-up to combined cycle operation, up to four hours of excess emissions are allowed. During shutdowns from combined cycle operation, up to three hours of excess emissions are allowed. Cold start-up is defined as a startup to combined cycle operation following a complete shutdown lasting at least 48 hours.
 - Excess emissions from the combustion turbines resulting from startup of the *steam turbines system* shall be permitted provided that best operational practices are adhered to and the

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duration of excess emissions shall be minimized. Excess emissions occurrences shall in no case exceed 12 hours ^{per CT} per cold startup of the steam turbine system.

[Applicant Request (FPL estimates that, on average, there will be approximately 12 startups to combined-cycle operation per year), G.E. Combined Cycle Startup Curves Data and Rules 62-210.700, 62-4.130 F.A.C.].(SCB.14.)

25. Excess emissions entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C. (SCB.15.)
26. Excess Emissions Report: If excess emissions occur for more than two hours due to malfunction, the owner or operator shall notify DEP's Central District office within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, all excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. Following this format, 40 CFR 60.7, periods of startup, shutdown, malfunction, and fuel switching shall be monitored, recorded, and reported as excess emissions when emission levels exceed the permitted standards listed in **Specific Condition No. 18 and 19**. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C., and 40 CFR 60.7 (1998 version)](SCB.48.)

COMPLIANCE DETERMINATION

27. Compliance with the allowable emission limiting standards shall be determined within 60 days after achieving the maximum production rate at which each unit will be operated, but not later than 180 days following initial operation of the unit, and annually thereafter as indicated in this permit, by using the following reference methods as described in 40 CFR 60, Appendix A (1998 version), and adopted by reference in Chapter 62-204.800, F.A.C.
28. Initial (I) performance tests shall be performed pursuant to 40 CFR Subpart GG. Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.310(7), F.A.C., on each CT as indicated. The following reference methods shall be used. No other test methods may be used for compliance testing unless prior DEP approval is received in writing.
- EPA Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" (I, A).
 - EPA Reference Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources" (I, A).
 - EPA Reference Method 20, "Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines." Initial test only for compliance with 40CFR60 Subpart GG.

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- EPA Reference Method 18, and/or 25A, "Determination of Volatile Organic Concentrations." Initial test only.
- EPA Reference Method 19, "Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates". Method 19 shall be used only for the calculation of lb/mmBtu and 40 CFR 75 shall be used to calculate mmBtu/hr and lb/hr emissions rates from stack tests. Initial test only.

29. Continuous compliance with the NO_x emission limits:

- Continuous compliance with the NO_x emission limits when firing natural gas shall be demonstrated with the CEM system based on a 30-day rolling average. Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and a new 30 day average emission rate is calculated from the arithmetic average of all valid hourly emission rates during the previous 30 operating days. Valid hourly emission rates shall not include periods of startup, shutdown, or malfunction. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., and 40 CFR 75]
- Compliance with the NO_x emission limits when firing oil shall be demonstrated with the CEM system based on a 24-hour block average. Based on CEMS data, a separate compliance determination is conducted at the end of each operating day and is calculated from the arithmetic average of all valid hourly emission rates during the previous day. Valid hourly emission rates shall not include periods of startup, shutdown, or malfunction. A valid hourly emission rate shall be calculated for each hour in which at least two NO_x concentrations are obtained at least 15 minutes apart. [Rules 62-4.070 F.A.C., 62-210.700, F.A.C., and 40 CFR 75]

30. Compliance with the SO₂ and PM/PM₁₀ emission limits: Notwithstanding the requirements of Rule 62-297.340, F.A.C., the use of pipeline natural gas is the method for determining compliance for SO₂ and PM₁₀ when firing natural gas. The use of very low sulfur (0.05% or less) is the method of compliance for SO₂ and PM₁₀ when firing distillate oil.

For the purposes of demonstrating compliance with the 40 CFR 60.333, when firing natural gas, data from the pipeline natural gas supplier may be submitted or the natural gas sulfur content referenced in 40 CFR 75 Appendix D may be utilized. Gas analysis, if conducted, may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e) (1998 version). However, the applicant is responsible for ensuring that the procedures in 40 CFR 60.335 or 40 CFR 75 are used for determination of fuel sulfur content if gas analysis is done.

Compliance when firing distillate oil, shall follow the requirements of 40 CFR 60.33.4(a)(b)(1) using methods specified in ASTM 2880-96 (or latest version).

31. Compliance with CO emission limit: An initial test for CO, shall be conducted concurrently with the initial NO_x test while operating at permitted capacity. These initial NO_x and CO test results shall be the average of three runs. Annual compliance testing for CO may be conducted

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at less than capacity when compliance testing is conducted concurrent with the annual NOx RATA testing which is performed pursuant to 40 CFR 75.

32. Compliance with the VOC emission limit: An initial test is required to demonstrate compliance with the VOC emission limit. Thereafter, CO emission limit will be employed as a surrogate and no annual testing is required.
33. Testing procedures: Testing of emissions shall be conducted with the combustion turbine operating at permitted capacity. Permitted capacity is defined as 95-100 percent of the maximum heat input rate allowed by the permit, corrected for the average compressor inlet temperature during the test (with 100 percent represented by a curve depicting heat input vs. compressor inlet temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. In this case, subsequent operation is limited by adjusting the entire heat input vs. compressor inlet temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for compressor inlet temperature) and 105 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Test procedures shall meet all applicable requirements (i.e., testing time frequency, minimum compliance duration, etc.) of Chapter 62-204 and 62-297 F.A.C.
34. Test Notification: The DEP's Central District office shall be notified, in writing, at least 30 days prior to the initial performance tests and at least 15 days before annual compliance test(s).
35. Special Compliance Tests: The DEP may request a special compliance test pursuant to Rule 62-297.310(7), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission standard is being violated.
36. Test Results: Compliance test results shall be submitted to the DEP's Central District office no later than 45 days after completion of the last test run.

NOTIFICATION, REPORTING, AND RECORDKEEPING

37. Records: All measurements, records, and other data required to be maintained by the permittee shall be recorded in a permanent form and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. These records shall be made available to DEP representatives upon request. (TV-4)
38. Emission Compliance Stack Test Reports: A test report indicating the results of the required compliance tests shall be filed with the DEP Central District Office as soon as practical, but no later than 45 days after the last sampling run is completed. [Rule 62-297.310(8), F.A.C.]. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.

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MONITORING REQUIREMENTS

39. Continuous Monitoring System: The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from each CT in accordance with the requirements of 40 CFR 75.
40. CEMS for reporting excess emissions: The NO_x CEMS may be used in lieu of the requirement for reporting excess emissions in 40 CFR 60.334(c)(1), Subpart GG (1998 version). Thirty day rolling average periods when NO_x emissions (ppmvd at 15% oxygen) are above the standards, listed in Specific Conditions No. 18 and 19, shall be provided to the DEP Central District Office within one working day (verbally) followed up by a written explanation not later than three (3) working days (alternately by facsimile). Excess Emissions and Monitoring System Performance Reports shall be submitted as specified in 40 CFR 60.7(c). CEM monitor downtime shall be calculated and reported according to the requirements of 40 CFR 60.7(c)(3) and 40 CFR 60.7(d)(2). Upon request from DEP, the CEMS emission rates for NO_x on each CT shall be corrected to ISO conditions to demonstrate compliance with the NO_x standard established in 40 CFR 60.332. [Rule 62-204.800 F.A.C., 40CFR75 and 40 CFR 60.7]
41. CEMS in lieu of Water to Fuel Ratio: The NO_x CEMS shall be used in lieu of the water/fuel monitoring system for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG (1998 version). The calibration of the water/fuel monitoring device required in 40 CFR 60.335(c) (2) (1998 version) will be replaced by the 40 CFR 75 certification tests of the NO_x CEMS. Upon request from DEP, the CEMS emission rates for NO_x on this Unit shall be corrected to ISO conditions to demonstrate compliance with the NO_x standard established in 40 CFR 60.332.
42. Continuous Monitoring System Reports: The monitoring devices shall comply with the certification and quality assurance, and any other applicable requirements of Rule 62-297.520, F.A.C., 40 CFR 60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5) or 40 CFR Part 75. Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F or 40 CFR 75. The monitoring plan, consisting of data on CEM equipment specifications, manufacturer, type, calibration and maintenance needs, and its proposed location shall be provided to the DEP Emissions Monitoring Section Administrator and EPA for review no later than 45 days prior to the first scheduled certification test pursuant to 40 CFR 75.62 .
43. Natural Gas Monitoring Schedule: The following custom monitoring schedule for natural gas is approved in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2):
 - The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.

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- The permittee shall submit a monitoring plan, certified by signature of the Designated Representative (DR), that commits to using a primary fuel of pipeline supplied natural gas (sulfur content less than 20 gr/100 scf pursuant to 40 CFR 75.11(d)(2)).
- Each unit shall be monitored for SO₂ emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

This custom fuel monitoring schedule will only be valid when pipeline natural gas is used as a primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO₂ emissions must be accounted for as required pursuant to 40 CFR 75.11(d).

44. Fuel Oil Monitoring Schedule: The following monitoring schedule for No. 2 or superior grade fuel oil shall be followed: For all bulk shipments of No. 2 or superior grade fuel oil received at the Sanford Station, an analysis which reports the sulfur content and nitrogen content of the fuel shall be provided by the fuel vendor. The analysis shall also specify the methods by which the analyses were conducted and shall comply with the requirements of 40 CFR 60.335(d).

45. Determination of Process Variables:

- The permittee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
- Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value [Rule 62-297.310(5), F.A.C](SCB.19.)

46. Facility-wide Emission Caps. The entire facility including repowered Units 4 and 5 and existing Unit 3, shall be limited to emission caps of 500 TPY of PM/PM₁₀, 4,500 TPY of NO_x, and 4,000 of SO₂. This limitation shall not become effective until 2003, following the initial startup testing and placing into commercial operation of repowered Units 4 and 5. [Applicant Request]

a. For the purpose of complying with the facility-wide emission cap, particulate matter emissions shall be calculated as follows:

Facility-wide Particulate Emissions (PM_{Total}) – Unit 3 PM emissions (PM₃) + Unit 4 PM emissions (PM₄) + Unit 5 PM emissions (PM₅) where

$$PM_4 = \text{annual heat input (mmBtu)} \times 0.0006 \text{ lb/mmBtu}$$

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$$PM_5 = PM_{5gas} + PM_{5oil}$$

$$PM_{5gas} = \text{annual gas operation heat input (mmBtu)} \times 0.006 \text{ lb/mmBtu}$$

$$PM_{5oil} = \text{annual oil operation heat input (mmBtu)} \times 0.01 \text{ lb/mmBtu}$$

$$PM_3 = PM_{3oil} + PM_{3gas}$$

$$PM_{3oil} = \text{Annual oil heat input (mmBtu)} \times \text{normalized annual stack test results (Fp), where}$$

$$Fp = [(\text{steady state PM test result} \times 16 \text{ hours}) + (\text{sootblowing PM test result} \times 8 \text{ hours})] / 24 \text{ hrs}$$

$$PM_{3gas} = \text{Annual gas operation heat input} \times 0.0076 \text{ lb/mmBtu}$$

- b. For the purpose of complying with the facility-wide emission cap, sulfur dioxide emissions shall be calculated by annually summing the data collected in the continuous emissions monitoring system required by Title IV of the Clean Air Act.
- c. For the purpose of complying with the facility-wide emission cap, nitrogen oxide emissions shall be calculated by annually summing the data collected in the continuous emissions monitoring system required by Title IV of the Clean Air Act. (F-wC 15.)

demonstrate compliance with the NOx standard established in 40 CFR 60.332. [Rule 62-204.800 F.A.C., and 40 CFR 60.7].

Specific Condition 46: FPL suggests the following language to make this specific condition enforceable, and to clarify when the facility-wide emissions caps take effect:

46. Facility-wide Emission Caps. The entire facility including repowered Units 4 and 5 and existing Unit 3, shall be limited to emission caps of 500 TPY of PM / PM₁₀, 4,500 TPY of NO_x, and 4,000 of SO₂. This limitation shall not become effective until 2003, following the Initial startup testing and placing into commercial operation of repowered Units 4 and 5. [Applicant Request]

a. For the purpose of complying with the facility-wide emission cap, particulate matter emissions shall be calculated as follows:

Facility-wide Particulate Emissions (PM_{Total}) = Unit 3 PM emissions (PM₃) + Unit 4 PM emissions (PM₄) + Unit 5 PM emissions (PM₅), where

PM₄ = annual heat input (mmBtu) x 0.006 lb. / mmBtu

PM₅ = PM_{gas} + PM_{oil}

PM_{gas} = annual gas operation heat input (mmBtu) x 0.006 lb. / mmBtu

PM_{oil} = annual oil operation heat input (mmBtu) x 0.01 lb. / mmBtu

PM₃ = PM_{oil} + PM_{gas}

PM_{oil} = Annual oil heat input (mmBtu) x normalized annual stack test results (Fp), where

Fp = [(steady-state PM test result x 16 hours) + (sootblowing PM test result x 8 hours)] / 24 hours

PM_{gas} = Annual gas operation heat input x 0.0076 lb. / mmBtu

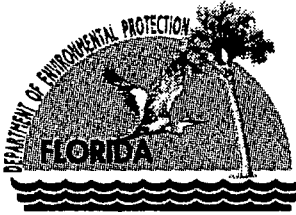
b. For the purpose of complying with the facility-wide emission cap, sulfur dioxide emissions shall be calculated by annually summing the data collected in the continuous emissions monitoring system required by Title IV of the Clean Air Act.

c. For the purpose of complying with the facility-wide emission cap, nitrogen oxide emissions shall be calculated by annually summing the data collected in the continuous emissions monitoring system required by Title IV of the Clean Air Act.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION:

Page TE-4, second-to-last sentence in the first paragraph: "The HRSGs will ~~raise steam~~ capture waste heat to repower the existing steam turbines thus producing approximately another 80 MW of electricity per unit or 2,200 for the eight combined cycle units."

In the second paragraph, second sentence: "Each turbine will have a nominal heat input of ~~4,600~~ 1,760 million BTUs per hour, lower heating value (MMBtu/hr, LHV) at 59°F. The HRSGs will not be



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DARM-OGG-07

SUBJECT: Guidance on Rate of Operation during Compliance
Testing for Combustion Turbines

DATE : March 1, 2000

This memo is to provide guidance on determining the rate of operation during compliance testing for combustion turbines (CTs).

The mass throughput rate of combustion turbines is inversely proportional to temperature and humidity measured at the CT inlet as a result of the changing air densities encountered. Inlet air temperature is the predominant factor; therefore, higher temperatures will result in a lower heat input rate (MMBtu/hr) and vice versa. The temperature is referenced to the CT inlet temperature rather than ambient temperature, as some CTs are equipped with inlet air conditioning systems (e.g., chillers or evaporative coolers) to maintain optimum operating temperature. Inlet air temperature and ambient temperature are equivalent in cases where no conditioning systems are used. Variations of heat input (capacity) are to be expected due to the range of ambient temperatures and humidities encountered in Florida. Over the usual operating ranges, the CT operating curve (capacity vs. inlet air temperature) is essentially a straight line.

The determination of the rate of CT operation during compliance testing is illustrated in the following example. The heat input limit is often referenced to 59°F, and in this example, corresponds to 750 MMBtu/hr (Point A). On the date that compliance testing is conducted, the average ambient (or conditioned) air temperature during the test period is determined to be 80°F. According to the attached curve, the maximum design heat input rate achievable is 700 MMBtu/hr (Point B). The CT has successfully achieved 90 percent of its maximum permitted capacity for this temperature if it is determined to be operating at 630 MMBtu/hr or more (Point C). In this example, the dashed line represents 90 percent of the maximum heat input value achievable over a range of inlet air temperatures. Heat input may vary depending on CT characteristics; therefore, manufacturer's curves for correction to other temperatures shall be provided to the Department, if a source intends to use the curves for compliance purposes. At the request of a permittee, the following conditions may be incorporated into the construction and corresponding operating permits:

1. An owner or operator may use manufacturer's curves or tables in determining the maximum heat input or fuel usage rate for compliance testing. These curves or tables relate compressor inlet conditions to heat input or fuel usage rate and are part of the permit. The data shall have a resolution of 1% of the maximum heat input or fuel usage rate. Inlet condition monitoring shall

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Guidance on Rate of Operation

Page 2

include compressor inlet temperature with optional monitoring of inlet pressure and/or moisture levels when these parameters are also used to correct heat input or fuel usage rate.

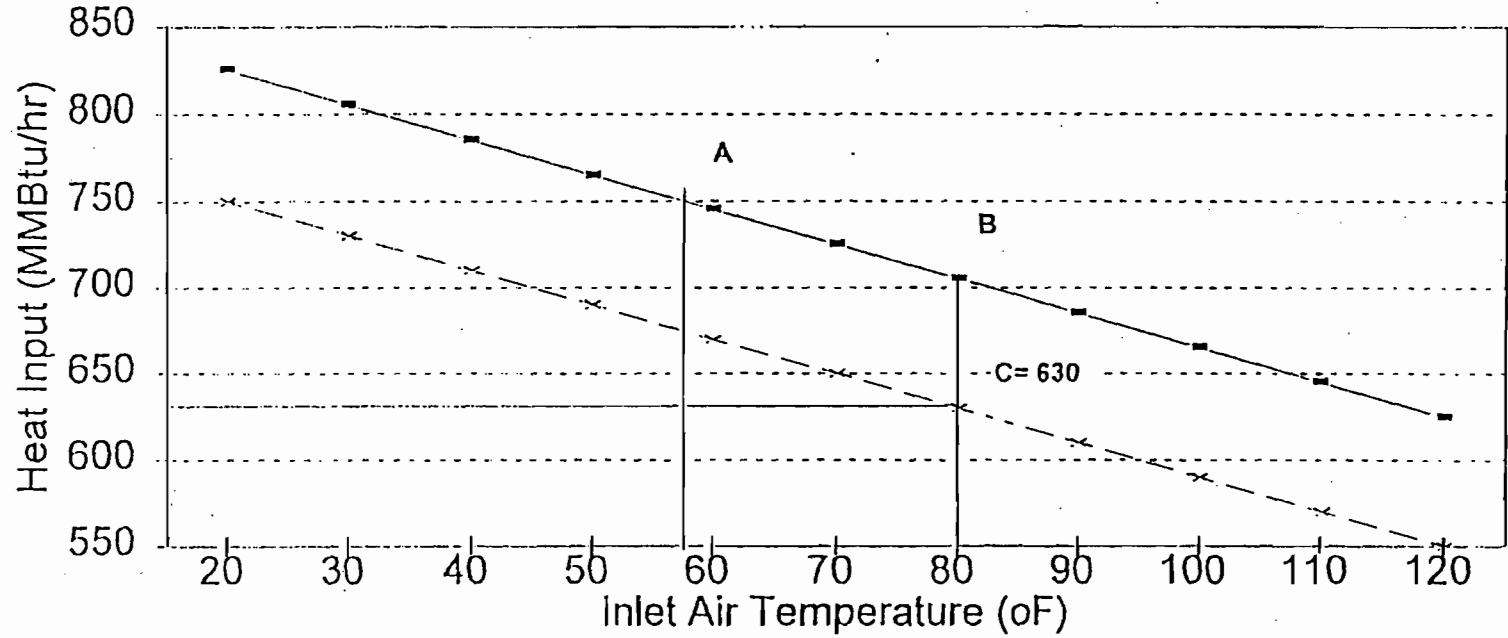
2. Compliance testing of emissions shall be conducted with the combustion turbine operating at capacity. Capacity is defined as 90-100 percent of the manufacturer's rated heat input achievable for the average compressor inlet conditions during the test. If it is impracticable to test at capacity, then combustion turbines may be tested at less than capacity. In such cases, the entire curve or table shall be adjusted downwards by the increment which reflects the reduced rate of operation at which compliance was demonstrated. This increment is equal to the difference between the manufacturer's heat input or fuel usage value and 110 percent of the value reached during the test. In this case, the data and calculations necessary to demonstrate the heat input or fuel usage rate correction shall be submitted to the Department with the compliance test report.

3. To demonstrate compliance with 40 CFR 60.330 federal New Source Performance Standard (NSPS) Subpart GG - Standards of Performance for Stationary Gas Turbines, an initial test shall be conducted at four load points and corrected to International Standards Organization (ISO) conditions for comparison to the NSPS allowable. Subsequent annual compliance tests conducted to establish compliance with NO_x limits that are more stringent than the NSPS standard shall not require an ISO correction or testing at four load points; rather, the testing shall be conducted at capacity, as defined above. However, when the Department has reason to believe that NO_x emissions exceed an applicable NO_x standard (based on emissions data from CEMS or stack testing, or based on fuel quality) the Department may require that the company conduct emissions testing at four loads as required in Subpart GG.



Howard L. Rhodes, Director
Division of Air Resources Management

COMBUSTION TURBINE OPERATING CURVE
 FUEL HEAT INPUT vs. INLET AIR TEMPERATURE



---x--- 90% of Maximum Operating Level --- Maximum Operating Capacity