

Florida Department of  
Environmental Protection

Memorandum

TO: Michael G. Cooke *MSC*  
THRU: Trina L. Vielhauer *TV*  
A.Linero *ay* 8/26  
FROM: Teresa Heron *TH*  
DATE: August 25, 2003  
SUBJECT: Peaking Mode of Operation for the Eight Combined Cycle Combustion Turbines.  
FPL Sanford 2200 MW Project  
DEP File No. 1270009-009-AC and PSD-FL-270D

Attached is the final permit package for the above facility.

The application is for a permit modification to allow peak operation mode up to 400 hours per year for each of the existing eight combined cycle turbines. Peaking is expected to increase short term NO<sub>x</sub> emissions from 9 to 15 ppmvd for each turbine and 68 TPY for all eight turbines due to higher temperatures during this mode. However, due to the substantial emissions decrease of this pollutant during the permitting of the repowering project, this project will not result in a net increase of NO<sub>x</sub> emissions or any other criteria pollutants.

We have determined that the project nets out of PSD for all pollutants because of the very substantial emissions reductions resulting from the 1999 repowering project at the site.

We recommend your approval of the attached final permit package.

AAL/th

Attachments

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
NOTICE OF PERMIT

In the Matter of an  
Application for Permit Modification by:

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

DEP File No. 1270009-009-AC and PSD-FL-270D  
Peak Mode of Operation Project  
2200 MW Combined Cycle Combustion Turbines  
Volusia County

Enclosed is the Final Permit Number 1270009-009-AC and PSD-FL-270D for an air construction permit to authorize peak mode operation for each 250 MW combined cycle turbine at the Sanford Power Plant in Volusia County. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.



Trina L. Vielhauer, Chief  
Bureau of Air Regulation

**CERTIFICATE OF SERVICE**

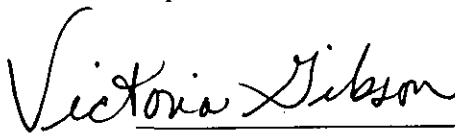
The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (\*) and copies were mailed by U.S. Mail before the close of business on

9/4/03 to the person(s) listed:

Roxane Kennedy, FPL\*  
Len Kozlov, DEP CD  
Gregg Worley, EPA  
John Bunyak, NPS  
Ken Kosky, P.E., Golder Associates

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date,  
pursuant to §120.52, Florida Statutes, with the designated  
Department Clerk, receipt of which is hereby acknowledged.

 September 4, 2003  
(Clerk) (Date)

## FINAL DETERMINATION

Florida Power and Light Company (FPL)  
Sanford Power Plant, Volusia County  
2200 MW Combined Cycle Turbines Peak Mode of Operation  
DEP File No. 1270009-009-AC and PSD-FL-270 D

An Intent to Issue an air construction permit authorizing peak operation mode up to 400 hours per year for each of the eight combined cycle turbines at the Sanford Power Plant in Volusia County was distributed on April 22, 2003. The applicant's name and address are Florida Power & Light, Sanford Plant, 950 South Highway 17-92, DeBary, Florida 32713.

The Public Notice of Intent to Issue Air Construction Permit was published in The News-Journal on July 31, 2003. Comments from FPL and the DEP Central District were received as a result of the Public Notice.

FPL requested to revise Specific Condition No. 50 to clarify that the lb/hr emissions are at ISO conditions and to revise Specific Condition No. 51 to include testing requirement for only two of the eight units. The Central District requested to define full load and peak load in terms of the heat input based on high or low heating value or in a manner that allows the field inspector to determine whether the turbine is operating at full or peak load. They also commented on the need for compliance stack testing for all eight units but are agreeable with representative testing for peak operation.

The Department considered FPL's request and revised Specific Conditions No. 50 and 51 as follows:

### 50. Peaking Mode Operation Limits:

The combined cycle gas turbines are subject to the following emission limits during peaking mode operation. Emissions limits are corrected to 15% O<sub>2</sub> (**lb/hr at ISO Conditions**).

Emission Unit ARMS 005-012	NO <sub>x</sub>	CO	VOC	PM/Visibility (% Opacity)	Technology and Comments
Combustion Turbines (each)	15 ppmvd (24-hr block avg) 102 lb/hr	9 ppmvd 29 lb/hr	1.4 ppmvd 3 lb/hr	10	Dry Low NO <sub>x</sub> Combustors Natural Gas, Good Combustion

*Averaging Time:* A 24-hour block shall begin at midnight of each operating day and shall be calculated from 24 consecutive hourly average emission rate values. If a unit operates less than 24 hours during the block, the 24-hour block average shall be the average of available valid hourly average emission rate values for the 24-hour block. For purposes of determining compliance with the 24-hour CEMS standards, missing (or excluded) data shall not be substituted. Instead, the 24-hour block average shall be determined using the remaining hourly data in the 24-hour block. CEMS data collected during peaking mode operation shall be excluded from the demonstration of compliance with the NO<sub>x</sub> standards during normal gas firing.

[Applicant Request, Rules 62-210.200 (Definitions-Potential Emissions), and 62-4.070(3), F.A.C.].

51. Compliance Procedures: 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 in the *peaking* mode, by using the following reference methods as described in 40 CFR 60, Appendix A, and adopted by reference in Chapter 62-204.800, F.A.C.

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."

EPA Reference Method 7, "Determination of Nitrogen Oxides Emissions from Stationary Sources."

Compliance for each pollutant after the initial tests shall be the same as outlined in the original permit 0710002-004-AC issued on 11/25/98.

**Testing for peak operation may be carried out on two of the units. The Department will consider testing of two of the units to be representative of all eight units.**

[Application; Rules 62-210.200(PTE) and 62-4.070 (3), F.A.C.]

Regarding the Central District's comment, we refer to Specific Condition 49 (revised as shown below) that states the heat input based on the maximum heat input rate at high-temperature peak mode. This is, 1,838 million Btu per hour (HHV) which is equivalent to 1,656 million Btu per hour (LHV).

This condition is modified as follows:

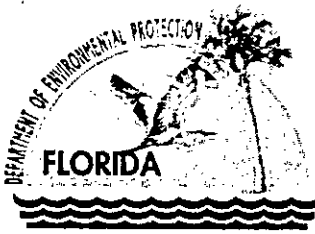
49. Each gas turbine may operate in a *high-temperature peaking mode* when firing natural gas to generate additional direct, shaft-driven electrical power to respond to peak demands. During any consecutive 12 months, each combined cycle gas turbine shall operate in this peaking mode for no more than 400 hours of operation. The maximum heat input rate to each gas turbine is 1,838 MMBtu per hour in peak mode operation (based on a compressor inlet air temperature of 59° F and the ~~lower~~-higher heating value (LHHV) of natural gas, ~~and 100% load~~). [Applicant Request, Rules 62-210.200 (Definitions-Potential Emissions), and 62-4.070(3), F.A.C.]

In reference to the *full load*, Specific Condition No. 9 of the original PSD-FL-270 permit states: "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)". The 1,776 million Btu per hour (HHV) is equivalent to 1,600 million Btu per hour (LHV) for gas firing and the 1,930 million Btu per hour (HHV) is equivalent to 1,820 million Btu per hour (LHV) for oil firing.

Regarding testing, we consider testing of two units to be representative of all eight units. These units are identical. This facility did not trigger PSD review for NOx or CO due to the substantial contemporaneous decreases as a result of the repowering project.

The sequence of the permit numeration was revised to PSD-FL-270€ D. The project modification No.1270009-008-AC/PSD-FL-270AC issued on 3/18/03 was added to the language in Specific Condition 48.

The final action of the Department will be to issue the permit with the changes noted above.



Jeb Bush  
Governor

# Department of Environmental Protection

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

David B. Struhs  
Secretary

## PERMITTEE:

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

Permit No.	1270009-009-AC (PSD-FL-270 D)
Project:	2200 MW Repowering Project
SIC No.	4911
Expires:	July 1, 2004

## Authorized Representative:

Roxane Kennedy  
Plant General Manager

## PROJECT AND LOCATION:

This permit modification authorizes peak operation mode for up to 400 hours per year for each of the existing eight combined cycle combustion turbines that comprise the 2200 MW repowering project. The eight combined cycle units have been constructed, tested, and are in operation. Each unit is a 170 megawatt General Electric MS7241FA gas-fired combustion turbine-generator with an unfired heat recovery steam generator (HRSG) that raises sufficient steam to produce another 80 MW via the existing steam-driven electrical generators.

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).

Michael G. Cooke, Director  
Division of Air Resources  
Management

**AIR CONSTRUCTION PERMIT MODIFICATION 1270009-009-AC AND PSD-FL-270D  
SPECIFIC CONDITIONS**

47. This permit modification (No.1270009-009-AC/PSD-FL-270D) regulates emissions during high temperature peaking mode operation and modifies original Permit No.1270009-004-AC/PSD-FL-270 issued on 9/14/99.
48. The provisions of the original air construction permit No.1270009-004-AC/PSD-FL-270 issued on 9/14/99, the administrative correction (No.1270009-004-AC/PSD-FL-270A) issued on 5/2/00, the authorization for excess emissions following a rotor blade change-out (No.1270009-004-AC/PSD-FL-270B) issued on 3/18/03 and the modification of Specific Conditions 24, 33 and 46 (No.1270009-008-AC/PSD-FL-270C) issued on 3/18/03 remain as originally issued except for these additional new specific conditions.
49. Each gas turbine may operate in a *high-temperature peaking mode* when firing natural gas to generate additional direct, shaft-driven electrical power to respond to peak demands. During any consecutive 12 months, each combined cycle gas turbine shall operate in this peaking mode for no more than 400 hours of operation. The maximum heat input rate to each gas turbine is 1838 MMBtu per hour in peak mode operation (based on a compressor inlet air temperature of 59° F and the higher heating value (HHV) of natural gas).

[Applicant Request, Rules 62-210.200 (Definitions-Potential Emissions), and 62-4.070(3), F.A.C.].

**50. Peaking Mode Operation Limits:**

The combined cycle gas turbines are subject to the following emission limits during peaking mode operation. Emissions limits are corrected to 15% O<sub>2</sub> (lb/hr at ISO Conditions).

Emission Unit ARMS 005-012	NO <sub>x</sub>	CO	VOC	PM/Visibility (% Opacity)	Technology and Comments
Combustion Turbines (each)	15 ppmvd (24-hr block avg) 102 lb/hr	9 ppmvd 29 lb/hr	1.4 ppmvd 3 lb/hr	10	Dry Low NO <sub>x</sub> Combustors Natural Gas, Good Combustion

*Averaging Time:* A 24-hour block shall begin at midnight of each operating day and shall be calculated from 24 consecutive hourly average emission rate values. If a unit operates less than 24 hours during the block, the 24-hour block average shall be the average of available valid hourly average emission rate values for the 24-hour block. For purposes of determining compliance with the 24-hour CEMS standards, missing (or excluded) data shall not be substituted. Instead, the 24-hour block average shall be determined using the remaining hourly data in the 24-hour block. CEMS data collected during peaking mode operation shall be excluded from the demonstration of compliance with the NO<sub>x</sub> standards during normal gas firing.

[Applicant Request, Rules 62-210.200 (Definitions-Potential Emissions), and 62-4.070(3), F.A.C.].

51. **Compliance Procedures:** 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 in the *peaking mode*, by using the following reference methods as described in 40 CFR 60, Appendix A, and adopted by reference in Chapter 62-204.800, F.A.C.

**AIR CONSTRUCTION PERMIT MODIFICATION 1270009-009-AC AND PSD-FL-270D  
SPECIFIC CONDITIONS**

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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."

EPA Reference Method 7, "Determination of Nitrogen Oxides Emissions from Stationary Sources."

Compliance for each pollutant after the initial tests shall be the same as outlined in the original permit 0710002-004-AC issued on 11/25/98.

Testing for peak operation may be carried out on two of the units. The Department will consider testing of two of the units to be representative of all eight units.

[Application; Rules 62-210.200(PTE) and 62-4.070 (3), F.A.C.]

52. Title V Permit: This permit authorizes modification of the emissions units and initial operation to determine compliance with Department rules. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]
53. Expiration Date: The expiration date of original permit No.1270009-004-AC/PSD-FL-270 is extended from December 31, 2003 to July 1, 2004.

**SENDER: COMPLETE THIS SECTION**

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Roxane Kennedy  
 Plant General Manager  
 FPL - Sanford Plant  
 950 South Highway 17-92  
 DeBary, FL 32713

2. 7001 0320 0001 3692 5344

**COMPLETE THIS SECTION ON DELIVERY**

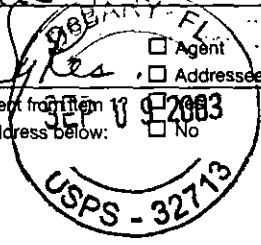
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DALE G. DYKES 9-9-03

C. Signature

X Dale Dykes  Agent  Addressee

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