Florida Department of Environmental Protection

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PERMITTEE

Florida Power & Light Company
4300 SW 42nd Avenue
Fort Lauderdale, Florida 33314

Authorized Representative:
Tony Berros, Plant General Manager

Air Permit No. 0110037-015-AC
(PSD-FL-423B)
Permit Expires: December 31, 2018
Minor Air Construction Permit

Lauderdale Plant
Unit 6 NOx Emission Cap

PROJECT

This is the final air construction permit, which authorizes the removal of the restriction on hours of operation of ULSD fuel oil firing for the five Unit 6 combustion turbines (CT's), provided the permittee complies with a NOx emission cap of 1,009 tons per 12-consecutive month period over the five CT's. This permit also authorizes the Unit 6 CT's to startup on ULSD fuel oil. The proposed work will be conducted at the existing Lauderdale Plant, which is an electric power plant categorized under Standard Industrial Classification No. 4911. The existing facility is located in Dania Beach in Broward County, two miles west of Ravenswood Road, and can be accessed from Southwest 42nd Street and Griffin Road. The UTM coordinates are Zone 17, 580.2 kilometers (km) East and 2,883.5 km North.

This final permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); and Section 4 (Appendices). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of Section 4 of this permit.

STATEMENT OF BASIS

This air pollution 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 permittee is authorized to conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and is not subject to the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) 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 must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida

David Lyle Read, P.E.
2017.08.14 09:35:44 -04'00'

For:
Syed Arif, P.E., Program Administrator
Office of Permitting and Compliance
Division of Air Resource Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Final Air Construction Permit package was sent by electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on the date indicated below to the following persons.

Mr. Tony Berros: (Tony.Berros@fpl.com)
Mr. John Hampp, FPL: (John.Hampp@fpl.com)
Mr. Dwayne Harper, FPL: (Dwayne.Harper@fpl.com)
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Ms. Lynn Scearce, DEP OPC: (lynn.scearce@dep.state.fl.us)

Clerk Stamp

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

Lynn Scearce

2017.08.14 09:53:42 -04'00'

FACILITY DESCRIPTION

The existing facility consists of the following emissions units.

EU No.	Emission Unit Description
003	Bank of 12 CT's (Nos. 1 to 12)
015	Bank of 12 CT's (Nos. 13 to 24)
027	Fuel Oil Storage Tank #2 (80,000 barrel (bbl), Light Distillate Fuel Oil)
028	Fuel Oil Storage Tank #3 (150,000 bbl, Light Distillate Fuel Oil)
030	2 Fuel Oil Dump Tanks (2,500 gallon and 110 gallon)
035	Combined-Cycle CT with Heat Recovery Steam Generator (CT 4A)
036	Combined-Cycle CT with Heat Recovery Steam Generator (CT 4B)
037	Combined-Cycle CT with Heat Recovery Steam Generator (CT 5A)
038	Combined-Cycle CT with Heat Recovery Steam Generator (CT 5B)
039	Site Solvent Usage
042	Auxiliary Boiler used to provide steam to the turbine shaft seals during a cold start of the plant. Maximum designed heat input rate is 15.5 MMBtu/hr.
044	Emergency Diesel Fire Pump Engine
046	Simple cycle CT-electrical generator (Unit 6B)
047	Simple cycle CT-electrical generator (Unit 6C)
048	Simple cycle CT-electrical generator (Unit 6D)
049	Simple cycle CT-electrical generator (Unit 6E)
053	Simple cycle CT-electrical generator (Unit 6A)
054	Circuit Breakers

The FPL Lauderdale Plant consists of two combined-cycle generating units (Unit 4 and Unit 5), five new simple-cycle GE 7F.05 generating units (Unit 6), twenty-four existing simple-cycle CT's, circuit breakers, an auxiliary boiler, an emergency fire pump engine, and fuel storage tanks. Each combined-cycle unit consists of two combustion turbines (CT's) which each exhaust through a separate heat recovery steam generator (HRSG). Each combined-cycle unit has a net summer continuous capability of 430 MW. The five GE 7F.05 simple-cycle CT's do not have HRSG units and operate primarily for peaking purposes, and each CT has a manufacturer's net generating capability of 241 MW.

PROPOSED PROJECT

This project removes the restriction on hours of operation of ULSD fuel oil firing for the five Unit 6 CT's, provided the permittee complies with a NOx emission cap of 1,009 tons per 12-consecutive month period over the five CT's. The project also authorizes the units to startup on ULSD fuel oil. Finally, this project includes minor changes to the specific conditions for the Unit 6 circuit breakers, in order to align with the Title V air operation permit.

This project will modify the following emissions units.

EU No.	Emission Unit Description
003	~~Bank of 12~~ Two Combustion Turbines ~~(Nos. 1 to 12)~~
~~015~~	~~Bank of 12 Combustion Turbines (Nos. 13 to 24)~~
046	Simple cycle CT-electrical generator (Unit 6B)
047	Simple cycle CT-electrical generator (Unit 6C)
048	Simple cycle CT-electrical generator (Unit 6D)

049	Simple cycle CT-electrical generator (Unit 6E)
053	Simple cycle CT-electrical generator (Unit 6A)
054	Circuit breakers

FACILITY REGULATORY CLASSIFICATION

- The facility is a major source of hazardous air pollutants (HAP).
- The facility operates units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.

SECTION 2. ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The permitting authority for this project is the Office of Permitting and Compliance in the Division of Air Resource Management of the Department of Environmental Protection (Department). The Office of Permitting and Compliance mailing address is 2600 Blair Stone Road (MS #5505), Tallahassee, Florida 32399-2400.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Southeast District Office. The mailing address of the Southeast District Office is: 400 North Congress Avenue, 3rd Floor, West Palm Beach, Florida 33401.

3. Appendices: The following Appendices are attached as a part of this permit: Appendix A (Citation Formats and Glossary of Common Terms); Appendix B (General Conditions); Appendix C (Common Conditions); Appendix D (Common Testing Requirements); Appendix E (NESHAP Subpart YYYY); Appendix F (NESHAP Subpart A – General Provisions); and Appendix G (Circuit Breaker Monitoring Plan).

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units 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 Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

5. New or Additional Conditions: 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.]

6. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No new emissions unit shall be constructed and no existing emissions unit shall be modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

7. Construction and Expiration. The expiration date shown on the first page of this permit provides time to complete the physical construction activities authorized by this permit, complete any necessary compliance testing, and obtain an operation permit. Notwithstanding this expiration date, all specific emissions limitations and operating requirements established by this permit shall remain in effect until the facility or emissions unit is permanently shut down. For good cause, the permittee may request that a permit be extended. Pursuant to Rule 62-4.080(3), F.A.C., such a request shall be submitted to the Permitting Authority in writing before the permit expires. [Rules 62-4.070(3) & (4), 62-4.080 & 62-210.300(1), F.A.C.]

8. Source Obligation: At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.
   [Rule 62-212.400(12), F.A.C.]

9. Effect on Other Permits: The conditions of this permit revises previously issued air construction permits for these emissions units. Unless otherwise specified, these conditions are in addition to all other applicable permit conditions and regulations. [Rule 62-4.070(1)&(3), F.A.C.]

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

A. Simple Cycle CT (EU ID No. 046 – 049 and 053)

This section of the permit addresses the following emissions units.

EU No.	Emission Unit Description
046	Simple cycle CT-electrical generator (Unit 6B)
047	Simple cycle CT-electrical generator (Unit 6C)
048	Simple cycle CT-electrical generator (Unit 6D)
049	Simple cycle CT-electrical generator (Unit 6E)
053	Simple cycle CT-electrical generator (Unit 6A)

Each CT is a General Electric (GE) Model 7F.05 stationary combustion turbine, with a manufacturer's net generation capacity of 241 MW. Each CT utilizes inlet air cooling and wet compression. The actual electrical generation rate is dependent on site-specific conditions such as temperature, pressure, relative humidity, and the heating value of each fuel.

Nominal Design Heat Input Ratings

- GE 7F.05 CT: 2,089.1 MMBtu/hr when firing natural gas and 2,211.3 MMBtu/hr when firing fuel oil, based on a compressor inlet air temperature of 59 Fahrenheit (°F), evaporative cooling and wet compression, 60 percent (%) relative humidity, 14.7 pounds per square inch (psi) pressure, the lower heating value (LHV) of each fuel and 100% load.

{Note: Actual heat input rate varies depending upon gas turbine characteristics, ambient conditions and inlet air cooling.}

This subsection of the permit addresses changes to applicable standards, performance restrictions, monitoring, and recordkeeping requirements.

Permit Being Modified:	Permit No. 0110037-013-AC (PSD-FL-423A)
Affected Emission Units:	046 through 049, and 053

{For simplified reading, the important revisions are emphasized with yellow highlight in this electronic document. ~~Strikethrough~~ is used to denote the deletion of text and double-underlines are used to denote the addition of text.}

APPLICABLE STANDARDS AND REGULATIONS

3. NESHAP Requirements: These units shall comply with the applicable NESHAP in 40 CFR 63, including: Subpart A (General Provisions) and Subpart YYYY (National Emission Standard for Hazardous Air Pollutants for Stationary Combustion Turbines). See Appendices Subpart A and YYYY of this permit. This NESHAP provision has a maximum achievable control technology (MACT) limit of 91 parts per billion by volume dry (ppbvd) corrected to 15% oxygen (O_2), i.e., 91 ppb~~m~~vd @ 15% O_2, for formaldehyde (CH_2O). This emission limit of Subpart YYYY shall apply if the facility exceeds 1,000 turbine fired hours on fuel oil cumulatively in any one year. Some separate reporting and monitoring may be required by the individual subparts. [Rule 62-204.800(7)(b), F.A.C.; and NESHAP 40 CFR 63, Subparts A and YYYY]

PERFORMANCE RESTRICTIONS

8. Hours of Operation:
   a. *Natural Gas Operation:* The five CTs may operate an average of no more than a total of 3,390 hours per turbine in any consecutive 12-month period.
   b. *ULSD Fuel Oil Operation:* Of the overall average 3,390 operational hours, each CT may operate ~~on average no more than 500 hours in any consecutive 12-month period~~ on ULSD fuel oil as needed, provided the permittee does not exceed a NOx emission cap of 1,009 tons per 12-consecutive month period across the five CT's. Compliance with the NOx emission cap shall be demonstrated on a 12-month rolled monthly basis using CEMS.

[Rules 62-210.200(PTE and BACT) and 62-212.400(PSD), F.A.C.]

11. Emission Standards: Emissions from the CT shall not exceed the following standards:

Pollutant	Emission Standard [a,b]	Basis	Compliance Method [c]	Averaging Time
$PM/PM_{10}/PM_{2.5}$ [f]	2.0 gr. sulfur/100 SCF natural gas 0.0015% sulfur fuel oil	BACT	Fuel Record Keeping	N/A
	10 percent opacity		Visible Emissions Annual Test [h]	6-minute block

[…]

h. Compliance with the 10% opacity standard shall be demonstrated by conducting 30-minute tests in accordance with EPA Method 9 - Visual Determination of Opacity, at normal operating conditions. Visible emissions when firing natural gas during startups, shutdowns, fuel switches and malfunctions shall not exceed 10% opacity, except for up to six 6-minute average periods during a calendar day, which shall not exceed 20% opacity. Visible emissions when firing ULSD fuel oil during startups and shutdowns shall be minimized by following the manufacturer's best practices and good combustion practices for minimizing emissions.

[Rules 62-4.070(3), 62-210.200, 62-212.400, 62-297, F.A.C.; and 40 CFR 60, Subpart KKKK]

24. Alternate Visible Emissions Standard: Visible emissions when firing natural gas due to startups, shutdowns, fuel switches and malfunctions shall not exceed 10% opacity, except for up to six 6-minute averaging periods during a calendar day, which shall not exceed 20% opacity. Visible emissions when firing ULSD fuel oil during startups and shutdowns shall be minimized by following the manufacturer's best practices and good combustion practices for minimizing emissions. [Rule 62-210.200(BACT)]

25. BACT Work Practice Standards for Startup and Shutdown:

    a. *Startup ~~on Gas~~*: The permittee shall fire only natural gas or ULSD fuel oil during all periods of startup, up to a load of no less than 40%, except for periods when the use of fuel oil is required for peaking generation ~~of gas curtailment or periods during which gas is not reasonably available~~, or for purposes of testing and maintenance. The permittee shall maintain documentation of all startups on ULSD~~, including the reason for starting on oil,~~ for a period of five years and shall make this documentation available to the Department upon request. [Rule 62-213.440(1)(b)2. and Rule 62-210.200 (BACT)]

B. Circuit Breakers (EU ID No. 054)

This section of the permit addresses the following emissions units.

EU No.	Emission Unit Description
054	Circuit Breakers containing sulfur hexafluoride (SF_6)

This subsection of the permit addresses changes to monitoring and recordkeeping requirements.

Permit Being Modified:	Permit No. 0110037-013-AC (PSD-FL-423A)
Affected Emission Unit:	054

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EQUIPMENT SPECIFICATIONS

1. Equipment: The permittee ~~is authorized to construct,~~ shall operate and maintain ~~approximately nine~~ the circuit breakers associated with Unit 6 containing sulfur hexafluoride (SF_6). The circuit breakers must have a manufacturer-guaranteed SF_6 leak rate of no more than 0.5% per year. The circuit breakers must be equipped with leakage detection systems and alarms. [Application No. 0110037-015-AC; Permit No. 0110037-013-AC and Rule 62-210.200(BACT)]

CIRCUIT BREAKER MONITORING PLAN

2. Monitoring Plan Requirements: ~~Within 180 days after the circuit breakers are placed into service,~~ The permittee shall ~~submit to the Department~~ maintain a circuit breaker monitoring plan on-site detailing the number of circuit breakers installed and procedures for detecting leaks from the circuit breakers and expected remedial courses of action after leaks are detected. Any necessary revisions to the monitoring plan shall submitted to the Department to be included with the facility's Title V air operation permit. Records of monitoring and any corrective actions taken shall be kept on-site for five years from the date of observation or corrective action and made available to the Department for inspection upon request. [Application No. 0110037-015-AC; Permit No. 0110037-013-AC; Rule 62-213.440(1)(b)2. and Rule 62-210.200(BACT)]

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

C. Two Combustion Turbines (EU ID No. 003)

This section of the permit addresses the following emissions units.

EU No.	Emission Unit Description
003	~~Bank of 12 combustion turbines (Nos. 1 to 12)~~ Two Combustion Turbines
~~015~~	~~Bank of 12 combustion turbines (Nos. 13 to 24)~~

This subsection of the permit addresses changes to emissions limits due to the permanent shutdown of 22 existing simple-cycle CT's.

Permit Being Modified:	Permit No. AC06-179848
Affected Emission Units:	003 and 015

{For simplified reading, the important revisions are emphasized with yellow highlight in this electronic document. ~~Strikethrough~~ is used to denote the deletion of text and double-underlines are used to denote the addition of text.}

19. Total VOC emissions from the ~~24~~ two gas turbines when operating at the permitted capacity shall not exceed ~~57. 28~~ 4.78 lbs/hr when the units are burning natural gas and ~~21.06~~ 1.76 lbs/hr when the units are burning oil. When both fuels are burned in the turbines at the same time, the allowable emissions shall be prorated. [Permit No. AC06-179848]