FLORIDA DEPARTMENT OF
Environmental Protection

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PERMITTEE

Florida Power and Light Company
19050 State Road 62
Parrish, FL 34219

Authorized Representative:
Ken Nusche, Regional Plant General Manager

Air Permit No. 0810010-027-AC (PSD-FL-328G)
Permit Expires: December 31, 2019
Minor Air Construction Permit
Manatee Plant
Unit 3 CT Tuning, Heat Input Increase and EHD Mode

PROJECT

This is the final air construction permit, which authorizes heat input increases for the combustion turbines (CTs) that make up Unit 3 (EU Nos. 005-008), continuation of Dry Low NO_X (DLN) 2.6+ combustor tuning after completion of the upgrades authorized by Permit No. 0810010-024-AC/PSD-FL-328E and authorization of enhanced hot day (EHD) mode for each CT. The proposed work will be conducted at the existing Manatee Plant, which is an electric utility categorized under Standard Industrial Classification No. 4911. The existing facility is in Manatee County at 19050 State Road 62 in Parrish, Florida. The UTM coordinates are Zone 17, 367.15 kilometers (km) East and 3054.23 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.
2018.11.30 14:04:42 -05'00'

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. Ken Nusche, Florida Power and Light Company: Ken.Nusche@fpl.com
Mr. John Hampp, Florida Power and Light Company: John.Hampp@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 Digitally signed by Lynn Scearce
Date: 2018.11.30 14:48:02 -05'00'

FACILITY DESCRIPTION

This nominal 2,899.6-megawatt (MW) facility consists of two fossil fuel steam generators, a "4-on-1" gas-fired combined cycle combustion turbine (CCCT) unit and associated support equipment.

Fossil Fuel Steam Generators, Unit 1 and Unit 2: Each unit is a Foster-Wheeler Steam Generator rated at 800 MW (900 MW gross capacity) output. These units burn a variable combination of natural gas, No. 6 fuel oil, No. 2 fuel oil, propane, and used oil from Florida Power and Light Company (FPL) operations, discharging pollutants through a stack 499 feet (ft) above ground level. Each unit is equipped with a flue gas recirculation system and staged combustion and also operates a Westinghouse tandem compound, reheat-type extraction turbine. The project authorized by air construction permit No. 0810010-016-AC was to construct two electrostatic precipitators (ESP) on Units 1 and 2. The existing cyclones used to control PM/PM_{10} emissions from the units were removed and replaced by the ESP equipment. In addition, to handle the additional fly ash collected by the ESP, a fly ash handling, storage and shipment system including two storage silos was installed.

Combined Cycle Gas Turbine, Unit 3 (EU Nos. 005–008): These units consist of four ("4-on-1") nominal 207.4 MW General Electric Model PG7241(FA) gas-fired combustion turbine (CT)-electrical generator sets with evaporative inlet cooling systems, an automated gas turbine control system, an inlet air filtration system, four 495 million British thermal units per hour (MMBtu/hr) supplementary-fired heat recovery steam generators (HRSGs) with selective catalytic reduction (SCR) reactors, a single nominal 470 MW steam-electrical generator that serves all four gas turbine/HRSG systems, four 120-ft exhaust stacks and associated support equipment. The total generating capacity of the "4-on-1" combined cycle system Unit 3 is 1,299.6 MW.

Ancillary equipment includes 4 diesel-fired and 2 propane-fired emergency engine-electrical generators and 1 diesel-fired emergency engine-fire pump.

The existing facility consists of the following emissions units (EU).

EU No.	Emission Unit Description
Regulated Emissions Units	
001	Fossil Fuel Steam Generator, Unit 1
002	Fossil Fuel Steam Generator, Unit 2
003	Emergency Diesel RICE Generator for Unit 1 and Unit 2; 1,000 kW; 32.10 L; 12-cylinder
005	Unit No. 3A Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
006	Unit No. 3B Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
007	Unit No. 3C Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
008	Unit No. 3D Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
012	Fly Ash Handling, Storage and Shipment System
014	Fire Pump Engine for Facility
Unregulated Emissions Units and Activities	
004	Painting of Plant Equipment and Non-Halogenated Solvent Cleaning Operations
010	Ammonia Storage Tank
011	Emergency Diesel Engines (2) 3,210 HP Each; Manufactured in 2005; Caterpillar
013	Two (2) Small Hurricane Hardening Program Propane "Emergency" Generators; 29.24 KW (40 HP)

PROPOSED PROJECT

This project authorizes the following projects and operating modes:

- A heat input increase for each Unit 3 CT (EU Nos. 005, 006, 007 and 008) from 1,884 MMBtu/hr to 1,978 MMBtu/hr.

- Continuation of DLN 2.6+ combustor tuning for the Unit 3 CTs to meet performance guarantees that the manufacturer proposed following the upgrades authorized by Permit No. 0810010-024-AC/PSD-FL-328E.
- The ability for each Unit 3 CT to utilize EHD mode to boost power output when ambient air temperature is above 90 degrees Fahrenheit (□F).

This project will modify the following emissions units.

EU No.	Emission Unit Description
005	Unit No. 3A Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
006	Unit No. 3B Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
007	Unit No. 3C Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
008	Unit No. 3D Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator

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.
- The facility does operate units subject to the New Source Performance Standards (NSPS) of Title 40 Part 60 of the Code of Federal Regulations (40 CFR 60).
- The facility does operate units subject to the National Emissions Standards of Hazardous Air Pollutants (NESHAP) of 40 CFR 63.

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 Department's Southwest District Office at: 13051 North Telecom Parkway, Temple Terrace, Florida 33637-0926.

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); and Appendix D (Common Testing Requirements).

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:

   a. 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.

   b. 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 exceeding its projected actual emissions, 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. Application for Title V Permit: This permit authorizes construction of the permitted emissions units and initial operation to determine compliance with Department rules. A Title V air operation permit is required

for regular operation of the permitted emissions unit. The permittee shall apply for a Title V air 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. The application shall be submitted to the appropriate Permitting Authority with copies to the Compliance Authority. [Rules 62-4.030, 62-4.050 and Chapter 62-213, F.A.C.]

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

A. Units 3A, 3B, 3C and 3D (EU Nos. 005, 006, 007 and 008)

This section of the permit addresses the following emissions units.

EU No.	Emission Unit Description
005	Unit No. 3A Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
006	Unit No. 3B Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
007	Unit No. 3C Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator
008	Unit No. 3D Gas Turbine (nominal 207.4 MW) with Heat Recovery Steam Generator

Units 3A–3D, collectively referred to as Unit 3, is a "4-on-1" natural gas fired CT system that can operate in simple cycle and combined cycle modes. Each of the CTs (regulated as Emissions Units 005, 006, 007 and 008) consist of a nominal 207.4 MW General Electric Model PG7241(FA) CCCT-electrical generator set, an automated CT control system, an inlet air filtration system, an evaporative inlet air cooling system, a HRSG each equipped with a 495 MMBtu/hr natural gas-fired duct burner, a stack, and associated support equipment. Each CT has been upgraded with new DLN 2.6+ combustors and Series 7FA.05 components including, but not limited to the following: new control software; a new Advanced Gas Path (AGP) Performance Tech Package; new 3SAR turbine rotors; and EHD improvements. Steam from each of the four HRSGs is delivered to the single steam turbine-electrical generator, which has a nominal capacity of 470 MW. The total nominal generating capacity of the "4 on 1" combined cycle system is 1,299.6 MW.

The units are fired exclusively with natural gas at a maximum heat input rate of 1,978 MMBtu/hr (normal conditions) based on a compressor inlet air temperature of 59□F, the lower heating value (LHV) of natural gas and 100% load. The efficient combustion of natural gas at high temperatures minimizes emissions of carbon monoxide (CO), particulate matter (PM), particulate matter less than 10 microns in diameter (PM_{10}), sulfuric acid mist (SAM), sulfur dioxide (SO_2) and volatile organic compounds (VOC). Nitrogen oxides (NO_X) emissions are reduced by DLN 2.6+ combustion technology while operating in simple cycle mode. An SCR system combined with DLN 2.6+ combustion technology further reduces NO_X emissions while operating in combined cycle mode. These emissions units commenced commercial operation in May 2005.

Each gas turbine is equipped with a continuous emissions monitoring system (CEMS) to measure and record CO (optional) and NO_X emissions, as well as flue gas oxygen or carbon dioxide content.

Compliance assurance monitoring (CAM) does not apply since these emissions units have NO_X CEMS which are used to demonstrate continuous compliance.

{Permitting Note: These emissions units are regulated under: 40 CFR 60, Subpart A, General Provisions and 40 CFR 60, Subpart KKKK, Standards of Performance for Stationary Combustion Turbines, adopted by reference in Rule 62-204.800(8)(d) and (8)(b)84., F.A.C., respectively; Rule 62-212.400, F.A.C., Best Available Control Technology (BACT) for PM/PM_{10}, SO_2, NO_X, CO, VOC and SAM in Permit No. 0810010-006-AC/PSD-FL-328; and Chapter 62-214, F.A.C., the Phase II Acid Rain Program.}

{Permitting Note: On March 5, 2004, EPA promulgated 40 CFR 63, Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines built after January 14, 2003. Unit 3 was under contractual obligations before this date and is therefore an existing unit. Currently, 'existing combustion turbines' are not required to meet the emission limitations, notifications, reporting or any other requirements of Subpart YYYY, in accordance with 40 CFR 63.6090(b)(4). EPA may at a future date promulgate standards for existing units.}

PREVIOUS PERMIT MODIFICATIONS

1. Other Permits: Unless otherwise specified in this subsection, these units remain subject to the applicable requirements established in all previous air construction permits issued for this facility. [Rule 62-4.070(3), F.A.C.]

{Permitting Note: All modifications of conditions in previous permits are revised as indicated. ~~Strikethrough~~ is used to indicate the deletion of text. Double underlines are used to indicate the addition of text. All changes are emphasized with yellow highlight.}

Permit Being Modified: Permit No. 0810010-006-AC/PSD-FL-328

Affected Emissions Units: EU Nos. 005, 006, 007 and 008

Section III, Specific Condition 9, Paragraph h: This condition has been revised as follows:

h. *Peaking*: When firing natural gas, each gas turbine may operate in a high-temperature peaking mode to generate additional direct, shaft-driven electrical power to respond to peak demands. During any consecutive 12 months, each gas turbine shall operate in this peaking mode for no more than 60 hours of simple cycle operation and no more than 400 hours of combined cycle operation. The gas turbines shall not operate simultaneously in peaking and power augmentation modes. In addition, total combined operation of power augmentation, enhanced hot day (EHD) and peaking modes shall not exceed 400 hours per unit during any consecutive 12 months.

Permit Being Modified: Permit No. 0810010-026-AC/PSD-FL-328F

Affected Emissions Units: EU Nos. 005, 006, 007 and 008

Section 2, Specific Condition 4: This condition has been revised as follows:

3. Gas Turbine Permitted Capacity. The maximum heat input rate to each gas turbine is 1,~~884~~978 MMBtu/hr (normal conditions) based on a compressor inlet air temperature of 59° F, the lower heating value (LHV) of natural gas, and 100% load. Heat input rates will vary depending upon gas turbine characteristics, ambient conditions, alternate methods of operation, and evaporative cooling. Operating data may be adjusted for the appropriate site conditions in accordance with the performance curves and/or equations on file with the Department. [Permit No. 0810010-02~~4~~6-AC/PSD-FL-328~~E~~F, Specific Condition ~~3~~4.; and, Application No. 0810010-027-AC/PSD-FL-328G]

EQUIPMENT

2. DLN 2.6+ Combustor Tuning: The permittee is authorized to continue tuning the DLN 2.6+ combustor system of each CT to meet the performance guarantees proposed by the manufacturer for the CT upgrades authorized by Permit No. 0810010-024-AC/PSD-FL-328E. This tuning may include, but is not limited to, increasing the combustor firing temperature and decreasing the mass flow of air through each CT. [Application No. 0810010-027-AC/PSD-FL-328G]

3. EHD Operating Mode: The permittee is authorized to use Enhanced Hot Day (EHD) mode on each CT, which increases CT output when the ambient air temperature is 90□F or greater. This mode of operation increases the power output of each CT during base load and peaking operating modes by increasing the combustor temperature and mass flow of air through each CT. [Application No. 0810010-027-AC/PSD-FL-328G]

TESTING REQUIREMENTS

4. Initial Compliance Tests: Each emissions unit in this subsection that completes the construction authorized by this Specific Condition **2** of this permit shall be tested to demonstrate initial compliance with the emissions standards for CO (if a CEMS is not used), visible emissions (VE) and ammonia slip. NO_X emissions recorded by the CEMS shall be reported for each ammonia slip test run. CO emissions recorded by the CEMS (if used) shall be reported for the VE observation period. The initial tests shall be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial operation of the unit. [Rules 62-4.070(3) and 62-297.310(8)(b)1, F.A.C.]

5. Test Requirements: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit. [Rule 62-297.310(9), F.A.C.]

6. Test Methods: Required tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content
9	Visual Determination of the Opacity of Emissions from Stationary Sources
10	Determination of Carbon Monoxide Emissions from Stationary Sources *{Notes: The method shall be based on a continuous sampling train. The ascarite trap may be omitted or the interference trap of section 10.1 may be used in lieu of the silica gel and ascarite traps.}*
CTM-027	Procedure for Collection and Analysis of Ammonia in Stationary Sources
CTM-028	Direct Interface GC/MS Performance-Based Method
320	Vapor Phase Organic and Inorganic Emissions by Extractive FTIR

Except for Conditional Test Method (CTM)-027, CTM-028 and CTM-029, the above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. Methods CTM-027, CTM-028 and CTM-029 are published on EPA's Air Emission Measurement Center website at: https://www.epa.gov/emc/emc-conditional-test-methods. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800, F.A.C.; Appendix A of 40 CFR 60; Permit No. 0810010-006-AC/PSD-FL-328; and, ASP Number 15-H-AP]

RECORDS AND REPORTS

7. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix D (Common Testing Requirements) of this permit. For each test run, the report shall also indicate the heat input rate during the time of the test run in units of MMBtu/hr. [Rule 62-297.310(10), F.A.C.]

8. Manufacturer's Performance Curves Report: Heat input rates will vary depending upon gas turbine characteristics, ambient conditions, alternate methods of operation and evaporative cooling. The permittee shall provide manufacturer's performance curves (or equations) for each CT that correct for site conditions to the Permitting and Compliance Authorities within 60 days of completing the initial compliance testing. Operating data may be adjusted for the appropriate site conditions in accordance with the performance curves and/or equations on file with the Department. [Rule 62-4.070(3), F.A.C.]