



# Florida Department of Environmental Protection

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## PERMITTEE

Duke Energy Florida, LLC (DEF)  
1601 Weedon Island Drive  
St. Petersburg, FL 33702

Authorized Representative:  
David E. Brown, DEF

Air Permit No. 1030011-023-AC  
(PSD-FL-381F)  
P.L. Bartow Power Plant, Unit 4  
Advanced Low-Load Turn Down  
Expires: December 31, 2017

## FACILITY AND LOCATION

This is the final air construction permit to enable simple cycle operation down to a CT load of 30% on the four combustion turbines of Unit 4 (Emission Unit Nos. 038 through 041) at the P.L. Bartow Power Plant. The facility is located at 1601 Weedon Island Drive, St. Petersburg, Pinellas County. The UTM coordinates are Zone 17, 343.87 kilometers (km) East and 3082.69 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); 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. As noted in the Final Determination provided with this final permit, only minor changes and clarifications were made to the draft 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

*For:*

Jeffery F. Koerner, Deputy Director  
Division of Air Resource Management

## FINAL PERMIT

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### CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this final air permit package (including the Final Determination and Final Permit with Appendices) 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.

David Brown, Duke Energy Florida: [david.e.brown@duke-energy.com](mailto:david.e.brown@duke-energy.com)  
Chris Bradley, Duke Energy Florida: [chris.bradley@duke-energy.com](mailto:chris.bradley@duke-energy.com)  
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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.

## SECTION 2. ADMINISTRATIVE REQUIREMENTS

### FACILITY DESCRIPTION

The P.L. Bartow Power Plant includes the following emissions units.

- Four 59 MW General Electric MS7000 simple cycle gas turbine peaking units, designated as Nos. P-1, P-2, P-3 and P-4 (EU 005-008);
- Combined cycle Unit 4 consisting of four 215 MW Siemens SGT6-5000F combined cycle gas turbine-electrical generators (CTs), four duct-fired heat recovery steam generators (HRSGs) (EU 038 - 041);
- Four 3 MMBtu/hour natural gas fired process heaters (EU 044);
- Two 3,500,000 diesel fuel storage tanks (EU 045);
- One 300 HP diesel fueled emergency fire pump (EU046); and
- Various insignificant emissions units.

The steam generated in the four Unit 4 HRSGs is used in a single nominal 420 MW steam turbine-electrical generator (STG).

### PROPOSED PROJECT

Following installation of the Advanced Low-Load Turn Down (ALLTD) package from Siemens on the four combustion turbines of combined cycle Unit 4, this permit will authorize simple-cycle operations down to a turbine load of approximately 30% for natural gas and 45% for fuel oil. This low-load operation will be permitted if compliance with the turbines' carbon monoxide limits can be achieved in an initial compliance demonstration. The following emissions units are affected by this project.

EU No.	Description
038	Unit 4A – One 215 MW (ISO) Combustion Turbine with Duct-fired Heat Recovery Steam Generator
039	Unit 4B – One 215 MW (ISO) Combustion Turbine with Duct-fired Heat Recovery Steam Generator
040	Unit 4C – One 215 MW (ISO) Combustion Turbine with Duct-fired Heat Recovery Steam Generator
041	Unit 4D – One 215 MW (ISO) Combustion Turbine with Duct-fired Heat Recovery Steam Generator

### REGULATORY CLASSIFICATION

The following federal regulations apply to the Bartow plant and this project.

- The existing facility is a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality and Rule 62-210.200 (Definitions), F.A.C.
- This project (as discussed below) does not trigger a PSD review and a requirement to conduct Best Available Control Technology (BACT) determinations pursuant to Department Rule 62-212.400, F.A.C.
- The existing facility is a major source of hazardous air pollutants (HAP).
- The existing facility has units regulated under Clean Air Act, Title IV, Acid Rain provisions, Phase II.
- The existing facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The proposed project includes units subject to the New Source Performance Standards (NSPS) of 40 CFR 60.
- The proposed project includes units subject to the National Emission Standards of Hazardous Air Pollutants NESHAP of 40 CFR 63.

### RELEVANT DOCUMENTS

The permit application and additional information received to make it complete are not a part of this permit. However this information can be accessed at the following Webpage.

[Application for Duke Bartow simple-cycle low-load project](#)

## SECTION 2. ADMINISTRATIVE REQUIREMENTS

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### GENERAL REQUIREMENTS

1. Permitting Authority: All documents related to applications for permits to construct, operate or modify an emissions unit shall be submitted to the Office of Permitting and Compliance in the Division of Air Resource Management of the Department. The mailing address for the Office of Permitting and Compliance is 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. Copies of all such documents shall also be submitted to the Compliance Authority.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the District Office and Local Air Program. All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Air Quality Division of the Pinellas County Department of Environmental Management Office at 300 South Garden Avenue, Clearwater, Florida 34616.
3. Appendices: Appendices: The following Appendices are attached as part of this permit:
  - a. Appendix A. Citation Formats and Glossary of Common Terms;
  - b. Appendix B. General Conditions;
  - c. Appendix C. Common Conditions; and
  - d. 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: No emissions unit shall be constructed or 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. 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 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(4), 62-4.080 & 62-210.300(1), F.A.C.]
8. Source Obligation:
  - a. Authorization to construct shall expire if construction is not commenced within 18 months after receipt of the permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. This provision does not apply to the time period between construction of the approved phases of a phased construction project except that each phase must commence construction within 18 months of the commencement date established by the Department in the permit.
  - 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 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

## SECTION 2. ADMINISTRATIVE REQUIREMENTS

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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.

- c. 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 low-load simple-cycle operation of the last combustion turbine to have Advanced Low-Load Turn Down (ALLTD) commissioned. 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, 62-4.220 and Chapter 62-213, F.A.C.]

*{Permitting note: The permittee has indicated the intention to install ALLTD on the Unit 4 combustion turbines (CTs) in a phased approach, with the last two CTs scheduled to be upgraded during the spring 2016 outage. Therefore the 180-day period begins only after commissioning the ALLTD installed on the final CT of Unit 4.}*

## SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

### Combined Cycle Unit 4 (EU Nos. 038, 039, 040, 041)

The specific conditions in this section apply to the following emissions unit:

EU ID	Emissions Units Comprising Combined Cycle Unit 4
038	Unit 4A–One 215 MW (ISO) Combustion Turbine with Duct-fired Heat Recovery Steam Generator
039	Unit 4B–One 215 MW (ISO) Combustion Turbine with Duct-fired Heat Recovery Steam Generator
040	Unit 4C–One 215 MW (ISO) Combustion Turbine with Duct-fired Heat Recovery Steam Generator
041	Unit 4D–One 215 MW (ISO) Combustion Turbine with Duct-fired Heat Recovery Steam Generator

Combined cycle Unit 4 consists of the four gas-fueled Siemens SGT6-5000F combustion turbines (CTs) and the four duct-fired heat recovery steam generators (HRSGs) listed above. The steam generated in the four HRSGs is used in a single nominal 420 MW steam turbine-electrical generator (STG).

Each CT is permitted to also operate in simple cycle mode by directing the exhaust to a bypass stack instead of the respective HRSG. Each CT is capable of firing low sulfur distillate fuel oil for the equivalent of 1000 hours per year. Unit 4 entered commercial operation in the summer of 2009.

*{These emissions units were reviewed under the rules for the Prevention of Significant Deterioration (PSD), Rule 62-212.400, F.A.C. Best Available Control Technology (BACT) determinations were made for carbon monoxide (CO) and volatile organic compounds (VOC) in accordance with Rule 62-210.200 (Definitions). PSD was avoided for all types of particulate matter, sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) due to massive reductions from the dismantling of three conventional residual oil fueled units. The CTs are also regulated under Acid Rain-Phase II, 40 CFR 60 – NSPS Subpart KKKK and 40 CFR 63 – NESHAP, Subpart YYYY}*

#### EQUIPMENT

1. Installation of Advanced Low-Load Turn Down (ALLTD) Package: The permittee is authorized to install the Siemens ALLTD package on these combustion turbines. This package may consist of additional piping and auxiliary valves to bypass air around the combustion system, additional piping and auxiliary valves for air recirculation in the compressor section, enhanced control software, or similar enhancements to facilitate reduced emissions at lower-load operation. [Application Nos. 1030011-022-AC and 1030011-023-AC; Design]

#### AUTHORIZED TEST BURN

2. Demonstration of Compliance with CO Limit at Low Load:
  - a. *Stack Test Option:* The permittee is authorized to conduct up to two stack tests per calendar year for CO from each turbine, operating in simple-cycle mode at low load. One test may be for natural gas operation, and one test may be for fuel oil operation. If firing natural gas, the test may be performed at a CT load no less than 30%. If firing fuel oil, the test may be performed at a CT load no less than 45%. [Application No. 1030011-023-AC]
  - b. *CEMS Option:* In lieu of stack tests, the permittee is authorized to use data collected by the CO CEMS from the combined-cycle stack for each CT/HRSG to simulate a stack test to demonstrate compliance with the CO limit for that turbine, for the purposes of **Specific Condition 3**. This demonstration shall consist of a period of no less than three hours, for each CT/HRSG. [Application No. 1030011-023-AC]

*{Permitting note: These low-load tests will not be used to define the unit's "testing capacity" for the purposes of Rule 62-297.310(3), F.A.C.}*

## SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

### Combined Cycle Unit 4 (EU Nos. 038, 039, 040, 041)

#### PERMITTED OPERATIONS

3. Permitted Simple Cycle Operating Conditions:

- a. *Natural Gas:* After the permittee demonstrates compliance with the CO limit in the testing on natural gas permitted by **Specific Condition 2**, simple cycle CT operations while combusting natural gas shall be at a load not less than 30% or that load at which compliance was demonstrated during the most recent natural gas test undertaken pursuant to **Specific Condition 2**, whichever is higher, other than startup, shutdown, fuel switching, or documented malfunction. [Application No. 1030011-023-AC; Permit No. 1030011-012-AC]
- b. *Fuel Oil:* After the permittee demonstrates compliance with the CO limit in the testing on fuel oil permitted by **Specific Condition 2**, simple cycle CT operations while combusting fuel oil shall be at a load not less than 45% or that load at which compliance was demonstrated during the most recent fuel oil test undertaken pursuant to **Specific Condition 2**, whichever is higher, other than startup, shutdown, fuel switching, or documented malfunction. [Application No. 1030011-023-AC; Permit No. 1030011-012-AC]

#### TESTING

4. Test Methods: If the permittee elects to perform simple-cycle stack tests (**Specific Condition 2.a**), the tests shall be performed in accordance with EPA Method 10, Determination of Carbon Monoxide Emissions from Stationary Sources. The method is described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C. With the exception of the CEMS-based option in **Specific Condition 2.b**, no other methods may be used for compliance testing unless prior written approval is received from the administrator of the Department's Office of Permitting and Compliance in accordance with an alternate sampling procedure pursuant to 62-297.620, F.A.C. [Rules 62-204.800, F.A.C.; 40 CFR 60, Appendix A]

#### NOTIFICATIONS AND REPORTING REQUIREMENTS

5. Notification of Stack Test: If the permittee elects to perform simple-cycle stack tests (**Specific Condition 2.a**), the permittee shall notify the Compliance Authority at least 15 days prior to each test. The notification shall include the date, time, place of each such test, Facility ID Number, Emission Unit ID Number(s) and description(s), test method, pollutant to be tested, along with the name and telephone number of the person who will be responsible for conducting such test(s) for the owner or operator. [Rule 62-297.310(9), F.A.C.]
6. Test Reports: The permittee shall submit a written test report to the Compliance Authority on the results of any stack test or CEMS-based simulated stack test pursuant to **Specific Condition 2**, as soon as practicable after the completion of testing, but no later than 45 days after the last run of each test is completed. This report shall clearly state if any minimum permitted simple-cycle operating CT loads are being adjusted in accordance with **Specific Condition 3**. The report shall follow the requirements in Appendix D, Common Testing Requirements. [Rule 62-297-310(10), F.A.C.]