



Florida Department of Environmental Protection

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PERMITTEE

Florida Power & Light Company
700 Universe Boulevard
Juno Beach, Florida 33408

Authorized Representative:
Mr. Jonathan Napoli, Plant General Manager

Air Permit No. 0090006-013-AC
Permit Expires: December 31, 2018
Minor Air Construction Permit
Cape Canaveral Energy Center
Unit 3 Performance Upgrade

PROJECT

This is the final air construction permit, which authorizes the installation of the Siemens 8000H(1.4) compressor components to improve the performance of Unit 3 (Units 3A through 3C). The proposed work will be conducted at the existing Cape Canaveral Energy Center (CCEC), which is an electric utility plant categorized under Standard Industrial Classification No. 4911. The existing facility is located in Brevard County at 6000 U.S. Highway One North in Cocoa, Florida. The UTM coordinates are Zone 17, 523.1 kilometers (km) East and 3,149 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

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.

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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 1. GENERAL INFORMATION

FACILITY DESCRIPTION

This facility includes a combined cycle unit, Unit 3, designated as emissions units (EU) 009, 010, and 011, which each consist of a combustion turbine generator with automated control, inlet air filtration system and evaporative cooling, a gas-fired heat recovery steam generator (HRSG) with duct burners, a HRSG stack, and associated support equipment. This facility also includes one steam turbine generator that serves the combined cycle unit, one nominal 3,000-kilowatt liquid fueled emergency generator, and one emergency diesel fire pump engine with a 500-gallon fuel oil storage tank.

A summary of the regulated existing emission units at the CCEC is given in table below.

EU No.	Emission Unit Description
009	Unit 3A – one nominal 265 MW CTG with supplementary-fired HRSG
010	Unit 3B – one nominal 265 MW CTG with supplementary-fired HRSG
011	Unit 3C – one nominal 265 MW CTG with supplementary-fired HRSG
015	One nominal 3,000 kilowatt (kW) liquid fueled emergency generator
016	One nominal 315 hp emergency diesel fire pump engine and 500-gallon fuel oil storage tank

{Permitting Note: This air construction permit will authorize Units 3A – 3C to be upgraded from 265 MW to 290 MW.}

PROPOSED PROJECT

The proposed project will replace component parts normally associated with maintenance outages for the Siemens Model 8000H(1.3) combustion turbines of Unit 3 (3A through 3C) with (1.4) compressor components and other upgrades that can provide performance increases through new combustion turbine tuning. The performance upgrade is intended to provide approximately an 8-percent increase in output power per turbine with increased reliability and a slight improvement in combined cycle heat rate over like-kind replacements. The construction project will improve compressor design, combustor optimization, ring clearance optimization, enhance turbine stages and improve material resilience. Details of the project are provided in the application and the Technical Evaluation and Preliminary Determination which is issued concurrently with this draft permit.

FACILITY REGULATORY CLASSIFICATION

Title III: The facility is not a major source of hazardous air pollutants (HAP).

Title IV: The facility operates units subject to the acid rain provisions of the Clean Air Act (CAA).

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.

PSD: The facility is a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.

NSPS: The facility operates units subject to the New Source Performance Standards (NSPS) of 40 CFR 60.

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. All documents related to applications for permits to operate an emissions unit shall be submitted to the OPC Section.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Central District Office at: 3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803.
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. Construction. This permit authorizes the installation of 8000H(1.4) components for Unit 3 (designated as Units 3A through 3C) with new turbine tuning curves; and, the initial operation after the replacement to determine compliance with Department rules. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Department's Office of Permitting and Compliance prior to the expiration of this permit. [Rules 62-210.300(1), 62-4.070(4) 62-4.080, and 62-4.210, F.A.C.]
9. 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 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.]
10. 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

SECTION 2. ADMINISTRATIVE REQUIREMENTS

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.]

11. **Actual Emissions Reporting:** This permit is based on an analysis that compared baseline actual emissions with projected actual emissions and avoided the requirements of subsection 62-212.400(4) through (12), F.A.C. for several pollutants. Therefore, pursuant to Rule 62-212.300(1)(e), F.A.C., the permittee is subject to the following monitoring, reporting and recordkeeping provisions as described in **Section 3, Specific Condition No. 3**. [Application No. 0090006-013-AC; and Rules 62-212.300(1)(e) and 62-210.370, F.A.C.]

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

A. COMBINED CYCLE UNIT 3

This section of the permit addresses the following emissions units.

EU No.	Emission Unit Description
009	Unit 3A – one nominal 265 290 MW CTG with supplementary-fired HRSG
010	Unit 3B – one nominal 265 290 MW CTG with supplementary-fired HRSG
011	Unit 3C – one nominal 265 290 MW CTG with supplementary-fired HRSG

PREVIOUS APPLICABLE REQUIREMENTS

1. Other Permits. The conditions of this permit supplement all previously issued air construction and operation permits for these emissions units. Unless otherwise specified below, these conditions are in addition to all other applicable permit conditions and regulations. The facility remains subject to all of the requirements contained in all previously issued air construction permits for this facility. [Rule 62-4.070, F.A.C.]

NEW EQUIPMENT

This permit allows the installation of new Siemens turbine components to improve the performance of Unit 3 (designated as Units 3A through 3C).

2. Combustion Turbine Improvements on Unit 3: The permittee is authorized to conduct the following work on Unit 3 (designated as Units 3A through 3C) including the replacement of various components of the Siemens Model 8000H(1.3) turbines with upgraded components of the (1.4) model including the following:
 - New compressor components;
 - Combustor optimization and tuning;
 - Ring clearance optimization;
 - Enhanced turbine stages and improved material.

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REPORTING REQUIREMENTS

3. Actual Emissions Reporting: This permit is based on an analysis that compared baseline actual emissions with projected actual emissions and avoided the requirements of subsection 62-212.400(4) through (12), F.A.C. for several pollutants. Therefore, pursuant to Rule 62-212.300(1)(e), F.A.C., the permittee is subject to the following monitoring, reporting and recordkeeping provisions.
 - a. The permittee shall monitor the emissions of any PSD pollutant that the Department identifies could increase as a result of the construction or modification and that is emitted by any emissions unit that could be affected; and, using the most reliable information available, calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of 10 years following resumption of regular operations after the change. Emissions shall be computed in accordance with the provisions in Rule 62-210.370, F.A.C., which are provided in Appendix C of this permit.
 - b. The permittee shall report to the Department within 60 days after the end of each calendar year during the 10-year period setting out the unit's annual emissions during the calendar year that preceded submission of the report. The report shall contain the following:
 - (1) The name, address and telephone number of the owner or operator of the major stationary source;
 - (2) The annual emissions calculations pursuant to the provisions of 62-210.370, F.A.C., which are provided in Appendix C of this permit;
 - (3) If the emissions differ from the preconstruction projection, an explanation as to why there is a difference; and

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

A. COMBINED CYCLE UNIT 3

- (4) Any other information that the owner or operator wishes to include in the report.
- c. The information required to be documented and maintained pursuant to subparagraphs 62-212.300(1)(e)1 and 2, F.A.C., shall be submitted to the Department, which shall make it available for review to the general public.
- d. For this project, the permittee estimated the following baseline actual emissions: 290.91 tons per year (TPY) of carbon monoxide (CO); 184.76 TPY of nitrogen oxides (NO_x); 14.20 TPY of sulfur dioxide; 0.92 TPY of volatile organic compounds; 43.9 TPY of particulate matter; 2.17 TPY of sulfuric acid mist; and 2,782,055 TPY of carbon dioxide-equivalent.
- e. The Department has identified CO and NO_x as the only PSD-pollutant that could reasonably increase as a result of this modification. For comparative purposes with baseline actual emissions, the permittee shall use the installed continuous emissions monitoring systems (CEMS) to determine and report the actual annual emissions of CO and NO_x.
- f. 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) that correct for site conditions to the Permitting and Compliance Authorities within 45 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 62-210.200(PTE), F.A.C.]

{Permitting Note: Continuous compliance with the CO and NO_x standard will be demonstrated by CEMS. Other required stack tests may be conducted during the next scheduled period in accordance with existing permit conditions.}

[Application No. 0090006-013-AC; and Rules 62-212.300(1)(e) & 62-210.370, F.A.C.]

RECORDS AND REPORTS

4. 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. [Rule 62-297.310(10), F.A.C.]

PERMITS MODIFIED

The following revisions to Permit No. 0090006-005-AC are shown below:

5. *Section III, Subsection A., Specific Condition 2.*

Combustion Turbines-Electrical Generators (CTG): The permittee is authorized to install, tune, operate, and maintain three "G" or "H" technology CTG each with a nominal generating capacity of ~~265~~290 MW. Each CTG shall include an automated control system and have dual-fuel capability. Ancillary equipment includes an inlet air filtration system and an evaporative inlet air-cooling system. The CTG will utilize DLN combustors. [Application ~~No. 0090006-013-AC~~and Design]

6. *Section III, Subsection A., Specific Condition 10.*

Emissions Standards. Emissions from each CTG/DB shall not exceed the following standards developed under state implementation plan (SIP) permitting procedures. Compliance with these limits also assures compliance with the emission limitations in 40 CFR 60, Subpart KKKK.

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

A. COMBINED CYCLE UNIT 3

Pollutant	Fuel	Method of Operation	Initial Stacks Tests		CEMS Rolling Average Limit ppmvd ^a
			ppmvd ^a	lb/hr ^b	
CO ^d	Oil	CTG	10.0	61.0	10.0, 30 unit operating days ^{c,d}
	Gas	CTG & DB	7.6	52.7 55.2	8.0, 30 unit operating days ^{c,d}
		CTG Normal Mode	5.0	29.0 31.5	
NO _x ^e	Oil	CTG	8.0	80.0	8.0, 30 unit operating days ^{c,e}
	Gas	CTG & DB	2.0	22.8 24.2	2.0, 30 unit operating days ^{c,e}
		CTG Normal Mode	2.0	19.3 20.7	
VOC ^f	Oil	CTG	6.0	18.9	NA
	Gas	CTG & DB	1.9	7.2	
		CTG Normal Mode	1.5	4.8	
NH ₃ ^g	Oil/Gas	CTG, All Modes	5	NA	NA
SAM/SO ₂ ^h	Oil/Gas	All Modes	2 gr S/100 SCF of gas, 0.0015% sulfur fuel oil Visible emissions shall not exceed 10% opacity for each 6-minute block average.		
PM/PM ₁₀ ⁱ					

- a. Concentration standards are given in terms of parts per million, by volume, dry at 15 percent oxygen and abbreviated as ppmvd.
- b. The mass emission rate standards in pounds per hour (lb/hr) are based on a turbine inlet condition of 59° F and may be adjusted to actual test conditions in accordance with the performance curves and/or equations filed with the Department.
- c. “Unit operating day” means a 24-hour period between 12 midnight and the following midnight during which any fuel is combusted at any time in the unit. It is not necessary for fuel to be combusted continuously for the entire 24-hour period.
[40 CFR 60.4420]
- d. Compliance with the continuous 30-unit operating days rolling CO standard shall be demonstrated based on data collected by the required CEMS. The initial EPA Method 10 tests associated with the certification of the CEMS instruments shall also be used to demonstrate initial performance guarantees for natural gas, oil, and DB mode.
- e. Continuous compliance with the 30-unit operating days rolling NO_x standards shall be demonstrated based on data collected by the required CEMS and will also insure compliance with the less stringent Subpart KKKK limits of 15 and 42 ppmvd for gas and fuel oil respectively on a 30-unit operating day rolling average basis. The initial EPA Method 7E or Method 20 tests associated with demonstration of compliance with 40 CFR 60, Subpart KKKK or certification of the CEMS instruments shall also be used to demonstrate compliance with the individual standards for natural gas, fuel oil, and duct burner modes during the time of those tests. NO_x mass emission rates are defined as oxides of nitrogen expressed as nitrogen dioxide (NO₂).
- f. Compliance with the VOC standards shall be demonstrated by conducting tests in accordance with EPA Method 25A. Optionally, EPA Method 18 may also be performed to deduct emissions of methane and ethane. The emission standards are based on VOC measured as methane.
- g. Compliance with the NH₃ slip standard shall be demonstrated by conducting tests in accordance with EPA Method CTM-027 or EPA Method 320.

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

A. COMBINED CYCLE UNIT 3

- h. The clean fuel sulfur specifications and visible emissions standard effectively limit the potential emissions of SAM and SO₂ from the CTG. Compliance with the fuel sulfur specifications shall be determined by the ASTM methods for determination of fuel sulfur as detailed in the draft permit.
- i. The clean fuel sulfur specifications, low CO and NO_x limits, and the visible emissions standard will effectively limit PM/PM₁₀/PM_{2.5} emissions. Compliance with the visible emissions standard shall be demonstrated by conducting tests in accordance with EPA Method 9.

[Application and Avoidance of Rule 62-212.400(4) through (12), F.A.C.; 40 CFR 60, Subpart KKKK; Permit
No. 0090006-005-AC, Specific Condition A.10.; and Application No. 0090006-013-AC]