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Air Permit No. 0310485-024-AC (PSD-FL-310G)
Permit Expires: September 30, 2020
Minor Air Construction Permit
Brandy Branch Generating Station
Combined-Cycle Uprate Project

PROJECT

This is the final air construction permit, which authorizes uprates to the two turbines in the combined-cycle block. The proposed work will be conducted at the existing Brandy Branch Generating Station, which is an electric power plant categorized under Standard Industrial Classification No. 4911. The existing facility is in Duval County at 15701 Beaver Street West in Baldwin, Florida. The UTM coordinates are Zone 17, 408.91 kilometers (km) East and 3354.64 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. 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

David Lyle Read, P.E.

David Lyle Read, P.E.
2018.08.14 13:24:39 -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.

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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.

Lynn Scearce 2018.08.14 13:32:18 -04'00'

FACILITY DESCRIPTION

This facility consists of three dual-fuel, nominal 170 megawatt (MW) General Electric model PG7241FA combustion turbine-electrical generators and two one-million-gallon capacity fuel oil storage tanks. Two of the combustion turbines (EU Nos. 002 and 003) are configured for combined cycle mode and one (EU No. 001) for simple cycle operation. Emissions from the units are controlled by Dry Low Nitrogen Oxides (NO_X) (DLN-2.6) combustors when operating on natural gas and wet injection when firing fuel oil. For the combined cycle units, selective catalytic reduction (SCR) systems are additionally utilized for further NO_X reductions. Inherently clean fuels and good combustion practices are employed to control all pollutants.

For the two combined-cycle turbines (EU Nos. 002 and 003), emissions of nitrogen oxides (NO_X) and carbon monoxide (CO) are measured by continuous emissions monitoring systems (CEMS). These turbines are also equipped with selective catalytic reduction (SCR) to control NO_X emissions.

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

EU No.	Emission Unit Description
001	Simple-Cycle Combustion Turbine-Electrical Generator
002	Combined-Cycle Combustion Turbine-Electrical Generator with supplementary-fired Heat Recovery Steam Generator (HRSG)
003	Combined-Cycle Combustion Turbine-Electrical Generator with supplementary-fired HRSG
007	Water Cooling - One Fresh Water Mechanical Draft Cooling Tower
008	Emergency Diesel-Fired Fire Pump Engine

PROPOSED PROJECT

This project entails an efficiency upgrade and uprate to the two combined-cycle turbines (EU Nos. 002 and 003). Components of the project include changes to the gas turbine compressors to advanced compressor and 3 step-aged turbine rotor (3SAR) that result in an increase in combustion air flow into and through the compressor section of the turbine, i.e., advanced gas pathway (AGP); an upgrade of the combustion system to the DLN2.6+ combustion system; changes to the combustion control logic; and new OpFlex software to enhance control of the inter-stage attemperators of the HRSG.

This project will modify the following emissions units.

EU No.	Emission Unit Description
002	Combined-Cycle Combustion Turbine-Electrical Generator with supplementary-fired HRSG
003	Combined-Cycle Combustion Turbine-Electrical Generator with supplementary-fired HRSG

FACILITY REGULATORY CLASSIFICATION

- The facility is not 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 Northeast District Office at: 8800 Baymeadows Way West, Jacksonville, Florida 32256.

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.]

10. 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

        (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. The permittee shall compute and report annual emissions in accordance with Rule 62-210.370(2), F.A.C. as provided by Appendix C of this permit. For this project, the permittee shall use the following methods in reporting the actual annual **CO**, **NO_X**, **SO_2**, and **GHG** emissions for EU Nos. 002 and 003:

        (1) The permittee shall use data collected from the CEMS to determine and report the actual annual emissions of NO_X and CO.

        (2) The permittee shall use the data reported to the Clean Air Markets Division of US EPA for SO_2 and GHG emissions.

        (3) As defined in Rule 62-210.370(2), F.A.C., the permittee shall use a more accurate methodology if it becomes available.

    {Permitting Note: Baseline emissions were determined to be the following: NO_X, 115.6 tons per year (tpy); CO, 34.8 tpy; SO_2, 8.07 tpy; GHG, 1,598,507 tpy. The additional excludable "could have accommodated" / demand growth emissions were determined to be the following: NO_X, 41.3 tpy; CO, 30.4 tpy; SO_2, 1.26 tpy; GHG, 192,902 tpy. "Projected actual emissions" were the following: NO_X, 177.3 tpy; CO, 122.9 tpy; SO_2, 41.2 tpy; GHG, 1,956,602 tpy.}

    [Application 0310485-024-AC; and Rules 62-212.300(1)(e) and 62-210.370, F.A.C.]

A. EU Nos. 002 and 003, Combined-Cycle Combustion Turbines

This section of the permit addresses the following emissions units.

EU No.	Emission Unit Description
002	Combined-Cycle Combustion Turbine-Electrical Generator with supplementary-fired HRSG
003	Combined-Cycle Combustion Turbine-Electrical Generator with supplementary-fired HRSG

Both units are equipped to fire both natural gas and oil. Each turbine is equipped with selective catalytic reduction and exhausts through an associated 190-foot stack. The turbines are equipped with continuous emissions monitoring systems for NO_X and CO. Fuel oil firing in each turbine is limited to 1,478 hours per year. Initial startup for both units occurred November 27, 2004.

Both units are equipped with duct burners with a maximum heat input rate of 200 million British thermal units per hour (MMBtu/hr). Duct burner firing is limited to 1,800,000 MMBtu per consecutive 12-month period.

{Permitting Note: Because this project results in a pound-per-hour increase in NO_X emissions, the project is considered a modification for NSPS purposes. After this project, both units will be subject to NSPS Subpart KKKK. These emissions units are regulated under: Acid Rain-Phase II, Rule 212.400, F.A.C., Prevention of Significant Deterioration (PSD); Best Available Control Technology (BACT); PSD-FL-310 and amendments (A thru H); and, Power Plant Siting Project No. PA 00-43.}

APPLICABLE STANDARDS AND REGULATIONS

1. NSPS Requirements: These units shall comply with the applicable New Source Performance Standards (NSPS) in 40 CFR 60, including: Subpart A (General Provisions), and Subpart KKKK (Standards of Performance for Stationary Combustion Turbines). See Appendices NSPS Subpart A and KKKK of this permit. Some separate reporting and monitoring may be required by the individual subparts. After completion of this project, the units will no longer be subject to NSPS Subpart GG. [Rules 62-204.800(8)(b) and (d), F.A.C.; and NSPS 40 CFR 60, Subparts A and KKKK]

EQUIPMENT

2. AGP Upgrade Package: The permittee is authorized to perform an efficiency upgrade that includes the following components: changes to the gas turbine compressors to advanced compressor and three step aged rotor (3SAR) that result in an increase in combustion air flow into and through the compressor section of the turbine, i.e., advanced gas pathway, or AGP; an upgrade of the combustion system to the DLN2.6+ combustion system; changes to the combustion control logic; and new OpFlex software to enhance control of the inter-stage attemperators of the HRSG. [Application No. 0310485-024-AC]

   {Permitting note: This project package is described as a hybrid of the 7F.04 and 7F.05 turbine models, described by GE as a 7F.04-200 Tech 3SAR submodel.}

PERFORMANCE RESTRICTIONS

3. Permitted Capacity: The nominal heat input rates, based on the higher heating value of the fuel, for each turbine shall not exceed 2,080 MMBtu/hr for natural gas or 2,170 MMBtu/hr for ultra-low-sulfur distillate fuel oil. Heat input rates will vary depending upon gas turbine characteristics, ambient conditions, and alternate methods of operation. 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. [Rule 62-210.200(PTE), F.A.C.]

4. Hours of Operation: The permitted hours of operation of the turbines and the permitted usage of the duct burners are unaffected by this project. [Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

EMISSIONS STANDARDS

5. Subpart KKKK NO_X Standards: Emissions of NO_X shall not exceed the following, on a 30-operating-day rolling average basis:
   a. *Natural gas*: 15 parts per million at 15 percent oxygen (ppm @ 15% O_2)
   b. *ULSD*: 42 ppm @ 15% O_2
   c. *Operation at less than 75% of peak load*: 96 ppm @ 15% O_2
   [40 CFR 60.4325 and Table 1 to Subpart KKKK]
   {Permitting note: These turbines are already subject to BACT limits of 3.5 ppmvd @ 15% O_2 for natural gas firing and 15.0 ppmvd @ 15% O_2 for ULSD firing. The BACT limits for SO_2 assure compliance with the Subpart KKKK SO_2 limit. The BACT limits for all pollutants are unaffected by this permit.}

TESTING REQUIREMENTS

6. Subpart KKKK Initial Compliance Demonstrations: The initial compliance demonstrations for NO_X shall be in accordance with Subpart KKKK, 40 CFR 60.4405. This subpart allows for the initial compliance demonstration to be performed as part of the relative accuracy test audit (RATA) for the NO_X CEMS. The initial compliance demonstration must be conducted within 60 days after achieving the maximum production rate of the turbine, but not later than 180 days after initial startup of the turbine. [Rules 62-4.070 and 62-297.310(8)(b), F.A.C., and 40 CFR 60.8 and 60.4405]

7. 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.]

8. 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
7E	Determination of Nitrogen Oxide Emissions from Stationary Sources

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. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800, F.A.C.; and Appendix A of 40 CFR 60]

RECORDS AND REPORTS

9. 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.]

10. Periodic Emissions Reporting:
    a. *Malfunction Notification*: If emissions in excess of a standard (subject to the specified averaging period) occur due to malfunction, the permittee shall notify the Compliance Authority within one working day of the following: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Compliance Authority may request a written summary report of the incident.
    b. *Subpart KKKK Semi-Annual Report*: Within 30 days following the end of each semi-annual period, the permittee shall submit a report to the Compliance Authority summarizing periods of NO_X emissions in excess of the Subpart KKKK limit, following the NSPS format in 40 CFR 60.7(c), Subpart A. In addition, the report shall summarize the NO_X CEMS system monitor availability for the previous semi-annual period.
    [Rules 62-4.130 and 62-210.700(5), F.A.C.; 40 CFR 60.7 and 60.4375]