Title V Air Operation Permit Revision
Permit No. 0310485-022-AV

APPLICANT

The applicant for this project is JEA. The applicant's responsible official and mailing address are: Michael J. Brost, P.E., President, Electric Systems, JEA, 21 West Church Street, Jacksonville, FL 32202.

FACILITY DESCRIPTION

The applicant operates the Brandy Branch Generating Station, which is located at 15701 Beaver Street West, Baldwin City, Florida.

The existing facility consists of three nominal 170 megawatt (MW) combustion turbine-electrical generators and two one-million gallon capacity fuel oil storage tanks. Two of the combustion turbines are configured for combined cycle mode (EU 002, EU 003) and one for simple cycle operation (EU 001). The combustion turbines use natural gas as the primary fuel and low-sulfur distillate fuel oil as backup fuel. The combined cycle mode combustion turbines are equipped with a supplementary-fired (natural gas) heat recovery steam generator (HRSG) duct burner. Emissions from the units are controlled by dry low nitrogen oxides (NO_X) combustors when operating on natural gas and wet injection when firing fuel oil. For the combined cycle units (EU 002, EU 003) selective catalytic reduction systems (SCR) are utilized for further NO_X reductions. Compliance with NO_X emissions from EU 001, EU 002 and EU 003 is demonstrated with continuous emissions monitoring systems (CEMS). For EU 001, EU 002 and EU 003, compliance with carbon monoxide (CO) emissions may be conducted concurrently with the relative accuracy test audit (RATA) for NO_X using CEMS. Sulfur dioxide (SO_2) emissions compliance is demonstrated with fuel analysis or vendor data. Compliance with the particulate matter (PM/PM_{10}) emissions limits is demonstrated for EU 001 by using compliant fuel and by complying with the opacity limit (10%) for EU 002 and EU 003. Clean fuels and good combustion practices are employed to control all pollutants.

Also included in this permit are miscellaneous unregulated/insignificant emissions units and/or activities.

PROJECT DESCRIPTION

The purpose of this permitting project is to revise the existing Title V permit for the above referenced facility.

PROCESSING SCHEDULE AND RELATED DOCUMENTS

Application for a Title V Air Operation Permit Revision received August 9, 2013.

Draft/Proposed Title V Air Operation Permit Revision package issued October 30, 2013.

PRIMARY REGULATORY REQUIREMENTS

Title III: The facility is not identified as 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.

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

PSD: The facility is a Prevention of Significant Deterioration (PSD)-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility operates units subject to the New Source Performance Standards (NSPS) of 40 Code of Federal Regulations (CFR) 60 (Subpart GG and Subpart A, Standards of Performance for Stationary Gas Turbines and General Provisions, respectively).

CAIR: The facility is subject to the Clean Air Interstate Rule (CAIR) set forth in Rule 62-296.470, F.A.C.

Siting: Units 002 and 003 were originally certified pursuant to the power plant siting provisions of Chapter 62-17, F.A.C.

CAM: Compliance Assurance Monitoring (CAM) does not apply to any of the units at the facility. A CAM plan is not required because the emission limitations or standards were proposed after 11/15/1990 and continuous compliance determination methods for emission limitations and standards are specified in the permit.

PROJECT REVIEW

This Title V permit revision reflects changes to specific conditions authorized by concurrent air construction permit No. 0310485-021-AC that revised the language of air construction permits 0310485-001-A C, 0310485-003-AC, 0310485-007-AC, 0310485-010-AC and 0310485-017-AC dealing primarily with a change to lower sulfur fuel oil for various emission units at the facility. The Technical Evaluation and Preliminary Determination document discusses the rationale for making these changes. The following revisions were made to the Title V permit. ~~Strikethrough~~ indicates deleted text; double underline indicates added text.

A.2. Methods of Operation – Fuels. Only ~~pipeline~~ natural gas or maximum ~~0.05~~ 0.0015 percent sulfur content, by weight, No. 2 or superior grade of distillate fuel oil shall be fired. [Rules 62-210.200(Definitions-PTE), F.A.C.; and Permit No. PSD-FL-267/0310485-001-AC, Specific Condition 7.; 0310485-021-AC, Specific Condition 2.]

{Permitting Note: Use of ULSD oil with maximum sulfur content of 0.0015-percent will be effective after the existing distillate oil inventory is spent or the sulfur content of the oil in storage is 0.0015-percent or less.}

A.3. Hours of Operation. The stationary gas turbine shall only operate up to 4,750 hours during any consecutive twelve-month period, of which 750 hours of operation per combustion turbine may be while firing fuel oil. ~~Additionally, the turbine shall be limited to 16 hours per day of fuel oil firing.~~ See also Specific Condition **B.3.** [Rule 62-210.200(Definitions - PTE), F.A.C.; and, Permit No. PSD-FL-267/0310485-001-AC, Specific Condition 13.; 0310485-021-AC, Specific Condition 2.]

A.5. Nitrogen Oxides (NO_X).

a. *Data Substitution*. For the sole purpose of Acid Rain reporting, when NO_X monitoring data are not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75).

b. *While firing Natural Gas*. The emission rate of NO_X in the exhaust gas shall not exceed ~~69.3 lb/hr (at ISO conditions)~~ 10.5 ppmvd corrected to 15% O_2 on a 24 hr block average as measured by the continuous emission monitoring system (CEMS). In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall not exceed 10.5 ppmvd @ 15% O_2 to be demonstrated by annual stack test.

c. *While firing Fuel Oil*. The concentration of NO_X in the exhaust gas shall not exceed 42 ppmvd at 15% O_2 on the basis of a 3-hr block average basis as measured by the continuous emission monitoring system (CEMS). In addition, NO_X emissions calculated as NO_2 (at ISO conditions) shall not exceed 42 ppmvd @ 15% O_2 to be demonstrated by stack test.

d. *After Firing Fuel Oil For 400 Hours*. After combusting fuel oil for at least 400 hours on any individual combustion turbine (CT), the permittee shall prepare and submit for the DEP's review and acceptance an engineering report regarding the lowest NO_X emission rate that can consistently be achieved when firing distillate oil. This lowest recommended rate shall include a reasonable operating margin, taking into account long-term performance expectations and good operating and maintenance practices. The DEP may revise the NO_X emission rate based upon this report.

[Rule 62-212.400, F.A.C.; and, Permit No. PSD-FL-267/0310485-001-AC, Specific Condition 21;0310485-021-AC, Specific Condition 2.]

A.7. Sulfur Dioxide (SO_2) and Sulfuric Acid Mist (SAM). SO_2 and SAM emissions shall be limited by firing ~~pipeline~~ natural gas (sulfur content not greater than 2 grains per 100 standard cubic feet) and ~~0.05~~ 0.0015% sulfur content, by weight, fuel oil. Compliance with this requirement in conjunction with implementation of

the Custom Fuel Monitoring Schedule in Specific Conditions A**.12.** and **E.5.** will demonstrate compliance with the applicable NSPS SO_2 emissions limitations from the combustion turbine. [40 CFR 60 Subpart GG; Rules 62-4.070, 62-212.400, and 62-204.800(7), F.A.C.; BACT; and, Permit No. 0310485-004-AC, Specific Condition 23 (as revised in permit modification letter dated 4/12/01); 0310485-021-AC, Specific Condition 2.]

A.11. Excess Emissions. Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted provided:

a. Best operational practices are adhered to and the duration of excess emissions shall be minimized, but in no case exceed two hours in any 24-hour period for other reasons, unless specifically authorized by the DEP for longer duration;
b. Operation below ~~50% output while firing fuel oil (and below~~ 62 gross megawatts while firing fuel oil and natural gas~~)~~ shall be limited to 2 hours per unit cycle (breaker closed to breaker open);
c. Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited pursuant to Rule 62-210.700, F.A.C.

[Permit No. PSD-FL-267/0310485-001-AC, Specific Condition 26; Permit No. 0310485-010-AC (revision dated 1/18/2005) Rules 62-210.700(1) - (5), F.A.C.; 0310485-021-AC, Specific Condition 6.]

A.19. Continuous Compliance With the NO_X Emission Limits. Continuous compliance with the NO_X emission limits shall be demonstrated with the CEM system based on the applicable averaging time of 24-hr block average (DLN technology while burning gas) or a 3-hr block average (~~SCR technology or~~ while burning oil). For the 24-hr block average (lb/hr) emissions may be determined via EPA Method 19 or equivalent EPA approved methods. Based on CEMS data, a separate compliance determination is conducted at the end of each operating day (or 3-hr period when applicable) and a new average emission rate is calculated from the arithmetic average of all valid hourly emission rates from the previous operating day (or 3-hr period when applicable). Valid hourly emission rates shall not include periods of startup, shutdown, or malfunction as defined in Rule 62-210.200, F.A.C., where emissions exceed the applicable NO_X standard. These excess emissions periods shall be reported as required in Specific Condition **A.25.** A valid hourly emission rate shall be calculated for each hour in which at least two NO_X concentrations are obtained at least 15 minutes apart. [Rules 62-4.070, F.A.C. and 62-210.700, F.A.C.; 40 CFR 75; and, Permit No. PSD-FL-267/031485-001-AC, Specific Condition 30; 031485-021-AC, Specific Condition 2.]

A.20. Compliance with the SO_2 and PM/PM_{10} Emission Limits. Notwithstanding the requirements of Rule 62-297.310(7), F.A.C., the use of ~~pipeline~~ natural gas and maximum ~~0.05~~ 0.0015 percent sulfur (by weight) No. 2 or superior grade distillate fuel oil, is the method for determining compliance for SO_2 and PM_{10}. For the purposes of demonstrating compliance with the 40 CFR 60Subpart GG SO_2 standard and the ~~0.05~~ 0.0015% sulfur limit, fuel oil analysis using ASTM D2880-941 or D4294-90 (or equivalent latest version) for the sulfur content of liquid fuels and D1072-80, D3031-81, D4084-82 or D3246-81 (or equivalent latest version) for sulfur content of gaseous fuel shall be utilized in accordance with the EPA-approved custom fuel monitoring schedule or natural gas supplier data may be submitted or the natural gas sulfur content referenced in 40 CFR 75, Appendix D, may be utilized. The applicant is responsible for ensuring that the procedures above are used for determination of fuel sulfur content. Analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60 Subpart GG. [Permit No. PSD-FL-267/0310485-001-AC, Specific Condition 31; 0310485-021-AC, Specific Condition 2.]

B.2. Methods of Operation – Fuels. The facility is authorized to burn any combination of natural gas (2.0 grains sulfur/100 scf), ~~low sulfur fuel oil (0.05% sulfur content, by weight)~~ and/or ~~lower~~ ultra low sulfur fuel oil (~~0.0065~~ 0.0015% sulfur content, by weight). ~~The combinations of these fuels are~~ These fuels are subject to the hour limitations and recordkeeping requirements set forth in this permit. Unless otherwise authorized by this permit, CT operation below 62 gross megawatts shall be limited to 2 hours during each calendar day.

[Rules 62-210.200(Definitions - PTE), F.A.C.; PSD-FL-310, Specific Condition 7; Permit Nos. 0310485-007-AC and 0310485-015-AC; 0310485-021-AC, Specific Condition 5.]

{Permitting Note: Use of USLD oil with maximum sulfur content of 0.0015-percent will be effective after the existing distillate oil inventory is spent or the sulfur content of the oil in storage is 0.0015-percent or less.}

B.3. Hours of Operation. Except for the HRSG duct burners, the emission units are authorized to operate 8,760 hours per year while firing natural gas (2.0 grains sulfur/100 scf). The combined cycle units are authorized to operate up to a combined maximum of ~~576 actual plus "equivalent hours" per consecutive 12-month period while firing 0.05% sulfur content, by weight, fuel oil~~ **~~OR~~** ~~a combined maximum of~~ 1,478 actual hours ~~plus "equivalent hours"~~ while firing ~~0.0065% sulfur content, by weight,~~ fuel oil ~~per consecutive 12-month period, whichever occurs first. The simple cycle unit is authorized to operate up to a maximum of 750~~ actual ~~plus "equivalent hours" per consecutive 12-month period, while firing either 0.05% or 0.0065% sulfur content, by weight, fuel oil, whichever occurs~~ first. Tracking of "equivalent hours" shall conform with and be recorded as defined within this permit. Additionally, the following requirements shall apply:

~~a. *0.05% Sulfur Fuel Oil.* In the event that any of the 3 emission units (simple or combined cycle) fires No. 2 distillate fuel oil (0.05% sulfur content, by weight) during a calendar day, that unit shall be limited to 16 hours of daily operation on any fuel. Additionally, the other 2 units shall not be fired on any of the allowable fuels for that calendar day.~~

~~b. *0.0065% Sulfur Fuel Oil.* In the event that the simple cycle unit fires lower sulfur oil (0.0065% sulfur content, by weight) during any calendar day, but for 8 hours or less, the combined cycle units may fire any combination of lower sulfur oil (0.0065% sulfur content, by weight) or natural gas (2 grains/100 scf) during that calendar day.~~

~~c. *0.0065% Sulfur Fuel Oil More Than 8 Hours.* In the event that the simple cycle unit fires lower sulfur fuel oil (0.0065% sulfur content, by weight) for more than 8 hours during a calendar day, it shall be allowed 24 hours of daily operation while the combined cycle units shall not be fired on any fuel for the calendar day.~~

d. *HRSG Duct Burners.* ~~Each~~ HRSG duct burner operation shall not exceed ~~4,500 hours~~ 1,800,000 MMBtu per consecutive 12-months for both duct burner systems (See Specific Condition **B.34.a.(3).**

[Rules 62-210.200(Definitions - PTE) and 62-212.400(12), F.A.C.; Permit Nos. 0310485-003-AC/PSD-FL-310, Specific Condition 14, 0310485-007-AC/PSD-FL-310(B) and 0310485-017-AC/PSD-FL-310(F); 0310485-021-AC, Specific Condition 7.]

B.10. Sulfur Dioxide (SO_2) and Sulfuric Acid Mist (SAM). SO_2 and SAM emissions shall be limited by firing ~~pipeline~~ natural gas (sulfur content not greater than 2 grains per 100 standard cubic feet) and a limited amount of ~~0.05~~ 0.0015% sulfur content, by weight, fuel oil (or superior). Compliance with this requirement will demonstrate compliance with the applicable NSPS SO_2 emissions limitations from the combustion turbines as well as the duct burners. [BACT; 40 CFR 60 Subpart GG; Rules 62-4.070, 62-212.400 and 62-204.800(7), F.A.C.; and Permit No. 0310485-003-AC/PSD-FL-310, Specific Condition 23.; 0310485-021-AC, Specific Condition 4.]

B.16. Continuous Monitoring Systems (CEMS).

a. *CEM Requirement.* The permittee shall calibrate, maintain, and operate a continuous emission monitors in the stack to measure and record the emissions of NO_X and CO from these emissions units, and the ~~carbon dioxide (CO_2)~~ oxygen (O_2) content of the flue gas at the location where NO_X and CO are monitored, in a manner sufficient to demonstrate compliance with the emission limits of this permit.

B.34. Special Recordkeeping Requirements. The owner or operator shall obtain, make, and keep the following records:

a. *Hours of operation* and heat input shall be:
   (1) submitted with the Annual Operation Report (AOR) for the prior year for each combustion turbine by fuel type;
   (2) kept for each consecutive 12-month period for each combustion turbine by fuel type; and

(3) kept for each consecutive 12-month period while firing natural gas for each HRSG duct burner. (See Specific Condition **B.3.d.**)

~~b. *Daily hours* shall be kept for:~~

~~(1) fuel oil and natural gas operation for each combustion turbine during any day in which fuel oil is fired;~~

~~(2) when the CT is being fired and the SCR is not in service, along with support documentation demonstrating that the unit was in a DLN Major Tuning, startup or shutdown condition; and~~

~~(3) (as-fired) sulfur content of fuel oil for each combustion turbine during any day in which fuel oil is fired.~~

[Permit No. 0310485-003-AC/PSD-FL-310, Specific Condition 40; and, Permit Nos. 0310485-017-AC/PSD-FL-310(F), 0310485-014-AC, Specific Condition 40 and 0310485-012-AC; 0310485-021-AC, Specific Condition 3.]

B.35. ~~Recordkeeping Requirements and Fuel Switching: Upon prior written notification, JEA may switch between firing 0.05% or 0.0065% sulfur content, by weight, fuel oil on a calendar day basis (i.e. switching is not authorized within any calendar day). A record shall be made every day for each emission unit documenting: the fuel type actually used, the number of actual hours of firing each fuel type, and (for the hours when any oil is fired) the "equivalent hours" for the fuel oil which was not fired. The following shall be used to determine the "equivalent hours": each actual hour of combustion of 0.05% sulfur content, by weight, distillate oil shall equate to 2.6 "equivalent hours" of lower sulfur oil (0.0065% sulfur content, by weight) combustion and each actual hour of firing lower sulfur oil (0.0065% sulfur content, by weight) shall equate to 0.39 "equivalent hours" of 0.05% sulfur content, by weight, fuel oil combustion. At the end of each calendar month, the total number of "equivalent hours" plus actual hours shall be determined. A running total shall be maintained in order to ensure compliance with Specific Condition **B.3**. [Permit No. 0310485-007-AC/PSD-FL-310(B); Rule 62-210.700(6), F.A.C.;~~ 0310485-021-AC, Specific Condition 5.]

CONCLUSION

This project revises Title V air operation permit No. 0310485-020-AV, which is effective on January 1, 2014. This Title V air operation permit revision is issued under the provisions of Chapter 403, Florida Statues (F.S.), and Chapters 62-4, 62-210, 62-213 and 214, F.A.C. In accordance with the terms and conditions of this permit, the above named permittee is hereby authorized to operate the facility as shown on the application and approved drawings, plans, and other documents, on file with the permitting authority.