TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

JEA Brandy Branch Generating Station

Modification to Increase the Maximum Heat Input Capacity of the Duct Burner Systems
Units 2 and 3, Two 170 Megawatt Combined-Cycle Combustion Turbines
Baldwin City, Duval County

DEP File No. 0310485-017-AC
Amendment to PSD-FL-310(F)

Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation
Air Permitting North Section

August 31, 2006

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

JEA
21 West Church Street
Jacksonville, FL 32202

Authorized Representative: *Mr. James M. Chansler, P.E.,D.P.A.,V.P – Operations and Maintenance*

1.2 Reviewing and Process Schedule

06-20-06: Date of Receipt of Application;
07-27-06: Receipt of Supplementary Material via E-mail; and,
07-31-06: Receipt of Supplementary Material via E-mail; and, application deemed complete.

2. FACILITY INFORMATION

2.1 Facility Location

The JEA Brandy Branch Generating Station is located approximately 1 mile northeast of Baldwin City, Duval County (See Figure 1). This site is approximately 34 kilometers southeast and 127 kilometers southwest of the Okefenokee and Wolf Island Class I National Wilderness Areas, respectively. UTM coordinates for this facility are Zone 17; 408.81 km E; 3354.38 km N.

2.2 Standard Industrial Classification Codes (SIC)

Industry Group No.	49	Electric, Gas, and Sanitary Services
Industry No.	4911	Electric Services

2.3 Facility Category

This existing facility can generate approximately 710 megawatts (nominal 170 MW x 3 + 200 MW) of electrical power. The facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 TPY.

This facility is <u>not</u> within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD). During the original permitting to authorize construction, a Best Available Control Technology determination was required for NO_x, SO_2, VOC, PM/PM_{10}, Sulfuric Acid Mist (SAM) and CO; also, an air quality impact review was required for CO, PM/PM_{10}, NO_x and SO_2.

The facility is not a major source of hazardous air pollutants (HAPS) and is not subject to any specific industry or HAP control requirements pursuant to Section 112 of the Clean Air Act.

2.4. Project History

In October 1999, the original facility was permitted for three nominal 170 MW General Electric (GE) PG7241 FA simple cycle, dual-fuel fired intermittent duty combustion turbine (CT)-electrical generators (Units 1, 2 and 3) with 90-foot stacks/CT, and three (only built two) 1 million gallon fuel oil storage tanks (PSD-FL-297).

In March 2002 and permitting action, No. 0310485-003-AC/PSD-FL-310, Units 2 and 3 were re-configured for combined-cycle operation, still intermittent duty units, with the addition of a heat recovery steam generator (HRSG) and supplementary-fired (natural gas) duct burner to each CT at a heat input rate of 85 mmBtu/hr (HHV). The air construction permit also included 190-foot stacks/CT, a shared

nominal 200 MW steam generator, one mechanical draft fresh water cooling tower, and a selective catalytic reduction (SCR) unit/CT for reducing NO_x emissions, including ancillary equipment and ammonia storage.

In June 2003 and permitting action, No. 0310485-006-AC/PSD-FL-310(A), the Department's revised permit authorized an increase in the heat input rate to each natural gas-fired HRSG duct burner from 85 to 170 mmBtu/hr, based on the higher heating value (HHV) for natural gas. For the CTs, the main fuel will be natural gas and supplemented with fuel oil. The CT-HRSG operations have varied permitted hours of operation depending on the fuels fired and operations of the CT and/or HRSG.

3. PROJECT DESCRIPTION

JEA proposes to increase the maximum heat input on the natural gas-fired HRSG duct burners from 170 to 200 mmBtu/hr for each combined-cycle CT, Unit 2 and Unit 3. The company has conducted some testing of the emissions units and found that they can achieve more heat input than what was actually permitted. No physical changes have been made, or need to be made, to the emissions units in order to achieve the requested additional heat input. In addition, a restriction on the hours of operation for each HRSG duct burner is included in the request at 4500 hours per consecutive 12-months in order to avoid exceeding the PSD significant emission rates and maintaining the existing allowable emission limits. The following table shows the total potential emissions from the duct burner systems as currently permitted, as proposed by this project, and the difference.

Table 1 – Estimated Potential to Emit (PTE)				
Pollutant	PSD Significant Emission Rates TPY	Both HRSG Duct Burner Systems (DBS) Combined		
		Current Permit 170 mmBtu/hr/DBS 8760 hours/year [1, 2] TPY	Project as Proposed 200 mmBtu/hr/DBS 4500 hours/year [2] TPY	Change in PTE TPY
NO_x	40	19.45	11.75	-7.70
SO_2[3]	40	9.11	5.51	-3.50
CO	100	149.27	90.21	-59.06
VOC[4]	40	35.74	21.60	-14.14
PM[4]	25	23.84	14.40	-9.44
PM_{10}[4]	15	23.84	14.40	-9.44
SAM[5]	7	1.40	0.84	-0.56

Notes:

[1] PTE is based on an operating rate of 8,760 hours per year and the use of lb/mmBtu emission rates derived from JEA's previous permitting efforts for the Brandy Branch Generating Station.

[2] Estimated emissions are from both duct burners combined.

[3] PTE is based on a pipeline natural gas sulfur content of 2 grains per 100 scf.

[4] VOC and PM/PM_{10} emissions are limited by permit on a lb/hr basis. JEA is not requesting an increase in the current lb/hr limits associated with the heat input rate increase of the duct burners. Therefore, there will be no increase in permitted hourly emissions of these pollutants.

[5] SAM (sulfuric acid mist) emissions are based on 10% SO_2 oxidation to SO_3 and 100% conversion of SO_3 to H_2SO_4.

As shown in the above table, the proposed project will result in lower potential emissions from the HRSG duct burner systems than are currently permitted.

4. RULE APPLICABILITY

PSD Applicability - General

The Department regulates major air pollution facilities in accordance with Florida's Prevention of Significant Deterioration (PSD) program, as defined in Rules 62-212.400 (PSD) and 62-210.200 (Definitions), F.A.C. A PSD review is required in areas currently in attainment with the state and federal Ambient Air Quality Standards (AAQS) or areas designated as "unclassifiable" for a given pollutant. A facility is considered "major" with respect to PSD if it emits or has the potential to emit: 250 tons per year or more of any regulated air pollutant, or 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the 28 PSD Major Facility Categories, or 5 tons per year of lead.

For new projects at existing PSD-major facilities, each regulated pollutant is reviewed for PSD applicability based on emissions thresholds known as the Significant Emission Rates defined in Rule 62-210.200, F.A.C. Pollutant emissions from the project exceeding these rates are considered "significant" and the applicant must employ the Best Available Control Technology (BACT) to minimize emissions of each such pollutant and evaluate the air quality impacts. Although a facility may be "major" with respect to PSD for only one regulated pollutant, it may be subject to PSD preconstruction review for several PSD-significant pollutants and required to install BACT controls for these pollutants.

PSD Applicability - Project

The existing facility is located in an area that is in attainment (or designated as unclassifiable or maintenance) for all pollutants subject to a National Ambient Air Quality Standard (NAAQS) in accordance with Rule 62-204.360, F.A.C. The existing facility is a PSD-major facility a defined in Rule 62-210.200 (Definitions), F.A.C. The proposed project is subject to a review for PSD applicability under Rule 62-212.400 (PSD), F.A.C.

As previously described, construction of the HRSG duct burner systems for combined cycle Units 2 and 3 is complete. Testing indicates that the maximum heat input rate as constructed is 200 mmBtu per hour and not 170 mmBTU per hour. The units have not yet operated for two years. Because the proposed project includes a limit of 4500 hours per year on duct firing, potential emissions from the proposed project will decrease compared to potential emissions as currently permitted. In addition, potential emissions from the duct burner systems as proposed are below the PSD significant emissions rates. Therefore, the project does not trigger a PSD preconstruction analysis.

Permit Conditions

The permit will be revised to recognize a capacity of 200 mmBtu per hour for each duct burner system, establish a limit of 4500 hours of duct burner operation during any consecutive 12 months, and require record keeping to demonstrate compliance with the restriction on hours. The current allowable emission limits in Title V Permit No. 0310485-015-AV will not change.

5. CONCLUSION

This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project does not result in a significant increase in emissions. Bruce Mitchell is the project engineer responsible for reviewing the application and drafting the permit. Jeff Koerner, P.E., provided additional project review.

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