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BUREAU OF AIR REGULATION

JEA
Combined Cycle Conversion Project

B&V Project 133972
B&V File 32.0000
March 12, 2003

Mike Halpin
Florida Department of Environmental Protection
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Duct Burner Size Increase

0310455-006-AC

On behalf of JEA, Black & Veatch is submitting both this letter report summarizing JEA's proposed increase in duct burner size for their combined cycle turbines at the Brandy Branch facility, as well as a CD-ROM containing the electronic air dispersion modeling files which demonstrate compliance with the Prevention of Significant Deterioration (PSD) Significant Impact Levels (SILs).

Specifically, JEA is proposing to modify their PSD Air Construction Permit for the Brandy Branch Combined Cycle Conversion project by increasing the duct burner size in the heat recovery steam generator (HRSG) of each combined cycle unit. Currently, the combined cycle Units 2 and 3 are each permitted with a natural gas fired duct burner in the HRSG. The permitted maximum heat input of each duct burner is 85 MMBtu/hr (HHV) and has a regulatory classification under 40 CFR Part 60 as a Dc unit. JEA proposes to increase each duct burner's actual maximum heat input from 85 MMBtu/hr to 170 MMBtu/hr (HHV). The change in duct burner size would then classify each burner as a Db unit.

As outlined in the submitted modeling protocol document and discussions with the FDEP at their office in Tallahassee on February 12, 2003, the demonstration of compliance was based on air dispersion modeling of the current permit conditions for

fuel firing scenarios as outlined in the FDEP PSD Air Construction Permit (PSD-FL-310), Condition #14 (page 7 of 14):

> *Maximum allowable hours of operation for the 540 MW Combined Cycle Plant are 8760 hours per year while firing natural gas. The combined hours of fuel oil firing for the two combined cycle combustion turbines is limited to 576 hours per consecutive 12-month period and fuel oil firing for the simple cycle unit is limited to 750 hours per consecutive 12-month period. In the event that any of the 3 emission units (simple or combined cycle) fires fuel oil 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 fuel for the calendar day.*

The modeling analyses followed the approved approach used in the original PSD application for this permit in which enveloping the emissions and stack parameters between the two fuels and over various operating scenarios yielded the worst-case modeling scenario. To account for the increase in duct burner emissions, each of the emission rates were doubled for the duct burners at 100 percent load for the natural gas fired case only. Furthermore, the modeling performed for this demonstration was limited to using the USEPA ISCST3 air dispersion model to predict pollutant concentrations for areas less than 50 km from the project. Specifically, the Class II area surrounding the project and Okefenokee National Wildlife Refuge (ONWR) Class I area were analyzed. A comparison of the modeled impacts to the applicable PSD SILs for the significantly emitted pollutants from the proposed modification was made and the results illustrated in Tables 1 and 2. It should be noted that modeled impacts for regional haze and deposition for Class I areas at distances greater than 50 km from the project was not performed because oil fired operating scenarios were not affected by the proposed modification.

Tables 1 and 2 compare the maximum model predicted concentrations for each pollutant and applicable averaging period with the Class II and Class I PSD SILs. As each table indicates, the project's maximum predicted concentrations are less than the applicable PSD SILs. Therefore, under the PSD program, no further air quality impact analyses are required for the proposed modification. Based on the results of the ambient air quality analyses, Black & Veatch requests that FDEP grant this modification to the Brandy Branch Unit 2 and 3 duct burners and issue a revision of the PSD Air Construction Permit (PSD-FL-310).

If you have any questions or comments, please feel free to contact either myself at 913-458-9062 or Ebenezer Gujjarlapudi at 904-665-6247.

Very truly yours,

BLACK & VEATCH

Kyle Lucas
Air Quality Specialist

Enclosure

cc: B. Gianazza – JEA
E. Gujjarlapudi – B&V
File
C. Holliday
P. Robinson

Table 1
Comparison of the facility's Maximum Modeled Impacts with the PSD Class II Significant Impact Levels[a]

Pollutant	Averaging Period	ISCST3 Maximum Impact ($\mu g/m^3$)	PSD Class II Significant Impact Level ($\mu g/m^3$)	Further Analysis Required (Yes/No)
NO_x	Annual [c]	0.09	1	No
PM/PM_{10}	24-hour [b]	4.15	5	No
	Annual [c]	0.06	1	No
CO	1-hour [b]	104.08	2,000	No
	8-hour [b]	27.60	500	No
SO_2	3-hour [b]	0.76	25	No
	24-hour [b]	0.24	5	No
	Annual [c]	0.01	1	No

[a] Air dispersion modeling for all three combustion turbines, including the 170 MMBtu/hr duct burners where applicable, was performed in accordance with the limits established in the FDEP PSD Air Construction Permit (PSD-FL-310), Condition #14.
[b] Short-term modeling was performed using natural gas emissions.
[c] Annual modeling was performed using annualized emissions firing of both natural gas and fuel oil.

Table 2
Comparison of the facility's Maximum Modeled Impacts with the PSD Class I Significant Impact Levels[a]

Pollutant	Averaging Period	ISCST3 Maximum Impact ($\mu g/m^3$)	PSD Class I Significant Impact Level ($\mu g/m^3$)[b]	Further Analysis Required (Yes/No)
NO_x	Annual	0.02	0.1	No
PM/PM_{10}	24-hour	0.29	0.32	No
	Annual	0.01	0.16	No
SO_2	3-hour	0.05	1.0	No
	24-hour	0.02	0.2	No
	Annual	0.003	0.08	No

[a] Modeling was performed using the ISCST3 air dispersion model for the portions of the ONWR that lie within 50 kilometers of the project location.
[b] Calculated as 4 percent of the Class I Increments as recommended by the Federal Land Managers.