

Golder Associates Inc.

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January 18, 2001

RECEIVED 0039515

JAN 22 2001

BUREAU OF AIR REGULATION

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

Attention: Mr. M. P. Halpin, P.E.

RE: AUBURNDALE COGENERATION FACILITY – NEW SIMPLE CYCLE
COMBUSTION TURBINE, DEP FILE NO. 1050221-004-AC (PSD-FL-311)
REQUEST FOR ADDITIONAL INFORMATION

Dear Mike:

This correspondence provides additional information requested in your letter dated January 10, 2001, which was the focal point for our discussions during our meeting of January 12, 2001. The comments and suggestions offered by the Department during the meeting are appreciated and form the basis of the additional information presented in this correspondence. Specifically, a "netting" approach suggested in your January 10, 2001 correspondence and discussed at the January 12th meeting is being proposed. The detailed information is presented below as responses to the additional information requested.

1. Requested Information: The initial (Phase I) gas fired emission level of NO_x requested for the CT is 25 ppmvd, using water injection as the control method. This does not represent BACT for the unit. Please reconsider the control technology, which is being proposed. Recent determinations by the Department have concluded that dry low NO_x combustion represents BACT for intermittent operation simple cycle CTs.

Response: As discussed at the January 12th meeting, the emissions limit proposed at 25 ppmvd NO_x as BACT was based on the availability of the combustion turbine and the ability to generate additional power during the 2001-2002 summer seasons. The Siemens Westinghouse 501D5A with water injection for NO_x control was the only available peaking turbine for the desired timeframe. Given the Department's concern with the proposed NO_x emission limit as BACT, the Department's suggestion of "netting-out" of BACT review by assuming a federally enforceable emissions cap on both the existing Auburndale Cogeneration Facility and the Peaker Project is being proposed. As pointed out by the Department at the January 12th meeting, the ability of using the SCR on the existing Auburndale Cogeneration Facility provides an opportunity to propose a NO_x emissions cap that would not trigger PSD review. The specifics are discussed in the response to Item No. 2 below.

2. Requested Information: According to Department records, annual NO_x emissions from the existing combined cycle unit for the past 3 years (1999, 1998, and 1997) have been 233.34, 367.2, and 300.0 tons/year respectively. Please evaluate the possibility of accepting an emissions cap for the combined emissions of the new CT and the existing unit. An emissions increase of less than 40 tons/year over past actual emissions would not require a review for BACT.

Response: As discussed at the meeting, the determination of "actual emissions" from the existing Auburndale Cogeneration Facility is complicated by two factors. First, the original PSD approval and subsequent permit modifications authorized a NO_x emissions limit in two stages. The first-stage NO_x limit was 25 ppmvd corrected to 15-percent oxygen, while the second stage NO_x limit was 15 ppmvd corrected to 15-percent oxygen. The latter was required to be achieved by December 31, 1998. The second factor that complicates determining "actual emissions" that are representative of normal operation of the Auburndale Cogeneration Facility is the technical problems in achieving the 15 ppmvd NO_x emissions limit using the methods suggested by the turbine manufacturer Siemens Westinghouse. The methods used involved over-injecting steam and/or water into the turbine combustors to lower NO_x levels. This approach led to repeated premature, severe wear of combustion turbine hot gas components and, as a result, the alternative NO_x control method of employing an SCR had to be implemented.

During 2000, the Auburndale facility was offline for an abnormal period of time due to problems associated with the over-injection of steam to control NO_x and then for the installation of the SCR. These downtimes consisted of an unplanned maintenance outage in 2000, an extended annual planned outage, and a forced outage in November 2000. Due to the fact that the over-injection of steam was causing combustion turbine blade damage, it was uncertain whether the extent of the potential damage would allow operation of the unit until its annual planned outage in October 2000. As a result, the Auburndale Cogeneration Facility was shut down in June 2000 for 3.8 days to perform an internal combustor visual inspection. The installation of the SCR caused the annual planned outage in October to be extended to 17.2 days, which is 10.2 days longer than the normal annual combustor inspection outage that typically lasts 5 to 7 days. Finally, a forced outage in November associated with SCR start-up problems caused the facility to be down for 7.1 days. Therefore, there were 21.1 days of abnormal outage time during 2000 that were associated with over-injection for NO_x control and the installation of the SCR.

As described above, the actual emissions from the existing facility is complicated by the staged emission limit and problems experienced with over-injecting steam in the turbine. Therefore, using the last 2 years to determine "actual emissions", as suggested in the definition of actual emissions in Rule 62-210.200 F.A.C., is not considered to be representative of normal operations. Given these circumstances, it is proposed that the latest year of operation (i.e., 2000), adjusted for forced outages resulting directly from the problems associated with the NO_x issues, be considered "representative" of "actual emissions". The data available from the facility and the Acid Rain continuous emissions monitoring (CEM) system is as follows for the year 2000.

Auburndale Cogeneration Facility – Year 2000 Fuel Usage and NO_x Emissions

Hours of Operation:	8,139
Heat Input Gas:	8,765,886 mmBtu/year
Heat Input Oil:	189,361 mmBtu/year
NO _x Emissions:	247.61 tons/year
Forced Outages:	506 hours (21.1 days associated with over injecting steam into the turbine and the installation of SCR)

The total hours that the unit would have operated without the forced outage was 8,475 hours ($8,139 + 506 = 8,645$). The remaining time was scheduled outages and other forced outages not resulting from the NO_x control issues. It is proposed that the 247.61 tons/year be adjusted to 8,645 hours of operation: $247.61 \text{ tons/year} \times 8,645/8,139 = 263 \text{ tons/year}$. A NO_x emissions cap of 302 tons/year is proposed for the Auburndale Facility (263 tons/year actual plus 39 tons/year = 302 tons/year). This NO_x emissions cap is proposed as a facility-wide cap for both the existing cogeneration facility and the new peaking unit. It should be noted that the existing potential NO_x emissions authorized for the existing unit is 344.3 tons/year. This represents a 42-TPY (12 percent) reduction in potential NO_x emissions currently authorized by the Department for the existing unit alone.

To allow for operational flexibility, it is proposed that existing short-term (ppmvd and lb/hr) NO_x emissions limits and compliance methods authorized for the Auburndale Cogeneration Facility remain as provided for in the PSD Permit (PSD-FL-185) and Final Title V Permit (1050221-002-AV). In addition, in the event a modification is made to the new peaking unit (e.g., installation of DLN and a BACT review request), then the conditions for the existing cogeneration would not have to be amended.

For the new peaking unit, the proposed emission limits and compliance methods are those proposed for Phase I of the project (i.e., 25 ppmvd corrected to 15-percent oxygen for gas firing and 42 ppmvd corrected to 15-percent oxygen for oil firing). It is requested that the NO_x emissions cap be a 12-month rolling average based on information from the 40 CFR Part 75 Acid Rain CEMs. In addition, as included in the permit application and discussed at the January 12th meeting, the facility limit for oil firing would be 400 hours for both units. To allow for flexibility in oil operations, it is requested that the oil limit be based on the hourly heat input limit and number of operation hours authorized for the existing unit. This would be $468,000 \text{ mmBtu/year}$ [$1,170 \text{ mmBtu/hr (LHV)} \times 400 \text{ hours/year} = 468,000 \text{ mmBtu/year (LHV)}$].

3. Requested Information: The Department has recently reviewed the proposal for a new combined cycle power plant (Osprey Energy Center), which is to be located in the same

proximity as the Auburndale Cogeneration Facility. Please evaluate the combined ambient impacts of these projects.

Response: An impact evaluation has been conducted for the proposed Auburndale Peaker Project, the existing Auburndale Cogeneration Facility, the Osprey Energy Center, and other sources in the area. The results of these analyses determined that the Project would not cause or contribute to a violation of any ambient air quality standard (AAQS) or PSD increment. In addition, the proposed Auburndale Peaker Project, in combination with the existing Auburndale Cogeneration Facility and the Osprey Energy Center, also do not contribute to a violation of the AAQS or PSD increments. Due to the volume of information in these analyses, these results are being provided under separate cover to the Department's air quality modeling reviewer, Mr. Cleve Holladay of the New Source Review Section. It should be noted that with the proposed "netting" approach suggested by the Department, the emissions and associated impacts from the site have almost entirely been accounted for in previous analyses. For example, no increase in annual NO_x emissions, as currently authorized for the existing unit, is being proposed for both units. The modeling conducted for the proposed Peaker Project, including other sources, accounts for differences in dispersion and location of the units.

The Department's suggestions and time allowed to discuss our permitting options are appreciated. Please call if there are any questions.

Sincerely,



Kennard F. Kosky, P.E.
Principal
Professional Engineer No. 14996


SEAL

KFK/nav

cc: Bruce Franco, Calpine Eastern Corporation
Benjamin Borsch, Calpine Eastern Corporation
Ted Baldwin, Calpine Eastern Corporation
A. A. Linero, FDEP, Bureau of Air Regulation

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Principal
Professional Engineer No. 14996



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cc: Bruce Franco, Calpine Eastern Corporation
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Ted Baldwin, Calpine Eastern Corporation
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