TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION

Florida Municipal Power Agency

Cane Island Power Park Unit 4

Osceola County

DEP File No. 0970043-018-AC

PSD-FL-400A Permit Revision

300-Megawatts Natural Gas-Fueled Combined Cycle Unit

Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation

October 27, 2011

I. APPLICATION INFORMATION

A. Applicant Name and Address

Florida Municipal Power Agency (FMPA)
8553 Commodity Circle
Orlando, Florida 32819

Authorized Representative: Roger Fontes, General Manager and CEO

B. Processing Schedule

August 3, 2011: Department received an application for a minor source air pollution construction permit.

October 28, 2011: The Intent to Issue PSD Permit Revision and Title V Permit Revision was distributed.

C. Facility Location

FMPA and the Kissimmee Utilities Authority (KUA) jointly own the Cane Island Power Plant (CIPP), which is located in Osceola County at 6075 Old Tampa Highway, Intercession City, Florida. The CIPP presently consists of one 40 megawatt (MW) simple cycle combustion turbine (Unit 1), and three combined cycle units with supplementary-fired heat recovery steam generator (HRSG): 120 MW (Unit 2), 250 MW (Unit 3) and the new 300 MW (Unit 4)

The location of the CIPP is shown in Figure 1 with a view of the facility in Figure 2. Unit 4 is seen in Figure 3, which is a complete view of the facility as of 2011.

Figure 1. Project Location

Figure 2. Aerial View of CIPP Units 1, 2 and 3 (left to right)

Figure 3. Cane Island Power Plant including new Unit 4 (to the far right)

D. Standard Industrial Classification Codes (SIC)

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

E. Air Pollution Regulations.

Projects at stationary sources with the potential to emit air pollution are subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The statutes authorize the Department of Environmental Protection (Department) to establish regulations regarding air quality as part of the Florida Administrative Code (F.A.C.), which includes the following applicable chapters: 62-4 (Permits); 62-204 (Air Pollution Control – General Provisions); 62-210 (Stationary Sources – General Requirements); 62-212 (Stationary Sources – Preconstruction Review); 62-213 (Operation Permits for Major Sources of Air Pollution); 62-296 (Stationary Sources - Emission Standards); and 62-297 (Stationary Sources – Emissions Monitoring). Specifically, air construction permits are required pursuant to Rules 62-4, 62-210 and 62-212, F.A.C.

In addition, the U. S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 specifies New Source Performance Standards (NSPS) for numerous industrial categories. Part 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP) based on specific pollutants. Part 63 specifies NESHAP based on the Maximum Achievable Control Technology (MACT) for numerous industrial categories. The Department adopts these federal regulations on a quarterly basis in Rule 62-204.800, F.A.C.

F. Glossary of Common Terms.

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of this permit.

G. Facility Regulatory Categories.

The facility is a major source of hazardous air pollutants (HAP).

The facility operates units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) of 40 Code of Federal Regulations (CFR) 63.

The facility operates units subject to the New Source Performance Standards (NSPS) of 40 Code of Federal Regulations (CFR) 60.

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, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

The facility operates units subject to the acid rain provisions of the Clean Air Act.

The facility operates units subject to the provisions of the clean air interstate rule (CAIR) set forth in Rule 62-296.470, F.A.C.

The facility operates units that were certified under the Florida Power Plant Siting Act, 403.501-518, F.S., and Chapter 62-17, F.A.C.

H. Project Description.

The applicant requests revisions to several specific conditions of PSD-FL-400 (0970043-014-AC) for new Unit 4, to clarify language of conditions related to unit capacity, tuning, ammonia emissions, CO averaging time and testing requirements. Unit 4 is regulated for purposes of the Air Resource Management System (ARMS) as Emissions Unit No. 009 and it is subject to the applicable requirements of 40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines that Commence Construction after February 18, 2005. In addition, Unit 4 is potentially subject to 40 CFR 63, Subpart YYYY - National Emission Standards for

Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbines. The applicability of this rule has been stayed for lean premix and diffusion flame gas-fired combustion turbines such as installed for this project.

PSD APPLICABILITY.

A. General PSD Applicability.

For areas currently in attainment with the state and federal ambient air quality standards (AAQS) or areas otherwise designated as unclassifiable, the Department regulates major stationary sources of air pollution in accordance with Florida's PSD preconstruction review program as defined in Rule 62-212.400, F.A.C. Under preconstruction review, the Department first must determine if a project is subject to the PSD requirements ("PSD applicability review") and, if so, must conduct a PSD preconstruction review. A PSD applicability review is required for projects at new and existing major stationary sources. In addition, proposed projects at existing minor sources are subject to a PSD applicability review to determine whether potential emissions *from the proposed project itself* will exceed the PSD major stationary source thresholds. A facility is considered a major stationary source 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 following 28 PSD-major facility categories: fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input, coal cleaning plants (with thermal dryers), Kraft pulp mills, Portland cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of charging more than 250 tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black plants (furnace process), primary lead smelters, fuel conversion plants, sintering plants, secondary metal production plants, chemical process plants, fossil fuel boilers (or combinations thereof) totaling more than 250 million British thermal units per hour heat input, petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels, taconite ore processing plants, glass fiber processing plants and charcoal production plants.

Once it is determined that a project is subject to PSD preconstruction review, the project emissions are compared to the "significant emission rates" defined in Rule 62-210.200, F.A.C. for the following pollutants: carbon monoxide (CO); nitrogen oxides (NO_X); sulfur dioxide (SO_2); particulate matter (PM); particulate matter with a mean particle diameter of 10 microns or less (PM_{10}); volatile organic compounds (VOC); lead (Pb); fluorides (Fl); sulfuric acid mist (SAM); hydrogen sulfide (H_2S); total reduced sulfur (TRS), including H_2S; reduced sulfur compounds, including H_2S; municipal waste combustor organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans; municipal waste combustor metals measured as particulate matter; municipal waste combustor acid gases measured as SO_2 and hydrogen chloride (HCl); municipal solid waste landfills emissions measured as non-methane organic compounds (NMOC); and mercury (Hg). In addition, significant emissions rate also means any emissions rate or any net emissions increase associated with a major stationary source or major modification which would construct within 10 kilometers of a Class I area and have an impact on such area equal to or greater than 1 $\mu g/m^3$, 24-hour average.

If the potential emission exceeds the defined significant emissions rate of a PSD pollutant, the project is considered "significant" for the pollutant and the applicant must employ the Best Available Control Technology (BACT) to minimize the emissions and evaluate the air quality impacts. Although a facility or project may be *major* with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several "significant" regulated pollutants.

B. PSD Applicability for Project.

The proposed project, revision of permit language, is a minor revision to the above mentioned PSD permit. This project will not increase any emissions limits or energy capacity; therefore is not subject to PSD construction review. Consequently, no air modeling was submitted and a new BACT determination is not required.

II. DEPARTMENT REVIEW.

This permit application request is for a minor source air construction permit revision of permit No. PSD-FL-400 (0970043-014-AC) for Unit 4. This Unit consists of: a nominal 150 MW gas fueled General Electric 7241 FA combustion turbine generator (CTG); a supplementary-fired heat recovery steam generator (HRSG) with natural gas-fueled duct burner (DB); and a nominal 150 MW steam turbine generator (STG) for an overall nominal rating of 300 MW. It includes highly automated controls, described as the GE Mark VI Gas Turbine Control System, to fulfill all of the gas turbine control requirements. Auxiliary equipment includes the following: a nominal 160-foot stack, a mechanical draft cooling tower with drift eliminators, an emergency diesel engine fire pump with small diesel fuel storage tank, and a nominal 750 kilowatts safe shutdown diesel generator with a small diesel fuel storage tank.

The proposed revisions to permit language do not affect emissions, production rates or any other significant change. A brief description of these request are stated below, followed by the Department's position on the requested changes.

A. Requested Permit Revisions for Unit 4 Section III of PSD-FL-400 permit.

With the process of revising the Title V permit to incorporate Unit 4, KUA requested changes to certain conditions related to the original PSD permit. The Department advised KUA that the requested changes required associated revisions to the underlying construction permit conditions, consequently KUA applied for a minor source air construction permit revision. This is the first air construction permit revision for Unit 4.

The requested changes can be grouped into five categories. These include:

- *Nominal Heat Input of Unit 4*: Clarification of language to reflect the nominal heat input rating of 1,900 MMBtu/hr.
- *Averaging Times for Nitrogen Oxides (NO_X) and Carbon Monoxide (CO):* Clarification of language and rearrangement of the Table for the CO limit averaging time. Also, to add the word "block" to the 24-hr "block" average for NO_X emissions.
- *Ammonia Injection*: Clarification to explicitly include language regarding other designated periods such as fuel switching and dry low NO_X (DLN) tuning in the context of the condition. Also, to exclude annual testing. *Ammonia Compliance Test*: Relocating the sentence "NO_X emissions recorded by the CEMS shall be reported for each ammonia slip test run." from Condition 22 to Condition 21.
- *DLN Tuning*: Defining further what is a major tuning.
- *Compliance Tests:* Clarification of language to refer to either Method 7E or 20 for NO_X testing.

The Department reviewed these requests and generally agrees with the intent of the changes to the proposed permit language (except to exclude annul ammonia slip testing). The Department believes there will be no change in the original permit intent or in emissions limits. Similar requests have previously been approved for other power plants in Florida. The approved changes are further discussed in Section 4, below.

B. Previously Authorized Construction Project Related to the Current Request.

PSD-FL-400 (0970043-014-AC) was issued for Unit 4 in 2008, construction started in 2009.

Figure 3. Unit 4 under construction

Figure 4. Unit 4 in operation since July 12, 2011

The following link shows the relevant PSD Permit and the original Technical Evaluation and Preliminary Determination (TEPD) related to the construction of Unit 4.

http://www.dep.state.fl.us/Air/emission/construction/cane_island.htm

III. CHANGES TO PSD-FL-400 PERMIT.

This project is being processed as line-item changes to applicable specific conditions of the previously issued air construction permit (AC). Through the conditions of this permit, where changes are made to the original conditions, additions are shown with underlined formatting and deletions are shown as ~~strikethrough~~. For ease of location, all changes are highlighted in yellow in the draft permit.

In general, the requested changes (revision of the unit heat input and clarifications of CEMS average time) are acceptable based on the applicant's assurance that Unit 4 is in compliance with all the emissions limits. The request to add the choice of using either EPA Method 7E or 20 to determine compliance with the NO_X standard is not necessary, as condition 20 presently allows either method.

Clarifications will be made to better define if and/or when ammonia injection is required; however, KUA requested to add a footnote ("ammonia slip testing is required for initial testing only") to Condition 12 suggesting that the ammonia slip testing requirements are no longer necessary, because the test was completed during the period of the initial performance tests of Unit 4.

The Department believes the testing of ammonia slip is an annual requirement. Ammonia slip is required to be tested initially and annually in Condition 12 (Emission Standards) together with all the other tests for all pollutants listed. It appears the words "ammonia slip" were inadvertently not included in Condition 22 (Annual Compliance Tests). This request will not be granted as part of this project, and the words "ammonia slip" will be inserted in the text of Condition 22. It is the intention of the Department to require initial and annual tests for ammonia slip in all combined cycle turbine projects. Even though potential annual emissions of ammonia are less than 100 tons per year, annual testing to determine the ammonia slip level (and corresponding NO_X CEMS readings) was specifically imposed in the PSD permit (Condition 12) to provide an indicator of catalyst viability and to maintain a correlation between the ammonia injection rate and actual NO_X emissions to be used as a surrogate parameter in the event the NO_X CEMS is temporarily out of service.

Regarding DLN tuning, the Department encourages operators to keep their combustion turbines properly tuned to ensure that emissions during normal operations are as low as possible, so clarifications that encourage tuning are routinely granted.

IV. PRELIMINARY DETERMINATION.

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. 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. Teresa Heron is the project engineer responsible for reviewing the application and drafting the permit documents. Jonathan Holtom, P.E., is the Air Permitting Supervisor responsible for reviewing, editing and approving these documents. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Division of Air Resource Management, Office of Permitting and Compliance at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400.