TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION

Florida Power and Light Company (FPL)

Lauderdale Plant

Excess Emissions

Broward County

DEP File No. 0110037-009-AC

Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
Permitting Section

October 14, 2013

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

1. GENERAL PROJECT INFORMATION

Applicant Name and Address

Florida Power and Light Company (FPL)
700 Universe Boulevard
Juno Beach, Florida 33408

Authorized Representative:
Mr. Dwayne Harper, Plant General Manager

Processing Schedule

July 11, 2013: Air construction permit application received and deemed incomplete.

July 16, 2013: Request for additional information letter sent.

September 16, 2013: Response received. Application deemed complete.

Facility Description and Location

This existing facility consists primarily of two combined-cycle generating units (Unit 4 and Unit 5), two banks of twelve simple-cycle gas turbine units, and six fuel storage tanks. Each combined-cycle unit consists of two combustion turbines (CT) which each exhaust through a separate heat recovery steam generator (HRSG). Each HRSG converts the heat from the CT exhaust into steam. The steam produced from the two HRSG units drives one single-reheat turbine generator. Each combined-cycle unit has a net summer continuous capability of 430 megawatts (MW). Each bank of simple-cycle gas turbines has a net capability of 504 MW.

Also included in this permit is a regulated unit for solvent usage; in addition, there are miscellaneous unregulated/insignificant emissions units and/or activities.

Major Regulatory Categories

The key regulatory provisions applicable to the facility are:

Title I, Part C, Clean Air Act (CAA): The facility is located in an area that is designated as "attainment", "maintenance", or "unclassifiable" for each pollutant subject to a National Ambient Air Quality Standard (NAAQS). It is classified as a "fossil fuel-fired steam electric plant of more than 250 million BTU per hour of heat input", which is one of the 28 Prevention of Significant Deterioration (PSD) Major Facility Categories with the lower PSD applicability threshold of 100 tons per year. Potential emissions of at least one regulated pollutant exceed 100 tons per year; therefore, the facility is classified as a "major stationary source" of air pollution with respect to Rule 62-212.400, F.A.C., Prevention of Significant Deterioration of Air Quality.

Title I, Section 111, CAA: The combined-cycle generating units are subject to Subpart GG (Standards of Performance for Stationary Gas Turbines) of the New Source Performance Standards in 40 CFR 60.

Title I, Section 112, CAA: The facility is a "Major Source" of hazardous air pollutants (HAP).

Title V, CAA: The facility is a Title V or "Major Source of Air Pollution" in accordance with Chapter 62-213, F.A.C., because the potential emissions of at least one regulated pollutant exceed 100 tons per year. Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NO_X), particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOC). The plant currently operates under Title V Air Operations Permit No. 0810010-015-AV.

Proposed Project

Because FPL is striving to gain more consistency in its Title V permits for the combustion turbine fleet, it has proposed common language to certain specific conditions that pertain to like combustion turbines. This common language has evolved as FPL has gained experience in operating and maintaining these turbines and developing proper protocol. These changes, primarily affecting excess emissions identification during startup (both cold and hot), shutdown and malfunction periods, and during fuel switching sessions are acceptable to the Department because proper operator management of these transient conditions results in less steady state emissions and is therefore beneficial to the environment. Excluding such identified periods of excess emissions from compliance data computations using appropriate time spans is sound policy.

More specifically, the purpose of this air construction permit revision is to implement site-specific excess emission language under the authority of Florida Rule 62-210.700(5), F.A.C. The underlying PSD permit (PSD-FL-145) is absent of excess emission language, thereby not requiring a revision. As such, this language will have to be incorporated within a new air construction permit for the facility in conjunction with an immediate change (revision) to the current Title V air operation permit associated specific condition.

These changes will not increase the potential to emit (PTE) of any pollutant. Based on the foregoing analysis, the project constitutes a non-major modification with respect to the Department's rules and requires a construction permit.

The part of the facility addressed by this specific condition includes four combined-cycle combustion turbines (CT 4A, CT 4B, CT 5A and CT 5B) that are identical in configuration. Each CT is connected to an electrical generator, and each CT generates heat which produces steam in a heat recovery steam generator (HRSG). Each CT and HRSG pairing is called a CT/HRSG system. The steam from the two HRSG units is then routed to a steam turbine-generator-set to provide additional electrical power. The combined CT 4A/HRSG and CT 4B/HRSG units are designated Unit 4; in like manner, the combined CT 5A/HRSG and CT 5B/HRSG units are designated Unit 5.

In the discussion below, the CT 4A/HRSG and CT 4B/HRSG (or CT5A/HRSG and CT 5B/HRSG) systems interconnected to their respective steam turbine generators are designated as 2-on-1 Combined Cycle Systems.

The applicant provided operational data which they felt supported their requested periods of excludable emissions data. Based on this data, the Department was able to justify approving some periods of excludable emissions data, but was not able to justify approving the full time periods requested. The operational data are included with this technical evaluation.

Based on the Department's review of the submitted data, the following allowable periods of excess emissions, which may be excluded from the compliance demonstration data, are established as a new specific condition through the issuance of air construction Permit No. 0110037-009-AC:

> <u>Excess Emissions Allowed</u>. As specified in this condition, excess emissions resulting from startup, shutdown, fuel switches and documented malfunctions are allowed provided that operators employ the best operational practices to minimize the amount and duration of emissions during such incidents. For each CT/HRSG system, excess emissions of NO_X resulting from startup, shutdown, or documented malfunctions may be excluded from the CEMS data in any 24-hour period ("any 24-hour period" means a calendar day, midnight to midnight) for the following conditions (these conditions are considered separate events and each event may occur independently within any 24-hour period):
>
> a. *Steam Turbine Cold Startup.* For cold startup of the steam turbine, excluded emissions from any CT/HRSG system shall not exceed three hours in any 24-hour period and shall not exceed five hours total for both CT/HRSG systems during the entire Steam Turbine Cold Startup event. A

"cold startup of the steam turbine" is defined as startup of system when the steam turbine high pressure metal temperature is below 250 degrees F.
{Permitting Note: During a cold startup of the steam turbine, each CT/HRSG system may be sequentially brought on line at low load to gradually increase the temperature of the steam-electrical turbine to prevent thermal metal fatigue. Note that shutdowns and documented malfunctions are separately regulated in accordance with the requirements of this condition.}

b. *CT/HRSG System Cold Startup*. For cold startup of an individual CT/HRSG system, excluded emissions shall not exceed three hours in any 24-hour period. A "cold startup of a CT/HRSG system" is defined as a startup of the system when the pressure in the high-pressure (HP) steam drum is below 600 pounds per square inch gauge (psig).
c. *CT/HRSG System Hot Startup*. For hot startup of a CT/HRSG system, excluded emissions shall not exceed two hours in any 24-hour period (and shall not exceed six hours per 2-on-1 Combined Cycle System, with the additional provision of a limit of 2 hot startup periods per 24 hours per CT/HRSG system). A "hot startup of a CT/HRSG system" is defined as a startup when the pressure in the high-pressure (HP) steam drum is above 600 psig.
d. *Shutdown Combined Cycle Operation*. For shutdown of the entire 2-on-1 combined cycle system operation, excluded emissions from any CT/HRSG system shall not exceed two hours in any 24-hour period.
e. *CT/HRSG System Shutdown*. For shutdown of the CT/HRSG systems operation, excluded emissions from any CT/HRSG system shall not exceed one hour in any 24-hour period.
f. *Fuel Switching*: For fuel switching, excluded emissions shall not exceed one hour in any 24-hour period for each fuel switch and no more than two hours in any 24-hour period for any CT/HRSG system.
g. *Documented Malfunction*. For the CT/HRSG system, excess emissions of NO_X resulting from documented malfunctions shall not exceed two hours in any 24-hour period. A "documented malfunction" means a malfunction that is documented within one working day of detection by contacting the Compliance Authority by telephone, facsimile transmittal, or electronic mail.

2. REGULATIONS THAT APPLY TO THE PROJECT

State Regulations

This project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The Florida Statutes authorize the Department of Environmental Protection to establish rules and regulations regarding air quality as part of the Florida Administrative Code (F.A.C.). This project is subject to the applicable rules and regulations defined in the following Chapters of the Florida Administrative Code. These include: 62-4 (Permitting Requirements); 62-204 (Ambient Air Quality Requirements, PSD Increments, and Federal Regulations Adopted by Reference); 62-210 (Permits Required, Public Notice, Reports, Stack Height Policy, Circumvention, Excess Emissions, and Forms); 62-212 (Preconstruction Review, PSD Review and BACT); 62-213 (Title V Air Operation Permits for Major Sources of Air Pollution); 62-296 (Emission Limiting Standards); and 62-297 (Test Methods and Procedures, Continuous Monitoring Specifications, and Alternate Sampling Procedures).

3. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state rules 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.

Tom Cascio is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting him by telephone at 850/717-9077 or by

e-mail at tom.cascio@dep.state.fl.us in the Department's Office of Permitting and Compliance at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.