TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Duke Energy Florida, Inc.
3219 State Road 630 West
Ft. Meade, Florida 33841

Tiger Bay Cogeneration Facility
Facility ID No. 1050223

PROJECT

Draft Permit Revision No. 1050223-017-AC (PSD-FL-190F)
Application for Minor Source Air Construction Permit

Methods of Operation Changes

COUNTY

Polk County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
2600 Blair Stone Road, MS#5505
Tallahassee, Florida 32399-2400

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1. GENERAL PROJECT INFORMATION

1.1. 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 Chapters 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 in Rule 62-204.800, F.A.C.

1.2. 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.

1.3. Facility Description and Location

Tiger Bay Cogeneration Facility is a power plant categorized under Standard Industrial Classification No. 4911. This existing facility consists of a nominal 270 MW (megawatts) one General Electric Model MS7221 FA combined-cycle combustion turbine (CT) that exhausts through a heat recovery steam generator (HRSG). The facility also has an emergency diesel generator (EU 004) rated at 415 horsepower (HP) and an emergency diesel-fired fire pump engine (EU 005) rated at 210 HP which are regulated under 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE) adopted in Rule 62-204.800(11)(b), F.A.C.

This existing plant is located in Polk County at 3219 State Road 630 West in Ft. Meade, Florida. The UTM coordinates are: Zone 17, 416.2 kilometers (km) East and 3069.22 km North; Latitude: 27° 44’ 56” North and Longitude: 81° 51’ 0” West. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to Ambient Air Quality Standards (AAQS).

1.4. Facility Regulatory Categories

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility operates units subject to the acid rain provisions of the Clean Air Act.
- 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.

1.5. Project Description

As part of the project to renew the Title V air operation permit (Project No. 1050223-018-AV), the applicant has requested a concurrent air construction permit revision, to change several underlying air construction permit conditions, related to distillate fuel oil burning and excess emissions for the Combined-Cycle Combustion Turbine (CT) and Heat Recovery Steam Generator (HRSG), emission unit (EU) No. 001 at the facility.

1.6. Processing Schedule

05/16/2014 Received the application for an air construction permit modification to be processed concurrently with Title V air operation permit renewal, application complete.

07/24/2014 Draft permit package issued.

1.7. Relevant Documents

- Permit No. AC53-214903/PSD-FL-190.
- Permit No. 1050223-013-AC/PSD-FL-190A (Previously revised permit No. AC53-214903/PSD-FL-190).

2. PSD APPLICABILITY

2.1. General PSD Applicability

For areas currently in attainment with the 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:

- 5 tons per year or more of lead;
- 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 (F); 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 equals or 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.

2.2. PSD APPLICABILITY FOR PROJECT

The project will revise permit conditions related to distillate fuel oil burning and excess emissions for the CT and HRSG. There will be no emissions increases and the project is not subject to PSD preconstruction review. Because the revisions are being made to a PSD air construction permit a 30-day comment period will be specified concurrent with the 30-day comment period for the draft/proposed Title V air operation permit.

3. DEPARTMENT REVIEW

As part of the project to renew the Title V air operation permit (Project No. 1050223-018-AV), the applicant requested several changes to Title V air operation permit conditions. Some of these changes required revisions to the underlying construction permit conditions, which are explained below. The "Specific Condition Nos." cited below refer to the specific conditions in the current Title V air operation Permit No. 1050223-015-AV.

This permit does not authorize any new construction or increases in allowable operating limitations or emissions limits. This permit supplements all existing valid air permits. Except as specified below, the permittee shall continue to comply with all applicable conditions from valid air construction and operation permits. The proposed project involves no physical changes and no obvious operational changes to the facility. It does not involve any maintenance, repair or replacement tasks. [Rule 62-4.070(3), F.A.C.]

The following conditions of previous permits are revised as indicated below. ~~Strikethrough~~ is used to denote the deletion of text. Double-underlines are used to denote the addition of text. All changes are emphasized with yellow highlight for ease of location.

PERMIT BEING MODIFIED: AC53-214903/PSD-FL-190

Affected Emissions Units: Combined-cycle Combustion Turbine and Heat Recovery Steam Generator, EU 001 (The remainder of the permit remains unchanged as a result of this permitting action)

1. To remove distillate fuel oil as an allowable fuel, in order to classify the EU 001 (CT and HRSG) as a natural gas unit, also to remove the emissions limits related to the duct burner (the duct burner were not installed). **Specific Conditions Nos. 2**, **4** and **5a** of permit No. AC53-214903/PSD-FL-190 are revised as follows:

Emission Limits

2. Visible emissions for full load operation shall not exceed 10% opacity when firing natural gas ~~and 20% opacity when firing distillate fuel oil~~.

Operation Rates

4. This source is allowed to use natural gas as the primary fuel for 8,760 hours per year ~~and low sulfur distillate fuel oil (0.05% S) as the secondary fuel up to 3,742,327 gallons per calendar year~~.

5. ~~a) The maximum heat input of 1,849.9 MMBtu/hr (LHV) at 27° F and at base load for distillate fuel oil.~~

2. The affected excerpts of Table 1 from **Specific Condition 1** of Permit No. AC53-214903/PSD-FL-190 and the Best Available Control Technology (BACT) Determination dated May 17, 1993 are hereby changed as follows:

Table 1 – Allowable Emission Rates

Pollutant	Fuel[A]	Allowable Emission[C] Standard/Limitation	Basis
NO_X (CT)	Gas	15 ppmvd @15% O_2 (97.2 lbs/hr, 425.7 TPY)[B]	BACT
	Gas	25 ppmvd @15% O_2 (161.9 lbs/hr, 709.1 TPY)	BACT
	~~Oil~~	~~15 ppmvd @15% O_2 (97.2 lbs/hr, 425.7 TPY)~~	~~BACT~~
~~NO_X (DB)~~	~~Gas~~	~~0.1 lbs/MMBtu (10 lbs/hr, 43.8 TPY)~~	~~BACT~~

Pollutant	Fuel[A]	Allowable Emission[C] Standard/Limitation	Basis
CO (CT) ~~CO (DB)~~	Gas ~~Oil~~ ~~Gas~~	15 ppmvd @15% O_2 (48.8 lbs/hr, 213.7 TPY)[D] ~~30 ppmvd @15% O_2 (98.4 lbs/hr, 14.8 TPY)~~ ~~10 lbs/hr; 43.8 TPY~~	BACT ~~BACT~~ ~~BACT~~
VOC (CT) ~~VOC (DB)~~	Gas ~~Oil~~ ~~Gas~~	2.8 lbs/hr; 12.3 TPY ~~7.5 lbs/hr; 1.1 TPY~~ ~~2.9 lbs/hr; 12.7 TPY~~	BACT ~~BACT~~ ~~BACT~~
PM_{10} (CT) ~~PM_{10} (DB)~~	Gas ~~Oil~~ ~~Gas~~	9 lbs/hr; 39.4 TPY ~~17 lbs/hr; 2.6 TPY~~ ~~0.0100 lbs/hr; 12.7lbs/MMBtu~~	BACT ~~BACT~~ ~~BACT~~
SO_2 (CT) ~~SO_2 (DB)~~	Gas ~~Oil~~ ~~Gas~~	4.86 lbs/hr; 21.3 TPY ~~99.7 lbs/hr; 15.0 TPY~~ ~~0.3lbs/hr; 1.325 TPY~~	Appl. ~~Appl.~~ ~~Appl.~~
H_2SO_4 (CT) ~~H_2SO_4 (DB)~~	Gas ~~Oil~~ ~~Gas~~	5.95×10^{-1} lbs/hr; 2.6 TPY ~~1.22 lbs/hr; 0.183 TPY~~ ~~3.7×10^{-2} lbs/hr; 1.61×10^{-1} TPY~~	Appl. ~~Appl.~~ ~~Appl.~~
Opacity	Gas ~~Oil~~	10 % Opacity ~~20% Opacity~~	BACT ~~BACT~~

A) Fuel: Natural Gas: Emissions are based on 8,760 hours per year operating time.

~~Fuel: Distillate Fuel Oil (0.05% S): Emissions are based on fuel usage equivalent to 300 hours per year at maximum capacity (i.e., 3,742,327 gallons per year).~~

PERMIT BEING MODIFIED: 1050223-013-AC/PSD-FL-190A (Previously revised permit No. AC53-214903/PSD-FL-190, Specific Condition 22).

Affected Emissions Units: Combined-cycle Combustion Turbine and Heat Recovery Steam Generator, EU 001. (The remainder of the permit remains unchanged as a result of this permitting action)

3. To revise the excess emissions resulting from combusting tuning for the CT and HRSG, EU 001, Specific Condition No. 22 is revised as follows:

22. a. This source shall be in compliance with all applicable provisions of F.A.C. Rules 62-210.650: Circumvention; 62-210.700: Excess Emissions; 62-296.800: Standards of Performance for New Stationary Sources (NSPS); 62-297: Stationary Sources-Emissions Monitoring; and, 62-4.130: Plant Operation-Problems.

b. Excess emissions resulting from activities related to optimization of operations and maintenance of the combustion turbine, HRSG, steam turbine and/or associated equipment "tuning session" including, but not limited to, combustor tuning sessions, shall be permitted provided the tuning session is performed in accordance with the manufacturer's specifications and in no case shall exceed 72 hours in any calendar year. A "tuning session" would occur after a combustor change-out, a repair to a combustor, or as required to maintain compliance or to optimize operation and/or maintenance of the combustion turbine, HRSG, steam turbine and/or associated equipment. Prior to performing any tuning session, the permittee shall provide the Compliance Authority with an advance notice that details the activity and proposed tuning session schedule. The notice may be made by telephone, facsimile transmittal, or electronic mail.

[Rule 62-210.700(1) & (5), F.A.C.; and, applicant request]

In general, the Department finds the requested changes acceptable based on the applicant's assurance that these units are in compliance with all of the emissions limits. See draft air construction permit No. 1050223-017-AC (PSD-FL-190F) for a detailed description of the changes being made as part of the project. These documents, along with all other associated documents in the issued permit package, can be accessed by entering the file

number in the permit number field at this web link. http://www.dep.state.fl.us/air/emission/apds/default.asp

4. 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.

Yousry (Joe) Attalla 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) 717-9078 or by e-mail at yousry.attalla@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.