PERMITTEE

Florida Power & Light Company (FPL)
700 Universe Boulevard, JES/JB
Juno Beach, Florida 33408

PERMITTING AUTHORITY

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

PROJECT

Air Permit No. 0930117-001-AC (PSD-FL-434)
Okeechobee Clean Energy Center (OCEC)
Construction of Combined-Cycle Unit 1

FPL proposed to construct a new power plant, including a 3-on-1 combined-cycle unit. Each of the combustion turbines (CTs) of the unit has a nominal generating capacity of 350 megawatts, and the electrical capacity for the entire unit is 1,600 megawatts, net. These CTs will be primarily fueled with natural gas, with ultra-low-sulfur diesel (ULSD fuel oil) as a limited-use backup fuel. Additional equipment at the OCEC site will include a storage tank for ULSD fuel oil, a natural gas-fired auxiliary boiler, three emergency generators, two natural gas heaters, one fire water pump diesel engine, two propane-fired engines for the hurricane shelter, a mechanical draft cooling tower, and circuit breakers.

NOTICE AND PUBLICATION

The Department distributed a draft Prevention of Significant Deterioration permit package on January 13, 2016. The applicant published the Public Notice in the Treasure Coast Palm on January 28, 2016, and in the Okeechobee News and VeroNews/Sebastian River News on January 29, 2016. The Department received the proofs of publication on February 3, 2016. No requests for a public meeting or extensions of time to file a petition for administrative hearing were received.

COMMENTS

Comments were received from US EPA Region 4 and from the applicant. No comments were received from the general public or interested third parties.

EPA Region 4

The Department received comments from EPA Region 4 on February 22, 2016. The EPA included two comments.

EPA Comment 1: The EPA stated that a chart detailing Potential to Emit (PTE) for each emissions unit should be included, in addition to the chart of emissions standards. It is recommended by the EPA that a chart with all facility emissions is placed within the body of the permit and in the preliminary determination.

Department Response: The Technical Evaluation and Preliminary Determination document was sent to EPA Region 4 on January 13, 2016. This document contains a table of the PTE for each emission unit of the project, in Table 5 on Page 8. Because this information is already included in the publicly available preliminary determination materials, reproducing the same information in the permit document is unnecessary.

EPA Comment 2: The EPA stated that while the applicant included an analysis of the proposed project's impact on secondary $PM_{2.5}$ for the 24-hour air quality standard, the applicant's analysis did not address the impact of secondary $PM_{2.5}$ for the annual air quality standard.

Department Response: The Department addressed this material in the Technical Evaluation and Preliminary Determination, on Pages 43 and 44. After calling this to the attention of EPA Region 4, the EPA indicated to the Department on February 24, 2016, that this concern had been addressed. No changes to the permit or preliminary evaluation are needed.

FPL

The applicant submitted to the Department a set of ten comments on February 23, 2016. These comments are reproduced below. Strikethrough typeface represents suggested deletions, and double-underline typeface represents suggested insertions.

FPL Comment 1:

Section 1, General Information, Regulatory Classification: On April 29, 2014, the Supreme Court issued an opinion upholding the Cross State Air Pollution Rule (CSAPR) and remanded the rule to the District of Columbia Court ("DC Circuit") for further proceedings. On October 23, 2014, the DC Circuit published an "interim final rule" effectively extending the initial program compliance deadlines by three years, with Phase 1 beginning May 1, 2015. As such, the Clean Air Interstate Rule (CAIR) has been replaced by CSAPR. Furthermore, on July 28, 2015, the DC Circuit issued an opinion finding Florida's applicability to the CSAPR NOx Ozone Season Program invalid and remanded the rule to EPA for reconsideration. On November 17, 2015, EPA proposed a rule to update CSAPR with the 2008 Ozone NAAQS ("CSAPR Update Rule"). EPA proposed to remove Florida from the CSAPR Program beginning in 2017 with Phase 2 implementation. At this time, the CSAPR Update Rule has not yet been finalized. FPL requests the permit language be updated to reflect that OCEC Unit 1 "may" be subject to CSAPR pending final rule promulgation.

> Proposed:
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> "The proposed project includes units that "may" be subject to the ~~Clean Air Interstate Rule (CAIR)~~ Cross State Air Pollution Rule (CSAPR)."

Department Response: Given the uncertain status of CAIR and CSAPR, as well as the uncertain status of Florida in CSAPR, the condition will be updated to reflect that the units *may be* subject to CAIR or CSAPR.

FPL Comment 2:

Section 3 Subsection A, Condition 8, Hours of Operation: The OCEC Unit 1 ULSD fuel oil operation limit, as proposed, is based on 500 hours per year of oil operation for each combustion turbine in the unit. FPL requests this condition be updated to parallel Section 3, Subsection A, Specific Condition #7 in the recently permitted Port Everglades Energy Center (PEEC) Air Construction permit.

> Proposed:
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> ~~8. Hours of Operation:~~
> ~~a. *Natural Gas Operation:* The hours of operation on natural gas for the three CTs are not restricted (i.e. 8,760 hours per year).~~
> ~~b. *ULSD Fuel Oil Operation:* The three CTs may collectively burn no more than 33.6 million gallons of ULSD fuel oil per 12-month period, rolled monthly.~~
> ~~*{Permitting note: The restriction on ULSD usage is the equivalent of 500 hours of operation at peak load.}*~~
>
> **8. Operation**: The hours of operation of Unit 1 are not limited (8,760 hours per year). ULSD fuel oil may be fired up to the fuel equivalent of 1,500 hours aggregated over the three CT's during any calendar year. [Applicant Request; Rule 62-210.200(PTE), F.A.C.]

Department Response: For the sake of consistency with other permits, the Department will make a change in the final permit, along with a permitting note that explains that the base-load fuel equivalent is expected to approximately equal 33.6 million gallons per 12-month period. The permit condition will still be on a 12-month rolling average basis, since that is the relevant assumption for PTE-related calculations.

FPL Comment 3:

Section 3 Subsection A, Condition 10, Prohibition on Low-Load Operation: FPL requests that the percentage of low load not be restricted to 30% for natural gas firing or 50% for ULSD firing. The permitting note in Section 3, Subsection A, Specific Condition 10, suggests that these values are typical and Condition 16(b) requires testing be performed to demonstrate compliance at low loads. FPL suggests language to allow lower loads if demonstrated as follows:

> Proposed:
> "The minimum operating CT loads for natural gas operation and ~~shall be no less than 30%, and the minimum operating CT load for~~ ULSD operation shall be ~~no less than 50%~~ determined using a stack test as required by Condition 16(b)."

Department Response: Given the very limited operational experience with this turbine model, and the very limited use to-date of turbines at very low loads, the Department's opinion is that the 30% and 50% minimums are appropriate. Should FPL decide to try to pursue lower operating loads, a separate air construction permit will be necessary. FPL could apply for a permit to perform tests at these lower loads. Additionally, although FPL is not required to install a continuous emissions monitoring system for carbon monoxide under this permit, the use of such a system would demonstrate carbon monoxide emissions under a range of operating conditions and could potentially render these minimum permitted operating loads unnecessary. No changes will be made to the permit.

FPL Comment 4:

Section 3 Subsection A, Condition 11, Emission Limit Table Subsequent Compliance Testing, (a) and (c): The Table of Emissions Standards located in Section 3, Subsection A, Specific Condition 11, currently identifies a NSPS KKKK Secondary BACT NOx emissions limit for both gas and oil operation set at 96.0 ppmvd. FPL has reviewed the NSPS KKKK standard and believes that this limit only applies to turbines with a maximum heat input rated less than 850 mmbtu/hr. The design heat input rate to each turbine in OCEC Unit 1 is 3,095.7 mmbtu/hr when firing natural gas. FPL requests this limit be removed from the emissions table in the final permit.

Department Response: The Department maintains that its interpretation of the limits in Subpart KKKK is correct. In the Preamble to the final Subpart KKKK, the EPA stated, "…we specified in the final rule that turbine owners and operators that are continuously monitoring parameters or emissions have an alternate limit during periods when the turbine operates at less than 75 percent of peak load or the ambient temperature is less than 0 °F" (71 FR 38486). Additionally, the relevant portion of Table 1 to Subpart KKKK from the Federal Register (71 FR 38506) is reproduced below.

TABLE 1.—TO SUBPART KKKK OF PART 60.—NITROGEN OXIDE EMISSION LIMITS FOR NEW STATIONARY COMBUSTION TURBINES—Continued

Combustion turbine type	Combustion turbine heat input at peak load (HHV)	NO_X emission standard
Turbines located north of the Arctic Circle (latitude 66.5 degrees north), turbines operating at less than 75 percent of peak load, modified and reconstructed offshore turbines, and turbine operating at temperatures less than 0°F.	≤ 30 MW output	150 ppm at 15 percent O_2 or 1,100 ng/J of useful output (8.7 lb/MWh).
Turbines located north of the Arctic Circle (latitude 66.5 degrees north), turbines operating at less than 75 percent of peak load, modified and reconstructed offshore turbines, and turbine operating at temperatures less than 0°F.	> 30 MW output	96 ppm at 15 percent O_2 or 590 ng/J of useful output (4.7 lb/MWh).
Heat recovery units operating independent of the combustion turbine.	All sizes	54 ppm at 15 percent O_2 or 110 ng/J of useful output (0.86 lb/MWh).

While the "≤" and ">" characters in this portion of the table do not appear clearly on the Electronic Code of Federal Regulations (eCFR) website, they are clear in the final rule in the Federal Register. The limit for loads below 75% is an applicable part of Subpart KKKK and will remain in the permit.

FPL Comment 5:

Section 3, Subsection A, Condition 15, Composite GHG Primary BACT Standard: The GHG Primary BACT standard currently includes the following pollutants: CO_2, N_2O, and CH_4. In the Department's "Technical Evaluation & Preliminary Determination" document (included with the draft/proposed permit package), the Department indicates that the contribution of CO_2 to total GHG emissions is 99.88% for the stationary combustion turbines. In addition, current federal New Source Performance Standards (NSPS) under Clean Air Act Sections 111(b) and 111(d) for stationary combustion turbines strictly regulate only CO_2 emissions at this time. FPL requests the ability to utilize CO_2-only as a surrogate for total GHG emissions. The facility would then only be required to analyze, monitor, and report CO_2 emissions as the primary method of compliance.

Department Response: This requested change will not be made. Though this would be a very small adjustment to the GHG limit (approximately 0.12%), the Department will not make this limit less stringent between the Draft and Final versions of this permit.

FPL Comment 6:

Section 3, Subsection A, Condition 16(c), Initial Compliance Demonstrations, GHGs: The GHG Primary BACT standard is a composite standard aggregated across all three (3) combustion turbines and the steam turbine ("the unit"). As such, any initial compliance demonstration for GHG's must come only after the unit has been fully commissioned on natural gas. FPL requests that this condition be revised to require the initial GHG natural gas test be tied to the unit itself rather than the first ever firing of natural gas in any combustion turbine at the site. FPL further requests updating of the language regarding "CO_2 CEMS" to indicate "CO_2 Monitoring System" in parallel with Condition 32 and options provided in Appendix D of 40 CFR Part 75.

Proposed:

"~~Within 60 days after first firing natural gas, t~~The combined cycle unit shall demonstrate achievement of an emissions rate of 800 lb CO_2 per MWh (gross-basis) firing natural gas at base load, corrected to ambient conditions of 85 °F and 55% relative humidity. This initial performance demonstration shall consist of a continuous operating period of no less than two hours. The initial performance demonstration shall be completed within 180 combined cycle operating days following achievement of the "maximum production rate" of the combined cycle unit. The permittee may use CO_2 ~~CEMS~~ Monitoring System data for this demonstration. [40 CFR 60.8(a) Subpart A]"

Department Response: Because the GHG limit for the initial compliance demonstration applies to the combined-cycle unit as a whole, the request to base the compliance date on the commissioning of the entire combined-cycle unit is a sensible one. Moving to a deadline of 60 days after achieving the "maximum production rate" would increase consistency with the NSPS General Provisions and Subpart KKKK, while still providing some relief from the requirement in the Draft Permit to test within 60 days of initial firing of gas. The date for initial testing for GHGs will be changed from 60 days after first firing of gas to 60 days after achieving maximum production for the entire 3-on-1 unit.

FPL Comment 7:

Section 3, Subsection A, Condition 17(a) and (c), Subsequent Compliance Testing: FPL requests FDEP's consideration to limit the Title V stack testing frequency for visible emissions and CO required by these conditions. Annual compliance testing for natural gas at base-load operation can be synced with the 40 CFR Part 75 annual Relative Accuracy Test Audit (RATA) requirements. Requiring annual stack testing for fuel oil will likely incur high costs. Fuel oil typically is only used periodically for a few hours to test operability and maintenance requirements and, more importantly, the differential fuel cost between fuel oil and natural gas as the primary fuel is substantial. FPL suggests adding the below proposed language and Permitting Note that would appear consistent with the requirements of FDEP Rule 62-297.310 F.A.C. FPL suggests the following language:

Proposed:

Condition 17(a), Visible Emissions and Base-Load CO:

"The annual compliance test for base-load (i.e. $\geq$ 90% CT load) CO and visible emissions shall be conducted while firing natural gas. Base-load CO and visible emissions tests shall also be performed

while firing fuel oil, on each combustion turbine that is fired with fuel oil for more than 400 hours during the calendar year. A base-load CO and visible emissions test shall be performed while firing fuel oil prior to each renewal of the facility's Title V operation permit if fuel oil was fired for more than 400 hours during any calendar year during the previous five-year period prior to the Title V application renewal date."

Condition 17(c), Non-Base-Load CO:
"Tests for non-base-load (i.e. below 90% CT load) CO for natural gas operation shall be conducted annually if natural gas was fired for more than 400 hours of "non-base-load" operation, and prior to each renewal of the facility's Title V operation permit if natural gas was fired in any calendar year in the previous five year period for more than 400 hours of "non-base-load" operation. Tests for non-base-load CO for ULSD operation shall be conducted on each combustion turbine that is fired with fuel oil for more than 400 hours of "non-base-load" operation during the calendar year, and prior to each renewal of the facility's Title V operation permit if fuel oil was fired in any calendar year in the previous five year period for more than 400 hours of "non-base-load" operation."
{Permitting Note: Consistent with FL Rule 62-297 F.A.C., for the purposes of renewal of an air operation permit, the owner or operator may utilize the most recent emissions test, provided such test occurred within the term of the current operation permit.}

Department Response: The request to not require a base-load test upon Title V permit renewal if a unit did not operate on fuel oil for 400 hours in any year of the permit period is a reasonable one, consistent with Rule 62-297.310(b)3.c., F.A.C. Condition 17(a) will be changed as requested.

Regarding the request to change Condition 17(c), the Department holds that there exist insufficient data regarding turbine performance at low loads to have reasonable assurance that these turbines would meet non-base-load limits without annual non-base-load testing. Additionally, the applicant's requested change would necessitate an additional recordkeeping requirement to track the monthly hours of non-base-load operation (presumably, operations at CT loads below 90% that are not associated with a startup or shutdown), which would be subject to a determination of when startup or shutdown has ended or begun. For these reasons, the requirement for non-base-load testing on natural gas will remain unchanged. Non-base-load testing on fuel oil will still be required for a CT that operates on fuel oil for more than 400 hours in a calendar year; non-base-load testing on fuel oil for Title V renewal will only be required for a CT that operates on fuel oil for more than 400 hours in any of the years covered by the Title V permit.

Additionally, consistent with Rule 62-297.310(b)2, F.A.C., the requested permitting note will be added.

Again, it is worth noting that although FPL is not required to install a continuous emissions monitoring system for carbon monoxide under this permit, the use of such a system would demonstrate carbon monoxide emissions under all operating conditions and could potentially render these minimum permitted operating loads, and low-load stack testing, unnecessary.

FPL Comment 8

Section 3 Subsection A, Heading after Condition 19 on Page 12: FPL requests the update of the heading located at the bottom of page 12 of the draft permit. We believe the shorter version of this heading is sufficient to characterize this section of the permit.

Proposed:
"**PRIMARY AND SECONDARY BACT APPLICABILITY ~~& EXCESS EMISSIONS~~**"

Department Response: This is a reasonable change to this section title. This will be changed as requested.

FPL Comment 9

Section 3 Subsection A, Condition 22, Demonstration of Compliance with Primary NO_X and GHG BACT: To maintain consistency with Title V permit language for other combustion turbines in FPL's fleet, FPL requests

similar language for demonstration of compliance with Primary NO_X and GHG BACT standards during established emission scenarios.

Proposed:

"Demonstration of Compliance with Primary NO_X and GHG BACT: As specified in this condition, t~~T~~he Primary NO_X and GHG BACT limits apply at all times, except that ~~during the following operating conditions:"~~ emissions resulting from startup, shutdown, fuel switching, DLN tuning events, 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, emissions resulting from startup, shutdown, fuel switching, DLN tuning events, or documented malfunctions shall be excluded from CEMS data in any 24-hour period ("any 24-hour period" means a calendar day, midnight to midnight) for the following operating conditions (these conditions are considered separate events and each event may occur independently within any 24-hour period)"

Department Response: The existing Condition 22 in the draft permit spells out specific definitions and time periods for each of the specified events. With the requested addition, the permittee seeks to clarify that the Primary BACT limits for NOx and GHGs do not apply during the various events specified in greater detail elsewhere in Condition 22. Also, the addition would clarify that the various events are independent ones that can each occur during a given 24-hour period. The following will be added to Condition 22:

> Emissions during the startup, shutdown, fuel switching, DLN tuning and documented malfunction events listed above are not subject to the Primary BACT standards for NO_X or GHGs. These are considered separate events, and each event may occur independently within any 24-hour period ("any 24-hour period" means a calendar day, midnight to midnight). Data from the NO_X and CO_2 CEMS (or fuel use monitor) collected during the events described above will not be used to demonstrate compliance with the Primary BACT emission limits for NO_X and GHGs.

FPL Comment 10

Section 3, Subsection D, Specific Condition 2: FPL requests the language be updated to correctly identify that OCEC Unit 1 is a minor (i.e. "area") source of hazardous air pollutants (HAPs).

Department Response: This correction will be made in the permit.

CONCLUSION

The final action is to issue the permit with the minor changes noted above in the responses to FPL Comments 1, 2, 6, 7, 8, 9 and 10.