TECHNICAL EVALUATION

&

PRELIMINARY DETERMINATION

APPLICANT

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

Fort Myers Plant
ARMS Facility ID No. 0710002

PROJECT

Installation of GE Turbine Components 7FA.04 in Unit 2
Combined Cycle Unit 2 (2A through 2 F)

DEP File No. 0710002-020-AC

COUNTY

Lee 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

January 27, 2014

1. GENERAL PROJECT INFORMATION

1.1. Facility Description and Location

The Florida Power & Light Company (FPL) operates the existing Fort Myers Plant which is located within unincorporated Lee County, Florida (see Figure 1and Figure 2). The facility is located at 10650 Palm Beach Boulevard (State Road 80), Fort Myers, Florida. The UTM coordinates are Zone 17, 422.3 kilometers (km) East, and 2952.9 km North. The facility is an electrical power generating plant with a Standard Industrial Classification Code (SIC) of No. 4911.

Figure 1. Location of Lee County.

Figure 2. Location of Fort Myers Plant.

This facility includes six 250 MW (each) combined-cycle combustion turbines (designated as Units 2A through 2F), operating since 2000/2001; two 170 MW (each) simple-cycle combustion turbine peaking units (designated as Units 3A and 3B) operating since 2003; twelve 63 MW (each) simple cycle gas turbine peaker units (designated as Units GT1 through GT12) operating since 1974. Figure 3 presents a satellite view of the overall facility, Figure 4 shows a close-up of the 250 MW combined-cycle units that will be upgraded with the GE 7FA.04 components as a result of the current project.

Figure 3. Satellite View of Fort Myer Plant.

Figure 4. Close-Up of Combined Cycle Units.

A summary of the regulated existing emission units at the Fort Myer Plant is given in Table 1 below. The emission units that are involved in this project are highlighted in turquoise in the table.

TABLE 1 – REGULATED EMISSION UNITS AT THE FORT MYERS PLANT.

EU ID No.	Brief Description
003	Combustion Turbine GT #1.
004	Combustion Turbine GT #2.
005	Combustion Turbine GT #3.
006	Combustion Turbine GT #4.
007	Combustion Turbine GT #5.
008	Combustion Turbine GT #6.
009	Combustion Turbine GT #7.
010	Combustion Turbine GT #8.
011	Combustion Turbine GT #9.
012	Combustion Turbine GT #10.
013	Combustion Turbine GT #11
014	Combustion Turbine GT #12.
018	Combustion Turbine 2A, Combined-Cycle Unit With Non-Fired HRSG.
019	Combustion Turbine 2B, Combined-Cycle Unit With Non-Fired HRSG.
020	Combustion Turbine 2C, Combined-Cycle Unit With Non-Fired HRSG.
021	Combustion Turbine 2D, Combined-Cycle Unit With Non-Fired HRSG.
022	Combustion Turbine 2E, Combined-Cycle Unit With Non-Fired HRSG.
023	Combustion Turbine 2F, Combined-Cycle Unit With Non-Fired HRSG.
024	Six Natural Gas Pre-Heaters.
027	Combustion Turbine 3A, Simple-Cycle Peaking Unit.
028	Combustion Turbine 3B, Simple-Cycle Peaking Unit.
029	Natural Gas Heater.
030	Natural Gas Heater.
033	One diesel fire pump, manufactured by Caterpillar, serial number 03Z17257, Model 3208, 2300 RPM, 187 HP, in service 2001, 8 cylinders, 646 cubic inches.

1.2. Primary Regulatory Categories

1.2.1. Federal Regulations

The U.S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40, Code of Federal Regulations, Part 60 (40 CFR 60) that identifies New Source Performance Standards (NSPS) for a variety of industrial activities. 40 CFR 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP). 40 CFR 63 specifies NESHAP provisions based on the Maximum Achievable Control Technology (MACT) for given source categories.

Federal regulations adopted by reference are given in Rule 62-204.800, F.A.C. State regulations approved by EPA are given in 40 CFR 52, Subpart K – Florida; also known as the State Implementation Plan (SIP) for Florida. The following federal regulations apply to the Fort Myers Plant and this project.

- The existing 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 and Rule 62-210.200 (Definitions), F.A.C.
- This project (as discussed below) does not trigger a PSD review and a requirement to conduct Best Available Control Technology (BACT) determinations pursuant to Department Rule 62-212.400, F.A.C. is not required.
- The existing facility is a major source of hazardous air pollutants (HAP).
- The existing facility has units regulated under Clean Air Act, Title IV, Acid Rain provisions, Phase II.
- The existing facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The proposed project includes units subject to Clean Air Interstate Rule (CAIR).
- The proposed project includes units subject to the NSPS of 40 CFR 60.

1.2.2. State 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 air quality regulations as part of the Florida Administrative Code (F.A.C.), which includes the applicable chapters contained in Table 2:

TABLE 2 – APPLICABLE RULES FROM THE F.A.C.

Chapter	Description
62-4	Permits
62-17	Electrical Power Plant Siting
62-204	Air Pollution Control – General Provisions
62-210	Stationary Sources of Air Pollution – General Requirements
62-212	Stationary Sources – Preconstruction Review
62-213	Operation Permits for Major Sources (Title V) of Air Pollution
62-296	Stationary Sources – Emission Standards
62-297	Stationary Sources – Emissions Monitoring

1.3. Project Description

The applicant proposes to upgrade the six combustion turbines of Unit 2 (designated as 2A through 2F) during an otherwise routine maintenance outage. The changes will increase the efficiency of each CT by installing new hot gas path components, combustion liners, flow sleeves and new control software characteristic of the more recent GE Model 7FA.04 CT to increase firing temperature. Link to FPL Ft Myers Application

Unit 2 (2A through 2F) Description

Unit 2 (2A through 2F) comprises six 170 MW nominal (each) General Electric MS7241FA combustion turbines, each with an unfired heat recovery steam generator (HRSG). When operating in the combined-cycle mode, the HRSG produces enough steam to generate an additional 80 MW via the existing steam-driven electrical generators (250 MW total from each unit).

Each of the combined cycle units have two relatively short stacks, one for simple cycle mode and one for combined-cycle mode. At a compressor inlet air temperature of 59° F, each gas turbine heat input is approximately 1,760 MMBtu lower heating value (LHV) per hour. The maximum heat input rate to each gas turbine is 1838 MMBtu per hour in peak mode operation (based on a compressor inlet air temperature o f 59° F, the higher heating value (HHV).

The units are fired exclusively with natural gas. The efficient combustion of natural gas at high temperatures minimizes emissions of carbon monoxide (CO), particulate matter (PM/PM_{10}), sulfuric acid mist (SAM), sulfur dioxide (SO_2), and volatile organic compounds (VOC). Nitrogen oxides (NOx) emissions are reduced by Dry Low-NOx (DLN) combustion technology. Each gas turbine is equipped with a continuous emissions monitoring system (CEMS) to measure and record NOx emissions, as well as flue gas oxygen or carbon dioxide content. These units also include six direct-fired heaters to heat the natural gas prior to use during simple cycle operation and cold start-ups.

New GE Components 7FA.04 Description

The left hand side of Figure 3 is a factory picture of an earlier version of the GE CT similar to the prime movers located within Unit 2. The right hand side of the figure is a cutaway diagram of a more recent version showing the 14-stage compressor, the 14 combustors cans oriented along the circumference of the mid-section and the three-stage rotor (expansion) section.

Figure 3. Factory Photo of an earlier GE 7FA and Internal View of a more recent GE 7FA.

Below are photos from a similar project of a CT undergoing similar modifications. The left hand side of Figure 4 is a photo of the combustion section and the three-stage rotor (expansion) section with the upper casings removed and combustors removed.

The photo on the right hand side of the figure shows further details of the hot gas path. The hot combustion gases pass from left to right through the 1st stage nozzle and then the 1st stage blades and buckets, 2nd stage nozzle and blades and finally the 3rd stage nozzle and blades. The blades, seen as the three vertical rings in the picture, are attached to the rotor and spin as the gas expands, thus providing thrust to drive the compressor section and an attached direct-drive electrical generator.

Figure 4. Internal Photo of GE 7FA with Combustors Removed. Details of Rotor Section.

The nozzles, of which only one per stage is visible (others removed) are stationary and fixed to the casing. The proposed project will change the materials, internal cooling passages, and sealing of some of these

components.

The photo on the left hand side of Figure 5 shows 14 liners (per CT), each of which is installed immediately downstream of the six fuel nozzles located within each combustor. These channel the hot gas to the rotor section. The photo on the right hand side of the figure shows 14 flow sleeves (one per liner). These direct compressor discharge air around the liners to keep them cool. The liner and flow sleeve combination will be modified to reduce resistance to air flow and improve efficiency.

Figure 5. Replacement Combustor Liners and Flow Sleeves (14 Sets/CT) Planned for Unit 2

The project will result in theoretical fuel heat input increases of 29 million Btu per hour (mmBtu/hr) per CT. This will not require an increase in the permitted design fuel heat input rates of 1,760 (LHV) during normal operation or of the 1,838 (HHV) mmBtu/hr/CT when operating in peaking mode (based on a compressor inlet air temperature of 59° F, the higher heating value (HHV).

As discussed further below, any increases in annual emissions will be less than the respective significant emission rates (SER) established in Rule 62-210.200(Definitions), Florida Administrative Code (F.A.C.). A review for the Prevention of Significant Deterioration (PSD) and a new Best Available Control Technology (BACT) determination were not required pursuant to Rule 62-212.400, F.A.C.

Unit 2 (designated as 2A to 2F) was permitted as a repowered combined cycle unit in 1998 in accordance with the PSD rules; and, a best available control technology (BACT) determination was not conducted for this unit since it netted out of PSD review for all pollutants. There will be no change in the allowable emission limits for NO_X, CO, PM/PM_{10}, SO_2 or VOC that insured that the PSD rules were not triggered for these pollutants. The units began commercial operation from September 2000 to March 2001.

The low emission levels are achieved through a combination of an inherently clean fuel and good combustion processes; in particular Dry Low NO_X (DLN-2.6) combustion technology. Unit 2 is subject to a NO_X concentration limits of **9** parts per million by volume, dry at 15 percent (%) oxygen (ppmvd) during normal mode of operation and to **15** parts per million by volume, dry at 15 percent (%) oxygen (ppmvd) during peaking mode of operation (no more than 400 hours in any consecutive 12 months of operation).

In summary, FPL is allowed to replace Unit 2 components of the Series 7FA.03 gas turbines with upgraded components of the Series 7FA.04 version including (but not limited to) the following:

- New hot gas path components;
- New combustion liners and flow sleeves; and
- New control software.

1.4. Processing Schedule

- Received Air Construction Application on December 2, 2013.
- Application complete on December 2, 2013.
- Intent to Issue Permits distributed January 27, 2014.

2. RULE REQUIREMENTS

2. A. General PSD Applicability

For areas currently in attainment with the state and federal 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 TPY or more of any regulated air pollutant; or
- 100 TPY or more of any regulated air pollutant and the facility belongs to one of 28 PSD-major facility categories listed at Rule 62-210.200 (Definitions), F.A.C., including fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input.

The rules cited are available at the following links: Link to 62-210, F.A.C. and Link to 62-212, F.A.C.

PSD pollutants include: CO; NO_X; SO_2; PM; PM_{10}; VOC; lead (Pb); Fluorides (F); sulfuric acid mist (SAM); total reduced sulfur (TRS), including hydrogen sulfide (H_2S); and mercury (Hg).

For major stationary sources, PSD applicability is based on the previously mentioned SER as defined in Rule 62-210.200 (Definitions), F.A.C. Emissions of PSD pollutants from the project exceeding these SER are considered "significant" and BACT must be employed to minimize emissions of each PSD pollutant. Refer to Table 1.

Table 1. List of SER by PSD-Pollutant. [1,4,5]

Pollutant	SER (TPY)	Pollutant	SER (TPY)
CO	100	NO_X	40
PM/PM_{10} [2]	25/15	Ozone (VOC) [3]	40
Ozone (NO_X) [3]	40	SAM	7
SO_2	40	F	3
Pb	0.6	TRS	10
H_2S	10	Hg	0.1

1. Excluding those defined exclusively for municipal waste combustors and municipal solid waste landfills.
2. PM with a diameter less than 2.5 micrometers ($PM_{2.5}$) is also a PSD pollutant, but an SER has not yet been defined in the Department's rules.
3. Ozone (O_3) is regulated by its precursors (VOC and NO_X).
4. There is a federal SER of 75,000 TPY for Greenhouse Gases (GHG) as carbon dioxide (CO_2) equivalent (CO_2e) that has not been incorporated into Department rules.
5. SER 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.

Although a facility may be "major" for only one PSD pollutant, a project must include BACT controls for any PSD pollutant that exceeds the corresponding SER.

2. B. PSD Applicability for Project

The PSD requirements of Rule 62-212.400(4) through (12), F.A.C., apply to the construction of any new major stationary source or the major modification of any existing major stationary source. A significant emissions increase of a PSD pollutant (and thus a major modification) will occur if the difference (or the sum of the differences if more than one emissions unit is involved) between the **projected actual emissions** and the **baseline actual emissions** equals or exceeds the SER for that pollutant. [Rule 62-212.400(2)(a)1., F.A.C.]

For any existing electric utility steam generating unit, "baseline actual emissions" means the average rate, in TPY, at which the unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 5-year period immediately preceding the date a complete permit application is received by the Department. [Rule 62-210.200 (Definitions), F.A.C.]

"Projected actual emissions" means the maximum annual rate, in TPY, at which an existing emissions unit is projected to emit a PSD pollutant in any one of the 5 years following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emissions unit's design capacity or its potential to emit that PSD pollutant and full utilization of the unit would result in a significant emissions increase or a significant net emissions increase at the major stationary source. [Rule 62-210.200 (Definitions), F.A.C.]

There are a number of additional considerations within the cited rules when making the described comparison of projected actual emissions to baseline actual emissions. One of the key considerations is that in making the calculation of projected actual emissions, the Department shall exclude that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions and that are also unrelated to the particular project including any increased utilization due to product demand growth.

The applicant conducted the described analysis, which is documented in the report attached to the application available at: Link to FPL Ft Myers Application

Table 2 is a summary of the applicant's PSD applicability analysis. The full step-by-step procedure is shown in the application report in Tables 1 through 7 (Part II of the Application).

Table 2. Summary of the Applicant's PSD Applicability Analysis.

Pollutant [1]	Baseline Actual Emissions (TPY)	Projected Actual Emissions (TPY)	Projected Emissions Increase (TPY)	SER (TPY)	Subject to PSD?
NO_X	926.15	957.32	31.17	40	No
CO	39.52	45.43	5.91	100	No
$PM/PM_{10}//PM_{2.5}$	216.21	216.21	2.03E-05	25/15/10	No
SO_2	19.45	19.86	0.41	40	No
VOC	0.0683	0.0693	9.76E-04	40	No
SAM	2.98	3.04	0.063	7	No
GHGs					
CO_2	3,888,066	3,893,764	5,698	75,000	No
N_2O (CO_2e)	2,238.24	2,238.24	0.0		
CH_4 (CO_2e)	1,516,23	1,516,23	0.0		
Total GHG (CO_2e)	3,891,821	3,897,519	5,698		
1. N_2O is nitrous oxide – a GHG. CH_4 is methane – a GHG.					

As shown in the above table, total project emissions will not exceed the PSD SER; therefore, the project is not subject to PSD preconstruction review. However, because the projected emissions increase for NO_X is approaching the PSD SER, future reporting comparing baseline actual emissions of NO_X to future

actual emissions of NO_X will be required for 5 years following completion of the project, in accordance with the requirements of Rule 62-210.370, F.A.C.

Fort Myers Unit 2's six gas turbines are permitted to burn only natural gas. Assuming an increase of the heat input rate of 29 mmBtu/hr/CT (1.7% of 1,760 mmBtu/hr/CT), NO_X emissions may increase at each compressor inlet temperature. At International Organization for Standardization (ISO) conditions, actual NO_X emissions are approximately 50 pounds per hour (lb/hr/CT). In that case, the additional emissions would be less than 1 lb/hr/CT or 24 TPY assuming the equivalent of 8,000 hours/year/CT at full load. At this emission increase (assuming there is any increase at all), the SER for NO_X would not be triggered. A similar analysis for CO, SO_2, VOC, PM/PM_{10} and SAM would yield the same conclusion; PSD is not triggered.

While a similar analysis would suggest that the SER for CO_2 could be triggered if conducting an extreme calculation, the applicant's calculation is more realistic. While there is a projected increase in GHG emissions, there is an overall reduction in heat rate (Btu/kilowatt-hour) that reduces the amount of emissions for each megawatt-hour (MWH) generated.

According to the applicant, there will be an approximate 1 % percent decrease in heat rate as a result of the project, which will reduce CO_2e emissions by roughly 38,000 TPY compared with the projected future actual emissions given in the table. Because of the efficiency improvements, the proposed project will reduce the output based emissions on the basis of lb CO_2e/MWH as well as lb NO_X/MWH. Similar conclusions apply for the other PSD pollutants, including CO, SO_2, PM/PM_{10} and VOC.

2. C. NSPS Applicability

Ft. Myers Unit 2 is an affected facility and an existing facility as defined in 40 CFR 60, Subpart A – General Provisions. [40 CFR 60.2 (Definitions) adopted as Rule 62-204.800(8)(a), F.A.C.] Link to 40 CFR 60.2

Unit 2 was constructed pursuant to 40 CFR 60, Subpart GG - Standards of Performance for Stationary Gas Turbines. [40 CFR 60, Subpart GG adopted as Rule 62-204.800(8)(b)(40), F.A.C.] Link to Subpart GG. The key minimum requirements of Subpart GG applicable to Unit 2 include standards for NO_X and SO_2. In summary these are:

- Limit of 75 ppmvd of NO_X plus an efficiency and fuel nitrogen correction that for the Unit 2 CT would result in a limit of approximately 110 ppmvd as measured by an annual NO_X compliance test and continuous water or steam to fuel monitoring (with continuous emissions monitoring system (CEMS) alternatives); and
- Limit of 0.8% by weight of sulfur in the fuel burned in the CT using one of several standard methods (with alternatives for contracts and representative sampling indicating sulfur less than 20 grains per 100 standard cubic feet – gr/100 SCF).

The requirements of Subpart GG are much less stringent than those imposed by the permit that was issued for Unit 2 in 1998. The following table 3 is the summary of the emission limits given in the original air construction permit (0710002-004-AC) for repowered Unit 2. The NO_X emissions are corrected to 15% oxygen and measured by continuous emission monitoring systems (CEMS).

Table 3. Emission Limits Applicable to FPL Ft. Myers Unit 2. Permit 0710002-004AC.

Emissions Standards. Emissions from each gas turbine shall not exceed the following standards.

Pollutant	Fuel	Method of Operation	Stack Test, 3-Run Average		CEMS Average
			ppmvd @ 15% O_2	lb/hour	ppmvd @ 15% O_2
CO	Gas	Simple or Combined Cycle	12	43	N/A
		Simple or Combined Cycle w/Peaking	9	29	
NO_x	Gas	Simple or Combined Cycle	9.0	65	30-days rolling avg
		Simple or Combined Cycle w/Peaking	15	102	24-hr block average
PM/PM_{10}	Gas	Simple or Combined Cycle, all permitted modes	Visible emissions shall not exceed 10% opacity for each 6-minute block average.		
VOC	Gas	Simple or Combined Cycle, all permitted modes	1.4	2.9	NA
SO_2	Gas	Simple or Combined Cycle all permitted modes: Sulfur dioxide emissions shall be controlled by the firing of natural gas.			

For the purposes of NSPS applicability, the term "modification" means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.
[40 CFR 60.2 (Definitions) adopted as Department Rule 62-204.800(8)(a), F.A.C.] Link to 40 CFR 60.2

Modifications are further addressed in Section 40 CFR 60.14. Link to 40 CFR 60.14. This section requires that emission rates be expressed on a short-term mass per hour basis i.e. kilograms/hour (kg/hr). It includes a key exemption from the definition of modification for "maintenance, repair, and replacement which the Administrator determines to be routine for a source category …."

Reconstruction, which would make an existing facility also an affected facility, is addressed in Section 40 CFR 60.15. Link to 40 CFR 60.15. Reconstruction means "replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50% of the fixed capital cost that would be required to construct a comparable entirely new facility".

The applicant presumed that replacement of the hot gas paths components with upgraded versions to improve efficiency does constitute "routine replacement".

Ft Myers Unit 2 was constructed at a cost close to $600 million.[1] The marginal cost of the improved hot path components compared with like-kind routine replacement of existing components is at most a few percent of the cost of constructing a comparable entirely new facility. The Department concludes that the project does not constitute reconstruction. Link to FPL Ft Myers Application

The "normal scenario" is each CT burning natural gas, while operating in combined cycle mode and achieving 9 ppmvd (65 lb NO_X/hr) during normal operation and 15 ppmvd (102 lb NO_X/hr) during peaking mode when corrected to 59°F (at 1,760 mmBtu/hr heat input, LHV and 1,838 MMBtu/hr, HHV in peak mode operation respectively). According to the CEMS data, the hourly emissions at the above heat inputs are typically less than the 65 lb/hr normal operation or the 102 lb/hr during peaking mode.

There may or may not be a small increase in short-term mass emission rates of NO_X. According to the application, "since the hourly emission rates for these pollutants may potentially increase, the proposed

[1] FPL News Release. PSC approves need determination request for FPL's Manatee and Martin expansion plans. November 19, 2002. It is assumed Unit 2 had a similar cost in 1998. www.fpl.com/news/2002/02126.shtml

project is a potential modification according to the rules for NSPS. As a result, the improved Unit 2 turbines may be subject to 40 CFR 60 Subpart KKKK …..".

40 CFR 60, Subpart KKKK - Standards of Performance for Stationary Combustion Turbines applies to stationary combustion turbines that commenced construction, modification or reconstruction after February 18, 2005. [40 CFR 60, Subpart KKKK adopted as Department Rule 62-204(8)(b)(81), F.A.C.]. Link to Subpart KKKK. Units subject to Subpart KKKK are not (no longer) subject to Subpart GG.

The key minimum requirements of Subpart KKKK applicable to Unit 2 include standards for NO_X and SO_2. In summary these are:

- Limits of 15 and 42 ppmvd of NO_X, respectively, on a 30-day basis when operating in combined cycle mode and on a 4-hour basis when operating in simple cycle mode; and
- Limit of 0.90 lb SO_2/MWH or 0.060 lb SO_2/mmBtu using one of several standard sulfur fuel test methods (with alternatives for contracts and representative sampling indicating sulfur less than 20 gr/100 SCF of natural gas and less than 0.05%, by weight, in the fuel oil).

These requirements are more stringent than those of Subpart GG and approximately as stringent as the NO_X emission limitation and the sulfur fuel specifications already applicable to Unit 2 per the original permit. The key exception is that the Subpart KKKK simple cycle NO_X limit when firing natural gas would be applicable on a 4-hour basis rather than a 30-day basis. Simple cycle operation is rarely if ever practiced for Unit 2.

Overall there would be no meaningful difference in the future operation of Unit 2 or future emissions regardless of the applicability of Subpart KKKK. The Department will make a final determination based on future operation and will require the applicant to submit data comparing emissions before and after the project in accordance with *40 CFR 60, Appendix C – Determination of Emission Rate Change*. Details of the methodology are provided in the following link: Link to Appendix C.

According to the introduction in Appendix C, the "method shall be used to determine whether a physical or operational change to an existing facility *resulted* in an increase in the emission rate to the atmosphere. The method used is the Student's *t* test, commonly used to make inferences from small samples". Fortunately Unit 2 has CEMS for NO_X and it will be easy to review data from before and after the change and make the inference from a relatively large number of runs (n = 20-29).

If short-term mass emission rate increases occur, then Unit 2 will be subject to the requirements of Subpart KKKK. The primary changes would be in certain reporting requirements.

3. DEPARMENT PROJECT REVIEW OF SPECIFIC CONDITIONS

The proposed project does not affect concentration emissions rates, production rates or any other significant change. Descriptions of these turbine upgrades and the reporting requirements needed are stated below, followed by the Department's position on the requested changes.

This permitting action affects the following emissions units:

ID	Emission Unit Description
018	Combustion Turbine 2A, Combined-Cycle Unit With Non-Fired HRSG.
019	Combustion Turbine 2B, Combined-Cycle Unit With Non-Fired HRSG.
020	Combustion Turbine 2C, Combined-Cycle Unit With Non-Fired HRSG.
021	Combustion Turbine 2D, Combined-Cycle Unit With Non-Fired HRSG.
022	Combustion Turbine 2E, Combined-Cycle Unit With Non-Fired HRSG.
023	Combustion Turbine 2F, Combined-Cycle Unit With Non-Fired HRSG.

Requested Specific Permit Conditions

1. *FPL Request – Upgrading GE7A.3 with GE7A.04 Components – New Condition:* FPL proposes to improve the performance of the MS7241FA General Electric turbine by replacing the 7FA.03 components with the 7FA.04.

   Department Response: The Department authorizes the installation of the new GE7A.04 components, therefore new conditions will be added to the permit to reflect this. The only permit conditions required are:

   - A description and authorization of the improvement project – replacement of hot gas path components with upgraded parts;
   - A requirement that the permittee report emissions pursuant to Rule 62-212.300(1)(e), F.A.C. to determine in the future whether the project has triggered PSD; and
   - A requirement that the permittee conduct tests in accordance with 40 CFR 60, Appendix C (using CEMS) and submit the data with a preliminary inference whether the emission rates after the change are greater than before the change with 95% confidence and whether Subpart KKKK applies.

3. A. Previously Authorized Construction Project Related to the Current Request

The following link shows the relevant original PSD Permits, the original Technical Evaluations and Preliminary Determinations (TEPD) and all permits/projects modifications affected by this review in Permit No. No. 0710002-020-AC: http://appprod.dep.state.fl.us/air/emission/apds/listpermits.asp

3. B. New Permit

In general, the Department finds the requested project acceptable based on the applicant's assurance that these CTs are in compliance with all the emissions limits. See draft new permit (0710002-020-AC) for detailed new conditions allowing the upgrade.

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. Teresa Heron is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Office of Permitting and Compliance at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.