

**TECHNICAL EVALUATION  
PRELIMINARY DETERMINATION  
AND  
STATEMENT OF BASIS**

Progress Energy Florida  
Hines Energy Complex

Heat Input Increase to Power Blocks 2 and 3

Polk County

DEP File No. 1050234-011-AC / PSD-FL-296 (PA 92-33)

DEP File No. 1050234-013-AC / PSD-FL-330 (PA 92-33)



Florida Department of Environmental Protection  
Division of Air Resource Management  
Bureau of Air Regulation  
North Permitting Section

February 11, 2005

1. APPLICATION INFORMATION

1.1 Applicant Name and Address

Progress Energy Florida  
P.O. Box 14042, MAC BB1A  
St. Petersburg, Florida 33733  
Authorized Representative:  
Roger Zirkle, Plant Manager

1.2 Processing Schedule

- Pre-meeting on January 30, 2005;
- Received application on February 1, 2005;
- Issued Draft permit on February 11, 2005.

1.3 Facility Description and Location

Power Block 1 consists of two combined cycle combustion turbines with heat recovery steam generators (HRSGs), for a nominal total of 500 MWs, a 99 MMBtu/hr auxiliary boiler, a 1,300 kW diesel generator and a 97,570 barrel fuel oil storage tank. Emissions from each CT and HRSG combination are vented through a single stack for each. Power Block 2 consists of two combined cycle combustion turbines with unfired heat recovery steam generators (HRSGs), and a single steam-turbine electrical generator. The existing facility (inclusive of both Power Blocks) has a total generating capacity of 1030 MW. Power Block 3 is under construction at the existing Hines Energy Complex. It is a “2-on-1” combined cycle unit with an electrical generating capacity of approximately 530 megawatts (MW). Power Block 4 is being permitted as a separate and unrelated project. Power Blocks 3 and 4 will each consist of two 170 MW gas turbine-electrical generator sets, two unfired heat recovery steam generator (HRSG) sets, and a single 190 MW steam turbine-electrical generator.



FIGURE 1 – Facility Location

FIGURE 2 – Satellite Image

FIGURE 3 – 1999 Close-up

The existing Hines Energy Complex is located in the southwest portion of Polk County, Florida, approximately 7 miles south-southwest of Bartow and 5 miles west-northwest of Fort Meade. UTM Zone 17; 414.4 km East; 3073.9 km North (Latitude: 27° 47' 19", Longitude: 81° 52' 10").

**1.4 Regulatory Categories**

Title III: The existing facility is a major source of hazardous air pollutants (HAPs). Based on the available information, this project does not trigger the requirements for a case-by-case determination of the Maximum Available Control Technology (MACT) under Section 112(g) of the Clean Air Act (CAA, or “the Act”).

Title IV: The facility operates emissions units subject to the acid rain provisions of the Act.

Title V: Because potential emissions of at least one regulated pollutant exceed 100 tons per year, the existing facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C. Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), and volatile organic compounds (VOC).

PSD: The project is located in an area designated as “attainment” or “unclassifiable” for each pollutant subject to a National Ambient Air Quality Standard. The facility is considered a “fossil fuel fired steam electric plant of more than 250 million British thermal units (MMBtu) per hour of heat input,” which is one of the 28 PSD source 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 PSD-major source of air pollution with respect to Rule 62-212.400, F.A.C.

Siting: The project is subject to Electrical Power Plant Siting in accordance with Chapter 62-17, F.A.C. and Chapter 403, Part II, F.S.

**2. PROPOSED PROJECT**

**2.1 Project Description**

The applicant has applied for a heat input increase to each of the combustion turbines in Power Blocks 2 and 3. This request is the result of actual testing on the Power Block 2 combustion turbines which are currently in operation. Although Power Block 3 is under construction, the combustion turbines are identical to those at Power Block 2.

Of note, Power Block 2 has not been in operation for a sufficient time period to have developed a representative ‘past actual emission’ basis for comparison to future potential emissions. Accordingly, the permitted ‘potential’ emissions are utilized herein for comparison purposes.

<u>Fuel</u>	<u>Permitted Heat Input Rate (HHV)</u>	<u>Compressor Inlet Temp.</u>	<u>Requested Heat Input Rate (HHV)</u>	<u>Percent Increase</u>
Gas	1915 MMBtu/hour	59° F	2048 MMBtu/hour	6.9%
Oil	2020 MMBtu/hour	59° F	2155 MMBtu/hour	6.7%

**2.2 Potential Emission Increases for Power Block 2**

The following tables summarize the Department’s estimate of the annual emissions in tons per year from the proposed heat input increase:

<b><u>Existing emission limits per CT (PSD-296)</u></b>				
<b><u>Pollutant</u></b>	<b><u>Gas ppm</u></b>	<b><u>Gas lb/hr</u></b>	<b><u>Oil ppm</u></b>	<b><u>Oil lb/hr</u></b>
PM *		7.3		64.8
NOx	3.5	25.2	12	93.5
CO	16	73.6	30	112
VOC	2	4.7	10	22

\* Note: The PM emission limit will remain unchanged as per applicant.

<b><u>Requested emission limits per CT</u></b>				
<b><u>Pollutant</u></b>	<b><u>Gas lb/hr</u></b>	<b><u>Gas lb/hr increase</u></b>	<b><u>Oil lb/hr</u></b>	<b><u>Oil lb/hr increase</u></b>
PM	7.3	0.0	64.8	0.0
NOx	27.0	1.8	99.7	6.2
CO	78.7	5.1	119.5	7.5
VOC	5.0	0.3	23.5	1.5

<b><u>Annual Increase per CT* :</u></b>				
	<b><u>Gas lb/yr</u></b>	<b><u>Oil lb/year</u></b>	<b><u>Total lb/yr</u></b>	<b><u>Total TPY</u></b>
PM	0.0	0.0	0.0	0.0
NOx	14071.5	4499.1	18570.6	9.3
CO	41097.6	5389.3	46486.9	23.2
VOC	2624.4	1058.6	3683.1	1.8

\* Note: Based upon 8040 hrs/yr gas and 720 hours per year oil.

Based upon the calculations above, the maximum potential emissions increases resulting from the requested heat input increases at Power Block 2 are:

<b><u>Pollutant</u></b>	<b><u>TPY</u></b>
<b>PM</b>	<b>0.0</b>
<b>NOx</b>	<b>18.6</b>
<b>CO</b>	<b>46.5</b>
<b>VOC</b>	<b>3.7</b>

**2.3 Potential Emission Increases for Power Block 3**

The following tables summarize the Department’s estimate of the annual emissions in tons per year from the proposed heat input increase:

<b>PB-3 Existing emission limits per CT (PSD-330)</b>				
<u>Pollutant</u>	<u>Gas ppm</u>	<u>Gas lb/hr</u>	<u>Oil ppm</u>	<u>Oil lb/hr</u>
PM *		8.5		64.8
NOx	2.5	17.9	10	76.9
CO	10	46	20	75
VOC	2	5.3	10	22

\* Note: The PM emission limit will remain unchanged as per applicant.

<b>Requested emission limits per CT</b>				
<u>Pollutant</u>	<u>Gas lb/hr</u>	<u>Gas lb/hr increase</u>	<u>Oil lb/hr</u>	<u>Oil lb/hr increase</u>
PM	8.5	0.0	64.8	0.0
NOx	19.1	1.2	82.0	5.1
CO	49.2	3.2	80.0	5.0
VOC	5.7	0.4	23.5	1.5

<b>Annual Increase per CT* :</b>				
	<u>Gas lb/yr</u>	<u>Oil lb/year</u>	<u>Total lb/yr</u>	<u>Total TPY</u>
PM	0.0	0.0	0.0	0.0
NOx	9995.2	3700.3	13695.5	6.8
CO	25686.0	3608.9	29294.9	14.6
VOC	2959.5	1058.6	4018.1	2.0

\* Note: Based upon 8040 hrs/yr gas and 720 hours per year oil.

Based upon the calculations above, the maximum potential emissions increases resulting from the requested heat input increases at Power Block 3 are:

<u>Pollutant</u>	<u>TPY</u>
<b>PM</b>	<b>0.0</b>
<b>NOx</b>	<b>13.7</b>
<b>CO</b>	<b>29.3</b>
<b>VOC</b>	<b>4.0</b>

**2.4 Potential Emission Increases for Hines Energy Complex**

<u>Pollutant</u>	<u>Increase (TPY)</u>	<u>PSD Threshold (TPY)</u>	<u>PSD applies?</u>
PM	0.0	15	NO
NOx	32.3	40	NO
CO	75.8	100	NO
VOC	7.7	40	NO

**3. CONCLUSION**

Based on the foregoing technical evaluation of the application as submitted by the applicant, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations.

The Department has reasonable assurance that the proposed project, as described in this report will not cause or significantly contribute to a violation of any AAQS.