

**HARDEE POWER  
PARTNERS LIMITED**

Invenergy

Via DHL

June 4, 2007

Mr. Jeffery F. Koerner, P.E.  
Bureau of Air Management – Air Permitting North  
Florida Department of Environmental Protection  
111 South Magnolia Street, Suite 23  
Tallahassee, FL 32301

RECEIVED

JUN 06 2007

BUREAU OF AIR REGULATION

**Re: Hardee Power Partners - Hardee Power Station  
Combustion Turbine CT-2B Heat Input Request  
Project No. 0490015-008-AC (PSD-FL-140A)  
Responses to Request for Additional Information**

Dear Mr. Koerner:

Hardee Power Partners (HPP) received your letter dated March 9, 2007 requesting additional information with regards to HPP's request to increase the permitted heat input rates for the Hardee Power Station's Combustion Turbine CT-2B. This correspondence provides a response to each specific question raised by the Department of Environmental Protection (Department).

The requested increase in CT-2B heat input rates for natural gas and distillate fuel oil firing represents an administrative correction to the original performance estimates provided by the CT vendor – General Electric. There will be no physical changes or changes to the method of operation of CT-2B. CT-2B is a peaking unit that operates in response to demand from the power grid. The administrative correction in permitted heat input rates will not affect the future operation of CT-2B. Accordingly, actual emission rates will not change due to the administrative correction in heat input rates.

For your convenience, the Department's comments and HPP's responses are provided below.

Department Comment No. 1

*Please provide actual capacity information for Unit 2B to support your request for an increase in the permitted heat input rate. Provide actual short-term heat input rates that validate the requested level.*

**HPP Response:**

Annual CT performance and emissions test data was utilized to calculate actual operating heat input rates corrected to ISO conditions (59 °F, 14.7 psia, 60% relative humidity [RH]). Based on the actual operating heat input rates, revised heat input limits were determined using the methodology that the limit should be 5% higher than the actual average to allow for testing uncertainties ( $\pm 2\%$ ), variations in ambient conditions, and uncertainties associated with applying correction curves. The correction curve utilized in the analysis of heat input is the 8/17/98 I Levine Curve 522HA283 Rev2 previously provided to the Department.

The requested gas and oil firing heat input limits for CT-2B were derived as follows:

Natural Gas – CT Plant Performance Testing

Plant Performance Test Results CT-2B, Natural Gas  
 All results corrected to 59 °F, 14.7 psi, 60% RH (ISO conditions)  
 Design Heat Input is 880 MMBtu/hr, lower heating value (LHV)

Year	Power Output (kW)	Heat Rate (Btu/kWhr)	Calculated Heat Input (MMBtu/hr, LHV)
2006	83,183	10,626	884
2005	83,714	10,651	892
2004	83,095	10,752	893
2003	84,074	11,082	932
2002	82,055	11,079	909
2001	82,829	10,863	900
2000	85,191	10,632	906
<b>Averages</b>	<b>83,449</b>	<b>10,812</b>	<b>902</b>

Natural Gas – CT Emission Tests

Emission Test Results CT-2B, Natural Gas  
 All results corrected to 59 °F, 14.7 psi, 60% RH (ISO conditions)  
 Design Heat Input is 880 MMBtu/hr, lower heating value (LHV)

Year	Heat Input (MMBtu/hr, LHV)
2006	905
2000	895
<b>Average</b>	<b>900</b>

Based upon the performance test results above, and the emissions tests results for which sufficient data was available to calculate the corrected heat input at design conditions, a permitted heat input level approximately

Mr. Jeffery F. Koerner, P.E.

June 4, 2007

Page -3-

5% higher than the average actual heat input when firing natural gas is requested; i.e., a natural gas heat input limit of 950 MMBtu/hr (LHV) at ISO conditions is requested.

Distillate Fuel Oil – CT Plant Performance Testing

Plant Performance Test Results CT-2B, Distillate Fuel Oil

All results corrected to 59 °F, 14.7 psi, 60% RH (ISO conditions)

Design Heat Input is 950 MMBtu/hr, lower heating value (LHV)

Year	Power Output (kW)	Heat Rate (Btu/kWhr)	Calculated Heat Input (MMBtu/hr, LHV)
2000	87,312	10,946	956

Distillate Fuel Oil – CT Emission Tests

Emission Test Results CT-2B, Distillate Fuel Oil

All results corrected to 59 °F, 14.7 psi, 60% RH (ISO conditions)

Design Heat Input is 950 MMBtu/hr, lower heating value (LHV)

Year	Heat Input (MMBtu/hr, LHV)
2001	1,027
2000	1,024
<b>Average</b>	<b>1,026</b>

As can be seen, the CT performance and emissions test data did not agree as well as the natural gas data. Due to this variability, a permitted heat input level that results in the actual average heat input being between approximately 90% and 97% of the permit limit when firing distillate fuel oil is requested; i.e., a distillate fuel oil heat input limit of 1,060 MMBtu/hr (LHV) at ISO conditions is requested.

Department Comment No. 2

*Provide the actual annual fuel firing rates and heat input rates for Unit 2B for the last 5 years of operation.*

**HPP Response:**

Annual fuel firing rates for CT-2B are summarized in the following table.

Year	Natural Gas Firing Rates ( $10^6$ ft <sup>3</sup> /yr)	Fuel Oil Firing Rates ( $10^3$ gal/yr)	Gas Heat Input (MMBtu/hr, LHV)	Oil Heat Input (MMBtu/yr, LHV)
2006	149.0	8.9	140,060	1,166
2005	175.3	161.7	164,782	21,183
2004	96.3	140.5	90,522	18,406
2003	537.9	59.8	505,626	7,834
2002	1,232.1	443.1	1,158,174	58,046

Fuel firing rates shown above were taken from the Annual Operating Reports (AORs). Heat input rates were calculated based on a natural gas heat content of 940 Btu/ft<sup>3</sup> (LHV), and distillate fuel oil heat content of 131,000 Btu/gal (LHV).

Department Comment No. 3

*Provide vendor information supporting the requested heat input rate.*

**HPP Response:**

As noted above, the requested increase in CT-2B heat input rates for natural gas and distillate fuel oil firing represents an administrative correction to the original performance estimates provided by the CT vendor – General Electric.

Department Comment No. 4

*Provide the manufacturer's guaranteed CO emission for natural gas and distillate oil firing (ppmvd @ 15% O<sub>2</sub> and lb/hr @59°F.*

**HPP Response:**

The manufacturer's (i.e., General Electric) original estimated performance emissions data, taken from the PSD air construction permit application submitted to the Department in June 1999, is provided as Attachment A. Note that HPP is not requesting any changes to the currently authorized CT-2B CO emission rates.

Mr. Jeffery F. Koerner, P.E.  
June 4, 2007  
Page -5-

Department Comment No. 5

*Provide annual CO emission test data for the past five years.*

**HPP Response:**

Annual CO emissions data for CT-2B are summarized in the following table.

Year	CO Emissions (ton/yr)
2006	0.43
2005	0.30
2004	0.20
2003	1.93
2002	3.68

Department Comment No. 6

*Provide the manufacturer's guaranteed NO<sub>x</sub> emission for natural gas and distillate oil firing (ppmvd @ 15% O<sub>2</sub> and lb/hr @ 59°F).*

**HPP Response:**

The manufacturer's (i.e., General Electric) original estimated performance emissions data, taken from the PSD air construction permit application submitted to the Department in June 1999, is provided as Attachment A. Note that HPP is not requesting any changes to the currently authorized CT-2B NO<sub>x</sub> emission rates.

Department Comment No. 7

*Summarize the actual NO<sub>x</sub> emissions from Unit 2B for the last 5 years*

**HPP Response:**

Annual NO<sub>x</sub> emissions data for CT-2B are summarized in the following table.

Year	NO <sub>x</sub> Emissions (ton/yr)
2006	2.49
2005	5.02
2004	4.97
2003	7.01
2002	23.03

Department Comment No. 8

*Provide actual NO<sub>x</sub> data supporting operation at the increased heat input rate.*

**HPP Response:**

The requested increase in CT-2B heat input rates for natural gas and distillate fuel oil firing represents an administrative correction to the original performance estimates provided by the CT vendor – General Electric. There will be no physical changes or changes to the method of operation of CT-2B. CT-2B is a peaking unit that operates in response to demand from the power grid. The administrative correction in permitted heat input rates will not affect the future operation of CT-2B. Accordingly, actual NO<sub>x</sub> emission rates will not change due to the administrative correction in heat input rates.

Department Comment No. 9

*Please estimate the emissions increases expected from the increase in heat input. Compare the projected actual emissions to baseline emissions as defined in 62-210.200, 62-210.370, and 62-212.30000, F.A.C. Will the predicted increases exceed the PSD significant emissions rates?*

**HPP Response:**

The requested increase in CT-2B heat input rates for natural gas and distillate fuel oil firing represents an administrative correction to the original performance estimates provided by the CT vendor – General Electric. There will be no physical changes or changes to the method of operation of CT-2B. CT-2B is a peaking unit that operates in response to demand from the power grid. The administrative correction in permitted heat input rates will not affect the future operation of CT-2B. Accordingly, actual emission rates will not change

Mr. Jeffery F. Koerner, P.E.  
June 4, 2007  
Page -7-

due to the administrative correction in heat input rates.

As requested, a professional engineer certification is also attached (Attachment B). The Department's continued expeditious processing of this request for an increase in the permitted heat input rates for CT-2B will be appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read "Alex C. George", followed by a horizontal line extending to the right.

Alex C. George  
Vice President

Attachments

**ATTACHMENT A**  
**GE ESTIMATED EMISSIONS PERFORMANCE**



**TPS Hardee Power Station**  
**ESTIMATED PERFORMANCE PG7121(EA)**

Load Condition		BASE	75%	65%
Ambient Temp.	Deg F.	32.	32.	32.
Fuel Type		Cust Gas	Cust Gas	Cust Gas
Fuel LHV	Btu/lb	20,802	20,802	20,802
Fuel Temperature	Deg F	90	90	90
Output	kW	91,440.	68,580.	59,440.
Heat Rate (LHV)	Btu/kWh	10,340.	11,080.	11,800.
Heat Cons. (LHV) X 10 <sup>6</sup>	Btu/h	945.5	759.9	701.4
Auxiliary Power	kW	665	665	665
Output Net	kW	90,780.	67,920.	58,780.
Heat Rate (LHV) Net	Btu/kWh	10,420.	11,190.	11,930.
Exhaust Flow X 10 <sup>3</sup>	lb/h	2499.	1955.	1793.
Exhaust Temp.	Deg F.	981.	1021.	1048.
Exhaust Heat (LHV) X 10 <sup>6</sup>	Btu/h	597.7	496.0	470.6

**EMISSIONS**

		9.	9.	9.
NOx	ppmvd @ 15% O2	9.	9.	9.
NOx AS NO2	lb/h	35.	28.	25.
CO	ppmvd	25.	29.	26.
CO	lb/h	57.	52.	42.
UHC	ppmvw	7.	7.	7.
UHC	lb/h	10.	8.	7.
VOC	ppmvw	1.4	1.4	1.4
VOC	lb/h	2.	1.6	1.4
Particulates	lb/h	5.0	5.0	5.0
PM10	lb/h	10.0	10.0	10.0

**EXHAUST ANALYSIS % VOL.**

Argon	0.89	0.90	0.89
Nitrogen	75.20	75.16	75.15
Oxygen	13.86	13.75	13.74
Carbon Dioxide	3.26	3.31	3.32
Water	6.79	6.89	6.90

**SITE CONDITIONS**

Elevation	ft.	120.0
Site Pressure	psia	14.64
Inlet Loss	in Water	3.5
Exhaust Loss	in Water	7.75
Relative Humidity	%	98
Application		7A6 Air-Cooled Generator
Combustion System		9/42 DLN Combustor

Emission information based on GE recommended measurement methods. NOx emissions are corrected to 15% O2 without heat rate correction and are not corrected to ISO reference condition per 40CFR 60.335(c)(1). NOx levels shown will be controlled by algorithms within the SPEEDTRONIC control system.

Sulfur Emissions Based On 0.00036 WT% Sulfur Content in the Fuel.  
 Particulates represent solid filterables of 10 microns; PM10 represents Solid filterable particulate matter of 10microns plus condensables (Front & Back half)

IPS- 80901 version code- 1 . 5 . 1 Opt: N 71210696  
 DARGUSFR 6/15/99 13:57 teco 32-gas 6\_9\_99Rev 1.dat

**TPS Hardee Power Station**  
**ESTIMATED PERFORMANCE PG7121(EA)**

Load Condition		BASE	75%	65%
Ambient Temp.	Deg F.	59.	59.	59.
Fuel Type		Cust Gas	Cust Gas	Cust Gas
Fuel LHV	Btu/lb	20,802	20,802	20,802
Fuel Temperature	Deg F	90	90	90
Output	kW	83,760.	62,820.	54,450.
Heat Rate (LHV)	Btu/kWh	10,510.	11,390.	12,150.
Heat Cons. (LHV) X 10 <sup>6</sup>	Btu/h	880.3	715.5	661.6
Auxiliary Power	kW	665	665	665
Output Net	kW	*83,100.	62,160.	53,790.
Heat Rate (LHV) Net	Btu/kWh	*10,590.	11,510.	12,300.
Exhaust Flow X 10 <sup>3</sup>	lb/h	2352.	1854.	1702.
Exhaust Temp.	Deg F.	999.	1047.	1075.
Exhaust Heat (LHV) X 10 <sup>6</sup>	Btu/h	561.0	472.9	449.2

**EMISSIONS**

NOx	ppmvd @ 15% O2	*9.	9.	9.
NOx AS NO2	lb/h	32.	26.	24.
CO	ppmvd	*25.	25.	25.
CO	lb/h	54.	42.	39.
UHC	ppmvw	*7.	7.	7.
UHC	lb/h	9.	7.	7.
VOC	ppmvw	*1.4	1.4	1.4
VOC	lb/h	1.8	1.4	1.4
Particulates	lb/h	*5.0	5.0	5.0
PM10	lb/h	*10.0	10.0	10.0

**EXHAUST ANALYSIS** % VOL.

Argon		0.89	0.90	0.91
Nitrogen		74.91	74.86	74.85
Oxygen		13.87	13.73	13.70
Carbon Dioxide		3.22	3.28	3.29
Water		7.12	7.24	7.26

**SITE CONDITIONS**

Elevation	ft.	120.0		
Site Pressure	psia	14.64		
Inlet Loss	in Water	3.5		
Exhaust Loss	in Water	7.75		
Relative Humidity	%	60		
Application		7A6 Air-Cooled Generator		
Combustion System		9/42 DLN Combustor		

Emission information based on GE recommended measurement methods. NOx emissions are corrected to 15% O2 without heat rate correction and are not corrected to ISO reference condition per 40CFR 60.335(c)(1). NOx levels shown will be controlled by algorithms within the SPEEDTRONIC control system.

**\* Guarantee Data**

Sulfur Emissions Based On 0.00036 WT% Sulfur Content in the Fuel.  
 Particulates represent solid filterables of 10 microns; PM10 represents Solid filterable particulate matter of 10microns plus condensables (Front & Back half)

IPS- 80901 version code- 1.5.1 Opt: N 71210696  
 DARGUSFR 6/15/99 13:55 teco 59 gas 6\_9\_99Rev1.dat

**TPS Hardee Power Station**  
**ESTIMATED PERFORMANCE PG7121(EA)**

Load Condition		BASE	75%	65%
Ambient Temp.	Deg F.	95.	95.	95.
Fuel Type		Cust Gas	Cust Gas	Cust Gas
Fuel LHV	Btu/lb	20,802	20,802	20,802
Fuel Temperature	Deg F	90	90	90
Output	kW	73,080.	54,810.	47,500.
Heat Rate (LHV)	Btu/kWh	10,860.	11,960.	12,770.
Heat Cons. (LHV) X 10 <sup>6</sup>	Btu/h	793.6	655.5	606.6
Auxiliary Power	kW	665	665	665
Output Net	kW	72,420.	54,150.	46,840.
Heat Rate (LHV) Net	Btu/kWh	10,960.	12,110.	12,950.
Exhaust Flow X 10 <sup>3</sup>	lb/h	2152.	1704.	1588.
Exhaust Temp.	Deg F.	1023.	1087.	1100.
Exhaust Heat (LHV) X 10 <sup>6</sup>	Btu/h	513.5	442.3	419.8

**EMISSIONS**

NOx	ppmvd @ 15% O2	9.	9.	9.
NOx AS NO2	lb/h	29.	24.	22.
CO	ppmvd	25.	25.	25.
CO	lb/h	49.	39.	36.
UHC	ppmvw	7.	7.	7.
UHC	lb/h	9.	7.	6.
VOC	ppmvw	1.4	1.4	1.4
VOC	lb/h	1.8	1.4	1.2
Particulates	lb/h	5.0	5.0	5.0
PM10	lb/h	10.0	10.0	10.0

**EXHAUST ANALYSIS % VOL.**

Argon	0.89	0.88	0.87
Nitrogen	73.83	73.75	73.78
Oxygen	13.70	13.48	13.56
Carbon Dioxide	3.15	3.25	3.22
Water	8.44	8.64	8.57

**SITE CONDITIONS**

Elevation	ft.	120.0
Site Pressure	psia	14.64
Inlet Loss	in Water	3.5
Exhaust Loss	in Water	7.75
Relative Humidity	%	45
Application		7A6 Air-Cooled Generator
Combustion System		9/42 DLN Combustor

Emission information based on GE recommended measurement methods. NOx emissions are corrected to 15% O2 without heat rate correction and are not corrected to ISO reference condition per 40CFR 60.335(c)(1). NOx levels shown will be controlled by algorithms within the SPEEDTRONIC control system.

Sulfur Emissions Based On 0.00036 WT% Sulfur Content in the Fuel.  
 Particulates represent solid filterables of 10 microns; PM10 represents Solid filterable particulate matter of 10microns plus condensables (Front & Back half)

IPS- 80901 version code- 1.5.1 Opt: N 71210696  
 DARGUSFR 6/15/99 14:00 teco 95 gas 6\_9\_99Rev 1.dat

## TPS Hardee Power Station

### ESTIMATED PERFORMANCE PG7121(EA)

Load Condition		BASE	75%	50%
Ambient Temp.	Deg F.	32.	32.	32.
Output	kW	94,570.	70,930.	47,290.
Heat Rate (LHV)	Btu/kWh	10,810.	11,640.	13,870.
Heat Cons. (LHV) X 10 <sup>6</sup>	Btu/h	1,022.3	825.6	655.9
Auxiliary Power	kW	749	749	749
Output Net	kW	93,820.	70,180.	46,540.
Heat Rate (LHV) Net	Btu/kWh	10,900.	11,760.	14,090.
Exhaust Flow X 10 <sup>3</sup>	lb/h	2555.	1940.	1575.
Exhaust Temp.	Deg F.	975.	1056.	1100.
Exhaust Heat (LHV) X 10 <sup>6</sup>	Btu/h	612.8	514.8	441.7
Water Flow	lb/h	47,530.	35,930.	25,450.

### EMISSIONS

NOx	ppmvd @ 15% O2	42.	42.	42.
NOx AS NO2	lb/h	179.	143.	113.
CO	ppmvd	20.	20.	20.
CO	lb/h	46.	35.	29.
UHC	ppmvw	7.	7.	7.
UHC	lb/h	10.	8.	6.
VOC	ppmvw	3.5	3.5	3.5
VOC	lb/h	5.	4.	3.
SO2	ppmvw	9.0	10.0	10.0
SO2	lb/h	53.0	43.0	34.0
SO3	ppmvw	1.0	1.0	0.0
SO3	lb/h	4.0	3.0	2.0
Sulfur Mist	lb/h	6.0	5.0	4.0
Particulates	lb/h	10.0	10.0	10.0
PM10	lb/h	26.0	25.0	24.0

### EXHAUST ANALYSIS % VOL.

Argon		0.87	0.88	0.89
Nitrogen		73.73	73.65	73.99
Oxygen		13.18	12.80	13.11
Carbon Dioxide		4.58	4.83	4.68
Water		7.64	7.84	7.34

### SITE CONDITIONS

Elevation	ft.	120.0
Site Pressure	psia	14.64
Inlet Loss	in Water	3.5
Exhaust Loss	in Water	7.75
Relative Humidity	%	98
Fuel Type		Distillate, H/C Ratio of 1.8
Fuel LHV	Btu/lb	18300 @ 90 °F
Application		7A6 Air-Cooled Generator
Combustion System		9/42 DLN Combustor

Emission information based on GE recommended measurement methods. NOx emissions are corrected to 15% O2 without heat rate correction and are not corrected to ISO reference condition per 40CFR 60.335(c)(1). NOx levels shown will be controlled by algorithms within the SPEEDTRONIC control system.

Distillate Fuel is Assumed to have 0.015% Fuel-Bound Nitrogen, or less.

FBN Amounts Greater Than 0.015% Will Add to the Reported NOx Value.

Sulfur Emissions Based On 0.05 WT% Sulfur Content in the Fuel.

Particulate represent solid filterables of 10microns; PM10 represents Solid filterable particulate matter of 10microns plus condensables (Front & Back half)

## TPS Hardee Power Station

### ESTIMATED PERFORMANCE PG7121(EA)

Load Condition		BASE	75%	50%
Ambient Temp.	Deg F.	59.	59.	59.
Fuel Type		Dist.	Dist.	Dist.
Fuel LHV	Btu/lb	18,300	18,300	18,300
Fuel Temperature	Deg F	90	90	90
Liquid Fuel H/C Ratio		1.8	1.8	1.8
Output	kW	86,640.	64,980.	43,320.
Heat Rate (LHV)	Btu/kWh	10,960.	11,890.	14,190.
Heat Cons. (LHV) X 10 <sup>6</sup>	Btu/h	949.6	772.6	614.7
Auxiliary Power	kW	749	749	749
Output Net	kW	*85,890.	64,230.	42,570.
Heat Rate (LHV) Net	Btu/kWh	*11,060.	12,030.	14,440.
Exhaust Flow X 10 <sup>3</sup>	lb/h	2403.	1858.	1528.
Exhaust Temp.	Deg F.	994.	1066.	1100.
Exhaust Heat (LHV) X 10 <sup>6</sup>	Btu/h	574.1	487.4	418.5
Water Flow	lb/h	42,800.	32,160.	22,410.

### EMISSIONS

NOx	ppmvd @ 15% O2	*42.	42.	42.
NOx AS NO2	lb/h	167.	134.	106.
CO	ppmvd	*20.	20.	20.
CO	lb/h	43.	34.	28.
UHC	ppmvw	*7.	7.	7.
UHC	lb/h	9.	7.	6.
VOC	ppmvw	*3.5	3.5	3.5
VOC	lb/h	4.5	3.5	3.
SO2	ppmvw	9.0	10.0	9.0
SO2	lb/h	49.0	40.0	32.0
SO3	ppmvw	1.0	0.0	1.0
SO3	lb/h	4.0	3.0	2.0
Sulfur Mist	lb/h	5.0	4.0	3.0
Particulates	lb/h	*10.0	10.0	10.0
PM10	lb/h	*25.0	24.0	23.0

### EXHAUST ANALYSIS % VOL.

Argon		0.88	0.88	0.88
Nitrogen		73.54	73.53	73.92
Oxygen		13.21	12.94	13.32
Carbon Dioxide		4.52	4.71	4.52
Water		7.85	7.94	7.36

### SITE CONDITIONS

Elevation	ft.	120.0
Site Pressure	psia	14.64
Inlet Loss	in Water	3.5
Exhaust Loss	in Water	7.75
Relative Humidity	%	60
Application		7A6 Air-Cooled Generator
Combustion System		9/42 DLN Combustor

Emission information based on GE recommended measurement methods. NOx emissions are corrected to 15% O2 without heat rate correction and are not corrected to ISO reference condition per 40CFR 60.335(c)(1). NOx levels shown will be controlled by algorithms within the SPEEDTRONIC control system.

Particulate represent solid filterables of 10microns; PM10 represents Solid filterable particulate matter of 10microns plus condensables (Front & Back half)

Distillate Fuel is Assumed to have 0.015% Fuel-Bound Nitrogen, or less.

FBN Amounts Greater Than 0.015% Will Add to the Reported NOx Value.

Sulfur Emissions Based On 0.05 WT% Sulfur Content in the Fuel.

**TPS Hardee Power Station**  
**ESTIMATED PERFORMANCE PG7121(EA)**

Load Condition		BASE	75%	50%
Ambient Temp.	Deg F.	95.	95.	95.
Output	kW	75,340.	56,500.	37,670.
Heat Rate (LHV)	Btu/kWh	11,250.	12,330.	14,810.
Heat Cons. (LHV) X 10 <sup>6</sup>	Btu/h	847.6	696.6	557.9
Auxiliary Power	kW	749	749	749
Output Net	kW	74,590.	55,750.	36,920.
Heat Rate (LHV) Net	Btu/kWh	11,360.	12,500.	15,110.
Exhaust Flow X 10 <sup>3</sup>	lb/h	2192.	1736.	1459.
Exhaust Temp.	Deg F.	1019.	1082.	1100.
Exhaust Heat (LHV) X 10 <sup>6</sup>	Btu/h	522.9	450.2	388.5
Water Flow	lb/h	33,600.	24,920.	16,770.

**EMISSIONS**

		42.	42.	42.
NOx	ppmvd @ 15% O2	42.	42.	42.
NOx AS NO2	lb/h	149.	121.	96.
CO	ppmvd	20.	20.	20.
CO	lb/h	39.	31.	26.
UHC	ppmvw	7.	7.	7.
UHC	lb/h	9.	7.	6.
VOC	ppmvw	3.5	3.5	3.5
VOC	lb/h	4.5	3.5	3.
SO2	ppmvw	9.0	9.0	9.0
SO2	lb/h	44.0	36.0	29.0
SO3	ppmvw	1.0	1.0	0.0
SO3	lb/h	3.0	3.0	2.0
Sulfur Mist	lb/h	5.0	4.0	3.0
Particulates	lb/h	10.0	10.0	10.0
PM10	lb/h	25.0	24.0	23.0

**EXHAUST ANALYSIS % VOL.**

Argon	0.88	0.87	0.88
Nitrogen	72.77	72.85	73.28
Oxygen	13.17	13.02	13.49
Carbon Dioxide	4.41	4.53	4.28
Water	8.78	8.74	8.07

**SITE CONDITIONS**

Elevation	ft.	120.0
Site Pressure	psia	14.64
Inlet Loss	in Water	3.5
Exhaust Loss	in Water	7.75
Relative Humidity	%	45
Fuel Type		Distillate, H/C Ratio of 1.8
Fuel LHV	Btu/lb	18300 @ 90 °F
Application		7A6 Air-Cooled Generator
Combustion System		9/42 DLN Combustor

Emission information based on GE recommended measurement methods. NOx emissions are corrected to 15% O2 without heat rate correction and are not corrected to ISO reference condition per 40CFR 60.335(c)(1). NOx levels shown will be controlled by algorithms within the SPEEDTRONIC control system.

Distillate Fuel is Assumed to have 0.015% Fuel-Bound Nitrogen, or less.  
 FBN Amounts Greater Than 0.015% Will Add to the Reported NOx Value.  
 Sulfur Emissions Based On 0.05 WT% Sulfur Content in the Fuel.

Particulate represent solid filterables of 10microns; PM10 represents Solid filterable particulate matter of 10microns plus condensables (Front & Back half)

**ATTACHMENT B**  
**PROFESSIONAL ENGINEER CERTIFICATION**

**HARDEE POWER PARTNERS  
HARDEE POWER STATION  
CT-2B HEAT INPUT INCREASE REQUEST**

**Professional Engineer Certification**

Professional Engineer Statement:

*I, the undersigned, hereby certify, except as particularly noted herein, that:*

*(1) To the best of my knowledge, the information provided in response to the Department's Request for Additional Information dated March 9, 2007 regarding the Hardee Power Partners request for an increase in heat input rates for CT-2B is true, accurate, and complete; and*

*(2) To the best of my knowledge, any emission estimates reported or relied on in this submittal are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of air pollutants not regulated for an emissions unit, based solely upon the materials, information and calculations provided with this certification.*

Signature




Date

Thomas W. Davis, P.E.

(seal)

06/04/07



		<b>2ND</b>		Pieces: <b>1/1</b>
<b>FM: DEP AIR RESOURCE MGMT</b> P. Adams DIRECTOR OFFICE STE 23 111 S MAGNOLIADR TALLAHASSEE, FL 32301 UNITED STATES Phone: 850-921-9505		<b>ORIGIN: TLH</b> Sender's ref: 37550201000 A7 AY230 POSTCODE: <b>33637</b>		TEL: 813-632-7600
<b>To: DEP SOUTHWEST DISTRICT OFFICE</b> MS. CINDY ZHANG-TORRES AIR RESOURCES TEMPLE TERRACE, FL 33637 UNITED STATES		Description: 04900015-008-AC 66-4-07 letter Weight: Letter Date: 2007-06-07 DHL standard terms and conditions apply.		
		<b>ALEX OD</b> <b>FSC</b>		
		<b>11MO</b> Day		
WAYBILL: 21916067751 (Non-Negotiable)		(2L)US33637		

▲ PEEL HERE PEEL HERE ▲

Please fold or cut in half  
**DO NOT PHOTOCOPY**

Using a photocopy could delay the delivery of your package and will result in additional shipping charge

<b>SENDER'S RECEIPT</b> Waybill #: 21916067751		Rate Estimate: 3.56 Protection: Not Required Description: 04900015-008-AC 66-4-07 letter
To(Company): DEP Southwest District Office Air Resources 13051 N. Telecom Parkway Temple Terrace, FL 33637 UNITED STATES		Weight (lbs.): Letter Dimensions: 0 x 0 x 0
Attention To: Ms. Cindy Zhang-Torres Phone#: 813-632-7600	Sent By: P. Adams Phone#: 850-921-9505	Ship Ref: 37550201000 A7 AY230 Service Level: 2nd Day (2nd business day by 5 PM) Special Svc: Date Printed: 6/6/2007 Bill Shipment To: Sender Bill To Acct: 778941286

DHL Signature (optional) \_\_\_\_\_ Route \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_  
 For Tracking, please go to [www.dhl-usa.com](http://www.dhl-usa.com) or call 1-800-225-5345  
 Thank you for shipping with DHL





# Florida Department of Environmental Protection

Bob Martinez Center  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Charlie Crist  
Governor

Jeff Kottkamp  
Lt. Governor

Michael W. Sole  
Secretary

March 9, 2007

ELECTRONIC MAIL - RECEIVED RECEIPT REQUESTED

Alex C. George, Vice President  
Hardee Power Partners Limited  
One South Wacker Drive, Suite 2020  
Chicago, Illinois 60606

Re: **Request for Additional Information**  
Project No. 0490015-008-AC (PSD-FL-140A)  
Combustion Turbine 2B Heat Input Increase

Dear Mr. George:

On February 7, 2007, the Department received your application for an air construction permit to increase the maximum heat inputs to combustion turbine 2B approximately 10 percent at Hardee Power Station. The application is incomplete. In order to continue processing your application, the Department will need the additional information requested below. Should your response to any of the items below require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form.

#### Heat Input

1. Please provide actual capacity information for Unit 2B to support your request for an increase in the permitted heat input rate. Provide actual short-term heat input rates that validate the requested level.
2. Provide the actual annual fuel firing rates and heat input rates for Unit 2B for the last 5 years of operation.
3. Provide vendor information supporting the requested heat input rate.

#### CO Emissions

4. Provide the manufacturer's guaranteed CO emission for natural gas and distillate oil firing (ppmvd @ 15% O<sub>2</sub> and lb/hr @ 59°F).
5. Provide annual CO emission test data for the past five years.

#### NO<sub>x</sub> Emissions

6. Provide the manufacturer's guaranteed NO<sub>x</sub> emission for natural gas and distillate oil firing (ppmvd @ 15% O<sub>2</sub> and lb/hr @ 59°F).
7. Summarize the actual NO<sub>x</sub> emissions from Unit 2B for the last 5 years.
8. Provide actual NO<sub>x</sub> data supporting operation at the increased heat input rate.

#### Projected Emissions

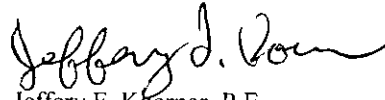
9. Please estimate the emissions increases expected from the increase in heat input. Compare the projected actual emissions to baseline emissions as defined in 62-210.200, 62-210.370, and 62-212.30000, F.A.C. Will the predicted increases exceed the PSD significant emissions rates?

The Department will resume processing your application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. For any material changes to the application, please include a new certification statement by the authorized representative or responsible official. You are reminded that Rule 62-4.055(1), F.A.C. requires applicants to

respond to requests for information within 90 days or provide a written request for an additional period of time to submit the information.

If you have any questions regarding this matter, please call the project engineer, Bruce Thomas, at 850/921-7744 or Jeff Koerner at 850/921-9536.

Sincerely,



Jeffery F. Koerner, P.E.  
BAR - Air Permitting North

Sent by Electronic Mail to the following persons:

Alex C. George, Hardee Power Partners ([ageorge@invenergyllc.com](mailto:ageorge@invenergyllc.com))  
Thomas W. Davis, ECT ([tdavis@ectinc.com](mailto:tdavis@ectinc.com))  
Frank Sarduy, Hardee Power Partners ([fsarduy@invenergyservices.com](mailto:fsarduy@invenergyservices.com))  
Cindy Zhang-Torres, ([Cindy.Zhang-Torres@dep.state.fl.us](mailto:Cindy.Zhang-Torres@dep.state.fl.us))  
Mr. Gregg Worley, EPA Region 4 ([worley.gregg@epamail.epa.gov](mailto:worley.gregg@epamail.epa.gov))