

Memorandum

Florida Department of Environmental Protection

Is your RETURN ADDRESS completed on the reverse side?

SENDER: ■ Complete items 1 and/or 2 for additional services. ■ Complete items 3, 4a, and 4b. ■ Print your name and address on the reverse of this form so that we can return this card to you. ■ Attach this form to the front of the mailpiece, or on the back if space does not permit. ■ Write "Return Receipt Requested" on the mailpiece below the article number. ■ The Return Receipt will show to whom the article was delivered and the date delivered.		I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.
3. Article Addressed to: Robert W. Carter, Chairman Panda Energy Int'l, Inc 4100 Springs Valley, Suite 1001 Dallas, TX 75244	4a. Article Number 2 333 612 496	
	4b. Service Type <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Express Mail <input type="checkbox"/> Insured <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> COD	
	7. Date of Delivery 11/13/98	
5. Received By: (Print Name)	8. Addressee's Address (Only if requested and fee is paid)	
6. Signature: (Addressee or Agent) X <i>[Signature]</i>		

Thank you for using Return Receipt Service.

PS Form 3811, December 1994 102595-97-B-0179 Domestic Return Receipt

rec of mail in this envelope

Z 333 612 496

US Postal Service
Receipt for Certified Mail
 No Insurance Coverage Provided.
 Do not use for International Mail (See reverse)

Sent to	Robert Carter	
Street & Number	Panda - Kathleen	
Post Office, State, & ZIP Code	Dallas, TX	
Postage	\$	
Certified Fee		
Special Delivery Fee		
Restricted Delivery Fee		
Return Receipt Showing to Whom & Date Delivered		
Return Receipt Showing to Whom, Date, & Addressee's Address		
TOTAL Postage & Fees	\$	
Postmark or Date	11-10-98	
	1050257-002-AC	

PS Form 3800, April 1995



Department of Environmental Protection

Lawton Chiles
Governor

September 22, 1998

Virginia B. Wetherell
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Jeffrey L. Meling, P.E.
Vice President
Environmental Consulting & Technology, Inc.
3701 Northwest 98th Street
Gainesville, Florida 32606

Re: Panda-Kathleen Cogeneration Facility
DEP File 1050257-002-AC (PSD-FL-216)

Dear Mr. Meling:

On March 5, 1997 the Department requested submittal of additional information to process the referenced application request. Your letter of January 19, 1998 requested that the Department keep the application in an "on hold" status, pending the Public Service Commission's ruling on the project within the following three months. To-date we have not received information on further development on this project and the additional information that we requested. Please note that per Rule 62-5.055(1):

"The applicant shall have ninety days after the Department mails a timely request for additional information to submit that information to the Department. If an applicant requires more than ninety days in which to respond to a request for additional information, the applicant may notify the Department in writing of the circumstances, at which time the application shall be held in active status for one additional period of up to ninety days. Additional extensions shall be granted for good cause shown by the applicant. A showing that the applicant is making a diligent effort to obtain the requested information shall constitute good cause. Failure of an applicant to provide the timely requested information by the applicable date shall result in denial of the application."

Over two ninety-day periods have transpired since our request for additional information. Because the rule provision was not in-effect when we requested the additional information, it will not be used at this time to deny the permit request. The nature of the information is such that a diligent effort would have yielded it by now and would certainly yield it in the next thirty days. Therefore, we are providing Panda-Kathleen a period of an additional 30 days from the day this letter is received to provide the requested information or show good cause that an extension is required.

If you have any questions regarding this matter, please call me at 850/921-9523 or Syed Arif at 850/921-9528.

Sincerely,

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/sa

cc: Mr. Bill Thomas, DEP/SWD
Mr. J. Brinson, Panda-Kathleen

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Z 333 612 514

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail (See reverse)

Sent to <i>Jeffrey L. Meling</i>	
Street & Number <i>EC+T Inc.</i>	
Post Office, State, & ZIP Code <i>Gainesville FL</i>	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date <i>2333 612 514</i>	

PS Form 3800, April 1995

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I also wish to receive the following services (for an extra fee):

- 1. Addressee's Address
- 2. Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

*Mr. Jeffrey L. Meling P.E.
V.P. EC+T Inc.
3701 NW 98th St.
Gainesville Fl. 32606*

4a. Article Number

Z 333 612 514

4b. Service Type

- Registered Certified
- Express Mail Insured
- Return Receipt for Merchandise COD

7. Date of Delivery

9-24-98

5. Received By: (Print Name)

6. Signature (Addressee or Agent)

X Rob L. Coof

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994

102595-97-B-0179

Domestic Return Receipt

Thank you for using Return Receipt Service.

Fold at line over top of envelope to the right of the return address

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SENDER:

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- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- 1. Addressee's Address
- 2. Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
 Jeffrey Meling, PE
 ECT
 3701 NW 98th St.
 Gainesville, FL 32606

4a. Article Number
 P 265 659 181

4b. Service Type
 Registered Certified
 Express Mail Insured
 Return Receipt for Merchandise COD

7. Date of Delivery
 2/2/97

5. Received By: (Print Name)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature: (Addressee or Agent)

X *Jeffrey Meling*

PS Form 3811, December 1994

Domestic Return Receipt

Thank you for using Return Receipt Service.

PS Form 3800, April 1995

US Postal Service
Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail (See reverse)

P 265 659 181

Send to Jeffrey Meling ECT Gainesville, FL	Postage \$	Certified Fee	Special Delivery Fee	Restricted Delivery Fee	Return Receipt Showing to Whom & Late Delivered	Return Receipt Showing to Whom, Date, & Addressee's Address	TOTAL Postage & Fees \$	Postmark or Date 3-5-97 AC 53-251898 D50-FI-216
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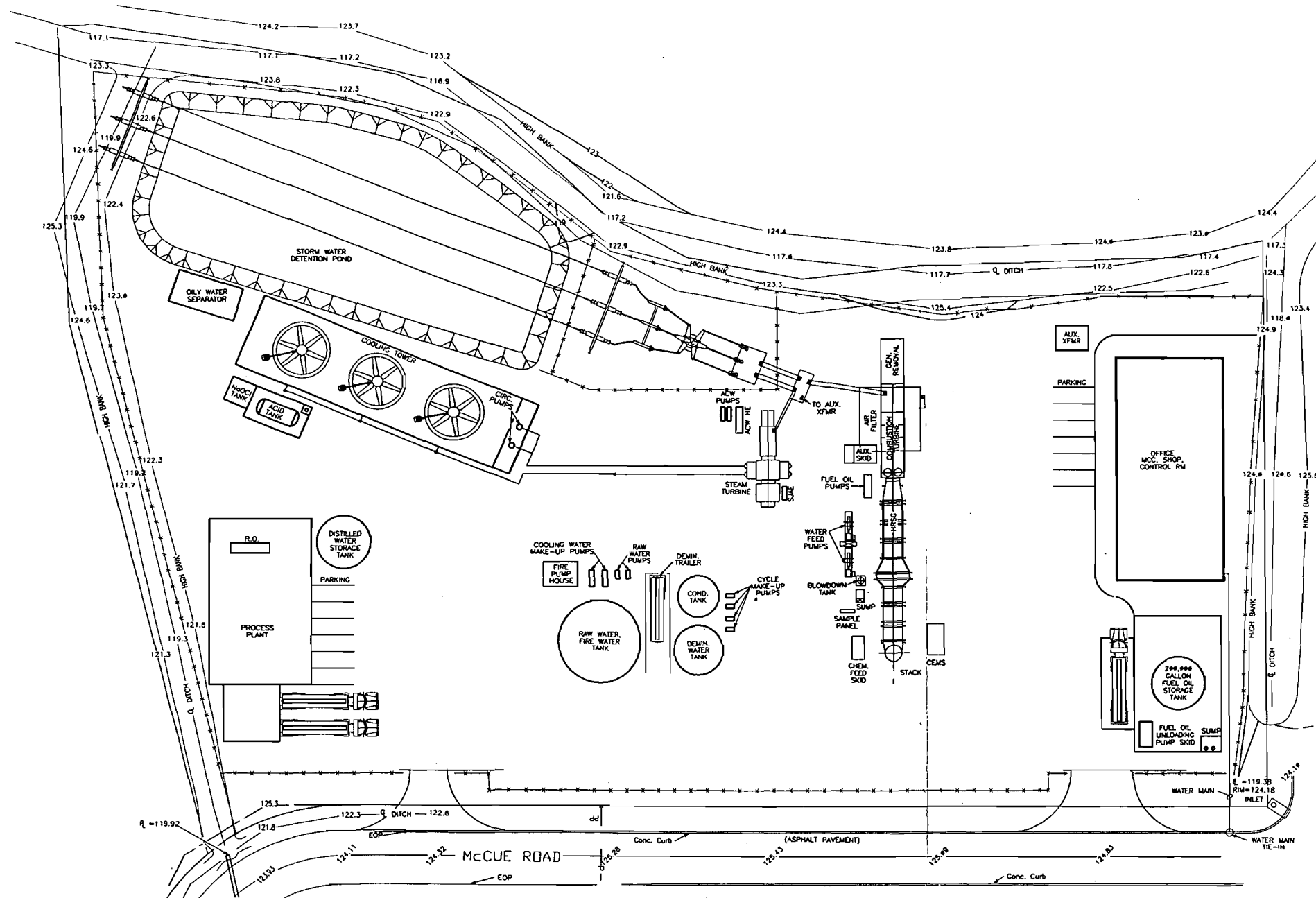
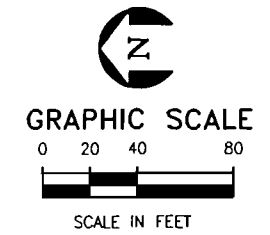


FIGURE 2-1.
PLANNED FACILITY LAYOUT, GE LM6000

Source: Utility Engineering, Amarillo, TX, 1997.



Table 4-4. RBLC PM Summary - Oil Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		PM EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS
						VALUE	UNITS	(LB/HR)	(LB/MMBTU)	(TPY)	DESCRIPTION	EFF.	(\$)	YEAR	
FL	FL-0046	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, OIL, 1 EACH	80.00	MW		0.0260		COMBUSTION CONTROL				BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/6/91	3/24/95	TURBINE, OIL, 2 EACH	400.00	MW	60.6000			COMBUSTION CONTROL				BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, OIL, 4 EACH			58.0000			COMBUSTION CONTROL				BACT-PSD
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, OIL, 2 EACH	42.00	MW		0.0260		COMBUSTION CONTROL, FUEL SPEC: CLEAN FUEL				BACT-PSD
	FL-0057	FLORIDA POWER GENERATION	10/18/91	3/24/95	TURBINE, OIL, 6 EACH	92.90	MW	15.0000			COMBUSTION CONTROL				BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, OIL	1,849.90	MMBTU/H	17.0000	0.0472		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	928.00	MMBTU/H	15.0000	0.0472		FUEL SPEC: LOW SULFUR FUEL				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	371.00	MMBTU/H	10.0000	0.0472		FUEL SPEC: LOW SULFUR FUEL				BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, OIL	1,170.00	MMBTU/H		0.0472		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0081	TECO POLK POWER STATION	2/24/94	3/24/95	TURBINE, FUEL OIL	1,765.00	MMBTU/H		0.0090		GOOD COMBUSTION				BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, FUEL OIL (2)	1,730.00	MMBTU/H	17.0000	0.0098		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,029.00	MMBTU/H	15.0000	0.0146		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,866.00	MMBTU/H	17.0000	0.0091		GOOD COMBUSTION PRACTICES				BACT-PSD
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	972.00	MMBTU/H, #2 OIL		0.0120		FUEL SPEC: LOW SULFUR FUEL OIL				BACT-PSD
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, OIL FIRED (2 EACH)	1,840.00	MMBTU/HR		0.0156		FUEL SPEC: CLEAN BURNING FUELS				BACT-PSD
HI	HI-0013	MAUI ELECTRIC COMPANY, LTD.	12/3/91	3/24/95	TURBINE, FUEL OIL #2	28.00	MW				FUEL SPEC: 0.4 % SULFUR				BACT-PSD
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW	19.7000			COMBUSTION DESIGN				BACT-PSD
	HI-0015	MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	7/28/92	3/24/95	TURBINE, COMBINED-CYCLE COMBUSTION	28.00	MW	19.7000			COMBUSTION TECHNOLOGY/DESIGN				BACT-OTHER
NC	NC-0059	CAROLINA POWER & LIGHT	4/11/96	8/19/96	COMBUSTION TURBINE, 4 EACH	1,907.60	MMBTU/HR	17.0000	0.0089		COMBUSTION CONTROL				BACT-PSD
NJ	NJ-0013	LAKWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (#2 FUEL OIL) (2)	1,190.00	MMBTU/HR (EACH)		0.0260		TURBINE DESIGN				BACT-OTHER
NY	NY-0049	KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	11/9/92	9/13/94	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650.00	MMBTU/HR		0.0300		COMBUSTION CONTROLS				BACT-OTHER
OK	OK-0027	OKLAHOMA MUNICIPAL POWER AUTHORITY	12/17/92	3/24/95	TURBINE, COMBUSTION	58.00	MW		0.0125		FUEL SPEC: USE OF DISTILLATE FUEL	90.000			BACT-OTHER
SC	SC-0036	CAROLINA POWER AND LIGHT	8/31/94	4/29/96	STATIONARY GAS TURBINE	1,520.00	MMBTU/H	22.0000	0.0145		PROPER OPERATION TO ACHIEVE GOOD COMBUSTION				BACT-PSD
VA	VA-0189	GORDONSVILLE ENERGY L.P.	9/25/92	3/24/95	TURBINES (2) (EACH WITH A SF)	1.36	X10(9) BTU/H #2 OIL	13.0000	0.0096		FUEL SPEC: CLEAN BURNING FUEL				BACT-PSD
	VA-0190	BEAR ISLAND PAPER COMPANY, L.P.	10/30/92	8/11/95	TURBINE, COMBUSTION GAS	468.00	X13(6) BTU/HR #2 OIL		0.0360		FUEL SPEC: CLEAN BURN FUEL				BACT-PSD
							MAXIMUM	60.6000	0.0472						
							MINIMUM	10.0000	0.0089						
							MEDIAN	17.0000	0.0156						
							NUMBER OF ENTRIES	14	19	0					

Source: EPA, 1997.

Table 4-3. RBLC PM Summary - Natural Gas-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		PM EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS
						VALUE	UNITS	(LB/HR)	(LB/MMBTU)	(TPY)	DESCRIPTION	EFF.	(\$)	YEAR	
AL	AL-0069	INTERNATIONAL PAPER CO. RIVERDALE MILL	33980	3/24/95	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER	40.00	MW		0.0100		FUEL SPECIFICATION				BACT-PSD
CO	CO-0017	THERMO INDUSTRIES, LTD.	2/19/92	3/24/95	TURBINE, GAS FIRED, 5 EACH	246.00	MMBTU/H	25.8000	0.1049		FUEL SPEC: NATURAL GAS FIRED				OTHER
	CO-0018	BRUSH COGENERATION PARTNERSHIP		7/20/94	TURBINE	350.00	MMBTU/H			9.9000					OTHER
	CO-0018	BRUSH COGENERATION PARTNERSHIP		7/20/94	TURBINE	350.00	MMBTU/H			9.9000					OTHER
	CO-0019	COLORADO POWER PARTNERSHIP		7/20/94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00	MMBTU/H EACH TURBINE			12.4000					OTHER
	CO-0019	COLORADO POWER PARTNERSHIP		7/20/94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00	MMBTU/H EACH TURBINE			12.4000					OTHER
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, GAS, 1 EACH	80.00	MW		0.0060		COMBUSTION CONTROL				BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, GAS, 4 EACH	400.00	MW	18.0000			COMBUSTION CONTROL				BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, CG, 4 EACH	400.00	MW	19.0000			COMBUSTION CONTROL				BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, GAS, 4 EACH	240.00	MW	15.4000			COMBUSTION CONTROL				BACT-PSD
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, GAS, 2 EACH	42.00	MW		0.0065		COMBUSTION CONTROL, FUEL SPEC: CLEAN FUEL				BACT-PSD
	FL-0068	ORANGE COGENERATION LP	12/30/93	1/13/95	TURBINE, NATURAL GAS, 2	368.30	MMBTU/H	5.0000	0.0136		GOOD COMBUSTION				BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, GAS	1,614.80	MMBTU/H	9.0000	0.0056		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	869.00	MMBTU/H	7.0000	0.0081		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	367.00	MMBTU/H	9.0000	0.0245		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, GAS	1,214.00	MMBTU/H		0.0136		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, NATURAL GAS (2)	1,510.00	MMBTU/H	9.0000	0.0060		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0104	SEMINOLE HARDEE UNIT 3	1/1/96	5/31/96	COMBINED CYCLE COMBUSTION TURBINE	140.00	MW	7.0000			DRY LNB, FUEL SPEC: LOW S OIL, LIMITED OPERATION ON OIL. GOOD COMBUSTION				BACT-PSD
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	1,032.00	MMBTU/H, NAT GAS		0.0060		FUEL SPEC: LOW SULFUR FUEL OIL				BACT-PSD
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, GAS FIRED (2 EACH)	1,817.00	M BTU/HR		0.0064		FUEL SPEC: CLEAN BURNING FUELS				BACT-PSD
NC	NC-0055	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,313.00	MM BTU/HR	5.0000	0.0064		COMBUSTION CONTROL				BACT-PSD
NJ	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (NATURAL GAS) (2)	1,190.00	MMBTU/HR (EACH)		0.0023		TURBINE DESIGN				BACT-OTHER
	NJ-0017	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	6/9/93	5/29/95	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617.00	MMBTU/HR (EACH)		0.0060		TURBINE DESIGN				OTHER
	NJ-0017	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	6/9/93	5/29/95	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617.00	MMBTU/HR (EACH)		0.0060		TURBINE DESIGN				BACT-PSD
MN	MN-0022	LSP-COTTAGE GROVE, L.P.	3/1/95	5/29/95	COMBUSTION TURBINE/GENERATOR	1,970.00	MMBTU/HR	10.7000	0.0054		FUEL SELECTION; GOOD COMBUSTION	1			BACT-PSD
MS	MS-0028	SOUTH MISSISSIPPI ELECTRIC POWER ASSOC.	4/9/96	8/19/96	COMBUSTION TURBINE, COMBINED CYCLE	1,299.00	MMBTU/HR NAT GAS	8.1000	0.0062		GOOD COMBUSTION CONTROLS				BACT-PSD
NC	NC-0059	CAROLINA POWER & LIGHT	4/11/96	8/19/96	COMBUSTION TURBINE, 4 EACH	1,907.60	MMBTU/HR	9.0000	0.0047		COMBUSTION CONTROL				BACT-PSD
NM	NM-0024	MILAGRO, WILLIAMS FIELD SERVICE		5/29/95	TURBINE/COGEN, NATURAL GAS (2)	900.00	MMCF/DAY		SEE P2 DESC.		COMBUSTION AIR FILTERS; GOOD COMBUSTION PRACTICE AND MAINTENANCE				BACT-PSD
NY	NY-0046	SARANAC ENERGY COMPANY	7/31/92	9/13/94	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123.00	MMBTU/HR (EACH)		0.0062		COMBUSTION CONTROLS				BACT-OTHER
	NY-0048	KAMINE/BESICORP CORNING L.P.	11/5/92	9/13/94	TURBINE, COMBUSTION (79 MW)	653.00	MMBTU/HR		0.0080		COMBUSTION CONTROL				BACT-OTHER
OH	OH-0218	CNG TRANSMISSION	8/12/92	4/5/95	TURBINE (NATURAL GAS) (3)	5,500.00	HP (EACH)		0.0350		FUEL SPEC: USE OF NATURAL GAS				OTHER
RI	RI-0010	NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	4/13/92	5/31/92	TURBINE, GAS AND DUCT BURNER	1,360.00	MMBTU/H EACH		0.0050						BACT-PSD
SC	SC-0031	BMW MANUFACTURING CORPORATION	1/7/94	8/12/96	TURBINE, NAT. GAS FIRED (3-1 SPARE) AND 2 BOILERS	54.50	MM BTU/HR TURBINES			3.7900	EACH OF THE 2 BOILER-TURBINE USE A COMMON STACK				BACT-PSD
	SC-0036	CAROLINA POWER AND LIGHT	8/31/94	4/29/96	STATIONARY GAS TURBINE	1,520.00	MMBTU/H	5.9000	0.0039		PROPER OPERATION TO ACHIEVE GOOD COMBUSTION				BACT-PSD
SD	SD-0001	NORTHERN STATES POWER COMPANY	9/2/92	3/24/95	TURBINE, SIMPLE CYCLE, 4 EACH	129.00	MW	12.0000			FUEL SPEC: NATURAL GAS AS PRIMARY FUEL				BACT-PSD
VA	VA-0189	GORDONVILLE ENERGY L.P.	9/25/92	3/24/95	TURBINES (2) (EACH WITH A SF)	1.51	X10(9) BTU/HR N GAS	8.0000	0.0053		FUEL SPEC: CLEAN BURNING FUEL				BACT-PSD
	VA-0190	BEAR ISLAND PAPER COMPANY, L.P.	10/30/92	8/11/95	TURBINE, COMBUSTION GAS	474.00	X10(6) BTU/HR N. GAS		0.0053		FUEL SPEC: CLEAN BURN FUEL				BACT-PSD
	VA-0206	PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP	9/15/93	3/24/95	TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3	10.20	X109 SCFYR NAT GAS	1.0000	0.0001		FUEL SPEC: CLEAN BURNING FUELS				BACT-PSD
							MAXIMUM	25.8000	0.1049	12.4000					
							MINIMUM	1.0000	0.0001	3.7900					
							MEDIAN	9.0000	0.0060	9.9000					
							NUMBER OF ENTRIES	18	27	5					

Source: EPA, 1997.

Table 4-8. RBLC PM Summary - Natural Gas-Fired Duct Burners

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	BURNER SIZE		PM EMISSION LIMITS			CONTROL			COST EFFECTIVENESS		BASIS	
						VALUE	UNITS	(LB/HR)	(LB/MMBTU)	(TPY)	DESCRIPTION	EFF.	(\$)	YEAR			
FL	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	DUCT BURNER, GAS	150.00	MMBTU/H				0.1000	NOT REQUIRED				BACT-PSD	
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	DUCT BURNER, GAS	100.00	MMBTU/H				0.1000	GOOD COMBUSTION PRACTICES				BACT-PSD	
NY	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/18/92	9/13/94	DUCT BURNERS (2)	206.00	MMBTU/HR (EACH)				0.0181	LOW NOX BURNER AND SCR				BACT-OTHER	
	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/18/92	9/13/94	DUCT BURNER	123.00	MMBTU/HR				0.0910	LOW NOX BURNER				BACT-OTHER	
	NY-0046	SARANAC ENERGY COMPANY	7/31/92	9/13/94	BURNERS, DUCT (2)	553.00	MMBTU/HR EACH				0.0800	SCR				BACT-OTHER	
	NY-0048	KAMINE/BESICORP CORNING L.P.	11/5/92	9/13/94	BURNER, DUCT	90.00	MMBTU/HR				0.1000	LOW NOX BURNER				BACT-OTHER	
	NY-0057	MEGAN-RACINE ASSOCIATES, INC	8/5/89	3/30/95	COEN DUCT BURNER	40.00	MMBTU/HR				0.1000	FUEL SPEC: NATURAL GAS ONLY				BACT-OTHER	
	NY-0061	ANITEC COGEN PLANT	7/7/93	4/27/95	DUCT BURNER EP #00001	70.00	MMBTU/HR				0.1000	ZINK LOW NOX DUCT BURNER	30.000			BACT-OTHER	
	NY-0063	TBG COGEN COGENERATION PLANT	8/5/90	4/27/95	COEN DUCT BURNER	161.80	MMBTU/HR				0.2000	FUEL SPEC: NATURAL GAS ONLY				BACT-OTHER	
	NY-0064	INDECK-OSWEGO ENERGY CENTER	10/6/94	4/27/95	DUCT BURNER	30.00	MMBTU/HR				0.1170	FUEL SPEC: NATURAL GAS ONLY				BACT-OTHER	
	NY-0066	INDECK ENERGY COMPANY	5/12/93	3/31/95	DUCT BURNER EP #00001	100.00	MMBTU/HR				0.1000	FUEL SPEC: NATURAL GAS ONLY				NSPS	
	NY-0073	LOCKPORT COGEN FACILITY	7/14/93	4/27/95	(3) DUCT BURNER (EP #S 00001-00003)	94.10	MMBTU/HR				0.2000	FUEL SPEC; NATURAL GAS ONLY				BACT-OTHER	
	NY-0075	PILGRIM ENERGY CENTER		4/27/95	(2) DUCT BURNER (EP #S 00001&2)	214.10	MMBTU/HR				0.0120	FUEL SPEC; NATURAL GAS ONLY				BACT-OTHER	
	NY-0077	INDECK-YERKES ENERGY SERVICES	6/24/92	3/31/95	DUCT BURNER (EP #00001)	20.00	MMBTU/HR				0.1100	FUEL SPEC: NATURAL GAS ONLY				BACT-OTHER	
	NY-0080	PROJECT ORANGE ASSOCIATES	12/1/93	3/31/95	STACK (TURBINE AND DUCT BURNER)	715.00	MMBTU/HR	69.0000	0.0965			NO CONTROLS FOR NOX ON STACK *SEE TURBINE NOX DATA				BACT-OTHER	
								MAXIMUM	69.0000	0.2000							
							MINIMUM	69.0000	0.0120								
							MEDIAN	69.0000	0.1000								
							NUMBER OF ENTRIES	1	15	0							

Source: EPA, 1997.

Table 4-13. RBLCO Summary - Natural Gas-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO. EMISSION LIMITS				CONTROL		COST EFFECTIVENESS		BASIS	
						VALUE	UNITS	(PPMVD)	(GM/HP HR)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR		
AL	AL-0074	FLORIDA GAS TRANSMISSION COMPANY	8/5/93	5/12/94	TURBINE, NATURAL GAS	12,600.00	BHP		0.4200				AIR-TO-FUEL RATIO CONTROL, DRY COMBUSTION CONTROLS				BACT-PSD
AZ	AZ-0010	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	10.60					FUEL SPEC: LEAN FUEL MIX				BACT-PSD
	AZ-0011	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	10.50					FUEL SPEC: LEAN FUEL MIX				BACT-PSD
	AZ-0012	EL PASO NATURAL GAS	10/18/91	7/20/94	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000.00	HP	60.00					LEAN BURN				BACT-PSD
CA	CA-0418	SOUTHERN CALIFORNIA GAS	10/29/91	8/4/93	TURBINE, GAS-FIRED	47.64	MMBTU/H	7.74					HIGH TEMPERATURE OXIDATION CATALYST	80.0			BACT-PSD
	CA-0463	SOUTHERN CALIFORNIA GAS	10/29/91	5/31/92	TURBINE, GAS FIRED, SOLAR MODEL H	5,500.00	HP	7.74					HIGH TEMP OXIDATION CATALYST	80.0			BACT-PSD
	CA-0613	UNOCAL	7/18/89	12/5/94	TURBINE, GAS (SEE NOTES)			10.00					OXIDATION CATALYST	75.0			BACT-OTHER
CO	CO-0017	THERMO INDUSTRIES, LTD.	2/19/92	3/24/95	TURBINE, GAS FIRED, 5 EACH	246.00	MMBTU/H	25.00					COMBUSTION CONTROL				BACT-PSD
	CO-0019	COLORADO POWER PARTNERSHIP		7/20/94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00	MMBTU/H EACH TURBINE	22.40									BACT-PSD
	CO-0020	CIMARRON CHEMICAL	3/25/91	7/20/94	TURBINE #2, GE FRAME 6	33.00	MW						CO CATALYST				OTHER
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, GAS, 1 EACH	80.00	MW	25.00					COMBUSTION CONTROL				BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, GAS, 4 EACH	400.00	MW	30.00					COMBUSTION CONTROL				BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, CG, 4 EACH	400.00	MW	33.00					COMBUSTION CONTROL				BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, GAS, 4 EACH	240.00	MW	30.00					COMBUSTION CONTROL				BACT-PSD
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, GAS, 2 EACH	42.00	MW	42.00					COMBUSTION CONTROL				BACT-PSD
	FL-0056	ORLANDO UTILITIES COMMISSION	11/5/91	5/14/93	TURBINE, GAS, 4 EACH	35.00	MW	10.00					COMBUSTION CONTROL				BACT-PSD
	FL-0068	ORANGE COGENERATION LP	12/30/93	1/13/95	TURBINE, NATURAL GAS, 2	368.30	MMBTU/H	30.00					GOOD COMBUSTION				BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, GAS	1,614.80	MMBTU/H		0.0303	49.00			GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	869.00	MMBTU/H		0.0621	54.00			GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	367.00	MMBTU/H		0.1090	40.00			GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, GAS	1,214.00	MMBTU/H	15.00					GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, NATURAL GAS (2)	1,510.00	MMBTU/H	25.00					GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0109	KEY WEST CITY ELECTRIC SYSTEM	9/28/95	5/31/96	TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	23.00	MW	20.00					GOOD COMBUSTION				BACT-PSD
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	1,032.00	MMBTU/H, NAT GAS	9.00					FUEL SPEC: LOW SULFUR FUEL OIL				BACT-PSD
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, GAS FIRED (2 EACH)	1,817.00	MMBTU/HR	25.00					FUEL SPEC: CLEAN BURNING FUELS				BACT-PSD
LA	LA-0079	ENRON LOUISIANA ENERGY COMPANY	8/5/91	10/30/91	TURBINE, GAS, 2	39.10	MMBTU/H	60.00					BASE CASE, NO ADDITIONAL CONTROLS				BACT-PSD
	LA-0086	INTERNATIONAL PAPER	2/24/94	4/17/95	TURBINE/HRSG, GAS COGEN	338.00	MM BTU/HR TURBINE		0.4908	165.90			COMBUSTION CONTROL				BACT
	LA-0089	FORMOSA PLASTICS CORPORATION, LOUISIANA	3/2/95	4/17/95	TURBINE/HRSG, GAS COGENERATION	450.00	MM BTU/HR		0.0573	25.80			PROPER OPERATION				BACT-PSD
MA	MA-0015	PEABODY MUNICIPAL LIGHT PLANT	11/30/89	3/24/95	TURBINE, 38 MW NATURAL GAS FIRED	412.00	MMBTU/HR	40.00					GOOD COMBUSTION PRACTICES				BACT-OTHER
MD	MD-0019	BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT		3/24/95	TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140.00	MW	20.00					GOOD COMBUSTION PRACTICES				BACT-PSD
MI	MI-0206	KALAMAZOO POWER LIMITED	12/3/91	3/23/94	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1,805.90	MMBTU/H	20.00					DRY LOW NOX TURBINES				BACT-PSD
NC	NC-0055	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,313.00	MM BTU/HR			0.0449	59.00		COMBUSTION CONTROL				BACT-PSD

Table 4-13. RBL CO Summary - Natural Gas-Fired Combustion Turbines (Page 2 of 2)

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO. EMISSION LIMITS				CONTROL		COST EFFECTIVENESS		BASIS		
						VALUE	UNITS	(PPMVD)	(GM/HP HR)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR			
NJ	NJ-0009	NEWARK BAY COGENERATION PARTNERSHIP	11/1/90	7/7/93	TURBINE, NATURAL GAS FIRED	585.00	MMBTU/HR					0.0055		CATALYTIC OXIDATION	80.0		1990	BACT-PSD
	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (NATURAL GAS) (2)	1,190.00	MMBTU/HR (EACH)					0.0260		TURBINE DESIGN				BACT-OTHER
	NJ-0017	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	6/9/93	5/29/95	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617.00	MMBTU/HR (EACH)	1.80						OXIDATION CATALYST				OTHER
NM	NM-0021	WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	10/29/93	3/2/94	TURBINE, GAS-FIRED	11,257.00	HP		60.00					COMBUSTION CONTROL				BACT-PSD
	NM-0022	MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	1/11/95	4/26/95	TURBINES, NATURAL GAS (2)	5,500.00	HP				13.20			LEAN-PREMIXED COMBUSTION TECHNOLOGY.	66.0			BACT-PSD
	NM-0024	MILAGRO, WILLIAMS FIELD SERVICE		5/29/95	TURBINE/COGEN, NATURAL GAS (2)	900.00	MMCF/DAY	27.60										BACT-PSD
NY	NY-0044	BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	6/6/95	6/30/95	TURBINE, NATURAL GAS FIRED	240.00	MW		4.00									LAER
	NY-0046	SARANAC ENERGY COMPANY	7/31/92	9/13/94	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123.00	MMBTU/HR (EACH)		3.00					OXIDATION CATALYST				BACT-OTHER
	NY-0050	SITHE/INDEPENDENCE POWER PARTNERS	11/24/92	9/13/94	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	2,133.00	MMBTU/HR (EACH)		13.00					COMBUSTION CONTROLS				BACT-OTHER
OH	OH-0218	CNG TRANSMISSION	8/12/92	4/5/95	TURBINE (NATURAL GAS) (3)	5,500.00	HP (EACH)			0.0150				FUEL SPEC: USE OF NATURAL GAS				OTHER
OR	OR-0010	PORTLAND GENERAL ELECTRIC CO.	5/31/94	5/1/95	TURBINES, NATURAL GAS (2)	1,720.00	MMBTU		15.00					GOOD COMBUSTION PRACTICES				BACT-PSD
	OR-0011	HERMISTON GENERATING CO.	4/1/94	5/1/95	TURBINES, NATURAL GAS (2)	1,696.00	MMBTU		15.00					GOOD COMBUSTION PRACTICES				BACT-PSD
PA	PA-0083	NORTHERN CONSOLIDATED POWER	5/3/91	7/20/94	TURBINES, GAS, 2	34.60	KW EACH							OXIDATION CATALYST; CO LIMIT = 110 TPY	90.0	1,090		OTHER
RI	RI-0010	NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	4/13/92	5/31/92	TURBINE, GAS AND DUCT BURNER	1,360.00	MMBTU/H EACH		11.00									BACT-PSD
	RI-0012	ALGONQUIN GAS TRANSMISSION CO.	7/31/91	5/31/92	TURBINE, GAS, 2	49.00	MMBTU/H				0.1140			GOOD COMBUSTION PRACTICES				BACT-OTHER
WA	WA-0027	SUMAS ENERGY INC.	6/25/91	8/1/91	TURBINE, NATURAL GAS	88.00	MW		6.00					CO CATALYST	80.0			BACT-PSD
							MAXIMUM	60.00	0.4200	0.4908	165.0000							
							MINIMUM	1.80	0.0150	0.0055	13.2000							
							MEDIAN	20.00	0.2175	0.0573	49.0000							
							NUMBER OF ENTRIES	34	2	9	7							

Source: EPA, 1997.

Table 4-14. RBLC CO Summary - Oil-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		CO EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS
						VALUE	UNITS	(PPMVD)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR	
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, OIL, 1 EACH	80.00	MW	25.00			COMBUSTION CONTROL				BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, OIL, 2 EACH	400.00	MW	33.00			COMBUSTION CONTROL				BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, OIL, 4 EACH			33.00			COMBUSTION CONTROL				BACT-PSD
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, OIL, 2 EACH	42.00	MW	78.00			COMBUSTION CONTROL				BACT-PSD
	FL-0056	ORLANDO UTILITIES COMMISSION	11/5/91	5/14/93	TURBINE, OIL, 4 EACH	35.00	MW	10.00			COMBUSTION CONTROL				BACT-PSD
	FL-0057	FLORIDA POWER GENERATION	10/18/91	3/24/95	TURBINE, OIL, 6 EACH	92.90	MW			54.00	COMBUSTION CONTROL				BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, OIL	1,849.90	MMBTU/H		0.0532	98.40	GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	928.00	MMBTU/H		0.0700	65.00	GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	371.00	MMBTU/H		0.2049	76.00	GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, OIL	1,170.00	MMBTU/H	25.00			GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0081	TECO POLK POWER STATION	2/24/94	3/24/95	TURBINE, FUEL OIL	1,765.00	MMBTU/H	40.00			GOOD COMBUSTION				BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, FUEL OIL (2)	1,730.00	MMBTU/H	30.00			GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,029.00	MMBTU/H		0.0525	54.00	GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,866.00	MMBTU/H		0.0423	79.00	GOOD COMBUSTION PRACTICES				BACT-PSD
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	972.00	MMBTU/H, #2 OIL	9.00			FUEL SPEC: LOW SULFUR FUEL OIL				BACT-PSD
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, OIL FIRED (2 EACH)	1,840.00	MMBTU/HR	25.00			FUEL SPEC: CLEAN BURNING FUELS				BACT-PSD
HI	HI-0013	MAUI ELECTRIC COMPANY, LTD.	12/3/91	3/24/95	TURBINE, FUEL OIL #2	28.00	MW				GOOD COMBUSTION PRACTICES				BACT-PSD
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			26.80	COMBUSTION DESIGN				BACT-PSD
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			56.40	COMBUSTION DESIGN				BACT-PSD
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			181.00	COMBUSTION DESIGN				BACT-PSD
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			475.60	COMBUSTION DESIGN				BACT-PSD
	HI-0015	MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	7/28/92	3/24/95	TURBINE, COMBINED-CYCLE COMBUSTION	28.00	MW			26.90	COMBUSTION TECHNOLOGY/DESIGN				BACT-OTHER
NC	NC-0055	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,247.00	MM BTU/HR			60.00	COMBUSTION CONTROL				BACT-PSD
NJ	NJ-0013	LAKWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (#2 FUEL OIL) (2)	1,190.00	MMBTU/HR (EACH)		0.0600		TURBINE DESIGN				BACT-OTHER
						MAXIMUM		78.00	0.2049	475.60					
						MINIMUM		9.00	0.0423	26.80					
						MEDIAN		27.50	0.0566	62.50					
						NUMBER OF ENTRIES		10	6	12					

Source: EPA, 1997.

Table 4-18. RBLCO Summary - Natural Gas-Fired Duct Burners

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	BURNER SIZE		CO EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS
						VALUE	UNITS	(PPMVD)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR	
CO	CO-0021	NORTHWEST PIPELINE CORPORATION	5/29/92	7/20/94	BURNERS, DUCT, COEN	29.00	MMBTU/HR PER BURNER			4.0000					OTHER
	CO-0023	PHOENIX POWER PARTNERS	5/11/93	3/24/95	GENERATOR, STEAM, W/ DUCT BURNER	50.00	MMBTU/HR				FUEL SPEC: NATURAL GAS COMBUSTION				OTHER
FL	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	DUCT BURNER, GAS	150.00	MMBTU/H		0.2000		NOT REQUIRED			BACT-PSD	
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	DUCT BURNER, GAS	100.00	MMBTU/H			10.0000	GOOD COMBUSTION PRACTICES			BACT-PSD	
NY	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/18/92	9/13/94	DUCT BURNERS (2)	206.00	MMBTU/HR (EACH)		0.0730		COMBUSTION CONTROLS			BACT-OTHER	
	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/18/92	9/13/94	DUCT BURNER	123.00	MMBTU/HR		0.0720		COMBUSTION CONTROL			BACT-OTHER	
	NY-0046	SARANAC ENERGY COMPANY	7/31/92	9/13/94	BURNERS, DUCT (2)	553.00	MMBTU/HR EACH		0.0600		OXIDATION CATALYST			BACT-OTHER	
	NY-0061	ANITEC COGEN PLANT	7/7/93	4/27/95	DUCT BURNER EP #00001	70.00	MMBTU/HR		0.0350	2.5000	NO CONTROLS			BACT-OTHER	
	NY-0064	INDECK-OSWEGO ENERGY CENTER	10/6/94	4/27/95	DUCT BURNER	30.00	MMBTU/HR		0.1280	3.8400	NO CONTROLS			BACT-OTHER	
	NY-0066	INDECK ENERGY COMPANY	5/12/93	3/31/95	DUCT BURNER EP #00001	100.00	MMBTU/HR		0.1400	12.0000	NO CONTROLS			BACT-OTHER	
	NY-0073	LOCKPORT COGEN FACILITY	7/14/93	4/27/95	(3) DUCT BURNER (EP #S 00001-00003)	94.10	MMBTU/HR		0.1000	9.4000	NO CONTROLS			BACT-OTHER	
	NY-0075	PILGRIM ENERGY CENTER		4/27/95	(2) DUCT BURNER (EP #S 00001&2)	214.10	MMBTU/HR		0.1080	17.5000				BACT-OTHER	
	NY-0077	INDECK-YERKES ENERGY SERVICES	6/24/92	3/31/95	DUCT BURNER (EP #00001)	20.00	MMBTU/HR		0.0400	0.8000	NO CONTROLS			BACT-OTHER	
							MAXIMUM		0.2000	17.5000					
							MINIMUM		0.0350	0.8000					
							MEDIAN		0.0865	6.7000					
							NUMBER OF ENTRIES	0	10	8					

Source: EPA, 1997.

Table 4-23. RBLC NO_x Summary - Natural Gas-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO _x EMISSION LIMITS				CONTROL DESCRIPTION	COST EFFECTIVENESS			BASIS
						VALUE	UNITS	(PPMVD)	(GM/HP HR)	(LB/MMBTU)	(LB/HR)		EFF.	(\$)	YEAR	
AL	AL-0069	INTERNATIONAL PAPER CO. RIVERDALE MILL	1/11/93	3/24/95	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BUR	40.00	MW					LOW NOX BURNERS (ON THE DUCT BURNER) STEAM INJECTION INTO THE TURBINE				BACT-PSD
AL	AL-0074	FLORIDA GAS TRANSMISSION COMPANY	8/5/93	5/12/94	TURBINE, NATURAL GAS	12,600.00	BHP			0.5800		AIR-TO-FUEL RATIO CONTROL, DRY LOW NOX COMBUSTION	71.0	593	1993	BACT-PSD
AZ	AZ-0010	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	84.90				LEAN BURN				NSPS
AZ	AZ-0010	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	42.00				DRY LOW NOX COMBUSTOR	51.0			BACT-PSD
AZ	AZ-0011	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	85.10				FUEL SPEC: LEAN FUEL MIX				NSPS
AZ	AZ-0011	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	42.00				DRY LOW NOX COMBUSTOR	51.0			BACT-PSD
AZ	AZ-0012	EL PASO NATURAL GAS	10/18/91	7/20/94	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000.00	HP	225.00				LEAN BURN				BACT-PSD
AZ	AZ-0012	EL PASO NATURAL GAS	10/18/91	7/20/94	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000.00	HP	42.00				DRY LOW NOX COMBUSTOR	80.0			BACT-PSD
CA	CA-0418	SOUTHERN CALIFORNIA GAS	10/29/91	8/4/93	TURBINE, GAS-FIRED	47.64	MMBTU/H	8.00				HIGH TEMPERATURE SELECTIVE CATALYTIC REDUCTION	93.0			BACT-PSD
CA	CA-0437	KINGSBURG ENERGY SYSTEMS	9/28/89	8/3/93	TURBINE, NATURAL GAS FIRED, DUCT BURNER	34.50	MW	6.00				SCR, STEAM INJECTION	90.0			BACT-PSD
CA	CA-0441	GRANITE ROAD LIMITED	5/6/91	8/3/93	TURBINE, GAS, ELECTRIC GENERATION	460.90	MMBTU/H*	3.50				SCR, STEAM INJECTION	97.0			BACT-PSD
CA	CA-0463	SOUTHERN CALIFORNIA GAS	10/29/91	5/31/92	TURBINE, GAS FIRED, SOLAR MODEL H	5,500.00	HP	8.00				HIGH TEMP SELECT. CAT. REDUCTION	93.0			BACT-PSD
CA	CA-0544	GOAL LINE, LP ICEFLOE	11/3/92	8/4/94	TURBINE, COMBUSTION (NATURAL GAS) (42.4 MW)	386.00	MMBTU/HR	5.00				WATER INJECTION & SCR W/ AUTOMATIC AMMONIA INJECT.	88.0			BACT-OTHER
CA	CA-0613	UNOCAL	7/18/89	12/5/94	TURBINE, GAS (SEE NOTES)			9.00				SELECTIVE CATALYTIC REDUCTION (SCR), WATER INJECTN	80.0			BACT-OTHER
CO	CO-0017	THERMO INDUSTRIES, LTD.	2/19/92	3/24/95	TURBINE, GAS FIRED, 5 EACH	248.00	MMBTU/H	25.00				DRY LOW NOX TECH.		1,326		BACT-PSD
CO	CO-0018	BRUSH COGENERATION PARTNERSHIP		7/20/94	TURBINE	350.00	MMBTU/H	25.00				DRY LOW NOX BURNER	74.0	946		BACT-PSD
CO	CO-0019	COLORADO POWER PARTNERSHIP		7/20/94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00	MMBTU/H EACH TURBINE	42.00				WATER INJECTION	66.0	1,146		BACT-PSD
CO	CO-0020	CIMARRON CHEMICAL	3/25/91	7/20/94	TURBINE #1, GE FRAME 6	33.00	MW	25.00				WATER INJECTION				OTHER
CO	CO-0020	CIMARRON CHEMICAL	3/25/91	7/20/94	TURBINE #2, GE FRAME 6	33.00	MW	9.00				SCR				OTHER
CO	CO-0021	NORTHWEST PIPELINE CORPORATION	5/29/92	7/20/94	TURBINE, SOLAR TAURUS	45.00	MMBTU/HR	95.00				DRY LOW NOX COMBUSTOR (BY 11/01/98)				BACT-PSD
CO	CO-0023	PHOENIX POWER PARTNERS	5/11/93	3/24/95	TURBINE (NATURAL GAS)	311.00	MMBTU/HR	22.00				DRY LOW NOX COMBUSTION				BACT-OTHER
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, GAS, 1 EACH	80.00	MW	25.00				WET INJECTION				BACT-PSD
FL	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, GAS, 4 EACH	400.00	MW	25.00				LOW NOX COMBUSTORS				BACT-PSD
FL	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, CG, 4 EACH	400.00	MW	42.00				LOW NOX COMBUSTORS				BACT-PSD
FL	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, GAS, 4 EACH	240.00	MW	42.00				COMBUSTION CONTROL				BACT-PSD
FL	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, GAS, 2 EACH	42.00	MW	25.00				COMBUSTION CONTROL				BACT-PSD
FL	FL-0056	ORLANDO UTILITIES COMMISSION	11/5/91	5/14/93	TURBINE, GAS, 4 EACH	35.00	MW	42.00				WET INJECTION	70.0			BACT-PSD
FL	FL-0059	SEMINOLE FERTILIZER CORPORATION	3/17/91	5/14/93	TURBINE, GAS	28.00	MW	9.00				SCR		3,438		BACT-PSD
FL	FL-0068	ORANGE COGENERATION LP	12/30/93	1/13/95	TURBINE, NATURAL GAS, 2	368.30	MMBTU/H	15.00				DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, GAS	1,614.80	MMBTU/H	15.00				DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0074	FLORIDA GAS TRANSMISSION	9/27/93	4/1/94	TURBINE, GAS	131.59	MMBTU/H	25.00				DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	869.00	MMBTU/H	15.00				DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	367.00	MMBTU/H	15.00				DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, GAS	1,214.00	MMBTU/H	15.00				DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, NATURAL GAS (2)	1,510.00	MMBTU/H	12.00				DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0104	SEMINOLE HARDEE UNIT 3	1/1/96	5/31/96	COMBINED CYCLE COMBUSTION TURBINE	140.00	MW	15.00				DRY LNB, STAGED COMBUSTION				BACT-PSD
FL	FL-0109	KEY WEST CITY ELECTRIC SYSTEM	9/28/95	5/31/96	TURBINE, EXISTING CT RELOCATION TO A NEW PLAN	23.00	MW	75.00				WATER INJECTION				BACT-PSD
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	1,032.00	MMBTU/H, NAT GAS	25.00				MAX WATER INJECTION				BACT-PSD
GA	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, GAS FIRED (2 EACH)	1,817.00	M BTU/HR	25.00				MAXIMUM WATER INJECTION		2,743	1992	BACT-PSD
GA	GA-0056	GEORGIA POWER COMPANY, ROBINS TURBINE PROJECT	5/13/94	3/24/95	TURBINE, COMBUSTION, NATURAL GAS	80.00	MW	25.00				WATER INJECTION, FUEL SPEC: NATURAL GAS				BACT-PSD
KY	KY-0053	KENTUCKY UTILITIES COMPANY	3/10/92	3/24/95	TURBINE, #2 FUEL OIL/NATURAL GAS (8)	1,500.00	MM BTU/HR (EACH)	42.00				WATER INJECTION				BACT-PSD
LA	LA-0079	ENRON LOUISIANA ENERGY COMPANY	8/5/91	10/30/91	TURBINE, GAS, 2	39.10	MMBTU/H	40.00				H2O INJECT 0.67 LB/LB	71.0	909		BACT-PSD
LA	LA-0086	INTERNATIONAL PAPER	2/24/94	4/17/95	TURBINE/HRSG, GAS COGEN	338.00	MM BTU/HR TURBINE	25.00				DRY LOW NOX COMBUSTOR/COMBUSTION CONTROL				BACT
LA	LA-0089	FORMOSA PLASTICS CORPORATION, LOUISIANA	3/2/95	4/17/95	TURBINE/HRSG, GAS COGENERATION	450.00	MM BTU/HR	9.00				DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONTROL		181	1990	LAER
MA	MA-0015	PEABODY MUNICIPAL LIGHT PLANT	11/30/89	3/24/95	TURBINE, 38 MW NATURAL GAS FIRED	412.00	MMBTU/HR	25.00				WATER INJECTION				BACT-OTHER
MD	MD-0017	SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO)	10/1/89	3/24/95	TURBINE, NATURAL GAS FIRED ELECTRIC	90.00	MW	199.00			199.00	WATER INJECTION				BACT-PSD
MD	MD-0018	PEPCO - CHALK POINT PLANT	6/25/90	7/20/94	TURBINE, 105 MW NATURAL GAS FIRED ELECTRIC	105.00	MW	77.00				DRY PREMIX AND WATER INJECTION				BACT-PSD
MD	MD-0018	PEPCO - CHALK POINT PLANT	6/25/90	7/20/94	TURBINE, 84 MW NATURAL GAS FIRED ELECTRIC	84.00	MW	25.00				QUIET COMBUSTION AND WATER INJECTION				BACT-PSD
MD	MD-0019	BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	3/24/95	3/24/95	TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140.00	MW	15.00				DRY BURN LOW NOX BURNERS	91.0			BACT-PSD
MD	MD-0021	PEPCO - STATION A	5/31/90	7/20/94	TURBINE, 124 MW NATURAL GAS FIRED	125.00	MW	42.00				WATER INJECTION				BACT-PSD

Table 4-23. RBLC NO_x Summary - Natural Gas-Fired Combustion Turbines (Page 2 of 2)

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO _x EMISSION LIMITS				CONTROL		COST EFFECTIVENESS		BASIS	
						VALUE	UNITS	(PPMVD)	(GM/HP HR)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR		
MI	MI-0206	KALAMAZOO POWER LIMITED	12/3/91	3/23/94	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1,805.90	MMBTU/H	15.00					DRY LOW NOX TURBINES				BACT-PSD
MN	MN-0022	LSP-COTTAGE GROVE, L.P.	3/1/95	5/29/95	COMBUSTION TURBINE/GENERATOR	1,970.00	MMBTU/HR	4.50					SELECTIVE CATALYTIC REDUCTION (SCR)	70.0			BACT-PSD
NC	NC-0056	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,313.00	MM BTU/HR		0.0906		119.00		MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION		1,155	1991	BACT-PSD
NC	NC-0059	CAROLINA POWER & LIGHT	4/11/96	8/19/96	COMBUSTION TURBINE, 4 EACH	1,907.60	MMBTU/HR		0.0828		158.00		WATER INJECTION		420	1994	BACT-PSD
NJ	NJ-0009	NEWARK BAY COGENERATION PARTNERSHIP	11/1/90	7/7/93	TURBINE, NATURAL GAS FIRED	585.00	MMBTU/HR				0.0330		STEAM INJECTION AND SCR	94.0		1990	BACT-PSD
NJ	NJ-0010	PEDRICKTOWN COGENERATION LIMITED PARTNERSHIP	2/23/90	4/30/93	TURBINE, NATURAL GAS FIRED	1,000.00	MMBTU/HR				0.0440		STEAM INJECTION AND SCR	93.0		1990	BACT-PSD
NJ	NJ-0011	LINDEN COGENERATION TECHNOLOGY	1/21/92	4/30/93	TURBINE, NATURAL GAS FIRED	60.00	X E12 BTU/YR					33.80	STEAM INJECTION AND SCR	94.5			BACT-PSD
NJ	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (NATURAL GAS) (2)	1,190.00	MMBTU/HR (EACH)				0.0330		SCR, DRY LOW NOX BURNER	64.0			BACT-OTHER
NJ	NJ-0017	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	6/9/93	5/29/95	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617.00	MMBTU/HR (EACH)	8.30					SCR				BACT-PSD
NM	NM-0021	WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	10/29/93	3/2/94	TURBINE, GAS-FIRED	11,257.00	HP	42.00					SOLONOX COMBUSTOR, DRY LOW NOX TECHNOLOGY	66.0			BACT-PSD
NM	NM-0022	MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	1/11/95	4/28/95	TURBINES, NATURAL GAS (2)	5,500.00	HP				7.40		LEAN-PREMIKED COMBUSTION TECHNOLOGY, DRY/LOW NOX	66.0			BACT-PSD
NM	NM-0024	MILAGRO, WILLIAMS FIELD SERVICE		5/29/95	TURBINE/COGEN, NATURAL GAS (2)	900.00	MMCF/DAY	9.00					DRY LOW NOX (GENERAL ELECTRIC MODEL PG6541B)	94.0			BACT-PSD
NY	NY-0044	BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	6/6/95	6/30/95	TURBINE, NATURAL GAS FIRED	240.00	MW	3.50					SCR				LAER
NY	NY-0046	SARANAC ENERGY COMPANY	7/31/92	9/13/94	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123.00	MMBTU/HR (EACH)	9.00					SCR				BACT-OTHER
NY	NY-0047	PASNY/HOLTSVILLE COMBINED CYCLE PLANT	9/1/92	9/13/94	TURBINE, COMBUSTION GAS (150 MW)	1,146.00	MMBTU/HR (GAS)*	9.00					DRY LOW NOX				BACT-OTHER
NY	NY-0048	KAMINE/BESICORP CORNING L.P.	11/5/92	9/13/94	TURBINE, COMBUSTION (79 MW)	653.00	MMBTU/HR	9.00					DRY LOW NOX OR SCR				BACT-OTHER
NY	NY-0049	KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	11/9/92	9/13/94	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650.00	MMBTU/HR	9.00					DRY LOW NOX OR SCR				BACT-OTHER
NY	NY-0050	SITHE/INDEPENDENCE POWER PARTNERS	11/24/92	9/13/94	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	2,133.00	MMBTU/HR (EACH)	4.50					SCR AND DRY LOW NOX				BACT-OTHER
NY	NY-0057	MEGAN-RACINE ASSOCIATES, INC	8/5/89	3/30/95	GE LM5000-N COMBINED CYCLE GAS TURBINE	401.00	LB/MMBTU	42.00					WATER INJECTION	60.0			BACT-OTHER
NY	NY-0061	ANITEC COGEN PLANT	7/7/93	4/27/95	GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001	451.00	MMBTU/HR	25.00	0.0909		41.00		NO CONTROLS	60.0			BACT-OTHER
NY	NY-0062	FULTON COGEN PLANT	9/15/94	4/27/95	GE LM5000 GAS TURBINE	500.00	MMBTU/HR	36.00	0.1300		65.00		WATER INJECTION	58.5			BACT
NY	NY-0063	TBG COGEN COGENERATION PLANT	8/5/90	4/27/95	GE LM2500 GAS TURBINE	214.90	MMBTU/HR	75.00					WATER INJECTION	60.0			BACT
NY	NY-0064	INDECK-OSWEGO ENERGY CENTER	10/6/94	4/27/95	GE FRAME 6 GAS TURBINE	533.00	LB/MMBTU	42.00	0.1407		75.00		STEAM INJECTION	53.0			BACT
NY	NY-0065	KAMINE/BESICORP CARTHAGE L.P.	1/18/94	4/27/95	GE FRAME 6 GAS TURBINE	491.00	BTU/HR	42.00	0.1560		76.50		STEAM INJECTION	53.0			BACT
NY	NY-0066	INDECK ENERGY COMPANY	5/12/93	3/31/95	GE FRAME 6 GAS TURBINE EP #00001	491.00	MMBTU/HR	32.00	0.1527		75.00		STEAM INJECTION	58.2			BACT
NY	NY-0068	KAMINE/BESICORP NATURAL DAM LP	12/31/91	6/30/95	GE FRAME 6 GAS TURBINE	500.00	MMBTU/HR	42.00	0.1602		80.10		STEAM INJECTION	35.0			BACT
NY	NY-0071	KAMINE SOUTH GLENS FALLS COGEN CO	9/10/92	4/27/95	GE FRAME 6 GAS TURBINE	498.00	MMBTU/HR	42.00	0.1538		76.60		WATER INJECTION	50.0			BACT
NY	NY-0072	KAMINE/BESICORP SYRACUSE LP	12/10/94	4/27/95	SIEMENS V84.3 GAS TURBINE (EP #00001)	650.00	MMBTU/HR	25.00	0.1154		75.00		WATER INJECTION	70.0			BACT
NY	NY-0073	LOCKPORT COGEN FACILITY	7/14/93	4/27/95	(6) GE FRAME 6 TURBINES (EP #S 00001-00006)	423.90	MMBTU/HR	42.00	0.1769		75.00		STEAM INJECTION	78.0			BACT
NY	NY-0075	PILGRIM ENERGY CENTER		4/27/95	(2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2)	1,400.00	MMBTU/HR	4.50	0.0169		23.60		STEAM INJECTION FOLLOWED BY SCR				BACT
NY	NY-0076	TRIGEN MITCHEL FIELD	4/16/93	3/31/95	GE FRAME 6 GAS TURBINE	424.70	MMBTU/HR	60.00	0.2119		90.00		STEAM INJECTION	20.0			BACT
NY	NY-0077	INDECK-YERKES ENERGY SERVICES	6/24/92	3/31/95	GE FRAME 6 GAS TURBINE (EP #00001)	432.20	MMBTU/HR	42.00	0.1712		74.00		STEAM INJECTION	35.0			BACT
NY	NY-0079	LEDERLE LABORATORIES		4/27/95	(2) GAS TURBINES (EP #S 00101&102)	110.00	MMBTU/HR	42.00	0.1636		18.00		STEAM INJECTION				BACT-PSD
OH	OH-0218	CNG TRANSMISSION	8/12/92	4/5/95	TURBINE (NATURAL GAS) (3)	5,500.00	HP (EACH)		1.6000				LOW NOX COMBUSTION				BACT-OTHER
OK	OK-0027	OKLAHOMA MUNICIPAL POWER AUTHORITY	12/17/92	3/24/95	TURBINE, COMBUSTION	68.00	MW	25.00					COMBUSTION CONTROLS	83.0			BACT-OTHER
OR	OR-0007	PACIFIC GAS TRANSMISSION	11/3/89	7/20/94	TURBINE, NAT. GAS	14,600.00	HP	42.00					LOW NOX BURNERS	75.0			BACT-PSD
OR	OR-0009	PACIFIC GAS TRANSMISSION COMPANY	6/19/90	7/20/94	TURBINE GAS, COMPRESSOR STATION	110.00	MMBTU/HR	199.00					LOW NOX BURNER DESIGN	30.0			NSPS
OR	OR-0010	PORTLAND GENERAL ELECTRIC CO.	5/31/94	5/1/95	TURBINES, NATURAL GAS (2)	1,720.00	MMBTU	4.50					SCR	82.0	8,537		BACT-PSD
OR	OR-0011	HERMISTON GENERATING CO.	4/1/94	5/1/95	TURBINES, NATURAL GAS (2)	1,696.00	MMBTU	4.50					SCR	82.0			BACT-PSD
PA	PA-0083	NORTHERN CONSOLIDATED POWER	5/3/91	7/20/94	TURBINES, GAS, 2	34.60	KW EACH	25.00					STEAM INJECTION/SCR IN 1997	85.0	263		OTHER
PA	PA-0098	GRAYS FERRY CO. GENERATION PARTNERSHIP	11/4/92	7/20/94	TURBINE (NATURAL GAS & OIL)	1,150.00	MMBTU	9.00					DRY LOW NOX BURNER, COMBUSTION CONTROL				BACT-OTHER
PA	PA-0130	PROCTOR AND GAMBLE PAPER PRODUCTS CO (CHARMIN)	5/31/95	11/27/95	TURBINE, NATURAL GAS	580.00	MMBTU/HR	55.00					STEAM INJECTION	75.0	3,045	1994	BACT
RI	RI-0010	NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	4/13/92	5/31/92	TURBINE, GAS AND DUCT BURNER	1,360.00	MMBTU/H EACH	9.00					SCR				BACT-PSD
RI	RI-0012	ALGONQUIN GAS TRANSMISSION CO.	7/31/91	5/31/92	TURBINE, GAS, 2	49.00	MMBTU/H	100.00					LOW NOX COMBUSTION				BACT-OTHER
SC	SC-0036	CAROLINA POWER AND LIGHT	8/31/94	4/29/96	STATIONARY GAS TURBINE	1,520.00	MMBTU/H	25.00					WATER INJECTION	30.0	1,520	1994	BACT-PSD
WA	WA-0027	SUMAS ENERGY INC.	6/25/91	8/1/91	TURBINE, NATURAL GAS	88.00	MW	6.00					SCR	90.0			BACT-PSD
WA	WA-0274	NORTHWEST PIPELINE COMPANY	8/13/92	4/5/95	TURBINE, GAS-FIRED	12,100.00	HP	196.00					ADVANCED DRY LOW NOX COMBUSTOR (BY 07/01/95)	76.0			BACT-PSD
						MAXIMUM		225.00	1.6000	0.2119	199.0000						
						MINIMUM		3.50	0.0828	0.0169	7.4000						
						MEDIAN		25.00	0.3353	0.1467	75.0000						
						NUMBER OF ENTRIES		87	4	16	18						

Source: EPA, 1997.

Table 4-24. RBLC NO, Summary - Oil-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO. EMISSION LIMITS			CONTROL		COST EFFECTIVENESS			BASIS
						VALUE	UNITS	(PPMVD)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR		
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, OIL, 1 EACH	80.00	MW	42.00			WET INJECTION					BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, OIL, 2 EACH	400.00	MW	65.00			LOW NOX COMBUSTORS					BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, OIL, 4 EACH			65.00			COMBUSTION CONTROL					BACT-PSD
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, OIL, 2 EACH	42.00	MW	42.00			COMBUSTION CONTROL					BACT-PSD
	FL-0056	ORLANDO UTILITIES COMMISSION	11/5/91	5/14/93	TURBINE, OIL, 4 EACH	35.00	MW	65.00			WET INJECTION					BACT-PSD
	FL-0057	FLORIDA POWER GENERATION	10/18/91	3/24/95	TURBINE, OIL, 6 EACH	92.90	MW	42.00			WET INJECTION					BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, OIL	1,849.90	MMBTU/H	42.00			WATER INJECTION					BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	928.00	MMBTU/H	42.00			WATER INJECTION					BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	371.00	MMBTU/H	42.00			WATER INJECTION					BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, OIL	1,170.00	MMBTU/H	42.00			STEAM INJECTION					BACT-PSD
	FL-0081	TECO POLK POWER STATION	2/24/94	3/24/95	TURBINE, FUEL OIL	1,765.00	MMBTU/H	42.00			WET INJECTION					BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, FUEL OIL (2)	1,730.00	MMBTU/H	42.00			WATER INJECTION					BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,029.00	MMBTU/H	42.00			WET INJECTION					BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,866.00	MMBTU/H	42.00			WET INJECTION					BACT-PSD
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	972.00	MMBTU/H, #2 OIL				MAX WATER INJECTION					BACT-PSD
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, OIL FIRED (2 EACH)	1,840.00	M BTU/HR	25.00			MAXIMUM WATER INJECTION		4,191			BACT-PSD
HI	HI-0013	MAUI ELECTRIC COMPANY, LTD.	12/3/91	3/24/95	TURBINE, FUEL OIL #2	28.00	MW	42.00			WATER INJECTION	71.0	1,560			BACT-PSD
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			42.30	COMBUSTOR WATER INJECTOR, WATER INJECTION	70.0	1,041	1990		BACT-PSD
	HI-0015	MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	7/28/92	3/24/95	TURBINE, COMBINED-CYCLE COMBUSTION	28.00	MW			42.30	WATER INJECTION	69.0				BACT-OTHER
NC	NC-0055	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,247.00	MM BTU/HR		0.230	287.00	MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION		1,348,683	1991		BACT-PSD
NJ	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (#2 FUEL OIL) (2)	1,190.00	MMBTU/HR (EACH)		0.082		SCR AND WATER INJECTION					BACT-OTHER
									65.00	0.2302	287.00					
									25.00	0.0820	42.30					
									42.00	0.1561	42.30					
									16	2	3					

Source: EPA, 1997.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- 1. Addressee's Address
- 2. Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
 Robert W Carter
 Panda-Kathleen, LP
 4100 Spring Valley, Suite 1001
 Dallas, TX 75244

4a. Article Number
 P 339 251 119

4b. Service Type
 Registered Insured
 Certified COD
 Express Mail Return Receipt for Merchandise

7. Date of Delivery
 7/2/96

5. Signature (Addressee)
 [Handwritten Signature]

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

Thank you for using Return Receipt Service.

P 339 251 119

US Postal Service
Receipt for Certified Mail

No Insurance Coverage Provided.
 Do not use for International Mail (See reverse)

Sent to	Robert Carter
Street & Number	Panda-Kathleen
Post Office, State, & ZIP Code	Dallas, TX
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	6-27-96
	PSD-FI-216A

PS Form 3800, April 1995



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

In the Matter of an
Application for Permit by:

Mr. Robert W. Carter, Chairman
Panda Energy International, Inc.
4100 Spring Valley, Suite 1001
Dallas, TX 75244

DEP File No. 1050257-002-AC
Panda-Kathleen, L.P.
Kathleen Cogeneration Plant
Polk County

NOTICE OF PERMIT DENIAL

The Applicant, Panda-Kathleen, L.P., applied on February 7, 1997, to the Department of Environmental Protection for a permit to modify their existing construction permit issued in 1995 related to an electrical power cogeneration facility near Lakeland, Polk County, Florida.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The Department has determined that a review for the Prevention of Significant Deterioration (PSD), a determination of Best Available Control Technology (BACT) and an air construction permit is required for the proposed work.

The Department hereby denies the permit for the following reasons:

1. The application to modify the existing PSD permit was submitted on February 7, 1997, with the intentions of submitting additional information to the proposed revisions to both the technical analysis and the actual permit within the following weeks. The information was never submitted.
2. The applicant's consultant Environmental Consulting & Technology (ECT), Inc. submitted a letter on March 4, 1997, informing the Department that contractual issues have affected the Kathleen cogeneration project. They asked the Department to place the review of the recently submitted application on hold until the contractual matters were resolved.
3. The Department in its letter of March 5, 1997 acknowledged the applicant's request to put the application on hold. The Department requested the applicant to submit the additional information about the project as early as possible.
4. The permit engineer in a telephone request during January 1998 requested the applicant to provide an update on the status of the project and, if appropriate, to withdraw the application. The application was still considered incomplete after eleven (11) months of submittal of application.

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.

5. ECT submitted another letter on January 19, 1998, in response to the Department's telephone request, indicating that the status of the project was pending. The project was awaiting a ruling from the Florida Public Service Commission (PSC) within the subsequent three (3) months. The Department was not notified of any further development regarding the PSC ruling.
6. The permit engineer in a telephone conversation with ECT in July 1998 re-iterated the importance of providing additional information to complete the application. The application at this stage was incomplete after seventeen (17) months of submittal.
7. The Department in a letter dated September 22, 1998, gave the applicant thirty (30) days after receipt of the letter to provide the requested information or show good cause that an extension is required. The letter made reference to Rule 62-4.055(1) F.A.C. which gives the applicant ninety (90) days after the Department mails a timely request for additional information to submit that information to the Department. Failure of an applicant to provide the timely requested information shall result in denial of the application.
8. Based on the above facts, the Department is issuing this notice of permit denial.

A person whose substantial interests are affected by the Department's permit denial may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this Notice of Permit Denial. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of receipt of this Notice of Permit Denial. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and (f) A demand for relief.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

This Notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 62-110.106, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department.

Any party to this Notice of Permit Denial has the right to seek judicial review pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.



Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT DENIAL and all copies were sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 11-10-98 to the person(s) listed:

Mr. Robert W. Carter, Panda Energy International, Inc.*
Mr. Jeffrey L. Meling, P.E., ECT
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS
Mr. Bill Thomas, DEP

Clerk Stamp

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52,
Florida Statutes, with the designated
Department Clerk, receipt of which is hereby
acknowledged.

Kim Joben 11-10-98
(Clerk) (Date)

Florida Department of Environmental Protection

Memorandum

Is your RETURN ADDRESS completed on the reverse side?	SENDER: ■ Complete items 1 and/or 2 for additional services. ■ Complete items 3, 4a, and 4b. ■ Print your name and address on the reverse of this form so that we can return this card to you. ■ Attach this form to the front of the mailpiece, or on the back if space does not permit. ■ Write "Return Receipt Requested" on the mailpiece below the article number. ■ The Return Receipt will show to whom the article was delivered and the date delivered.	I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.
3. Article Addressed to: Robert W. Carter, Chairman Panda Energy Int'l, Inc 400 Spring Valley, Suite 1001 Dallas, TX 75244		4a. Article Number 2 333 612 496
5. Received By: (Print Name)		4b. Service Type <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Express Mail <input type="checkbox"/> Insured <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> COD
6. Signature: (Addressee or Agent) X <i>[Signature]</i>		7. Date of Delivery 11/13/98
PS Form 3811, December 1994		8. Addressee's Address (Only if requested and fee is paid)

Thank you for using Return Receipt Service.

102595-97-B-0179 Domestic Return Receipt

Z 333 612 496

US Postal Service
Receipt for Certified Mail
 No Insurance Coverage Provided.
 Do not use for International Mail (See reverse)

Sent to		<i>Robert Carter</i>	
Street & Number		<i>Panda - Kathleen</i>	
Post Office, State, & ZIP Code		<i>Dallas, TX</i>	
Postage	\$		
Certified Fee			
Special Delivery Fee			
Restricted Delivery Fee			
Return Receipt Showing to Whom & Date Delivered			
Return Receipt Showing to Whom, Date, & Addressee's Address			
TOTAL Postage & Fees	\$		
Postmark or Date		<i>11-10-98</i>	
		<i>1050257-002-AC</i>	

PS Form 3800, April 1995



Department of Environmental Protection

Lawton Chiles
Governor

September 22, 1998

Virginia B. Wetherell
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Jeffrey L. Meling, P.E.
Vice President
Environmental Consulting & Technology, Inc.
3701 Northwest 98th Street
Gainesville, Florida 32606

Re: Panda-Kathleen Cogeneration Facility
DEP File 1050257-002-AC. (PSD-FL-216)

Dear Mr. Meling:

On March 5, 1997 the Department requested submittal of additional information to process the referenced application request. Your letter of January 19, 1998 requested that the Department keep the application in an "on hold" status, pending the Public Service Commission's ruling on the project within the following three months. To-date we have not received information on further development on this project and the additional information that we requested. Please note that per Rule 62-5.055(1):

"The applicant shall have ninety days after the Department mails a timely request for additional information to submit that information to the Department. If an applicant requires more than ninety days in which to respond to a request for additional information, the applicant may notify the Department in writing of the circumstances, at which time the application shall be held in active status for one additional period of up to ninety days. Additional extensions shall be granted for good cause shown by the applicant. A showing that the applicant is making a diligent effort to obtain the requested information shall constitute good cause. Failure of an applicant to provide the timely requested information by the applicable date shall result in denial of the application."

Over two ninety-day periods have transpired since our request for additional information. Because the rule provision was not in-effect when we requested the additional information, it will not be used at this time to deny the permit request. The nature of the information is such that a diligent effort would have yielded it by now and would certainly yield it in the next thirty days. Therefore, we are providing Panda-Kathleen a period of an additional 30 days from the day this letter is received to provide the requested information or show good cause that an extension is required.

If you have any questions regarding this matter, please call me at 850/921-9523 or Syed Arif at 850/921-9528.

Sincerely,

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/sa

cc: Mr. Bill Thomas, DEP/SWD
Mr. J. Brinson, Panda-Kathleen

Z 333 612 514

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail (See reverse)

Sent to <i>Jeffrey L. Meling</i>	
Street & Number <i>EC+T Inc.</i>	
Post Office, State, & ZIP Code <i>Gainesville FL</i>	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date <i>2333 612 514</i>	

PS Form 3800, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER: ■ Complete items 1 and/or 2 for additional services. ■ Complete items 3, 4a, and 4b. ■ Print your name and address on the reverse of this form so that we can return this card to you. ■ Attach this form to the front of the mailpiece, or on the back if space does not permit. ■ Write "Return Receipt Requested" on the mailpiece below the article number. ■ The Return Receipt will show to whom the article was delivered and the date delivered.		I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.
3. Article Addressed to: <i>Mr. Jeffrey L. Meling P.E.</i> <i>V.P. EC+T Inc.</i> <i>3701 NW 98th St.</i> <i>Gainesville FL 32606</i>	4a. Article Number <i>Z 333 612 514</i>	4b. Service Type <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Express Mail <input type="checkbox"/> Insured <input type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> COD
5. Received By: (Print Name) 	7. Date of Delivery <i>4-24-98</i>	8. Addressee's Address (Only if requested and fee is paid)
6. Signature (Addressee or Agent) <i>X Rob L. Wolf</i>	PS Form 3811, December 1994 102595-97-B-0179 Domestic Return Receipt	

Thank you for using Return Receipt Service.



Environmental Consulting & Technology, Inc.

January 19, 1998
ECT No. 94007-0201

Mr. Clair Fancy
Bureau of Air Regulation
Florida Department of Environmental Protection
Mail Stop 5500
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Panda-Kathleen Cogeneration Facility (AC 53-251898, PSD-F-216)
Application for Modification

Dear Mr. Fancy:

In February 1997, Panda-Kathleen, L.P., submitted an application to modify its proposed co-generation facility near Lakeland, which had received its original construction permit in 1995. Subsequent to the February 1997 submittal, we informed Florida Department of Environmental Protection (FDEP) that issues delaying construction were not close to resolution; we asked FDEP to put the application on hold. We have recently been asked by Syed Arif of your staff to provide an update on the status of the project and, if appropriate, withdraw the application.

The status of the project remains "pending." Panda has asked the Florida Public Service Commission (PSC) for certain relief of schedule that would still allow Panda to proceed with the project. Panda expects the PSC's ruling within the next 3 months. Panda therefore requests that FDEP keep the 1997 application in an "on hold" status, pending the PSC's forthcoming ruling. We will inform you of any developments that would affect the status of the project.

Thank you very much for your kind attention to this matter.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

Jeffrey L. Meling, P.E.
Vice President

JLM/dlm

cc: J. Brinson, Panda

G-PRJ98.2/JLM0119.DOC.1

RECEIVED

JAN 20 1998

BUREAU OF
AIR REGULATION

3701 Northwest
98th Street
Gainesville, FL
32606

(352)
332-0444

FAX (352)
332-6722



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

March 5, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Jeffrey L. Meling, P.E.
Environmental Consulting and Technology, Inc.
3701 Northwest 98th Street
Gainesville, Florida 32606

Re: Panda - Kathleen Cogeneration Facility
Modification of Permits AC 53-251898, PSD-FL-216
File No. 1050257-002-AC

Dear Mr. Meling:

Based on your letter dated March 4, 1997, we understand that additional information about this project will become available at an undetermined future date. Until that information is submitted or you advise that the project plans will not change, we consider the application to be incomplete. As requested in your letter, further processing of the application will be on-hold.

If you have any questions regarding this matter, please contact Mr. Syed Arif at 904/488-1344.

Sincerely,

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/sa/l

cc: Mr. Brian Beals, EPA
Mr. John Bunyak, NPS
Mr. Bill Thomas, SWD
Mr. Tom Davis, P.E., ECT
Mr. Robert W. Carter, Panda

Fold at line over top of envelope to the right of the return address

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- Addressee's Address
- Restricted Delivery

Consult postmaster for fee.

Is your RETURN ADDRESS completed on the reverse side?

3. Article Addressed to:
 Jeffrey Meling, PE
 ECT
 3701 NW 98th St.
 Gainesville, FL 32606

4a. Article Number
 P 265 659 181

4b. Service Type
 Registered Certified
 Express Mail Insured
 Return Receipt for Merchandise COD

7. Date of Delivery
 2/19/94

5. Received By: (Print Name)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature: (Addressee or Agent)
 X *Jeffrey Meling*

PS Form 3811, December 1994 Domestic Return Receipt

Thank you for using Return Receipt Service.

PS Form 3800, April 1995

US Postal Service
 Receipt for Certified Mail
 No Insurance Coverage Provided.
 Do not use for International Mail (See reverse)

Postmark or Date: 3-5-97

Postage: \$

Certified Fee

Special Delivery Fee

Restricted Delivery Fee

Return Receipt Showing to Whom & Date Delivered

Return Receipt Showing to Whom, Date, & Addressee's Address

TOTAL Postage & Fees \$

Street & Number: Jeffrey Meling
 Gainesville, FL

First Office, State, & ZIP Code

Send to: Jeffrey Meling

PS Form 3800, April 1995

AC 53-851898
 PSD FI-914

P 265 659 181



Environmental Consulting & Technology, Inc.

March 4, 1997
ECT No. 94007-0201

Mr. A.A. Linero, P.E.
Administrator, New Source Review Section
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road, MS #5505
Tallahassee, FL 32399-2400

Re: Panda-Kathleen Application for Modification

Dear Al:

Panda-Kathleen has just informed me that contractual issues have again affected the Kathleen cogeneration project. As was the case previously, these issues have no direct connection with the air permitting process. However, they affect the project as a whole and, therefore, also affect air permitting.

Therefore, Panda has instructed me to: (1) inform you that these issues have arisen, and (2) request that you place the review of the recently submitted application on hold until further notice.

We appreciate the cooperation that you and your staff have given Panda and the Kathleen project. Please keep the file on the project open. Panda plans to reactive the permitting process once the contractual matters have been resolved.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

Jeffrey L. Meling, P.E.
Vice President

JLM/edd

cc: Kyle Woodruff, Panda

G-PANDA97.1/JLM0303.1

RECEIVED

MAR 6 1997
BUREAU OF
AIR REGULATION

RECEIVED

MAR 3 1997
BUREAU OF
AIR REGULATION

3701 Northwest
98th Street
Gainesville, FL
32606

(352)
332-0444

FAX (352)
332-6722



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

February 19, 1997

Mr. Jeffrey L. Meling, P.E.
Environmental Consulting &
Technology, Inc.
3701 Northwest 98th Street
Gainesville, Florida 32606

RE: Panda-Kathleen Cogeneration Facility
Polk County, 1050257-002-AC

Dear Jeff:

Enclosed is ECT's check no. 047230 for \$4,500 submitted February 7 with the Panda-Kathleen Cogeneration Facility air permit application. Since, the \$1,000 check to cover the processing fee for this project has been received by the Department, we are returning your \$4,500 as arranged with Syed Arif.

Sincerely,

Patty Adams
Bureau of Air Regulation

/pa

Enclosure

cc: Syed Arif

Environmental Consulting & Technology, Inc.

PLEASE DETACH AND RETAIN FOR YOUR RECORDS

INVOICE NUMBER	DATE		VOUCHER NO.	AMOUNT
012197	01/21/97		P01268 * Total	4,500.00 4,500.00

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AIR REGULATION

Mr. Clair Fancy
Bureau of Air Regulation
Florida Department of Environmental Protection
Mail Stop 5500
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Panda-Kathleen Cogeneration Facility (AC 53-251898, PSD-FL-216)
Application for Modification

Dear Mr. Fancy:

Panda-Kathleen, L.P., proposes to modify the specifications relating to its electrical power cogeneration facility near Lakeland. The facility received its construction permit in 1995; however, as a result of issues that have arisen which have no direct bearing on the previous air permitting process, construction has been delayed. In order to facilitate construction of the plant at this time, Panda proposes to change the combustion turbine and make other related modifications, the net effect of which will be to reduce the generating capacity of the plant from 115 megawatts (MW) to 75 MW. Another significant effect of the proposed modifications is to ultimately reduce the facility's maximum potential emissions. Panda plans to begin construction of the modified Kathleen Cogeneration Plant later this spring, but no later than June 30, 1997.

Enclosed for your review is the application to modify the Kathleen plant; an original and four copies are provided, per instructions. The original contains the actual signature pages as well as the electronic (ELSA) long form application (4 identical diskettes) and a diskette containing dispersion modeling output files. A check for the \$4,500.00 permit modification application fee is also attached.

Within the next several weeks, we will submit to you our proposed revisions to both the technical analysis and actual permit. We plan to do this at the suggestion of your staff in order to assist them to the extent possible in their processing of the application and to thereby expedite final issuances of the modified permit.

Finally, we wish to thank Al Linero, Syed Arif, Martin Costello, Cleve Holladay, and others at FDEP for taking the time to meet with us on two occasions to discuss the

3701 Northwest
98th Street
Gainesville, FL
32606

(352)
332-0444

FAX (352)
332-6722

G-PANDA97.1/JLM0206.1

Mr. Clair Fancy
Bureau of Air Regulation
Florida Department of Environmental Protection
February 6, 1997
Page 2

proposed modification. Their assistance and advice has been instrumental to the preparation of the enclosed application.

Thank you in advance for your prompt attention to this application. Please contact me if questions arise or if additional information is needed to finalize and approve this permit application in a timely manner.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.



Jeffrey L. Meling, P.E.
Vice President

JLM/edd

Enclosures

cc: Kyle Woodruff, Panda, w/encl.

cc: EPA
NPS
SWD
S. Arif



Environmental Consulting & Technology, Inc.

February 6, 1997
ECT No. 94007-0201

Charlotte has the check!

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Jeffrey L. Meling, P.E.
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Enclosures

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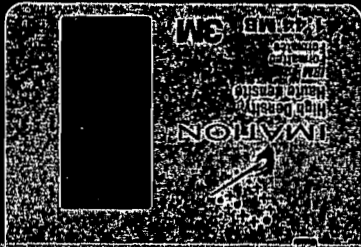
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Plant



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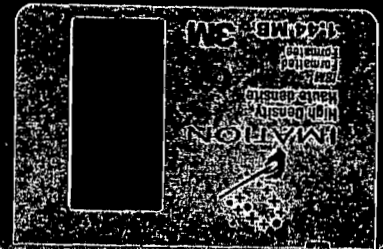
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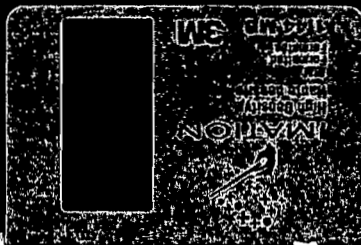
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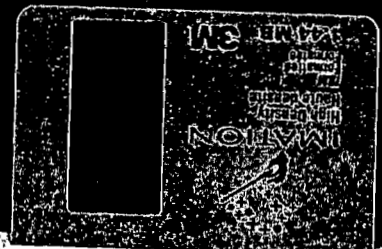
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P.K.

PANDA-KATHLEEN COGENERATION PLANT

**APPLICATION TO MODIFY
AIR POLLUTION SOURCES**

Prepared for:

**PANDA-KATHLEEN, L.P.
DALLAS, TEXAS**

Prepared by:

ECT

Environmental Consulting & Technology, Inc.

*3701 Northwest 98TH Street
Gainesville, FL 32606*

ECT No. 94007-0201

February 1997

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1.0 INTRODUCTION AND SUMMARY

In January 1995 Panda-Kathleen, Limited Partnership, a wholly-owned subsidiary of Panda Energy International, Inc., received a Permit to Construct from the Florida Department of Environmental Protection (FDEP). The permit addressed the installation of a combined cycle combustion turbine (CT) cogeneration facility at a site near Lakeland in Polk County. The permit was assigned numbers AC 53-251898 and PSD-FL-216.

Consistent with the permit, the Panda-Kathleen Cogeneration Plant was to consist of one CT, one unfired heat recovery steam generator (HRSG), and one steam turbine generator. The facility was to be capable of producing a nominal 115 megawatts (MW) of electricity. The CT was to be either a General Electric (GE) Model 7EA or an ABB Power Generation (ABB) Model 11N1; the permit allowed Panda to construct the plant around either CT.

Based on up to 500 hours per year (hr/yr) firing low-sulfur distillate No. 2 fuel oil and continuous firing of natural gas (the primary fuel) during the remaining 8,260 hr/yr, worst-case emissions of air pollutants from the CT were calculated. The annual emission estimates were such that the pollutants particulate matter (PM), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), beryllium, and inorganic arsenic were subject to full air quality review under the rules pertaining to prevention of significant deterioration (PSD) (see Section 62-212.400, Florida Administrative Code [F.A.C.]). As required for PSD reviews, the Panda-Kathleen facility underwent the following analyses for each of the subject pollutants:

1. Control technology review (best available control technology [BACT] analysis).
2. Air quality analysis (monitoring).
3. Source impact analysis.

4. Source information.
5. Additional impacts analyses.

For each pollutant subject to PSD review, a BACT analysis was conducted, as were analyses of existing air quality and air quality impacts. The BACT analyses were done using the required *top-down* approach. Air quality impacts were analyzed using appropriate dispersion models and meteorological data. Finally, emissions of potentially toxic air pollutants were analyzed and the impacts evaluated in the context of FDEP guidelines. The results of these analyses demonstrated that the facility would meet all air quality and PSD requirements.

Since FDEP issued the Permit to Construct in January 1995, however, various factors have come into play that have prevented Panda from constructing the Kathleen facility. These factors relate to issues that have no direct bearing on or connection with the previous air permitting process.

In order to facilitate construction of the plant at this time, Panda proposes to make certain modifications. The proposed modifications include:

- Installing a GE LM6000 PD CT instead of a GE 7EA or ABB 11N1.
- Installing a natural gas-fired duct burner.
- Reducing the size of the fuel oil storage tank.
- Adjusting the facility layout to accommodate the new equipment.

As a result of these proposed modifications, the net output of the facility will be reduced to a maximum of 75 MW. The proposed modifications will also affect emissions of air pollutants. Worst-case potential annual emissions of all pollutants will decrease relative to the current permit allowables, except for NO_x during the facility's first year of operation.

Panda plans to begin construction of the modified Kathleen facility in the spring of 1997, but no later than June 30, 1997. Construction must be completed and the facility must begin commercial operation in the spring of 1998.

Following this introductory section, the remainder of this application is organized as follows:

- Section 2.0 describes the modified facility, including its air emissions.
- Section 3.0 briefly summarizes air quality review requirements applicable to the proposed modification.
- Section 4.0 updates the BACT analyses to address the LM6000 PD CT and the duct burner.
- Section 5.0 provides updates to all air quality modeling-related analyses.
- Appendix A contains the new FDEP air permit application form, both hardcopy and electronic (ELSA) versions.
- Appendix B provides vendor information pertaining to the LM6000 PD CT and the duct burner.
- Appendix C provides the derivations of all emission estimates.
- Appendix D includes air quality dispersion modeling output files on diskette.

It is noted that this application is intended to supplement the original application for the Kathleen facility (ECT, 1994). Where methods of analysis or review procedures have changed, this report presents those changes. However, where they have not, the reviewer is referred to the original application. For example, the air quality modeling procedures have changed only slightly from the original application. Therefore, this application identifies the specific modeling changes, but leaves the original report to fully describe the overall approach.

Of course, all analytical results relevant to the proposed modification are presented here in detail. Taken as a whole with the original application, the proposed plant, as modified, has been evaluated to the same level of review as the original facility.

As presented in the remainder of this report, the analyses conducted for this permit modification resulted in the following conclusions:

- The proposed modification will ultimately result in decreases in emissions relative to those allowed by the current permit.
- As found in the original application, the use of good combustion practices and clean fuels is considered to be BACT for PM and metals. The Panda-Kathleen CT and duct burner will use the latest burner technologies to maximize combustion efficiency and minimize PM emission rates. Fuels combusted in the CT will be natural gas and low-ash, low-sulfur distillate fuel oil; the duct burner will fire only natural gas.
- The GE LM6000 PD CT will utilize “dry low-emissions” (DLE) burner technology to minimize NO_x emissions for *both* natural gas and fuel oil firing. DLE burner technology is GE’s latest advancement in emission control for the LM6000 and therefore represents BACT for the CT. The GE LM6000 PD equipped with DLE technology will ultimately achieve NO_x concentrations of 15 and 42 parts per million by dry volume (ppmvd) for natural gas and oil firing, respectively. A NO_x exhaust concentration of 15 ppmvd has generally been considered to represent BACT for natural gas-fired CTs in Florida; the proposed NO_x concentration is equal to the FDEP BACT guidelines of 15 ppmvd for natural gas-fired CTs using dry low-NO_x burners. DLE burner technology will achieve low-NO_x emission rates comparable to those achieved with selective catalytic reduction (SCR) technology but without the adverse impacts associated with SCR. These adverse impacts including ammonia (NH₃) emissions due to ammonia slip, potential ammonium salt PM formation with subsequent downstream corrosion and reduced efficiency of heat transfer equipment, hazards associated with NH₃ storage and spent catalyst disposal, and energy penalties due to increased turbine backpressure and additional downtime for catalyst replacement. As an additional advantage, DLE technology will achieve

42 ppmvd NO_x concentrations when firing fuel oil *without* water or steam injection.

- Based on the GE data and guarantees, interim NO_x emission limits of 25 ppmvd (gas) and 65 ppmvd (oil) are proposed for operation through June 30, 1999 (i.e., approximately the first year of operation). Thereafter, the BACT limits of 15 ppmvd (gas) and 42 ppmvd (oil) will be achieved. The interim limits are needed to allow completion of GE's ongoing development of DLE technology (no commercial CTs with DLE technology have yet been delivered).
- The duct burner will achieve NO_x levels of 0.080 pounds per million British thermal units (lb/MMBtu), based on vendor guarantees. This emission guarantee compares favorably to other recently permitted NO_x emission rates for similar equipment and is therefore considered BACT.
- The original analysis of the economics of NO_x control technologies was updated for the modification. Overall, cost effectiveness of SCR for controlling NO_x emissions is estimated to be approximately \$4,931 per ton removed. This level of cost is unreasonable, and SCR is not considered cost effective.
- As before, advanced burner design and good operating practices to minimize incomplete combustion are proposed as BACT for CO and VOCs for the CT. Exhaust concentrations of CO from the CT using DLE technology are projected to be 25 ppmvd for both natural gas and distillate oil firing. Exhaust concentrations of VOC are projected to be 6.0 ppmvd for natural gas and distillate oil firing.
- Vendor data indicate that the duct burner will achieve a CO emission level of 0.080 lb/MMBtu. As for NO_x, this emission rate is considered BACT.
- Overall cost effectiveness of oxidation catalyst is estimated to be \$2,463 per ton of CO removed. This cost is considered to be unreasonably high, especially considering the minimal environmental benefits. The slightly higher CO emissions produced by the CT which result from the use of dry

low-NO_x combustors is an acceptable compromise with respect to overall NO_x and CO emission rates.

- The CT and duct burner will fire natural gas containing no more than 1 grain of sulfur per one hundred standard cubic feet (gr S/100 scf) of gas. The backup fuel will be distillate fuel oil containing no more than 0.05 weight percent sulfur.
- An exemption from the PSD preconstruction monitoring requirements is still appropriate for NO_x, PM, and CO because projected facility impacts are less than the applicable *de minimis* values.
- An exemption from the PSD preconstruction monitoring requirements is still appropriate for arsenic because a *de minimis* level has not been established for this pollutant.
- Updated dispersion modeling for NO_x, PM, and CO still resulted in insignificant maximum impacts due to Panda-Kathleen emissions. No further analyses were conducted for these pollutants.
- Updated modeling of potential toxic air pollutants showed that maximum facility impacts will still be below FDEP no-threat levels.
- The proposed facility, after modification, will still have no adverse impacts on soils or vegetation in the plant vicinity, and growth-related air quality impacts will be minimal.
- The Chassahowitzka National Wilderness Area (NWA) is a PSD Class I area located approximately 85 kilometers (km) northwest of the Panda-Kathleen cogeneration facility. Updated analysis showed that the impact of emissions on this area will still be less than significance levels. Impacts on visibility, soils, vegetation, and wildlife in the area are still predicted to be minimal.

2.0 DESCRIPTION OF THE MODIFIED FACILITY

With a few exceptions, the modified Panda-Kathleen Cogeneration Facility will greatly resemble the originally-permitted plant. The major facility components will remain the same, except for the addition of a natural gas-fired duct burner. The CT will be a GE LM6000 PD, versus a GE 7EA or ABB 11N1 as originally planned and permitted. The maximum generating capacity of the modified facility will be 75 MW.

Due at least in part to the change in CT and the addition of a duct burner, the plant layout will change. The new layout is presented in Figure 2-1.

Natural gas will continue to be the facility's primary fuel. The CT will also be capable of firing backup No. 2 distillate fuel oil, while the duct burner will fire only natural gas. Panda proposes to limit operation of the CT on fuel oil to a maximum of 500 hours per year (hr/yr).

The GE LM6000 PD CT will be equipped with DLE burner technology to minimize NO_x and CO emissions for both natural gas and fuel oil firing. This technology, which is still in development, will represent the latest advancement in emission controls for the LM6000 CT. It will ultimately result in NO_x emission levels of 15 ppmvd (natural gas) and 42 ppmvd (fuel oil) *without* the need for water injection or SCR controls.

However, no LM6000 PD CTs with DLE technology have yet been delivered by GE for commercial operation. Because GE does not yet have actual operating data from the LM6000 PD CT, the performance parameters of the unit cannot yet be predicted with total confidence. Therefore, it is noted that while GE is able to guarantee the *concentrations* of air pollutant constituents in the CT exhaust stream, the translations of those concentrations to *mass emissions* involve some degree of uncertainty (see GE information provided in Appendix B).

With this caveat and utilizing the data and information supplied by the vendors, contained in Appendix B, ECT has developed emission rates and stack parameters for the modified facility. These calculations and the resulting data are provided in detail in Appendix C.

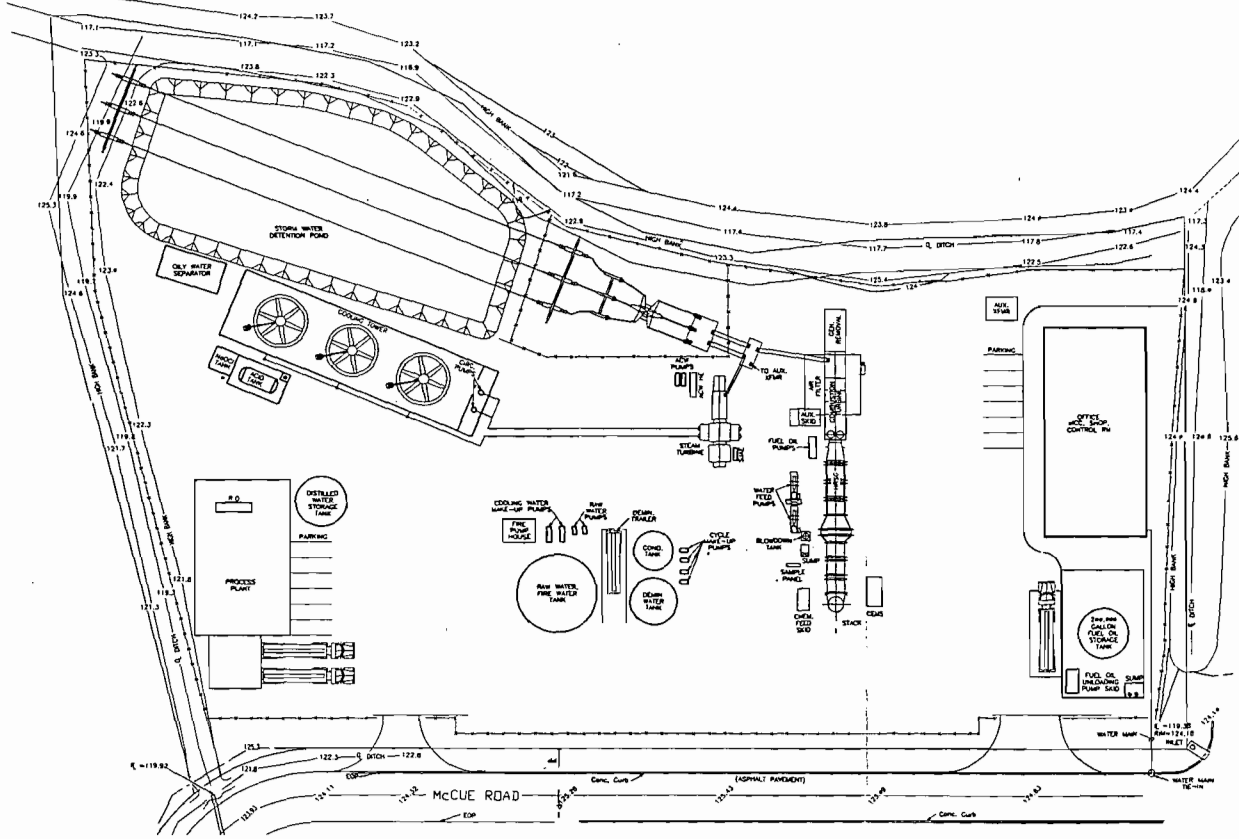
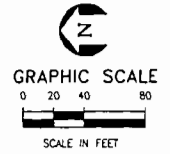


FIGURE 2-1.
PLANNED FACILITY LAYOUT, GE LM6000

Source: Utility Engineering, Amarillo, TX, 1997.



3.0 AIR QUALITY REVIEW REQUIREMENTS

The proposed modification of the Panda-Kathleen Cogeneration Facility will ultimately result in decreases in potential annual emission rates. These decreases are documented in Table 3-1. No pollutant's potential annual emissions will increase, except for NO_x emissions during the facility's first year of operation. Although the modified facility will have lower emissions than already permitted, certain factors warrant updates to the analyses presented in the original application. First, regarding BACT, it has been two and one-half years since the original application was submitted. Therefore, an update to the BACT analysis for the CT is appropriate. Second, the original BACT analysis did not address the duct burner. And third, air quality models and the emission sources' characteristics have changed sufficiently to warrant updates to the various modeling-related analyses. To address these issues, the next section, Section 4.0, provides updates to the BACT analyses. Section 5.0 presents the results of updated modeling.

Table 3-1. Projected Emissions: Proposed Modification Compared to Current Plant Configuration

Pollutant	Projected Maximum Potential Annual Emissions (tpy)		Change in Potential Annual Emissions (tpy)
	Modified Configuration	Current Configuration*	
PM (TSP)	26.1	36.5	(10.4)
PM (PM ₁₀)	26.1	36.5	(10.4)
SO ₂	12.3	23.3	(11.0)
NO _x	197.0†	262	(65)†
CO	188.3	240	(51.7)
Ozone/VOC	34.7	40.2	(5.5)
Pb	0.001	0.01	(0.009)
H ₂ SO ₄	1.9	3.8	(1.9)
Fluorides	0.003	0.009	(0.006)
Mercury	0.0004	0.0009	(0.0005)
Beryllium	0.0003	0.0007	(0.0004)
Total reduced sulfur (including H ₂ S)	Neg.**	Neg.**	0
Reduced sulfur compounds (including H ₂ S)	Neg.**	Neg.**	0
Vinyl chloride	0	0	0
Asbestos	0	0	0
Benzene	Neg.**	Neg.**	0
Radionuclides	Neg.**	Neg.**	0
Inorganic arsenic	0.0004	0.001	(0.0006)

*Emissions shown are permitted rates for either the GE 7EA or the ABB 11N1 configuration, whichever produced the higher rate for that pollutant.

†Emissions shown are based on the BACT NO_x limits of 15 and 42 ppmvd. Annual emissions with the interim NO_x limits of 25 and 65 ppmvd will be 267.6 tpy, which will result in a slight increase in potential emissions of 5.6 tpy relative to the current configuration.

**Negligible amount of emission.

Sources: FDEP, 1995.
ECT, 1997.

4.0 UPDATE TO BEST AVAILABLE CONTROL TECHNOLOGY ANALYSES

This update to the previous BACT analyses provides information which has changed from that contained in the June 1994 permit application. The revisions to the prior BACT analyses primarily reflect the changes in project scope; i.e., (1) installation of a GE LM6000 PD aeroderivative turbine instead of the GE 7EA or ABB 11N1 heavy frame turbines, and (2) the addition of a duct burner. To avoid duplication of previously submitted information, references are made to the June 1994 permit application for those portions of the BACT analyses which have not changed.

4.1 METHODOLOGY

The BACT analysis was performed in accordance with the top-down method as described in the previous study; reference Section 4.1 of the June 1994 permit application.

As indicated in Section 3.4, Tables 3-6 and 3-7 of the original application, projected annual emission rates of NO_x, PM/PM₁₀, CO, ozone/VOC, beryllium, and inorganic arsenic for the Panda-Kathleen cogeneration project exceeded the PSD significance rates and, therefore, were subject to BACT analysis. For the modified project, maximum potential annual emissions of ozone/VOC and beryllium no longer exceed the PSD significance rates (see Table 3-1 and Appendix C) and therefore these pollutants are not subject to further BACT review (i.e., no BACT update is required). For the modified project, control technology analyses using the five-step top-down BACT method are provided in Sections 4.3, 4.4, and 4.5 for combustion products (PM/PM₁₀ and inorganic arsenic), products of incomplete combustion (CO), and acid gases (NO_x), respectively. Where appropriate, BACT is discussed separately for the GE LM6000 PD CT and the duct

burner because the performance of these two units differ with respect to emission rates.

4.2 FEDERAL AND STATE EMISSION STANDARDS

BACT emission limitations must be no less stringent than any applicable NSPS (40 CFR Part 60), NESHAP (40 CFR Parts 61 and 63), and state emission standards (Chapter 62-296, Stationary Sources - Emission Standards, F.A.C.).

On the federal level, the GE LM6000 PD CT would be classified as an electric utility stationary gas turbine and therefore is subject to the emission limitations of NSPS 40 CFR 60, Subpart GG § 60.332(a)(1) for NO_x and § 60.333 for SO₂. The natural gas-fired duct burner will have a maximum heat input greater than 250 MMBtu/hr and will therefore be subject to the applicable provisions of NSPS Subpart 40 CFR 60, Subpart Da - Standards of Performance for Electric Utility Steam Generating Units For Which Construction Is Commenced After September 18, 1978. Because the duct burner will be fired solely with natural gas, applicable emission limitations of NSPS Subpart Da include the 0.03 lb/MMBtu PM limit specified in § 60.42a(a)(1), the 20 percent opacity limit specified in § 60.42a(b), and the 0.20 lb/MMBtu limits specified in § 60.43a(b)(2) and § 60.44a(a)(1) for SO₂ and NO_x, respectively.

The Panda-Kathleen facility distillate fuel oil storage will have a capacity equal to or less than the capacity indicated in the June 1994 permit application; i.e., equal to or less than approximately 1,800 m³ or 475,000 gallons. The maximum true vapor pressure of distillate fuel oil at 100°F of 0.152 kPa (0.022 psia) is below the Subpart Kb 3.5 kPa applicability criterion. The distillate fuel oil storage tank, therefore, remains exempt from the provisions of NSPS Subparts A and Kb, with the exception of the monitoring requirements specified by § 60.116b(b) of Subpart Kb. There are no other NSPS requirements that would apply to the project.

FDEP emission standards for stationary sources are contained in Chapter 62-296, Stationary Sources - Emission Standards, F.A.C. Chapter 62-296, F.A.C., contains general emission standards for sources emitting VOCs and PM (reference Section 62-296.320, F.A.C.) which are applicable to the Panda-Kathleen project. If deemed necessary by FDEP, vapor emission control devices must be employed during the handling of any VOC as required by Rule 62-296.320(1)(a), F.A.C. Visible emissions are limited to a maximum of 20 percent opacity pursuant to Rule 62-296.320(4)(b), F.A.C. Sections 62-296.410 through 62-296.417, F.A.C., also specifies emission standards for 18 categories of sources; none of these categories are applicable to CTs or duct burners. Emission standards applicable to sources located in nonattainment areas are contained in Sections 62-296.500 (for ozone nonattainment areas) and 62-296.700 (for PM nonattainment areas), F.A.C. Because the Panda-Kathleen project will be located in Polk County, Florida, and this county is designated attainment for all criteria pollutants, these emission standards are not applicable. Finally, Section 62-204.800, F.A.C., adopts federal NSPS and NESHAP by reference. As noted previously, NSPS Subpart GG, Stationary Gas Turbines, and NSPS Subpart Da, Electric Utility Steam Generating Units, are applicable to the Panda-Kathleen CT and duct burner, respectively. There are no applicable NESHAP requirements.

Applicable federal and state emission standards are summarized in Tables 4-1 and 4-2, respectively. Detailed calculations of NSPS Subpart GG NO_x limitations are provided in Appendix C. BACT emission limitations proposed for the Panda-Kathleen cogeneration project are all more stringent than the applicable federal and state standards cited in these tables.

4.3 UPDATE OF BACT ANALYSIS FOR COMBUSTION PRODUCTS

4.3.1 CONTROL TECHNOLOGIES

The general discussion of control technology review for combustion products (PM and inorganic arsenic), specific available control technologies, and BACT conclusions remain unchanged from that provided in the June 1994 permit application; reference Section 4.3.1 of the June 1994 application.

Post-process stack controls for PM (centrifugal collectors, electrostatic precipitators, baghouses, or wet scrubbers) are not feasible for controlling PM and heavy metal emissions from CTs and duct burners because PM concentrations in the exhaust stream are inherently low due to the use of clean fuels; i.e., natural gas and low-sulfur distillate fuel oil. The minor PM emissions resulting from the use of clean fuels coupled with a large volume of exhaust gas produce extremely low exhaust stream PM concentrations. Exhaust stream PM concentrations of such low magnitude are not amenable to control using available technologies since removal efficiencies would be unreasonably low and costs excessive.

Because post-process stack controls for PM are not appropriate for CTs and duct burners, the use of good combustion practices and clean fuels is considered to be BACT. The Panda-Kathleen CT and duct burner will use the latest burner technology to maximize combustion efficiency and minimize PM emission rates. Combustion efficiency, defined as the percentage of fuel that is completely oxidized in the combustion process, is projected to be greater than 99 percent. Project fuels will consist of natural gas and low-sulfur distillate fuel oil.

Table 4-1. Federal Emission Limitations

A. NSPS Subpart GG, Stationary Gas Turbines

<u>Pollutant</u>	<u>Emission Limitation</u>
NO _x	STD = 0.0075 x (14.4/Y) + F

where: STD = allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = manufacturer's rated heat rate in kilojoules per watt hour at manufacturer's rated load, or actual measured heat rate based on LHV of fuel as measured at actual peak load. Y cannot exceed 14.4 kilojoules per watt hour.

F = NO_x emission allowance for fuel-bound nitrogen per:

<u>FBN</u> <u>(weight percent)</u>	<u>F</u> <u>(NO_x - volume percent)</u>
N ≤ 0.015	0
0.015 < N ≤ 0.1	0.04 x N
0.1 < N ≤ 0.25	0.004 + 0.0067 x (N-0.1)
N > 0.25	0.005

where: N = nitrogen content of fuel; percent by weight.

SO₂ = ≤0.015 percent by volume at 15 percent oxygen and on a dry basis; or fuel sulfur content ≤0.8 weight percent.

B. NSPS Subpart Da, Electric Utility Steam Generating Units

<u>Pollutant</u>	<u>Emission Limitation</u>
PM	0.03 lb/MMBtu
SO ₂	0.20 lb/MMBtu
NO _x	0.20 lb/MMBtu
Opacity	≤20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity.

Source: 40 CFR 60, Subparts GG and Da.

Table 4-2. State Emission Limitations

Pollutant	Emission Limitation
A. Rule 62-296.320(4)(b), F.A.C.: General Visible Emissions Standard	
● Visible emissions	<20 percent opacity
B. Rule 62-296.320(1)(a), F.A.C.: General Volatile Organic Compounds or Organic Solvents Standard	
● VOC	No person shall store, pump, handle, process, load, unload, or use in any process or installation VOCs or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department.

Source: Chapter 62-296, F.A.C.

4.3.2 PROPOSED BACT EMISSION LIMITATIONS

The summaries of historical emission limitations for PM previously included in Section 4.3.2 of the June 1994 permit application have been updated to reflect the latest 5 years of available determinations as obtained from EPA's RBLC database. Tables 4-3 and 4-4 contain RBLC PM determinations for natural gas and oil-fired CTs, respectively. Ranked BACT PM limits are provided in Tables 4-5 and 4-6 for natural gas- and oil-fired CTs, respectively. Data provided in Tables 4-3 and 4-4 include determinations from multiple fuel CTs (RBLC process type code 15.007) as well as natural gas (RBLC process type code 15.004) and oil-fired (RBLC process type code 15.006) units. For process type code 15.007 (multiple fuels), many RBLC entries contain emission limits without indicating whether the limits apply to gas- or oil-firing. Examination of the RBLC data for process type code 15.007 also shows that the source classification codes (SCC) provided in the RBLC database are unreliable; i.e., an entry showing an emission limit for oil-firing may contain a SCC that corresponds to gas-firing. Accordingly, only those entries for process type code 15.007 which clearly indicate the basis for the emission limit (i.e., whether the limit applies to gas- or oil-firing) were included in Tables 4-3 and 4-4. Recent Florida PM BACT determinations for gas turbines are summarized in Table 4-7.

Tables 4-8 and 4-9 provide RBLC and Florida PM determinations for natural gas-fired duct burners, respectively. Ranked BACT PM limits are provided in Table 4-10 for natural gas-fired duct burners.

For CTs fired with natural gas, RBLC PM emission limits range from 0.0001 to 0.1049 lb/MMBtu with a median rate of 0.0060 lb/MMBtu. The RBLC range for oil-fired turbines is 0.0089 to 0.0472 lb/MMBtu with a median rate of 0.0156 lb/MMBtu. For duct burners fired with natural gas, RBLC PM emission limits range from 0.0120 to 0.2000 lb/MMBtu with a median rate of 0.1000 lb/MMBtu.

Table 4-3. RBLC PM Summary - Natural Gas-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		PM EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS	
						VALUE	UNITS	(LB/HR)	(LB/MMBTU)	(TPY)	DESCRIPTION	EFF.	(\$)	... YEAR		
AL	AL-0069	INTERNATIONAL PAPER CO. RIVERDALE MILL	3/30/90	3/24/95	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER	40.00	MW		0.0100			FUEL SPECIFICATION				BACT-PSD
CO	CO-0017	THERMO INDUSTRIES, LTD.	2/19/92	3/24/95	TURBINE, GAS FIRED, 3 EACH	246.00	MMBTU/H		25.8000	0.1049		FUEL SPEC: NATURAL GAS FIRED				OTHER
	CO-0018	BRUSH COGENERATION PARTNERSHIP		7/20/94	TURBINE	350.00	MMBTU/H				9.9000					OTHER
	CO-0018	BRUSH COGENERATION PARTNERSHIP		7/20/94	TURBINE	350.00	MMBTU/H				9.9000					OTHER
	CO-0019	COLORADO POWER PARTNERSHIP		7/20/94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00	MMBTU/H EACH TURBINE				12.4000					OTHER
	CO-0019	COLORADO POWER PARTNERSHIP		7/20/94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00	MMBTU/H EACH TURBINE				12.4000					OTHER
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, GAS, 1 EACH	80.00	MW			0.0060		COMBUSTION CONTROL				BACT-PSD
	FL-0032	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, GAS, 4 EACH	400.00	MW	18.0000				COMBUSTION CONTROL				BACT-PSD
	FL-0032	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, CG, 4 EACH	400.00	MW	10.0000				COMBUSTION CONTROL				BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, GAS, 4 EACH	240.00	MW	15.4000				COMBUSTION CONTROL				BACT-PSD
	FL-0054	LAKE COGEN LIMITED	1/20/91	3/24/95	TURBINE, GAS, 2 EACH	42.00	MW			0.0065		COMBUSTION CONTROL, FUEL SPEC: CLEAN FUEL				BACT-PSD
	FL-0068	ORANGE COGENERATION LP	12/30/93	1/13/95	TURBINE, NATURAL GAS, 2	368.30	MMBTU/H	5.0000		0.0136		GOOD COMBUSTION				BACT-PSD
	FL-0072	TIGER BAY LP	6/17/93	1/13/95	TURBINE, GAS	1,914.80	MMBTU/H	9.0000		0.0058		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	869.00	MMBTU/H	7.0000		0.0081		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	387.00	MMBTU/H	9.0000		0.0245		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, GAS	1,214.00	MMBTU/H			0.0136		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/23/94	1/13/95	TURBINE, NATURAL GAS (2)	1,810.00	MMBTU/H	9.0000		0.0060		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0104	SEMINOLE HARDEE UNIT 3	1/1/96	8/31/96	COMBINED CYCLE COMBUSTION TURBINE	140.00	MW		7.0000			DRY LNB, FUEL SPEC: LOW S OIL, LIMITED OPERATION ON OIL, GOOD COMBUSTION				BACT-PSD
GA	GA-0032	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	1,032.00	MMBTU/H, NAT GAS			0.0060		FUEL SPEC: LOW SULFUR FUEL OIL				BACT-PSD
	GA-0033	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, GAS FIRED (2 EACH)	1,817.00	M BTU/HR			0.0064		FUEL SPEC: CLEAN BURNING FUELS				BACT-PSD
NC	NC-0055	DUKE POWER CO, LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,313.00	MM BTU/HR	5.0000		0.0064		COMBUSTION CONTROL				BACT-PSD
NJ	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (NATURAL GAS) (2)	1,190.00	MMBTU/HR (EACH)			0.0023		TURBINE DESIGN				BACT-OTHER
	NJ-0017	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	6/9/93	5/29/95	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	917.00	MMBTU/HR (EACH)			0.0060		TURBINE DESIGN				OTHER
	NJ-0017	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	6/9/93	5/29/95	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	917.00	MMBTU/HR (EACH)			0.0060		TURBINE DESIGN				BACT-PSD
MN	MN-0022	LSP-COTTAGE GROVE, L.P.	3/1/95	5/29/95	COMBUSTION TURBINE/GENERATOR	1,970.00	MMBTU/HR	10.7000		0.0034		FUEL SELECTION; GOOD COMBUSTION	1			BACT-PSD
MS	MS-0028	SOUTH MISSISSIPPI ELECTRIC POWER ASSOC.	4/9/96	8/19/96	COMBUSTION TURBINE, COMBINED CYCLE	1,299.00	MMBTU/HR NAT GAS	8.1000		0.0062		GOOD COMBUSTION CONTROLS				BACT-PSD
NC	NC-0089	CAROLINA POWER & LIGHT	4/11/96	8/19/96	COMBUSTION TURBINE, 4 EACH	1,907.60	MMBTU/HR	9.0000		0.0047		COMBUSTION CONTROL				BACT-PSD
NM	NM-0024	MILAGRO, WILLIAMS FIELD SERVICE		5/29/95	TURBINE/COGEN, NATURAL GAS (2)	900.00	MMCF/DAY			SEE P2 DESC.		COMBUSTION AIR FILTERS; GOOD COMBUSTION PRACTICE AND MAINTENANCE				BACT-PSD
NY	NY-0048	SARANAC ENERGY COMPANY	7/31/92	9/13/94	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123.00	MMBTU/HR (EACH)			0.0062		COMBUSTION CONTROLS				BACT-OTHER
	NY-0048	KAMINE/BESICORP CORNING L.P.	11/5/92	9/13/94	TURBINE, COMBUSTION (79 MW)	653.00	MMBTU/HR			0.0080		COMBUSTION CONTROL				BACT-OTHER
OH	OH-0218	CNG TRANSMISSION	8/12/92	4/5/95	TURBINE (NATURAL GAS) (3)	5,500.00	HP (EACH)			0.0350		FUEL SPEC: USE OF NATURAL GAS				OTHER
RI	RI-0010	NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	4/13/92	5/31/92	TURBINE, GAS AND DUCT BURNER	1,360.00	MMBTU/H EACH			0.0050						BACT-PSD
SC	SC-0031	BMW MANUFACTURING CORPORATION	1/7/94	8/12/96	TURBINE, NAT.GAS FIRED (3 -1 SPARE) AND 2 BOILERS	54.50	MM BTU/HR TURBINES				3.7900	EACH OF THE 2 BOILER-TURBINE USE A COMMON STACK				BACT-PSD
	SC-0036	CAROLINA POWER AND LIGHT	8/31/94	4/29/96	STATIONARY GAS TURBINE	1,820.00	MMBTU/H	5.9000		0.0039		PROPER OPERATION TO ACHIEVE GOOD COMBUSTION				BACT-PSD
SD	SD-0001	NORTHERN STATES POWER COMPANY	9/2/92	3/24/94	TURBINE, SIMPLE CYCLE, 4 EACH	129.00	MW		12.0000			FUEL SPEC: NATURAL GAS AS PRIMARY FUEL				BACT-PSD
VA	VA-0189	CORDONSVILLE ENERGY L.P.	9/25/92	3/24/95	TURBINES (2) EACH WITH A SFI	1.51	X10(9) BTU/HR N GAS	8.0000		0.0053		FUEL SPEC: CLEAN BURNING FUEL				BACT-PSD
	VA-0190	BEAR ISLAND PAPER COMPANY, L.P.	10/30/92	8/11/95	TURBINE, COMBUSTION GAS	474.00	X10(6) BTU/HR N. GAS			0.0053		FUEL SPEC: CLEAN BURN FUEL				BACT-PSD
	VA-0206	PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP	9/15/93	3/24/95	TURBINE, COMBUSTION, SIEMENS MODEL V84.2.3	10.20	X109 SCF/YR NAT GAS	1.0000		0.0001		FUEL SPEC: CLEAN BURNING FUELS				BACT-PSD
							MAXIMUM	25.8000	0.1049	12.4000						
							MINIMUM	1.0000	0.0001	3.7900						
							MEDIAN	9.0000	0.0060	9.9000						
							NUMBER OF ENTRIES	18	27	5						

Source: EPA, 1997.

Table 4-4. RBLC PM Summary - Oil Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		PM EMISSION LIMITS			CONTROL DESCRIPTION	EFF.	COST EFFECTIVENESS		BASIS
						VALUE	UNITS	(LB/HR)	(LB/MBTU)	(TPY)			(\$)	YEAR	
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, OIL, 1 EACH	80.00	MW		0.0250		COMBUSTION CONTROL				BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	9/5/91	3/24/95	TURBINE, OIL, 2 EACH	400.00	MW	60.6000			COMBUSTION CONTROL				BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, OIL, 4 EACH			58.0000			COMBUSTION CONTROL				BACT-PSD
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, OIL, 2 EACH	42.00	MW		0.0260		COMBUSTION CONTROL, FUEL SPEC: CLEAN FUEL				BACT-PSD
	FL-0057	FLORIDA POWER GENERATION	10/18/91	3/24/95	TURBINE, OIL, 6 EACH	92.90	MW	15.0000			COMBUSTION CONTROL				BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, OIL	1,849.90	MMBTU/H	17.0000	0.0472		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	928.00	MMBTU/H	15.0000	0.0472		FUEL SPEC: LOW SULFUR FUEL				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	371.00	MMBTU/H	10.0000	0.0472		FUEL SPEC: LOW SULFUR FUEL				BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, OIL	1,170.00	MMBTU/H		0.0472		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0081	TECO POLK POWER STATION	2/24/94	3/24/95	TURBINE, FUEL OIL	1,765.00	MMBTU/H		0.0090		GOOD COMBUSTION				BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, FUEL OIL (2)	1,730.00	MMBTU/H	17.0000	0.0098		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,829.00	MMBTU/H	15.0000	0.0146		GOOD COMBUSTION PRACTICES				BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,866.00	MMBTU/H	17.0000	0.0091		GOOD COMBUSTION PRACTICES				BACT-PSD
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	972.00	MMBTU/H, #2 OIL		0.0120		FUEL SPEC: LOW SULFUR FUEL OIL				BACT-PSD
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/25/92	3/24/95	TURBINE, OIL FIRED (2 EACH)	1,840.00	MMBTU/HR		0.0156		FUEL SPEC: CLEAN BURNING FUELS				BACT-PSD
HI	HI-0013	MAUI ELECTRIC COMPANY, LTD.	12/3/91	3/24/95	TURBINE, FUEL OIL #2	28.00	MW				FUEL SPEC: 0.4 % SULFUR				BACT-PSD
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW	19.7000			COMBUSTION DESIGN				BACT-PSD
	HI-0015	MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	7/28/92	3/24/95	TURBINE, COMBINED-CYCLE COMBUSTION	28.00	MW	19.7000			COMBUSTION TECHNOLOGY/DESIGN				BACT-OTHER
NC	NC-0059	CAROLINA POWER & LIGHT	4/1/96	8/19/96	COMBUSTION TURBINE, 4 EACH	1,907.50	MMBTU/HR	17.0000	0.0089		COMBUSTION CONTROL				BACT-PSD
NJ	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	6/29/95	TURBINES (#2 FUEL OIL) (2)	1,190.00	MMBTU/HR (EACH)		0.0260		TURBINE DESIGN				BACT-OTHER
NY	NY-0049	KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	11/9/92	9/13/94	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650.00	MMBTU/HR		0.0300		COMBUSTION CONTROLS				BACT-OTHER
OK	OK-0027	OKLAHOMA MUNICIPAL POWER AUTHORITY	12/17/92	3/24/95	TURBINE, COMBUSTION	88.00	MW		0.0125		FUEL SPEC: USE OF DISTILLATE FUEL	90.000			BACT-OTHER
SC	SC-0036	CAROLINA POWER AND LIGHT	8/31/94	4/29/96	STATIONARY GAS TURBINE	1,520.00	MMBTU/H	22.0000	0.0145		PROPER OPERATION TO ACHIEVE GOOD COMBUSTION				BACT-PSD
VA	VA-0189	GORDONSVILLE ENERGY L.P.	9/25/92	3/24/95	TURBINES (2) (EACH WITH A SF)	1.36	X10(9) BTU/HR #2 OIL	13.0000	0.0096		FUEL SPEC: CLEAN BURNING FUEL				BACT-PSD
	VA-0190	BEAR ISLAND PAPER COMPANY, L.P.	10/30/92	8/11/95	TURBINE, COMBUSTION GAS	468.00	X10(6) BTU/HR #2 OIL		0.0300		FUEL SPEC: CLEAN BURN FUEL				BACT-PSD
						MAXIMUM		60.6000	0.0472						
						MINIMUM		10.0000	0.0089						
						MEDIAN		17.0000	0.0146						
						NUMBER OF ENTRIES		14	19	0					

Source: EPA, 1997.

Table 4-5. CT PM RBLC Ranking - Natural Gas

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

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*** NONSTANDARD UNITS REPORT ***

Process Type: 15.004 Natural Gas

Pollutant: PM

RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
FL-0068	12/30/93	ORANGE COGENERATION LP TURBINE, NATURAL GAS, 2	5.0000 LB/H
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, NATURAL GAS	7.0000 LB/H
FL-0072	05/17/93	TIGER BAY LP TURBINE, GAS	9.0000 LB/H
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, NATURAL GAS	9.0000 LB/H
FL-0082	02/25/94	FLORIDA POWER CORPORATION POLK COUNTY SITE TURBINE, NATURAL GAS (2)	9.0000 LB/H
FL-0053	03/14/91	FLORIDA POWER AND LIGHT TURBINE, GAS, 4 EACH	15.4000 LB/H
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, GAS, 4 EACH	18.0000 LB/H
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, CG, 4 EACH	19.0000 LB/H
CO-0017	02/19/92	THERMO INDUSTRIES, LTD. TURBINE, GAS FIRED, 5 EACH	25.8000 LB/H
NC-0055	12/20/91	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STAT TURBINE, COMBUSTION	5.0000 LB/HR
GA-0053	07/28/92	HARTWELL ENERGY LIMITED PARTNERSHIP TURBINE, GAS FIRED (2 EACH)	0.0064 LB/M BTU
NJ-0013	04/01/91	LAKWOOD COGENERATION, L.P. TURBINES (NATURAL GAS) (2)	0.0023 LB/MMBTU
FL-0045	07/25/91	CHARLES LARSEN POWER PLANT TURBINE, GAS, 1 EACH	0.0060 LB/MMBTU
GA-0052	02/12/92	SAVANNAH ELECTRIC AND POWER CO. TURBINES, 8	0.0060 LB/MMBTU

Table 4-5. CT PM RBLC Ranking - Natural Gas

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT
*** NONSTANDARD UNITS REPORT ***

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RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
NJ-0017	06/09/93	NEWARK BAY COGENERATION PARTNERSHIP, L.P. TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	0.0060 LB/MMBTU
NY-0046	07/31/92	SARANAC ENERGY COMPANY TURBINES, COMBUSTION (2) (NATURAL GAS)	0.0062 LB/MMBTU
FL-0054	11/20/91	LAKE COGEN LIMITED TURBINE, GAS, 2 EACH	0.0065 LB/MMBTU
NY-0048	11/05/92	KAMINE/BESICORP CORNING L.P. TURBINE, COMBUSTION (79 MW)	0.0080 LB/MMBTU
FL-0080	12/14/92	AUBURNDALE POWER PARTNERS, LP TURBINE, GAS	0.0136 LB/MMBTU
OH-0218	08/12/92	CNG TRANSMISSION TURBINE (NATURAL GAS) (3)	0.0350 LB/MMBTU
RI-0010	04/13/92	NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO. TURBINE, GAS AND DUCT BURNER	0.0050 LB/MMBTU, ~
NM-0024	05/25/95*	MILAGRO, WILLIAMS FIELD SERVICE TURBINE/COGEN, NATURAL GAS (2)	N/a SEE P2 DES~
CO-0018	05/31/92*	BRUSH COGENERATION PARTNERSHIP TURBINE	9.9000 T/YR
CO-0018	05/31/92*	BRUSH COGENERATION PARTNERSHIP TURBINE	9.9000 T/YR
CO-0019	05/31/92*	COLORADO POWER PARTNERSHIP TURBINES, 2 NAT GAS & 2 DUCT BURNERS	12.4000 T/YR
CO-0019	05/31/92*	COLORADO POWER PARTNERSHIP TURBINES, 2 NAT GAS & 2 DUCT BURNERS	12.4000 T/YR
SC-0031	01/07/94	BMW MANUFACTURING CORPORATION TURBINE, NAT.GAS FIRED (3 -1 SPARE) AND 2 BOILERS	3.7900 TPY

Note: * Indicates date initially inserted into RBLC database.

~ Units have been truncated. See RBLC database.

Source: EPA, 1997.

Table 4-6. CT PM RBLC Ranking - Fuel Oil

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT
*** NONSTANDARD UNITS REPORT ***

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RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
		Process Type: 15.006 Fuel Oil	
		Pollutant: PM	
HI-0013	12/03/91	MAUI ELECTRIC COMPANY, LTD. TURBINE, FUEL OIL #2	0.0450 GR/DSCF
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, FUEL OIL	10.0000 LB/H
FL-0057	10/18/91	FLORIDA POWER GENERATION TURBINE, OIL, 6 EACH	15.0000 LB/H
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, FUEL OIL	15.0000 LB/H
FL-0083	08/17/92	FLORIDA POWER CORPORATION TURBINE, OIL	15.0000 LB/H
FL-0072	05/17/93	TIGER BAY LP TURBINE, OIL	17.0000 LB/H
FL-0082	02/25/94	FLORIDA POWER CORPORATION POLK COUNTY SITE TURBINE, FUEL OIL (2)	17.0000 LB/H
FL-0083	08/17/92	FLORIDA POWER CORPORATION TURBINE, OIL	17.0000 LB/H
FL-0053	03/14/91	FLORIDA POWER AND LIGHT TURBINE, OIL, 4 EACH	58.0000 LB/H
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, OIL, 2 EACH	60.6000 LB/H
HI-0014	02/12/92	HAWAII ELECTRIC LIGHT CO., INC. TURBINE, FUEL OIL #2	19.7000 LB/HR
HI-0015	07/28/92	MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING TURBINE, COMBINED-CYCLE COMBUSTION	19.7000 LB/HR
GA-0053	07/28/92	HARTWELL ENERGY LIMITED PARTNERSHIP TURBINE, OIL FIRED (2 EACH)	0.0156 LB/M BTU
FL-0081	02/24/94	TECO POLK POWER STATION TURBINE, FUEL OIL	0.0090 LB/MMBTU

Table 4-6. CT PM RBLC Ranking - Fuel Oil (Page 2 of 2)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

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RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
GA-0052	02/12/92	SAVANNAH ELECTRIC AND POWER CO. TURBINES, 8	0.0120 LB/MMBTU
FL-0045	07/25/91	CHARLES LARSEN POWER PLANT TURBINE, OIL, 1 EACH	0.0250 LB/MMBTU
FL-0054	11/20/91	LAKE COGEN LIMITED TURBINE, OIL, 2 EACH	0.0260 LB/MMBTU
NJ-0013	04/01/91	LAKWOOD COGENERATION, L.P. TURBINES (#2 FUEL OIL) (2)	0.0260 LB/MMBTU
FL-0080	12/14/92	AUBURNDALE POWER PARTNERS, LP TURBINE, OIL	0.0472 LB/MMBTU

Source: EPA, 1997.

Table 4-7. Florida BACT PM Emission Limitation Summary for CTs

Permit Date	Source Name	Turbine Size		Fuel Type	PM Emission Limit		Control Technology
		MW	MMBtu/hr		lb/hr	lb/MMBtu	
08/17/92	Orlando Cogeneration, L.P.	79	857	Gas	9.0	0.01	Combustion design and clean fuels
08/17/92	Florida Power Corp. Intercession City	93	1,144	Oil	15.0	(0.0131)	Combustion design and clean fuels
		186	2,032	Oil	17.0	(0.0084)	Combustion design and clean fuels
12/17/92	Auburndale Power Partners	104	1,214	Gas	10.5	0.0134	Combustion design and clean fuels
			1,170	Oil	36.8	0.0472	Combustion design and clean fuels
04/09/93	Kissimmee Utility Authority	40	367	Gas	(9.0)	0.0245	Combustion design and clean fuels
			371	Oil	(12.0)	0.0323	Combustion design and clean fuels
		80	869	Gas	(8.7)	0.0100	Combustion design and clean fuels
			928	Oil	(15.0)	0.0162	Combustion design and clean fuels
05/17/93	Central Florida Power, L.P. (Tiger Bay - Destec)	184	1,615	Gas	9.0	(0.0056)	Combustion design and clean fuels
			1,850	Oil	17.0	(0.0092)	Combustion design and clean fuels
09/28/93	Florida Gas Transmission	N/A	32	Gas	0.64	N/A	Combustion design and clean fuels
02/24/94	Tampa Electric Company Polk Power Station	260	1,755	Syngas	17.0	0.013	Combustion design and clean fuels
			1,765	Oil	17.0	0.009	Combustion design and clean fuels
02/25/94	Florida Power Corp. Polk County Site	235	1,510	Gas	9.0	0.006	Combustion design and clean fuels
			1,730	Oil	17.0	0.010	Combustion design and clean fuels
03/07/95	Orange Cogeneration, L.P.	39	388	Gas	5.0	(0.013)	Combustion design and clean fuels
02/24/94	Tampa Electric Company Polk Power Station	260	1,755	Syngas	17.0	0.013	Combustion design and clean fuels
			1,765	Oil	17.0	0.009	Combustion design and clean fuels
07/20/94	Pasco Cogen, Limited	42	403	Gas	5.0	0.0065	Combustion design and clean fuels
			406	Oil	20.0	0.026	Combustion design and clean fuels
04/11/95	Gainesville Regional Utilities Deerhaven CT3	74	971	Gas	7.0	(0.0072)	Combustion design and clean fuels
			991	Oil	15.0	(0.0151)	Combustion design and clean fuels

Note: () = calculated values.

Source: FDEP, 1997.

Table 4-8. RBLC PM Summary - Natural Gas-Fired Duct Burners

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	BURNER SIZE		PM EMISSION LIMITS			CONTROL DESCRIPTION	COST EFFECTIVENESS			BASIS
						VALUE	UNITS	(LB/HR)	(LB/MMBTU)	(TPY)		EFF.	(\$)	YEAR	
FL	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	DUCT BURNER, GAS	100.00	MMBTU/H		0.1000		NOT REQUIRED				BACT-PSD
	FL-0072	TIGER BAY LP	6/17/93	1/13/95	DUCT BURNER, GAS	100.00	MMBTU/H		0.1000		GOOD COMBUSTION PRACTICES				BACT-PSD
NY	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/16/92	9/13/94	DUCT BURNERS (2)	206.00	MMBTU/HR (EACH)		0.0181		LOW NOX BURNER AND SCR				BACT-OTHER
	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/16/92	9/13/94	DUCT BURNER	123.00	MMBTU/HR		0.0910		LOW NOX BURNER				BACT-OTHER
	NY-0046	SARANAC ENERGY COMPANY	7/31/92	9/13/94	BURNERS, DUCT (2)	553.00	MMBTU/HR EACH		0.0600		SCR				BACT-OTHER
	NY-0046	KAMINEBESICORP CORNING L.P.	11/5/92	9/13/94	BURNER, DUCT	90.00	MMBTU/HR		0.1000		LOW NOX BURNER				BACT-OTHER
	NY-0057	MEGAN-RACINE ASSOCIATES, INC	6/5/89	3/30/95	COEN DUCT BURNER	40.00	MMBTU/HR		0.1000		FUEL SPEC. NATURAL GAS ONLY				BACT-OTHER
	NY-0061	ANITEC COGEN PLANT	7/7/93	4/27/95	DUCT BURNER EP #00001	70.00	MMBTU/HR		0.1000		ZINK LOW NOX DUCT BURNER	30.000			BACT-OTHER
	NY-0063	TBG COGEN COGENERATION PLANT	6/5/90	4/27/95	COEN DUCT BURNER	181.80	MMBTU/HR		0.2000		FUEL SPEC. NATURAL GAS ONLY				BACT-OTHER
	NY-0064	INDECK-OSWEGO ENERGY CENTER	10/6/94	4/27/95	DUCT BURNER	30.00	MMBTU/HR		0.1170		FUEL SPEC. NATURAL GAS ONLY				BACT-OTHER
	NY-0066	INDECK ENERGY COMPANY	6/12/93	3/31/95	DUCT BURNER EP #00001	100.00	MMBTU/HR		0.1000		FUEL SPEC. NATURAL GAS ONLY				NSPS
	NY-0073	LOCKPORT COGEN FACILITY	7/14/93	4/27/95	(3) DUCT BURNER (EP #S 00001-00003)	94.10	MMBTU/HR		0.2000		FUEL SPEC. NATURAL GAS ONLY				BACT-OTHER
	NY-0075	PILGRIM ENERGY CENTER		4/27/95	(2) DUCT BURNER (EP #S 00001&2)	214.10	MMBTU/HR		0.0120		FUEL SPEC. NATURAL GAS ONLY				BACT-OTHER
	NY-0077	INDECK-YERKES ENERGY SERVICES	6/24/92	3/31/95	DUCT BURNER (EP #00001)	20.00	MMBTU/HR		0.1100		FUEL SPEC. NATURAL GAS ONLY				BACT-OTHER
	NY-0080	PROJECT ORANGE ASSOCIATES	12/1/93	3/31/95	STACK (TURBINE AND DUCT BURNER)	715.00	MMBTU/HR	69.0000	0.0965		NO CONTROLS FOR NOX ON STACK *SEE TURBINE NOX DATA				BACT-OTHER
							MAXIMUM		69.0000	0.2000					
							MINIMUM		69.0000	0.0120					
						MEDIAN		69.0000	0.1000						
						NUMBER OF ENTRIES		1	15	0					

Source: EPA, 1997.

Table 4-9. Florida BACT PM Emission Limitation Summary for Natural Gas-Fired CT Duct Burners

Permit Date	Source Name	Burner Size (MMBtu/hr)	PM Emission Limit		Control Technology
			lb/hr	lb/MMBtu	
08/17/92	Orlando Cogeneration, L.P.	122	1.2	0.01	Combustion design and clean fuels
05/17/93	Central Florida Power, L.P. (Tiger Bay - Destec)	100	(1.0)	0.01	Combustion design and clean fuels
07/20/94	Pasco Cogen, Limited	90	2.6	0.006	Combustion design and clean fuels

Note: () = calculated values.

Source: FDEP, 1997.

Table 4-10. Duct Burner PM RBLC Ranking - Natural Gas

REPORT DATE: 01/20/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

PAGE 1

Process Type: 11.005 Natural Gas Combustion

Pollutant: NOX

RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
NY-0075	09/14/94*	PILGRIM ENERGY CENTER (2) DUCT BURNER (EP #S 00001&2)	0.0120 LB/MMBTU
NY-0046	07/31/92	SARANAC ENERGY COMPANY BURNERS, DUCT (2)	0.0800 LB/MMBTU
FL-0054	11/20/91	LAKE COGEN LIMITED DUCT BURNER, GAS	0.1000 LB/MMBTU
FL-0072	05/17/93	TIGER BAY LP DUCT BURNER, GAS	0.1000 LB/MMBTU
NY-0048	11/05/92	KAMINE/BESICORP CORNING L.P. BURNER, DUCT	0.1000 LB/MMBTU
NY-0057	08/05/89	MEGAN-RACINE ASSOCIATES, INC COEN DUCT BURNER	0.1000 LB/MMBTU
NY-0063	08/05/90	TBG COGEN COGENERATION PLANT COEN DUCT BURNER	0.2000 LB/MMBTU
NY-0045	06/18/92	SELKIRK COGENERATION PARTNERS, L.P. DUCT BURNERS (2)	0.0181 LB/MMBTU G
NY-0073	07/14/93	LOCKPORT COGEN FACILITY (3) DUCT BURNER (EP #S 00001-00003)	0.2000 LB/MMBTU, -
NY-0077	06/24/92	INDECK-YERKES ENERGY SERVICES DUCT BURNER (EP #00001)	0.1100 LB/MMBTU, -
NY-0064	10/06/94	INDECK-OSWEGO ENERGY CENTER DUCT BURNER	0.1170 LB/MMBTU, -
NY-0061	07/07/93	ANITEC COGEN PLANT DUCT BURNER EP #00001	0.1000 LB/MMBTU, -
NY-0066	05/12/93	INDECK ENERGY COMPANY DUCT BURNER EP #00001	0.1000 LB/MMBTU, -

Table 4-10. Duct Burner PM RBLC Ranking - Natural Gas (Page 2 of 2)

REPORT DATE: 01/20/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

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RBLCID	Permit Date	Facility / Process	Emission Limit/Unit
NY-0045	06/18/92	SELKIRK COGENERATION PARTNERS, L.P. DUCT BURNER	0.0910 LB/MMBTU, -
NY-0080	12/01/93	PROJECT ORANGE ASSOCIATES STACK (TURBINE AND DUCT BURNER)	26.0000 PPM, 69 LB-

Note: * Indicates date initially inserted into RBLC database.

- Units have been truncated. See RBLC database.-

Source: EPA, 1997

All determinations are based on the use of clean fuels and good combustion techniques.

Use of clean fuels (natural gas and low-sulfur distillate fuel oil) and combustion controls are proposed as BACT for PM/PM₁₀ and heavy metals. Specific BACT emission limits proposed for the Panda-Kathleen cogeneration project GE LM6000 PD CT and duct burner are summarized in Table 4-11. The proposed BACT technology and emission limits are consistent with previous determinations both within Florida and on the national level. It is noted that PM/PM₁₀ emissions as measured by EPA Reference Method 5 include H₂SO₄ mist. A significant portion of the total distillate fuel oil PM/PM₁₀ emission rate is comprised of H₂SO₄, i.e., approximately 50 percent. PM/PM₁₀ emission rates excluding H₂SO₄ are also shown in Table 4-11.

4.4 UPDATE OF BACT ANALYSIS FOR PRODUCTS OF INCOMPLETE COMBUSTION

4.4.1 CONTROL TECHNOLOGIES AND ENERGY AND ENVIRONMENTAL IMPACTS

Products of incomplete combustion subject to BACT review consist of CO only because the maximum total annual VOC emission rate for the GE LM6000 PD/duct burner system is less than the PSD significance level. The general discussion of control technology review for products of incomplete combustion, specific available control technologies, and energy and environmental impacts remain essentially unchanged from that provided in the June 1994 permit application; reference Sections 4.4.1 and 4.4.2 of the June 1994 application. Updated information regarding economic impacts and proposed BACT limits for CO are provided in the following sections.

Table 4-11. Proposed PM BACT Emission Limits

	Pollutant	Proposed BACT Emission Limits ¹	
		lb/hr	lb/MMBtu
A. GE LM6000 PD CT			
Natural gas	PM/PM ₁₀ (including H ₂ SO ₄)	3.18	0.0088
	PM/PM ₁₀ (excluding H ₂ SO ₄)	3.00	0.0084
Distillate fuel oil	PM/PM ₁₀ (including H ₂ SO ₄)	6.33	0.0168
	PM/PM ₁₀ (excluding H ₂ SO ₄)	3.00	0.0090
	Inorganic arsenic	0.0018	4.2 x 10 ⁻⁶
B. Duct Burner			
Natural gas	PM/PM ₁₀ (including H ₂ SO ₄)	2.62	0.0104
	PM/PM ₁₀ (excluding H ₂ SO ₄)	2.52	0.0100

¹ Maximum rates for all operating scenarios.

Sources: Stewart & Stevenson, 1997.
ECT, 1997.

4.4.2 ECONOMIC IMPACTS

The Panda-Kathleen cogeneration facility will use natural gas as the primary fuel with No. 2 distillate fuel oil serving as the backup fuel. The natural gas annual capacity factor is 100 percent. The distillate fuel oil annual capacity factor is 5.7 percent; i.e., 500 hr/yr at baseload. The duct burner will be fired solely with natural gas for no more than 4,000 hr/yr.

The annual baseline CO emission rate for the GE LM6000 PD CT and duct burner system, based on 25 ppmvd for the CT (natural gas- and oil-firing) and 0.080 lb/MMBtu for the duct burner, is much lower than the rate for the GE 7EA CT shown in the June 1994 permit application; i.e., 188.3 tons per year (tpy) for the GE LM6000 PD CT/duct burner system vs. 239.5 tpy for the GE 7EA CT. Based on a controlled emission exhaust CO concentration of 10 ppmvd at 15 percent O₂ (the level typically required for oxidation catalyst systems located in nonattainment areas), annual controlled emissions for the GE LM6000 PD CT/duct burner system are projected to be 51.3 tpy. Base case and controlled emission rates are summarized in Table 4-12. Oxidation control system capital and annualized costs for the GE LM6000 PD CT/duct burner system were approximated from the costs previously developed for the GE 7EA CT by assuming that control costs are proportional to exhaust flow rates. Based on vendor data, the exhaust flow rate at 100 percent load, 59 °F for the GE LM6000 PD CT/duct burner system is 2.3 times lower than the rate previously calculated for the GE 7EA CT.

Using the premises mentioned above, the updated cost effectiveness of oxidation catalyst for controlling CO emissions is estimated to be \$2,463 per ton of CO removed in 1994 dollars. This value is provided as an approximation only for the purpose of updating the prior BACT analysis. From an air quality perspective, the only benefit of CO oxidation catalyst control is to prevent localized CO hot spots because the catalyst does not remove CO but rather simply accelerates the natural

Table 4-12. Summary of CO BACT Analysis

Control Option	Emission Impacts			Economic Impacts			Energy Impacts	Environmental Impacts	
	Emission Rates		Emission Reduction	Installed Capital Cost	Total Annualized Cost	Cost Effectiveness Over Baseline	Increase Over Baseline	Toxic Impact	Adverse Envir. Impact
	(lb/hr)	(tpy)	(tpy)	(\$)	(\$/yr)	(\$/ton)	(MMBtu/yr)	(Y/N)	(Y/N)
Oxidation catalyst	11.7	51.3	137.0	791,025	337,403	2,463	2,708	Y	Y
Baseline	43.0	188.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Basis: GE LM6000 PD CT/Duct Burner System, 100 percent load, 59°F ambient temperature, 8,260 hr/yr gas-fired, 500 hr/yr oil-fired.

Source: ECT, 1997.

atmospheric oxidation of CO to CO₂. The location of the Panda-Kathleen cogeneration project (Polk County, Florida) is classified attainment for all criteria pollutants, including CO. Dispersion modeling of CO emissions from the Panda-Kathleen cogeneration facility demonstrate that maximum CO ambient impacts will be insignificant. Based on the high control costs, use of oxidation catalyst technology to control CO emissions is not considered to be economically feasible. Results of the oxidation catalyst economic analysis are summarized in Table 4-12.

4.4.3 PROPOSED BACT EMISSION LIMITATIONS

The summaries of historical emission limitations for CO previously included in Section 4.4.4 of the June 1994 permit application have been updated to reflect the latest 5 years of available determinations as obtained from EPA's RBLC database. Tables 4-13 and 4-14 contain RBLC CO determinations for natural gas and oil-fired CTs, respectively. Ranked BACT CO limits are provided in Tables 4-15 and 4-16 for natural gas- and oil-fired CTs, respectively. Recent Florida CO BACT determinations for gas turbines are summarized in Table 4-17.

Tables 4-18 and 4-19 provide RBLC and Florida CO determinations for natural gas-fired duct burners, respectively. Ranked BACT CO limits are provided in Table 4-20 for natural gas-fired duct burners.

For natural gas firing, CO emissions range from 0.0055 to 0.4908 lb/MMBtu with a median rate of 0.0573 lb/MMBtu. The range for distillate fuel oil-fired turbines is 0.0423 to 0.2049 lb MMBtu with a median rate of 0.0566 lb/MMBtu. BACT CO determinations expressed as a concentration (corrected to 15 percent oxygen) range from 1.8 to 60 ppmvd with a median of 20.0 ppmvd for gas-fired units. For distillate-fired turbines, CO concentrations range from 9 to 78 ppmvd with a median of 27.5 ppmvd.

Table 4-13. RBLC CO Summary - Natural Gas-Fired Combustion Turbines

STATE	RBU/CD	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO. EMISSION LIMITS				CONTROL			COST EFFECTIVENESS			BASIS
						VALUE	UNITS	(PPMVD)	(GM/HP HR)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR			
AL	AL-0074	FLORIDA GAS TRANSMISSION COMPANY	8/5/93	6/12/94	TURBINE, NATURAL GAS	12,600.00	BHP		0.4200				AIR-TO-FUEL RATIO CONTROL, DRY COMBUSTION CONTROLS					BACT-PSD
AZ	AZ-0010	EL PASO NATURAL GAS	10/23/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,600.00	HP	10.50					FUEL SPEC: LEAN FUEL MIX					BACT-PSD
	AZ-0011	EL PASO NATURAL GAS	10/23/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,600.00	HP	10.50					FUEL SPEC: LEAN FUEL MIX					BACT-PSD
	AZ-0012	EL PASO NATURAL GAS	10/18/91	7/20/94	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12,000.00	HP	60.00					LEAN BURN					BACT-PSD
CA	CA-0418	SOUTHERN CALIFORNIA GAS	10/29/91	8/4/93	TURBINE, GAS-FIRED	47.64	MMBTU/H	7.74					HIGH TEMPERATURE OXIDATION CATALYST	80.0				BACT-PSD
	CA-0463	SOUTHERN CALIFORNIA GAS	10/29/91	5/1/92	TURBINE, GAS FIRED, SOLAR MODEL H	5,800.00	HP	7.74					HIGH TEMP OXIDATION CATALYST	80.0				BACT-PSD
	CA-0613	UNOCAL	7/18/89	12/5/94	TURBINE, GAS (SEE NOTES)			10.00					OXIDATION CATALYST	75.0				BACT-OTHER
CO	CO-0017	THERMO INDUSTRIES, LTD.	2/19/92	3/24/95	TURBINE, GAS FIRED, 6 EACH	248.00	MMBTU/H	25.00					COMBUSTION CONTROL					BACT-PSD
	CO-0019	COLORADO POWER PARTNERSHIP	7/20/94		TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00	MMBTU/H EACH TURBINE	22.40										BACT-PSD
	CO-0020	CIMARRON CHEMICAL	3/25/91	7/20/94	TURBINE #2, GE FRAME 6	33.00	MW						CO CATALYST					OTHER
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/23/91	3/24/95	TURBINE, GAS, 1 EACH	80.00	MW	25.00					COMBUSTION CONTROL					BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, GAS, 4 EACH	400.00	MW	30.00					COMBUSTION CONTROL					BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, CG, 4 EACH	400.00	MW	33.00					COMBUSTION CONTROL					BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, GAS, 4 EACH	240.00	MW	30.00					COMBUSTION CONTROL					BACT-PSD
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, GAS, 2 EACH	42.00	MW	42.00					COMBUSTION CONTROL					BACT-PSD
	FL-0056	ORLANDO UTILITIES COMMISSION	11/5/91	5/14/93	TURBINE, GAS, 4 EACH	33.00	MW	10.00					COMBUSTION CONTROL					BACT-PSD
	FL-0068	ORANGE COGENERATION LP	12/20/93	1/13/95	TURBINE, NATURAL GAS, 3	358.20	MMBTU/H	30.00					GOOD COMBUSTION					BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, GAS	1,614.60	MMBTU/H				0.0303	49.00	GOOD COMBUSTION PRACTICES					BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	889.00	MMBTU/H				0.0621	64.00	GOOD COMBUSTION PRACTICES					BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, NATURAL GAS	367.00	MMBTU/H				0.1090	40.00	GOOD COMBUSTION PRACTICES					BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, GAS	1,214.00	MMBTU/H	15.00					GOOD COMBUSTION PRACTICES					BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, NATURAL GAS (2)	1,510.00	MMBTU/H	25.00					GOOD COMBUSTION PRACTICES					BACT-PSD
	FL-0109	KEY WEST CITY ELECTRIC SYSTEM	9/28/95	5/31/96	TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	23.00	MW	20.00					GOOD COMBUSTION					BACT-PSD
GA	GA-0032	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	1,032.00	MMBTU/HL NAT GAS	9.00					FUEL SPEC: LOW SULFUR FUEL OIL					BACT-PSD
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, GAS FIRED (2 EACH)	1,617.00	M BTU/HR	25.00					FUEL SPEC: CLEAN BURNING FUELS					BACT-PSD
LA	LA-0079	ENRON LOUISIANA ENERGY COMPANY	8/5/91	10/30/91	TURBINE, GAS, 2	39.10	MMBTU/H	60.00					BASE CASE, NO ADDITIONAL CONTROLS					BACT-PSD
	LA-0086	INTERNATIONAL PAPER	2/24/94	4/17/95	TURBINE/HRSG, GAS COGEN	338.00	MM BTU/HR TURBINE				0.4968	165.90	COMBUSTION CONTROL					BACT
	LA-0089	FORMOSA PLASTICS CORPORATION, LOUISIANA	3/2/95	4/17/95	TURBINE/HRSG, GAS COGENERATION	450.00	MM BTU/HR				0.0573	25.80	PROPER OPERATION					BACT-PSD
MA	MA-0015	FEABODY MUNICIPAL LIGHT PLANT	11/30/89	3/24/95	TURBINE, 38 MW NATURAL GAS FIRED	412.00	MMBTU/HR	40.00					GOOD COMBUSTION PRACTICES					BACT-OTHER
MD	MD-0019	BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT		3/24/95	TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140.00	MW	20.00					GOOD COMBUSTION PRACTICES					BACT-PSD
MI	MI-0206	KALAMAZOO POWER LIMITED	12/5/91	3/23/94	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1,805.90	MMBTU/H	20.00					DRY LOW NOX TURBINES					BACT-PSD
NC	NC-0055	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,313.00	MM BTU/HR				0.0449	59.00	COMBUSTION CONTROL					BACT-PSD

Table 4-13. RBLC CO Summary - Natural Gas-Fired Combustion Turbines (Page 2 of 2)

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO. EMISSION LIMITS				CONTROL			COST EFFECTIVENESS			BASIS
						VALUE	UNITS	(PPMVD)	(GM/HP HR)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR			
NJ	NJ-0009	NEWARK BAY COGENERATION PARTNERSHIP	11/1/90	7/7/93	TURBINE, NATURAL GAS FIRED	585.00	MMBTU/HR					0.0055		CATALYTIC OXIDATION	80.0		1990	BACT-PSD
	NJ-0013	LAKWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (NATURAL GAS) (2)	1,190.00	MMBTU/HR (EACH)					0.0290		TURBINE DESIGN				BACT-OTHER
	NJ-0017	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	6/9/93	5/29/95	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617.00	MMBTU/HR (EACH)	1.80						OXIDATION CATALYST				OTHER
NM	NM-0021	WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	10/29/93	3/2/94	TURBINE, GAS-FIRED	11,257.00	HP	50.00						COMBUSTION CONTROL				BACT-PSD
	NM-0022	MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	1/11/93	4/26/93	TURBINES, NATURAL GAS (2)	5,500.00	HP				13.20			LEAN-PREMIKED COMBUSTION TECHNOLOGY.	60.0			BACT-PSD
	NM-0024	MILAGRO, WILLIAMS FIELD SERVICE		5/29/93	TURBINE/COGEN, NATURAL GAS (2)	900.00	MMCP/DAY	27.60										BACT-PSD
NY	NY-0044	BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	6/6/93	6/30/93	TURBINE, NATURAL GAS FIRED	240.00	MW	4.00										LAER
	NY-0046	SARANAC ENERGY COMPANY	7/1/92	9/12/94	TURBINES, COMBUSTION (2) (NATURAL GAS)	1,123.00	MMBTU/HR (EACH)	3.00						OXIDATION CATALYST				BACT-OTHER
	NY-0050	SITHE/INDEPENDENCE POWER PARTNERS	11/24/92	9/13/94	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	2,133.00	MMBTU/HR (EACH)	13.00						COMBUSTION CONTROLS				BACT-OTHER
OH	OH-0218	CNG TRANSMISSION	8/12/92	4/5/95	TURBINE (NATURAL GAS) (3)	5,500.00	HP (EACH)		0.0150				FUEL SPEC: USE OF NATURAL GAS				OTHER	
OR	OR-0010	PORTLAND GENERAL ELECTRIC CO.	6/11/94	6/1/95	TURBINES, NATURAL GAS (2)	1,720.00	MMBTU	16.00						GOOD COMBUSTION PRACTICES				BACT-PSD
	OR-0011	HERMESTON GENERATING CO.	4/1/94	5/1/95	TURBINES, NATURAL GAS (2)	1,696.00	MMBTU	16.00						GOOD COMBUSTION PRACTICES				BACT-PSD
PA	PA-0083	NORTHERN CONSOLIDATED POWER	5/3/91	7/20/94	TURBINES, GAS, 2	34.50	KW EACH						OXIDATION CATALYST, CO LIMIT = 110 TPY	90.0	1,090		OTHER	
RI	RI-0010	NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	4/13/92	5/31/92	TURBINE, GAS AND DUCT BURNER	1,360.00	MMBTU/H EACH	11.00										BACT-PSD
	RI-0012	ALGONQUIN GAS TRANSMISSION CO.	7/31/91	5/31/92	TURBINE, GAS, 2	49.00	MMBTU/H				0.1140			GOOD COMBUSTION PRACTICES				BACT-OTHER
WA	WA-0027	SUMAS ENERGY INC.	5/25/91	8/1/91	TURBINE, NATURAL GAS	88.00	MW	6.00					CO CATALYST	80.0				BACT-PSD
							MAXIMUM	50.00	0.4200	0.4908	155.9000							
							MINIMUM	1.80	0.0150	0.0055	13.2000							
							MEDIAN	20.00	0.2175	0.0373	49.0000							
							NUMBER OF ENTRIES	34	2	9	7							

Source: EPA, 1997.

Table 4-14. RBLC CO Summary - Oil-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		CO EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS					
						VALUE	UNITS	(PPMVD)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR						
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, OIL, 1 EACH	80.00	MW	25.00			COMBUSTION CONTROL				BACT-PSD					
	FL-0052	FLORIDA POWER AND LIGHT	6/5/91	3/24/95	TURBINE, OIL, 2 EACH	400.00	MW	33.00			COMBUSTION CONTROL				BACT-PSD					
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, OIL, 4 EACH			33.00			COMBUSTION CONTROL				BACT-PSD					
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, OIL, 2 EACH	42.00	MW	78.00			COMBUSTION CONTROL				BACT-PSD					
	FL-0056	ORLANDO UTILITIES COMMISSION	11/5/91	5/14/93	TURBINE, OIL, 4 EACH	35.00	MW	10.00			COMBUSTION CONTROL				BACT-PSD					
	FL-0057	FLORIDA POWER GENERATION	10/18/91	3/24/95	TURBINE, OIL, 6 EACH	92.90	MW			54.00	COMBUSTION CONTROL				BACT-PSD					
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, OIL	1,849.90	MMBTU/H		0.0532	98.40	GOOD COMBUSTION PRACTICES				BACT-PSD					
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	928.00	MMBTU/H		0.0700	65.00	GOOD COMBUSTION PRACTICES				BACT-PSD					
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	371.00	MMBTU/H		0.2049	76.00	GOOD COMBUSTION PRACTICES				BACT-PSD					
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, OIL	1,170.00	MMBTU/H	25.00			GOOD COMBUSTION PRACTICES				BACT-PSD					
	FL-0081	TECO POLK POWER STATION	2/24/94	3/24/95	TURBINE, FUEL OIL	1,765.00	MMBTU/H	40.00			GOOD COMBUSTION				BACT-PSD					
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, FUEL OIL (2)	1,730.00	MMBTU/H	30.00			GOOD COMBUSTION PRACTICES				BACT-PSD					
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,029.00	MMBTU/H		0.0525	54.00	GOOD COMBUSTION PRACTICES				BACT-PSD					
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,866.00	MMBTU/H		0.0423	79.00	GOOD COMBUSTION PRACTICES				BACT-PSD					
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	972.00	MMBTU/H, #2 OIL	9.00			FUEL SPEC. LOW SULFUR FUEL OIL				BACT-PSD					
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, OIL FIRED (2 EACH)	1,840.00	M BTU/HR	25.00			FUEL SPEC. CLEAN BURNING FUELS				BACT-PSD					
HI	HI-0013	MAUI ELECTRIC COMPANY, LTD.	12/3/91	3/24/95	TURBINE, FUEL OIL #2	28.00	MW				GOOD COMBUSTION PRACTICES				BACT-PSD					
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			26.80	COMBUSTION DESIGN				BACT-PSD					
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			56.40	COMBUSTION DESIGN				BACT-PSD					
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			181.00	COMBUSTION DESIGN				BACT-PSD					
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			475.60	COMBUSTION DESIGN				BACT-PSD					
	HI-0015	MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	7/28/92	3/24/95	TURBINE, COMBINED-CYCLE COMBUSTION	28.00	MW			26.90	COMBUSTION TECHNOLOGY/DESIGN				BACT-OTHER					
NC	NC-0055	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,247.00	MM BTU/HR			60.00	COMBUSTION CONTROL				BACT-PSD					
NJ	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (#2 FUEL OIL) (2)	1,190.00	MMBTU/HR (EACH)		0.0600		TURBINE DESIGN					BACT-OTHER				
																	MAXIMUM	78.00	0.2049	475.60
																	MINIMUM	9.00	0.0423	26.80
																	MEDIAN	27.50	0.0566	62.50
																	NUMBER OF ENTRIES	10	6	12

Source: EPA, 1997.

Table 4-15...CT CO RBLG Ranking - Natural Gas

REPORT DATE: 01/16/97

RACT/BACT/LAER CLEARINGHOUSE
RANKING BY STANDARD EMISSION LIMIT

PREFACE

Search Criteria:

PROCTYPE = 15.004 (Natural Gas) AND
PROCESS = TURBINE AND
POLLUTANT = CO

Part 1 presents a ranking based on emission limits expressed in the standard units.

Part 2, if present, is a listing of related processes that have not filed standard units. The processes are grouped by reported units and ranked for like units.

Table 4-15. CT CO RBLC Ranking - Natural Gas (Page 2 of 5)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 1

Process Type: 15.004 Natural Gas

Process Name: TURBINE

Pollutant: CO

Standard Unit: PPM @ 15% O2

Processes/Pollutants Meeting Criteria: 48

Processes/Pollutants Not Included: (see Note) 13

Average for Processes/Pollutants: 21.3222

Minimum for Processes/Pollutants: 1.8000

Maximum for Processes/Pollutants: 60.0000

RBLCID	Permit Date	Facility / Process	Emission Limit
NJ-0017	06/09/93	NEWARK BAY COGENERATION PARTNERSHIP, L.P. TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	1.8000
NY-0046	07/31/92	SARANAC ENERGY COMPANY TURBINES, COMBUSTION (2) (NATURAL GAS)	3.0000
NY-0044	06/06/95	BROOKLYN NAVY YARD COGENERATION PARTNERS L.P. TURBINE, NATURAL GAS FIRED	4.0000
WA-0027	06/25/91	SUMAS ENERGY INC. TURBINE, NATURAL GAS	6.0000
CA-0418	10/29/91	SOUTHERN CALIFORNIA GAS TURBINE, GAS-FIRED	7.7400
CA-0463	10/29/91	SOUTHERN CALIFORNIA GAS TURBINE, GAS FIRED, SOLAR MODEL H	7.7400
GA-0052	02/12/92	SAVANNAH ELECTRIC AND POWER CO. TURBINES, 8	9.0000
CA-0613	07/18/89	UNOCAL TURBINE, GAS (SEE NOTES)	10.0000
FL-0056	11/05/91	ORLANDO UTILITIES COMMISSION TURBINE, GAS, 4 EACH	10.0000
AZ-0010	10/25/91	EL PASO NATURAL GAS TURBINE, GAS, SOLAR CENTAUR H	10.5000
AZ-0011	10/25/91	EL PASO NATURAL GAS TURBINE, GAS, SOLAR CENTAUR H	10.5000

Table 4-15. CT CO RBLC Ranking - Natural Gas (Page 3 of 5)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 2

RBLCID	Permit Date	Facility / Process	Emission Limit
RI-0010	04/13/92	NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO. TURBINE, GAS AND DUCT BURNER	11.0000
NJ-0013	04/01/91	LAKEWOOD COGENERATION, L.P. TURBINES (NATURAL GAS) (2)	12.0000
NY-0050	11/24/92	SITHE/INDEPENDENCE POWER PARTNERS TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	13.0000
OR-0010	05/31/94	PORTLAND GENERAL ELECTRIC CO. TURBINES, NATURAL GAS (2)	15.0000
OR-0011	04/01/94	HERMISTON GENERATING CO. TURBINES, NATURAL GAS (2)	15.0000
FL-0080	12/14/92	AUBURNDALE POWER PARTNERS, LP TURBINE,GAS	15.0000
MD-0019	07/13/93*	BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	20.0000
FL-0109	09/28/95	KEY WEST CITY ELECTRIC SYSTEM TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	20.0000
MI-0206	12/03/91	KALAMAZOO POWER LIMITED TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	20.0000
CO-0019	05/31/92*	COLORADO POWER PARTNERSHIP TURBINES, 2 NAT GAS & 2 DUCT BURNERS	22.4000
CO-0017	02/19/92	THERMO INDUSTRIES, LTD. TURBINE, GAS FIRED, 5 EACH	25.0000
FL-0045	07/25/91	CHARLES LARSEN POWER PLANT TURBINE, GAS, 1 EACH	25.0000
FL-0082	02/25/94	FLORIDA POWER CORPORATION POLK COUNTY SITE TURBINE, NATURAL GAS (2)	25.0000
GA-0053	07/28/92	HARTWELL ENERGY LIMITED PARTNERSHIP TURBINE, GAS FIRED (2 EACH)	25.0000
NM-0024	05/25/95*	MILAGRO, WILLIAMS FIELD SERVICE TURBINE/COGEN, NATURAL GAS (2)	27.6000

Table 4-15. CT CO RBLC Ranking - Natural Gas (Page 4 of 5)

REPORT DATE: 01/16/97		RANKING BY STANDARD EMISSION LIMIT		PAGE 3
RBLCID	Permit Date	Facility / Process	Emission Limit	
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, GAS, 4 EACH	30.0000	
FL-0053	03/14/91	FLORIDA POWER AND LIGHT TURBINE, GAS, 4 EACH	30.0000	
FL-0068	12/30/93	ORANGE COGENERATION LP TURBINE, NATURAL GAS, 2	30.0000	
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, CG, 4 EACH	33.0000	
MA-0015	11/30/89	PEABODY MUNICIPAL LIGHT PLANT TURBINE, 38 MW NATURAL GAS FIRED	40.0000	
FL-0054	11/20/91	LAKE COGEN LIMITED TURBINE, GAS, 2 EACH	42.0000	
NM-0021	10/29/93	WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR TURBINE, GAS-FIRED	50.0000	
AZ-0012	10/18/91	EL PASO NATURAL GAS TURBINE, NAT. GAS TRANSM., GE FRAME 3	60.0000	
LA-0079	08/05/91	ENRON LOUISIANA ENERGY COMPANY TURBINE, GAS, 2	60.0000	

Note: Standard emission limits that are zero (i.e., value is missing) are not included in statistics or report above. Refer to Exception report on next page.

* Indicates date initially inserted into RBLC database.

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT
*** NONSTANDARD UNITS REPORT ***

PAGE 4

Process Type: 15.004 Natural Gas

Process Name: TURBINE

Pollutant: CO

RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
OH-0218	08/12/92	CNG TRANSMISSION TURBINE (NATURAL GAS) (3)	0.0150 G/HP-HR
AL-0074	08/05/93	FLORIDA GAS TRANSMISSION COMPANY TURBINE, NATURAL GAS	0.4200 GM/HP HR
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, NATURAL GAS	40.0000 LB/H
FL-0072	05/17/93	TIGER BAY LP TURBINE, GAS	49.0000 LB/H
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, NATURAL GAS	54.0000 LB/H
LA-0089	03/02/95	FORMOSA PLASTICS CORPORATION, LOUISIANA TURBINE/HRSG, GAS COGENERATION	25.8000 LB/HR
NC-0055	12/20/91	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STAT TURBINE, COMBUSTION	59.0000 LB/HR
LA-0086	02/24/94	INTERNATIONAL PAPER TURBINE/HRSG, GAS COGEN	165.9000 LB/HR
NJ-0009	11/01/90	NEWARK BAY COGENERATION PARTNERSHIP TURBINE, NATURAL GAS FIRED	0.0055 LB/MMBTU
RI-0012	07/31/91	ALGONQUIN GAS TRANSMISSION CO. TURBINE, GAS, 2	0.1140 LB/MMBTU
NM-0022	01/11/95	MARATHON OIL CO. - INDIAN BASIN N.G. PLAN TURBINES, NATURAL GAS (2)	13.2000 LBS/HR
PA-0083	05/03/91	NORTHERN CONSOLIDATED POWER TURBINES, GAS, 2	110.0000 T/YR
CO-0020	03/25/91	CIMARRON CHEMICAL TURBINE #2, GE FRAME 6	250.0000 T/YR, LESS

Note: Units have been truncated. See RBLC database.

Source: EPA, 1997.

Table 4-16: CT CO/RBLC Ranking - Fuel Oil

REPORT DATE: 01/16/97 RACT/BACT/LAER CLEARINGHOUSE
RANKING BY STANDARD EMISSION LIMIT PREFACE

Search Criteria:

PROCTYPE = 15.006 (Fuel Oil) AND
PROCESS = TURBINE AND
POLLUTANT = CO

Part 1 presents a ranking based on emission limits expressed in the standard units.

Part 2, if present, is a listing of related processes that have not filed standard units. The processes are grouped by reported units and ranked for like units.

Table 4-16. CT CO RBLC Ranking - Fuel Oil (Page 2 of 4)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 1

Process Type: 15.006 Fuel Oil

Process Name: TURBINE

Pollutant: CO

Standard Unit: PPM @ 15% O2

Processes/Pollutants Meeting Criteria: 24

Processes/Pollutants Not Included: (see Note) 13

Average for Processes/Pollutants: 30.2727

Minimum for Processes/Pollutants: 9.0000

Maximum for Processes/Pollutants: 78.0000

RBLCID	Permit Date	Facility / Process	Emission Limit
GA-0052	02/12/92	SAVANNAH ELECTRIC AND POWER CO. TURBINES, 8	9.0000
FL-0056	11/05/91	ORLANDO UTILITIES COMMISSION TURBINE, OIL, 4 EACH	10.0000
NJ-0013	04/01/91	LAKWOOD COGENERATION, L.P. TURBINES (#2 FUEL OIL) (2)	25.0000
FL-0045	07/25/91	CHARLES LARSEN POWER PLANT TURBINE, OIL, 1 EACH	25.0000
FL-0080	12/14/92	AUBURNDALE POWER PARTNERS, LP TURBINE, OIL	25.0000
GA-0053	07/28/92	HARTWELL ENERGY LIMITED PARTNERSHIP TURBINE, OIL FIRED (2 EACH)	25.0000
FL-0082	02/25/94	FLORIDA POWER CORPORATION POLK COUNTY SITE TURBINE, FUEL OIL (2)	30.0000
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, OIL, 2 EACH	33.0000
FL-0053	03/14/91	FLORIDA POWER AND LIGHT TURBINE, OIL, 4 EACH	33.0000
FL-0081	02/24/94	TECO POLK POWER STATION TURBINE, FUEL OIL	40.0000

Table 4-16. CT CO RBLC Ranking - Fuel Oil (Page 3 of 4)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT
*** NONSTANDARD UNITS REPORT ***

PAGE 2

RBLCID	Permit Date	Facility / Process	Emission Limit
FL-0054	11/20/91	LAKE COGEN LIMITED TURBINE, OIL, 2 EACH	78.0000

Note: Standard emission limits that are zero (i.e., value is missing) are not included in statistics or report above. Refer to Exception report on next page.

Table 4-16. CT CO RBLC Ranking - Fuel Oil (Page 4 of 4)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT
*** NONSTANDARD UNITS REPORT ***

PAGE 3

Process Type: 15.006 Fuel Oil

Process Name: TURBINE

Pollutant: CO

RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
FL-0057	10/18/91	FLORIDA POWER GENERATION TURBINE, OIL, 6 EACH	54.0000 LB/H
FL-0083	08/17/92	FLORIDA POWER CORPORATION TURBINE, OIL	54.0000 LB/H
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, FUEL OIL	65.0000 LB/H
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, FUEL OIL	76.0000 LB/H
FL-0083	08/17/92	FLORIDA POWER CORPORATION TURBINE, OIL	79.0000 LB/H
FL-0072	05/17/93	TIGER BAY LP TURBINE, OIL	98.4000 LB/H
HI-0014	02/12/92	HAWAII ELECTRIC LIGHT CO., INC. TURBINE, FUEL OIL #2	475.6000 LB/H @ 25--
HI-0014	02/12/92	HAWAII ELECTRIC LIGHT CO., INC. TURBINE, FUEL OIL #2	181.0000 LB/H @ 50--
HI-0014	02/12/92	HAWAII ELECTRIC LIGHT CO., INC. TURBINE, FUEL OIL #2	56.4000 LB/H @ 75--
HI-0015	07/28/92	MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING TURBINE, COMBINED-CYCLE COMBUSTION	26.9000 LB/HR
NC-0055	12/20/91	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STAT TURBINE, COMBUSTION	60.0000 LB/HR
HI-0014	02/12/92	HAWAII ELECTRIC LIGHT CO., INC. TURBINE, FUEL OIL #2	26.8000 LB/HR @ 10--
HI-0013	12/03/91	MAUI ELECTRIC COMPANY, LTD. TURBINE, FUEL OIL #2	N/a SEE NOTES

Note: - Units have been truncated. See RBLC database.-

Source: EPA, 1997.

Table 4-17. Florida BACT CO Emission Limitation Summary for CTs

Permit Date	Source Name	Turbine Size		Fuel Type	CO Emission Limit		Control Technology
		MW	MMBtu/hr		ppmvd	lb/MMBtu	
08/17/92	Orlando Cogeneration, L.P.	79	857	Gas	10	(0.0260)	Good combustion
08/17/92	Florida Power Corp. University of Florida	43	348	Gas	42	(0.1115)	Good combustion
			383	Oil	75	(0.1841)	Good combustion
08/17/92	Florida Power Corp. Intercession City	93 186	1,144	Oil	-	(0.0472)	Good combustion
			2,032	Oil	-	(0.0389)	Good combustion
12/17/92	Auburndale Power Partners	104	1,214	Gas	15	0.0358	Good combustion
			1,170	Oil	30	0.0624	Good combustion
04/09/93	Kissimmee Utility Authority	40	367	Gas	30	(0.1090)	Good combustion
			371	Oil	63	(0.2049)	Good combustion
		80	869	Gas	20	(0.0621)	Good combustion
			928	Oil	20	(0.0700)	Good combustion
05/17/93	Central Florida Power, L.P. (Tiger Bay - Destec)	184	1,615	Gas	15	(0.0302)	Good combustion
			1,850	Oil	30	(0.0532)	Good combustion
02/21/94	Polk Power Partners	84	1,013	Gas	25	(0.0523)	Good combustion
			1,016	Oil	35	(0.0741)	Good combustion
02/24/94	Tampa Electric Company Polk Power Station	260	1,755	Syngas	25	(0.0558)	Good combustion
			1,765	Oil	40	(0.0561)	Good combustion
02/25/94	Florida Power Corp. Polk County Site	235	1,510	Gas	25	(0.0510)	Good combustion
			1,730	Oil	30	(0.0538)	Good combustion
07/20/94	Pasco Cogen, Limited	42	403	Gas	28	(0.1390)	Good combustion
			406	Oil	18	(0.0850)	Good combustion
03/07/95	Orange Cogeneration, L.P.	39	388	Gas	30	(0.0716)	Good combustion

Note: () = calculated values.

Source: FDEP, 1997.

Table 4-18. RBLC CO Summary - Natural Gas-Fired Duct Burners

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	BURNER SIZE		CO EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS	
						VALUE	UNITS	(PPMVD)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR		
CO	CO-0021	NORTHWEST PIPELINE CORPORATION	5/29/92	7/20/94	BURNERS, DUCT, COEN	29.00	MMBTU/HR PER BURNER			4.0000						OTHER
	CO-0023	PHOENIX POWER PARTNERS	5/11/93	3/24/95	GENERATOR, STEAM, W/ DUCT BURNER	50.00	MMBTU/HR				FUEL SPEC: NATURAL GAS COMBUSTION					OTHER
FL	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	DUCT BURNER, GAS	150.00	MMBTU/H		0.2000		NOT REQUIRED				BACT-PSD	
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	DUCT BURNER, GAS	100.00	MMBTU/H			10.0000	GOOD COMBUSTION PRACTICES				BACT-PSD	
NY	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/18/92	9/13/94	DUCT BURNERS (2)	206.00	MMBTU/HR (EACH)		0.0730		COMBUSTION CONTROLS				BACT-OTHER	
	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/18/92	9/13/94	DUCT BURNER	123.00	MMBTU/HR		0.0720		COMBUSTION CONTROL				BACT-OTHER	
	NY-0046	SARANAC ENERGY COMPANY	7/31/92	9/13/94	BURNERS, DUCT (2)	553.00	MMBTU/HR EACH		0.0600		OXIDATION CATALYST				BACT-OTHER	
	NY-0061	ANITEC COGEN PLANT	7/7/93	4/27/95	DUCT BURNER EP #00001	70.00	MMBTU/HR		0.0350	2.5000	NO CONTROLS				BACT-OTHER	
	NY-0064	INDECK-OSWEGO ENERGY CENTER	10/6/94	4/27/95	DUCT BURNER	30.00	MMBTU/HR		0.1280	3.8400	NO CONTROLS				BACT-OTHER	
	NY-0066	INDECK ENERGY COMPANY	5/12/93	3/31/95	DUCT BURNER EP #00001	100.00	MMBTU/HR		0.1400	12.0000	NO CONTROLS				BACT-OTHER	
	NY-0073	LOCKPORT COGEN FACILITY	7/14/93	4/27/95	(3) DUCT BURNER (EP #S 00001-00003)	94.10	MMBTU/HR		0.1000	9.4000	NO CONTROLS				BACT-OTHER	
	NY-0075	PILGRIM ENERGY CENTER		4/27/95	(2) DUCT BURNER (EP #S 00001&2)	214.10	MMBTU/HR		0.1080	17.5000					BACT-OTHER	
	NY-0077	INDECK-YERKES ENERGY SERVICES	6/24/92	3/31/95	DUCT BURNER (EP #00001)	20.00	MMBTU/HR		0.0400	0.8000	NO CONTROLS				BACT-OTHER	
							MAXIMUM			0.2000	17.5000					
						MINIMUM			0.0350	0.8000						
						MEDIAN			0.0865	6.7000						
						NUMBER OF ENTRIES		0		10					8	

Source: EPA, 1997.

Table 4-19. Florida BACT CO Emission Limitation Summary for Natural Gas-Fired CT Duct Burners

Permit Date	Source Name	Burner Size (MMBtu/hr)	CO Emission Limit		Control Technology
			lb/hr	lb/MMBtu	
08/17/92	Orlando Cogeneration, L.P	122	12.2	0.1	Good combustion
08/17/92	Florida Power Corporation University of Florida	187	28.1	0.15	Good combustion
05/17/93	Central Florida Power, L.P. (Tiger Bay - Destec)	100	10	(0.1)	Good combustion
07/20/94	Pasco Cogen, Limited	90	36	0.2	Good combustion

Note: () = calculated values.

Source: FDEP, 1997.

Table 4-20. Duct Burner CO RBLC Ranking - Natural Gas

REPORT DATE: 01/20/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

PAGE 1

Process Type: 11.005 Natural Gas Combustion

Pollutant: CO

RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
FL-0072	05/17/93	TIGER BAY LP DUCT BURNER, GAS	10.0000 LB/H
CO-0021	05/29/92	NORTHWEST PIPELINE CORPORATION BURNERS, DUCT, COEN	4.0000 LB/HR
NY-0080	12/01/93	PROJECT ORANGE ASSOCIATES STACK (TURBINE AND DUCT BURNER)	106.4000 LB/HR TEMP
NY-0046	07/31/92	SARANAC ENERGY COMPANY BURNERS, DUCT (2)	0.0600 LB/MMBTU
FL-0054	11/20/91	LAKE COGEN LIMITED DUCT BURNER, GAS	0.2000 LB/MMBTU
NY-0045	06/18/92	SELKIRK COGENERATION PARTNERS, L.P. DUCT BURNER	0.0720 LB/MMBTU G
NY-0045	06/18/92	SELKIRK COGENERATION PARTNERS, L.P. DUCT BURNERS (2)	0.0730 LB/MMBTU G
NY-0077	06/24/92	INDECK-YERKES ENERGY SERVICES DUCT BURNER (EP #00001)	0.0400 LB/MMBTU, -
NY-0066	05/12/93	INDECK ENERGY COMPANY DUCT BURNER EP #00001	0.1400 LB/MMBTU, -
NY-0075	09/14/94*	PILGRIM ENERGY CENTER (2) DUCT BURNER (EP #S 00001&2)	0.1080 LB/MMBTU, -
NY-0061	07/07/93	ANITEC COGEN PLANT DUCT BURNER EP #00001	0.0350 LB/MMBTU, -
NY-0064	10/06/94	INDECK-OSWEGO ENERGY CENTER DUCT BURNER	0.1280 LB/MMBTU, -
NY-0073	07/14/93	LOCKPORT COGEN FACILITY (3) DUCT BURNER (EP #S 00001-00003)	0.1000 LB/MMBTU, -

Table 4-20. Duct Burner CO RBLC Ranking - Natural Gas (Page 2 of 2)

REPORT DATE: 01/20/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

PAGE 2

RBLCID	Permit Date	Facility / Process	Emission Limit/Unit
CO-0023	05/11/93	PHOENIX POWER PARTNERS GENERATOR, STEAM, W/ DUCT BURNER	91.1800 TPY

Note: * Indicates date initially inserted into RBLC database.

- Units have been truncated. See RBLC database.-

Source: EPA, 1997.

The latest 5-year BLIS database contains nine CT installations which employ oxidation catalyst technology. Six of these projects employed oxidation catalyst due to nonattainment area considerations (three in California, two in New Jersey, and one in New York). The other three projects installed oxidation catalyst controls to avoid PSD review for either CO or VOCs. The remaining CT BACT determinations are all based on the use of good combustion techniques. All Florida CO BACT determinations for CTs and duct burners are based on the use of good combustion techniques.

Application of current combustor design and good operating practices to minimize incomplete combustion are proposed as BACT for CO. Table 4-21 summarizes specific BACT CO emission limits proposed for the Panda-Kathleen cogeneration facility. The proposed BACT technology and emission limits are consistent with previous state and national determinations.

4.5 UPDATE TO BACT ANALYSIS FOR ACID GASES: NITROGEN OXIDES

4.5.1 CONTROL TECHNOLOGIES AND ENERGY AND ENVIRONMENTAL IMPACTS

The general discussion of control technology review for nitrogen oxides (NO_x), specific available control technologies, and energy and environmental impacts remain essentially unchanged from that provided in the June 1994 permit application; reference Sections 4.5.1 and 4.5.2 of the June 1994 application.

All of the combustion process modification technologies described in the June 1994 application (water/steam injection and standard combustor design, water/steam injection and advanced combustor, and dry low-NO_x combustor design) would be feasible for the combined-cycle GE LM6000 PD CT. Low-NO_x burner design would also be feasible for controlling duct burner NO_x emissions. Of the post-combustion stack gas treatment technologies, SNCR is not feasible since the

Table 4-21. Proposed CO BACT Emission Limits

	Proposed BACT Emission Limits ¹		
	lb/hr	lb/MMBtu	ppmvd
A. GE LM6000 PD CT			
Natural gas	24.8	0.055	25.0
No. 2 fuel oil	25.1	0.059	25.0
B. Duct Burner			
Natural gas	20.1	0.080	N/A

¹ Maximum rates for all operating scenarios.

Sources: Stewart & Stevenson, 1997.
ECT, 1997.

temperature required for this technology (between 1,600 and 2,000°F) exceeds that found in CT exhaust gas streams (approximately 1,000°F). NSCR was also determined to be technically infeasible since the process must take place in a fuel rich (less than 3 percent oxygen) environment. Due to high excess air rates, the oxygen content of combustion turbine exhaust gases is typically 13 percent.

Use of advanced dry low-NO_x combustor technology will achieve similar NO_x emission rates in comparison to wet injection based on vendor data. Effective June 1999, the GE LM6000 PD CT is projected to attain NO_x exhaust concentrations of 15 and 42 ppmvd at 15 percent oxygen for gas and oil-firing, respectively. For the first year of operation, the GE LM6000 PD CT will achieve NO_x exhaust concentrations of 25 and 65 ppmvd at 15 percent oxygen for gas and oil-firing, respectively. The GE LM6000 PD CT will employ dry low-NO_x combustor technology for both gas- and oil-firing therefore eliminating the need for water or steam injection for either fuel. The duct burner will achieve a NO_x emission rate of 0.080 lb/MMBtu based the use of low-NO_x burner technology.

Accordingly, BACT analysis for NO_x for the CT and duct burner was confined to advanced dry low-NO_x combustors/burners and the application of post-combustion SCR control technologies. Steam/water injection technology was not reviewed since it results in NO_x emissions that are comparable to those achieved by advanced dry low-NO_x combustor technology. In addition, the water consumption and sludge treatment/disposal requirements associated with water/steam injection do not exist for dry low-NO_x combustors, making dry low-NO_x combustor technology preferable to wet injection. SCR has been evaluated although there are a number of concerns regarding the technical feasibility of SCR to CTs fired with sulfur-containing fuels. Updated information regarding economic impacts and proposed BACT limits for NO_x are provided in the following sections.

4.5.2 ECONOMIC IMPACTS

An assessment of economic impacts was performed by comparing control costs between a baseline case of advanced dry low-NO_x combustor/burner technology and baseline technology with the addition of SCR controls. For the GE LM6000 PD CT, baseline technology is expected to achieve NO_x exhaust concentrations of 15 and 42 ppmvd at 15 percent oxygen for natural gas and distillate oil-firing, respectively, effective June 1999. The duct burner is projected to achieve a NO_x emission rate of 0.080 lb/MMBtu based on the use of low-NO_x burner technology. SCR technology was premised to achieve CT exhaust NO_x concentrations of 6 and 13 ppmvd at 15 percent oxygen for natural gas and distillate oil-firing, respectively. The NO_x concentration of 6 ppmvd is representative of recent LAER determinations made in California for natural gas-fired CTs equipped with dry low-NO_x combustor technology and SCR controls. The NO_x concentration selected for SCR controlled emissions for distillate oil-firing is that which is generally accepted as a BACT level for CT applications; e.g., Northeast States for Coordinated Air Use Management (NESCAUM) recommendations for new CTs emission limits dated October 1991. An SCR control efficiency of 70 percent was assumed with respect to duct burner NO_x emissions. Based on these premises, annual baseline and controlled NO_x emissions for the GE LM6000 PD CT/duct burner system are calculated to be 197.0 and 68.6 tpy, respectively. Base case and controlled emission rates are summarized in Table 4-22. SCR control system capital and annualized costs for the GE LM6000 PD/duct burner system were approximated from the costs previously developed for the GE 7EA CT by assuming that control costs are proportional to exhaust flow rates. Based on vendor data, the exhaust flow rate at 100 percent load, 59 °F for the GE LM6000 PD CT/duct burner system is 2.3 times lower than the rate previously calculated for the GE 7EA CT.

Table 4-22. Summary of NO_x BACT Analysis

Control Option	<u>Emission Impacts</u>		Emission Reduction (tpy)	<u>Economic Impacts</u>			<u>Energy Impacts</u>	<u>Environmental Impacts</u>	
	<u>Emission Rates</u> (lb/hr)	(tpy)		Installed Capital Cost (\$)	Total Annualized Cost (\$/yr)	Cost Effectiveness Over Baseline (\$/ton)	Increase Over Baseline (MMBtu/yr)	Toxic Impact (Y/N)	Adverse Envir. Impact (Y/N)
SCR	12.4	68.6	128.4	1,731,177	633,175	4,931	5,416	Y	Y
Baseline	45.0	197.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Basis: GE LM6000 PD CT/ Burner System, 100 percent load, 59°F ambient temperature, 8,260 hr/yr gas-fired, 500 hr/yr oil-fired.

Source: ECT, 1997

Using the premises mentioned above, the updated cost effectiveness of SCR for controlling NO_x emissions is estimated to be \$4,931 per ton of NO_x removed in 1994 dollars. This value is provided as an approximation only for the purpose of updating the prior BACT analysis. This control cost is greater than those previously found to be reasonable for BACT NO_x determinations. Results of the NO_x BACT analysis are summarized in Table 4-22.

4.5.3 PROPOSED BACT EMISSION LIMITATIONS

The summaries of historical emission limitations for NO_x previously included in Section 4.5.3 of the June 1994 permit application have been updated to reflect the latest 5 years of available determinations as obtained from EPA's RBLC database. Tables 4-23 and 4-24 contain RBLC NO_x determinations for natural gas and oil-fired CTs, respectively. Ranked BACT NO_x limits are provided in Tables 4-25 and 4-26 for natural gas- and oil-fired CTs, respectively. Recent Florida NO_x BACT determinations for gas turbines are summarized in Table 4-27.

Tables 4-28 and 4-29 provide RBLC and Florida NO_x determinations for natural gas-fired duct burners, respectively. Ranked BACT NO_x limits are provided in Table 4-30 for natural gas-fired duct burners.

For natural gas firing, NO_x emissions range from 0.0169 to 0.2119 lb/MMBtu with a median rate of 0.1467 lb/MMBtu. The range for distillate fuel oil-fired turbines is 0.0820 to 0.2302 lb/MMBtu with a median rate of 0.1561 lb/MMBtu. BACT NO_x determinations expressed as a concentration (corrected to 15 percent oxygen) range from 3.5 to 225 ppmvd with a median of 25.0 ppmvd for gas-fired units. For distillate-fired turbines, NO_x concentrations range from 25 to 65 ppmvd with a median of 42.0 ppmvd.

Table 4-24. RBLC NO, Summary - Oil-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO. EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS
						VALUE	UNITS	(PPMV)	(LBMMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR	
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/25/91	3/24/95	TURBINE, DIL. 1 EACH	80.00	MW	42.00			WET INJECTION				BACT-PSD
	FL-0052	FLORIDA POWER AND LIGHT	6/8/91	3/24/95	TURBINE, DIL. 2 EACH	400.00	MW	65.00			LOW NOX COMBUSTORS				BACT-PSD
	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, OIL. 4 EACH			65.00			COMBUSTION CONTROL				BACT-PSD
	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, OIL. 2 EACH	42.00	MW	42.00			COMBUSTION CONTROL				BACT-PSD
	FL-0056	ORLANDO UTILITIES COMMISSION	11/05/91	6/14/93	TURBINE, OIL. 4 EACH	35.00	MW	65.00			WET INJECTION				BACT-PSD
	FL-0057	FLORIDA POWER GENERATION	10/18/91	3/24/95	TURBINE, OIL. 6 EACH	92.90	MW	42.00			WET INJECTION				BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	TURBINE, OIL	1,849.90	MMBTU/H	42.00			WATER INJECTION				BACT-PSD
	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	928.00	MMBTU/H	42.00			WATER INJECTION				BACT-PSD
	FL-0076	KISSIMMEE UTILITY AUTHORITY	4/7/93	1/13/95	TURBINE, FUEL OIL	371.00	MMBTU/H	42.00			WATER INJECTION				BACT-PSD
	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/95	TURBINE, OIL	1,170.00	MMBTU/H	42.00			STEAM INJECTION				BACT-PSD
	FL-0081	TECO POLK POWER STATION	2/24/94	3/24/95	TURBINE, FUEL OIL	1,765.00	MMBTU/H	42.00			WET INJECTION				BACT-PSD
	FL-0082	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/95	TURBINE, FUEL OIL (2)	1,750.00	MMBTU/H	42.00			WATER INJECTION				BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,029.00	MMBTU/H	42.00			WET INJECTION				BACT-PSD
	FL-0083	FLORIDA POWER CORPORATION	8/17/92	1/13/95	TURBINE, OIL	1,866.00	MMBTU/H	42.00			WET INJECTION				BACT-PSD
GA	GA-0052	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	972.00	MMBTU/H, #2 OIL				MAX WATER INJECTION				BACT-PSD
	GA-0053	HARTWELL ENERGY LIMITED PARTNERSHIP	7/28/92	3/24/95	TURBINE, OIL FIRED (2 EACH)	1,846.00	MMBTU/HR	25.00			MAXIMUM WATER INJECTION		4.191		BACT-PSD
HI	HI-0013	MAUI ELECTRIC COMPANY, LTD.	12/3/91	3/24/95	TURBINE, FUEL OIL #2	28.00	MW	42.00			WATER INJECTION	71.0	1,560		BACT-PSD
	HI-0014	HAWAII ELECTRIC LIGHT CO., INC.	2/12/92	3/24/95	TURBINE, FUEL OIL #2	20.00	MW			42.30	COMBUSTOR WATER INJECTOR, WATER INJECTION	70.0	1,041	1990	BACT-PSD
	HI-0015	MAUI ELECTRIC COMPANY, LTD./MAALAEFA GENERATING STA	7/28/92	3/24/95	TURBINE, COMBINED-CYCLE COMBUSTION	28.00	MW			42.30	WATER INJECTION	69.0			BACT-OTHER
NC	NC-0055	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/95	TURBINE, COMBUSTION	1,247.00	MM BTU/HR		0.230	287.00	MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION		1,348,653	1991	BACT-PSD
NJ	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	5/29/95	TURBINES (#2 FUEL OIL) (2)	1,190.00	MMBTU/HR (EACH)		0.082		SCR AND WATER INJECTION				BACT-OTHER
									65.00	0.2302	287.00				
									25.00	0.0620	42.30				
									42.00	0.1681	42.30				
									16	2	3				

Source: EPA, 1997.

Table 4-23. RBLC NO_x Summary - Natural Gas-Fired Combustion Turbines

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO. EMISSION LIMITS				CONTROL		COST EFFECTIVENESS		BASIS	
						VALUE	UNITS	(PPMVD)	(GM/HP HR)	(L/1000BTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR		
AL	AL-0069	INTERNATIONAL PAPER CO. RIVERDALE MILL	1/1/93	3/24/95	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER	40.00	MW					0.0000	LOW NOX BURNERS (ON THE DUCT BURNER) STEAM INJECTION INTO THE TURBINE				BACT-PSD
AL	AL-0074	FLORIDA GAS TRANSMISSION COMPANY	8/5/93	5/12/94	TURBINE, NATURAL GAS	12,000.00	BHP					0.5800	AIR-TO-FUEL RATIO CONTROL, DRY LOW NOX COMBUSTION	71.0	593	1993	BACT-PSD
AZ	AZ-0010	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	64.90					LEAN BURN				NSPS
AZ	AZ-0010	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	42.00					DRY LOW NOX COMBUSTOR	91.0			BACT-PSD
AZ	AZ-0011	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	85.10					FUEL SPEC. LEAN FUEL MIX				NSPS
AZ	AZ-0011	EL PASO NATURAL GAS	10/25/91	3/24/95	TURBINE, GAS, SOLAR CENTAUR H	5,500.00	HP	42.00					DRY LOW NOX COMBUSTOR	91.0			BACT-PSD
AZ	AZ-0012	EL PASO NATURAL GAS	10/18/91	7/29/94	TURBINE, NAT. GAS TRANSM., CE FRAME 3	12,000.00	HP	23.90					LEAN BURN				BACT-PSD
AZ	AZ-0012	EL PASO NATURAL GAS	10/18/91	7/29/94	TURBINE, NAT. GAS TRANSM., CE FRAME 3	12,000.00	HP	42.00					DRY LOW NOX COMBUSTOR	80.0			BACT-PSD
CA	CA-0418	SOUTHERN CALIFORNIA GAS	10/29/91	8/4/93	TURBINE, GAS-FIRED	47.04	MMBTU/HR	8.00					HIGH TEMPERATURE SELECTIVE CATALYTIC REDUCTION	93.0			BACT-PSD
CA	CA-0437	KINGSBURG ENERGY SYSTEMS	8/25/89	8/3/93	TURBINE, NATURAL GAS FIRED, DUCT BURNER	34.50	MW	6.00					SCR, STEAM INJECTION	90.0			BACT-PSD
CA	CA-0441	GRANITE ROAD LIMITED	8/6/91	8/3/93	TURBINE, GAS, ELECTRIC GENERATION	460.00	MMBTU/HR*	2.50					SCR, STEAM INJECTION	97.0			BACT-PSD
CA	CA-0463	SOUTHERN CALIFORNIA GAS	10/29/91	8/1/93	TURBINE, GAS FIRED, SOLAR MODEL H	8,500.00	HP	8.00					HIGH TEMP SELECT. CAT. REDUCTION	83.0			BACT-PSD
CA	CA-0544	GOAL LINE, LP ICEFLOE	11/3/92	8/4/94	TURBINE, COMBUSTION (NATURAL GAS) (42.4 MW)	386.00	MMBTU/HR	5.00					WATER INJECTION & SCR W/ AUTOMATIC AMMONIA INJECT.	88.0			BACT-OTHER
CA	CA-0613	UNOCAL	7/18/89	12/5/94	TURBINE, GAS (SEE NOTES)			9.00					SELECTIVE CATALYTIC REDUCTION (SCR), WATER INJECTN	80.0			BACT-OTHER
CO	CO-0017	THERMO INDUSTRIES, LTD.	2/18/92	3/24/95	TURBINE, GAS FIRED, 8 EACH	348.00	MMBTU/HR	35.00					DRY LOW NOX TECH.		1,328		BACT-PSD
CO	CO-0018	BRUSH COGENERATION PARTNERSHIP		7/29/94	TURBINE	350.00	MMBTU/HR	35.00					DRY LOW NOX BURNER	74.0	946		BACT-PSD
CO	CO-0019	COLORADO POWER PARTNERSHIP		7/29/94	TURBINES, 2 NAT GAS & 2 DUCT BURNERS	285.00	MMBTU/HR EACH TURBINE	42.00					WATER INJECTION	66.0	1,148		BACT-PSD
CO	CO-0020	CIMARRON CHEMICAL	3/25/91	7/29/94	TURBINE #1, CE FRAME 8	33.00	MW	35.00					WATER INJECTION				OTHER
CO	CO-0020	CIMARRON CHEMICAL	3/25/91	7/29/94	TURBINE #2, CE FRAME 8	33.00	MW	9.00					SCR				OTHER
CO	CO-0021	NORTHWEST PIPELINE CORPORATION	5/28/92	7/29/94	TURBINE, SOLAR TAURUS	45.00	MMBTU/HR	66.00					DRY LOW NOX COMBUSTOR (BY 11/01/98)				BACT-PSD
CO	CO-0023	PHOENIX POWER PARTNERS	8/11/93	3/24/95	TURBINE (NATURAL GAS)	311.00	MMBTU/HR	22.00					DRY LOW NOX COMBUSTION				BACT-OTHER
FL	FL-0045	CHARLES LARSEN POWER PLANT	7/29/91	3/24/95	TURBINE, GAS, 1 EACH	80.00	MW	25.00					WET INJECTION				BACT-PSD
FL	FL-0053	FLORIDA POWER AND LIGHT	05/91	3/24/95	TURBINE, GAS, 4 EACH	400.00	MW	25.00					LOW NOX COMBUSTORS				BACT-PSD
FL	FL-0053	FLORIDA POWER AND LIGHT	05/91	3/24/95	TURBINE, CG, 4 EACH	400.00	MW	42.00					LOW NOX COMBUSTORS				BACT-PSD
FL	FL-0053	FLORIDA POWER AND LIGHT	3/14/91	3/24/95	TURBINE, GAS, 4 EACH	240.00	MW	42.00					COMBUSTION CONTROL				BACT-PSD
FL	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	TURBINE, GAS, 2 EACH	42.00	MW	35.00					COMBUSTION CONTROL				BACT-PSD
FL	FL-0056	ORLANDO UTILITIES COMMISSION	11/5/91	8/14/93	TURBINE, GAS, 4 EACH	25.00	MW	42.00					WET INJECTION	70.0			BACT-PSD
FL	FL-0059	SEMINOLE FERTILIZER CORPORATION	3/17/91	5/14/93	TURBINE, GAS	25.00	MW	9.00					SCR		2,438		BACT-PSD
FL	FL-0066	ORANGE COGENERATION LP	12/20/93	1/13/96	TURBINE, NATURAL GAS, 2	368.30	MMBTU/HR	15.00					DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0073	TICER BAY LP	8/17/93	1/13/96	TURBINE, GAS	1,514.80	MMBTU/HR	15.00					DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0074	FLORIDA GAS TRANSMISSION	8/27/93	4/11/94	TURBINE, GAS	131.59	MMBTU/HR	35.00					DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/83	1/13/95	TURBINE, NATURAL GAS	869.00	MMBTU/HR	15.00					DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0078	KISSIMMEE UTILITY AUTHORITY	4/7/83	1/13/95	TURBINE, NATURAL GAS	347.00	MMBTU/HR	15.00					DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0080	AUBURNDALE POWER PARTNERS, LP	12/14/92	1/13/96	TURBINE, GAS	1,214.00	MMBTU/HR	15.00					DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0083	FLORIDA POWER CORPORATION POLK COUNTY SITE	2/25/94	1/13/96	TURBINE, NATURAL GAS (8)	1,810.00	MMBTU/HR	13.00					DRY LOW NOX COMBUSTOR				BACT-PSD
FL	FL-0104	SEMINOLE HARDEE UNIT 3	1/1/96	8/21/96	COMBINED CYCLE COMBUSTION TURBINE	140.00	MW	15.00					DRY LNB, STAGED COMBUSTION				BACT-PSD
FL	FL-0109	KEY WEST CITY ELECTRIC SYSTEM	9/28/95	8/21/96	TURBINE, EXISTING CT RELOCATION TO A NEW PLAN	23.00	MW	75.00					WATER INJECTION				BACT-PSD
GA	GA-0032	SAVANNAH ELECTRIC AND POWER CO.	2/12/92	3/24/95	TURBINES, 8	1,023.00	MMBTU/HR, NAT GAS	25.00					MAX WATER INJECTION				BACT-PSD
GA	GA-0033	HARTWELL ENERGY LIMITED PARTNERSHIP	7/29/92	3/24/95	TURBINE, GAS FIRED (2 EACH)	1,817.00	M BTU/HR	25.00					MAXIMUM WATER INJECTION		2,743	1992	BACT-PSD
GA	GA-0056	GEORGIA POWER COMPANY, ROBINS TURBINE PROJECT	5/13/94	3/24/95	TURBINE, COMBUSTION, NATURAL GAS	80.00	MW	25.00					WATER INJECTION, FUEL SPEC. NATURAL GAS				BACT-PSD
KY	KY-0053	KENTUCKY UTILITIES COMPANY	3/10/92	3/24/95	TURBINE, #2 FUEL OIL/NATURAL GAS (8)	1,500.00	MM BTU/HR (EACH)	42.00					WATER INJECTION				BACT-PSD
LA	LA-0079	ENBRON LOUISIANA ENERGY COMPANY	8/5/91	10/26/91	TURBINE, GAS, 2	39.10	MMBTU/HR	40.00					H2O INJECT @ 47 LB/LB	71.0	909		BACT-PSD
LA	LA-0086	INTERNATIONAL PAPER	2/24/94	4/17/95	TURBINE/HRSG, GAS COGEN	238.00	MM BTU/HR TURBINE	35.00					DRY LOW NOX COMBUSTOR/COMBUSTION CONTROL				BACT
LA	LA-0089	FORMOSA PLASTICS CORPORATION, LOUISIANA	3/2/95	4/17/95	TURBINE/HRSG, GAS COGENERATION	450.00	MM BTU/HR	9.00					DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONTROL		151	1990	LAER
MA	MA-0015	PEARBODY MUNICIPAL LIGHT PLANT	11/20/89	3/24/95	TURBINE, 28 MW NATURAL GAS FIRED	412.00	MMBTU/HR	25.00					WATER INJECTION				BACT-OTHER
MD	MD-0017	SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO)	10/1/89	3/24/95	TURBINE, NATURAL GAS FIRED ELECTRIC	90.00	MW	199.00				199.00	WATER INJECTION				BACT-PSD
MD	MD-0018	PEPOO - CHALK POINT PLANT	6/25/90	7/29/94	TURBINE, 105 MW NATURAL GAS FIRED ELECTRIC	105.00	MW	77.00					DRY PREMIX AND WATER INJECTION				BACT-PSD
MD	MD-0018	PEPOO - CHALK POINT PLANT	6/25/90	7/29/94	TURBINE, 84 MW NATURAL GAS FIRED ELECTRIC	84.00	MW	25.00					QUIET COMBUSTION AND WATER INJECTION				BACT-PSD
MD	MD-0019	BALTIMORE GAS & ELECTRIC - PERBYMAN PLANT		3/24/95	TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140.00	MW	15.00					DRY BURN LOW NOX BURNERS	91.0			BACT-PSD
MD	MD-0021	PEPOO - STATION A	8/21/90	7/29/94	TURBINE, 124 MW NATURAL GAS FIRED	125.00	MW	42.00					WATER INJECTION				BACT-PSD

Table 4-23. RBLC NO, Summary - Natural Gas-Fired Combustion Turbines (Page 2 of 2)

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	TURBINE SIZE		NO. EMISSION LIMITS				CONTROL			COST EFFECTIVENESS		BASIS	
						VALUE	UNITS	(PPMVD)	(GM/10 ³ HR)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	19	YEAR			
MI	MI-0206	KALAMAZOO POWER LIMITED	12/01	3/23/94	TURBINE, GAS-FIRED, 2, W/WASTE HEAT BOILERS	1,655.90	MMBTU/HR	15.00										BACT-PSD
MN	MN-0022	LSP-COTTAGE GROVE, L.P.	3/1/95	4/29/95	COMBUSTION TURBINE/GENERATOR	1,970.00	MMBTU/HR	4.50						70.0				BACT-PSD
NC	NC-0035	DUNGE POWER CO. LINCOLN COMBUSTION TURBINE STATION	12/20/91	3/24/93	TURBINE, COMBUSTION	1,213.00	MM BTU/HR			0.0906		119.00				1,134	1991	BACT-PSD
NC	NC-0059	CAROLINA POWER & LIGHT	4/1/96	8/19/96	COMBUSTION TURBINE, 4 EACH	1,907.60	MMBTU/HR			0.0828		158.00				420	1994	BACT-PSD
NJ	NJ-0008	NEWARK BAY COGENERATION PARTNERSHIP	11/1/90	7/1/93	TURBINE, NATURAL GAS FIRED	585.00	MMBTU/HR				0.0330						1990	BACT-PSD
NJ	NJ-0010	PEDRICKTOWN COGENERATION LIMITED PARTNERSHIP	3/3/90	4/30/93	TURBINE, NATURAL GAS FIRED	1,000.00	MMBTU/HR				0.0440						1990	BACT-PSD
NJ	NJ-0011	LINDEN COGENERATION TECHNOLOGY	1/21/92	4/30/93	TURBINE, NATURAL GAS FIRED	50.00	X E L12 STU/HR					33.80						BACT-PSD
NJ	NJ-0013	LAKEWOOD COGENERATION, L.P.	4/1/91	6/26/93	TURBINES (NATURAL GAS) (2)	1,190.00	MMBTU/HR (EACH)				0.0330							BACT-OTHER
NJ	NJ-0017	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	6/9/93	6/29/93	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617.00	MMBTU/HR (EACH)			8.30								BACT-PSD
NM	NM-0021	WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	10/26/93	3/2/94	TURBINE, GAS-FIRED	11,237.00	HP	42.00										BACT-PSD
NM	NM-0022	MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	3/1/98	4/25/93	TURBINES, NATURAL GAS (2)	8,500.00	HP					7.40						BACT-PSD
NM	NM-0024	MILCRO, WILLIAMS FIELD SERVICE	6/29/95		TURBINE, COGEN, NATURAL GAS (2)	900.00	MMCF/DAY	0.00										BACT-PSD
NY	NY-0044	BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	6/6/93	6/30/93	TURBINE, NATURAL GAS FIRED	240.00	MW	1.50										LAER
NY	NY-0046	BARANAG ENERGY COMPANY	7/31/92	9/12/94	TURBINES, COMBUSTION (3) (NATURAL GAS)	1,123.00	MMBTU/HR (EACH)	0.00										BACT-OTHER
NY	NY-0047	PARTY/HOLTSVILLE COMBINED CYCLE PLANT	9/1/93	9/13/94	TURBINE, COMBUSTION GAS (130 MW)	1,148.00	MMBTU/HR (GAS)	0.00										BACT-OTHER
NY	NY-0048	KAMINER/ESCOOP CORP/INDYING L.P.	11/5/92	9/13/94	TURBINE, COMBUSTION (79 MW)	653.00	MMBTU/HR	0.00										BACT-OTHER
NY	NY-0049	KAMINER/ESCOOP BEAVER FALLS COGENERATION FACILITY	11/9/92	9/13/94	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650.00	MMBTU/HR	0.00										BACT-OTHER
NY	NY-0050	SITHEN/INDEPENDENCE POWER PARTNERS	11/24/93	9/13/94	TURBINES, COMBUSTION (4) (NATURAL GAS)	2,133.00	MMBTU/HR (EACH)	4.00										BACT-OTHER
NY	NY-0057	MEGAN/RAGINE ASSOCIATES, INC	6/5/93	3/20/93	GE LM5000-N COMBINED CYCLE GAS TURBINE	401.00	LB/MMBTU	23.00										BACT-OTHER
NY	NY-0061	ANTTEC COGEN PLANT	7/7/93	4/27/93	GE LM5000 COMBINED CYCLE GAS TURBINE, EP #0001	451.00	MMBTU/HR	43.00		0.0099	41.00							BACT-OTHER
NY	NY-0063	FULTON COGEN PLANT	9/13/94	4/27/93	GE LM5000 GAS TURBINE	600.00	MMBTU/HR	36.00		0.1300	65.00							BACT
NY	NY-0063	TBG COGEN COGENERATION PLANT	8/5/90	4/27/93	GE LM2500 GAS TURBINE	214.90	MMBTU/HR	75.00										BACT
NY	NY-0064	INDECK/OSWEGO ENERGY CENTER	10/6/94	4/27/93	GE FRAME 6 GAS TURBINE	633.00	LB/MMBTU	42.00		0.1407	75.00							BACT
NY	NY-0065	KAMINER/ESCOOP CARTRIDGE L.P.	1/18/94	4/27/93	GE FRAME 6 GAS TURBINE	491.00	BTU/HR	42.00		0.1560	76.00							BACT
NY	NY-0066	INDECK ENERGY COMPANY	5/13/93	3/31/93	GE FRAME 6 GAS TURBINE EP #0001	491.00	MMBTU/HR	33.00		0.1527	71.00							BACT
NY	NY-0068	KAMINER/ESCOOP NATURAL DAM LP	12/11/91	6/30/93	GE FRAME 6 GAS TURBINE	600.00	MMBTU/HR	42.00		0.1602	80.10							BACT
NY	NY-0071	KAMINER SOUTH CLEN'S FALLS COGEN CO	9/16/92	4/27/96	GE FRAME 6 GAS TURBINE	498.00	MMBTU/HR	42.00		0.1538	76.00							BACT
NY	NY-0072	KAMINER/ESCOOP STRACUSE LP	12/10/94	4/27/96	SIEMENS V64.3 GAS TURBINE (EP #0001)	650.00	MMBTU/HR	25.00		0.1134	75.00							BACT
NY	NY-0073	LOCKPORT COGEN FACILITY	7/14/93	4/27/96	(6) GE FRAME 6 TURBINES (EP #S 0001-0006)	423.90	MMBTU/HR	42.00		0.1789	75.00							BACT
NY	NY-0078	PILGRIM ENERGY CENTER		4/27/95	(2) WESTINGHOUSE W501D TURBINES (EP #S 00001&2)	1,400.00	MMBTU/HR	42.00		0.0189	23.00							BACT
NY	NY-0078	TRIGEN MITCHEL FIELD	4/14/93	3/31/93	GE FRAME 6 GAS TURBINE	434.70	MMBTU/HR	80.00		0.2119	80.00							BACT
NY	NY-0077	INDECK/TEARLES ENERGY SERVICES	6/24/92	3/31/93	GE FRAME 6 GAS TURBINE (EP #0001)	433.30	MMBTU/HR	43.00		0.1712	74.00							BACT
NY	NY-0079	LEDERLE LABORATORIES	4/27/95	4/27/95	(2) GAS TURBINES (EP #S 00101&102)	110.00	MMBTU/HR	42.00		0.1638	18.00							BACT-PSD
OH	OH-0218	CNG TRANSMISSION	8/12/92	4/5/93	TURBINE (NATURAL GAS) (3)	5,300.00	HP (EACH)			1,6000								BACT-OTHER
OK	OK-0037	OKLAHOMA MUNICIPAL POWER AUTHORITY	12/17/92	3/24/95	TURBINE, COMBUSTION	58.00	MW	25.00										BACT-OTHER
OR	OR-0007	PACIFIC GAS TRANSMISSION	11/3/89	7/20/94	TURBINE, NAT. GAS	14,800.00	HP	42.00										BACT-PSD
OR	OR-0009	PACIFIC GAS TRANSMISSION COMPANY	6/19/90	7/20/94	TURBINE GAS, COMPRESSOR STATION	110.00	MMBTU/HR	199.00										NSPS
OR	OR-0010	PORTLAND GENERAL ELECTRIC CO.	6/31/94	5/1/93	TURBINES, NATURAL GAS (2)	1,720.00	MMBTU	4.00								8,337		BACT-PSD
OR	OR-0011	HERMISTON GENERATING CO.	4/1/94	5/1/93	TURBINES, NATURAL GAS (2)	1,696.00	MMBTU	4.50										BACT-PSD
PA	PA-0083	NORTHERN CONSOLIDATED POWER	6/3/91	7/20/94	TURBINES, GAS, 2	34.60	KW EACH	25.00										OTHER
PA	PA-0098	GRAYS FERRY CO. GENERATION PARTNERSHIP	11/4/92	7/20/94	TURBINE (NATURAL GAS & OIL)	1,150.00	MMBTU	9.00										BACT-OTHER
PA	PA-0130	PROCTOR AND GAMBLE PAPER PRODUCTS CO (CHARMIN)	6/21/95	11/27/95	TURBINE, NATURAL GAS	580.00	MMBTU/HR	65.00										BACT
RI	RI-0010	HARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	4/13/92	5/31/92	TURBINE, GAS AND DUCT BURNER	1,380.00	MMBTU/HR EACH	0.00										BACT-PSD
RI	RI-0012	ALCONQUIN GAS TRANSMISSION CO.	7/31/91	5/31/92	TURBINE, GAS, 2	49.00	MMBTU/HR	100.00										BACT-OTHER
SC	SC-0036	CAROLINA POWER AND LIGHT	6/31/94	4/29/96	STATIONARY GAS TURBINE	1,520.00	MMBTU/HR	25.00										BACT-PSD
WA	WA-0007	SUMAS ENERGY INC.	8/25/91	8/1/91	TURBINE, NATURAL GAS	88.00	MW	0.00										BACT-PSD
WA	WA-0274	NORTHWEST PIPELINE COMPANY	8/13/92	4/5/93	TURBINE, GAS-FIRED	12,100.00	HP	196.00										BACT-PSD
						MAXIMUM	223.00	1,6000	0.2119	199.0000								
						MINIMUM	3.50	0.0828	0.0166	7.4000								
						MEDIAN	25.00	0.2353	0.1467	75.0000								
						NUMBER OF ENTRIES	87	4	16	18								

Source: EPA, 1997.

Table 4-25. CT NOx RBLC Ranking - Natural Gas

REPORT DATE: 01/16/97

RACT/BACT/LAER CLEARINGHOUSE
RANKING BY STANDARD EMISSION LIMIT

PREFACE

Search Criteria:

PROCTYPE = 15.004 (Natural Gas) AND
PROCESS = TURBINE AND
CAS = 10102

Part 1 presents a ranking based on emission limits expressed in the standard units.

Part 2, if present, is a listing of related processes that have not filed standard units. The processes are grouped by reported units and ranked for like units.

Table 4-25. CT NOx RBLC Ranking - Natural Gas (Page 2 of 7)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 1

Process Type: 15.004 Natural Gas

Process Name: TURBINE

Pollutant: NOX

Standard Unit: PPM @ 15% O2

Processes/Pollutants Meeting Criteria: 72

Processes/Pollutants Not Included: (see Note) 7

Average for Processes/Pollutants: 35.5200

Minimum for Processes/Pollutants: 3.5000

Maximum for Processes/Pollutants: 225.0000

RBLCID	Permit Date	Facility / Process	Emission Limit
NY-0044	06/06/95	BROOKLYN NAVY YARD COGENERATION PARTNERS L.P. TURBINE, NATURAL GAS FIRED	3.5000
CA-0441	05/06/91	GRANITE ROAD LIMITED TURBINE, GAS, ELECTRIC GENERATION	3.5000
NY-0050	11/24/92	SITHE/INDEPENDENCE POWER PARTNERS TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	4.5000
OR-0010	05/31/94	PORTLAND GENERAL ELECTRIC CO. TURBINES, NATURAL GAS (2)	4.5000
OR-0011	04/01/94	HERMISTON GENERATING CO. TURBINES, NATURAL GAS (2)	4.5000
CA-0544	11/03/92	GOAL LINE, LP ICEFLOE TURBINE, COMBUSTION (NATURAL GAS) (42.4 MW)	5.0000
CA-0437	09/28/89	KINGSBURG ENERGY SYSTEMS TURBINE, NATURAL GAS FIRED, DUCT BURNER	6.0000
WA-0027	06/25/91	SUMAS ENERGY INC. TURBINE, NATURAL GAS	6.0000
CA-0463	10/29/91	SOUTHERN CALIFORNIA GAS TURBINE, GAS FIRED, SOLAR MODEL H	8.0000
CA-0418	10/29/91	SOUTHERN CALIFORNIA GAS TURBINE, GAS-FIRED	8.0000
NJ-0017	06/09/93	NEWARK BAY COGENERATION PARTNERSHIP, L.P. TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	8.3000

Table 4-25. CT NOx RBLC Ranking - Natural Gas (Page 2 of 7)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 1

Process Type: 15.004 Natural Gas

Process Name: TURBINE

Pollutant: NOX

Standard Unit: PPM @ 15% O2

Processes/Pollutants Meeting Criteria: 72

Processes/Pollutants Not Included: (see Note) 7

Average for Processes/Pollutants: 35.5200

Minimum for Processes/Pollutants: 3.5000

Maximum for Processes/Pollutants: 225.0000

RBLCID	Permit Date	Facility / Process	Emission Limit
NY-0044	06/06/95	BROOKLYN NAVY YARD COGENERATION PARTNERS L.P. TURBINE, NATURAL GAS FIRED	3.5000
CA-0441	05/06/91	GRANITE ROAD LIMITED TURBINE, GAS, ELECTRIC GENERATION	3.5000
NY-0050	11/24/92	SITHE/INDEPENDENCE POWER PARTNERS TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	4.5000
OR-0010	05/31/94	PORTLAND GENERAL ELECTRIC CO. TURBINES, NATURAL GAS (2)	4.5000
OR-0011	04/01/94	HERMISTON GENERATING CO. TURBINES, NATURAL GAS (2)	4.5000
CA-0544	11/03/92	GOAL LINE, LP ICEFLOE TURBINE, COMBUSTION (NATURAL GAS) (42.4 MW)	5.0000
CA-0437	09/28/89	KINGSBURG ENERGY SYSTEMS TURBINE, NATURAL GAS FIRED, DUCT BURNER	6.0000
WA-0027	06/25/91	SUMAS ENERGY INC. TURBINE, NATURAL GAS	6.0000
CA-0463	10/29/91	SOUTHERN CALIFORNIA GAS TURBINE, GAS FIRED, SOLAR MODEL H	8.0000
CA-0418	10/29/91	SOUTHERN CALIFORNIA GAS TURBINE, GAS-FIRED	8.0000
NJ-0017	06/09/93	NEWARK BAY COGENERATION PARTNERSHIP, L.P. TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	8.3000

Table 4-25. CT NOx RBLC Ranking - Natural Gas (Page 3 of 7)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 2

RBLCID	Permit Date	Facility / Process	Emission Limit
NJ-0013	04/01/91	LAKWOOD COGENERATION, L.P. TURBINES (NATURAL GAS) (2)	9.0000
NY-0046	07/31/92	SARANAC ENERGY COMPANY TURBINES, COMBUSTION (2) (NATURAL GAS)	9.0000
NY-0048	11/05/92	KAMINE/BESICORP CORNING L.P. TURBINE, COMBUSTION (79 MW)	9.0000
CA-0613	07/18/89	UNOCAL TURBINE, GAS (SEE NOTES)	9.0000
CO-0020	03/25/91	CIMARRON CHEMICAL TURBINE #2, GE FRAME 6	9.0000
FL-0059	03/17/91	SEMINOLE FERTILIZER CORPORATION TURBINE, GAS	9.0000
NM-0024	05/25/95*	MILAGRO, WILLIAMS FIELD SERVICE TURBINE/COGEN, NATURAL GAS (2)	9.0000
RI-0010	04/13/92	NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO. TURBINE, GAS AND DUCT BURNER	9.0000
LA-0089	03/02/95	FORMOSA PLASTICS CORPORATION, LOUISIANA TURBINE/HRSG, GAS COGENERATION	9.0000
FL-0082	02/25/94	FLORIDA POWER CORPORATION POLK COUNTY SITE TURBINE, NATURAL GAS (2)	12.0000
FL-0068	12/30/93	ORANGE COGENERATION LP TURBINE, NATURAL GAS, 2	15.0000
FL-0072	05/17/93	TIGER BAY LP TURBINE, GAS	15.0000
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, NATURAL GAS	15.0000
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, NATURAL GAS	15.0000
MD-0019	07/13/93*	BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	15.0000
MI-0206	12/03/91	KALAMAZOO POWER LIMITED TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	15.0000

Table 4-25. CT NOx RBLC Ranking - Natural Gas (Page 4 of 7)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 3

RBLCID	Permit Date	Facility / Process	Emission Limit
FL-0080	12/14/92	AUBURNDALE POWER PARTNERS, LP TURBINE, GAS	15.0000
CO-0023	05/11/93	PHOENIX POWER PARTNERS TURBINE (NATURAL GAS)	22.0000
NC-0055	12/20/91	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION TURBINE, COMBUSTION	25.0000
GA-0056	05/13/94	GEORGIA POWER COMPANY, ROBINS TURBINE PROJECT TURBINE, COMBUSTION, NATURAL GAS	25.0000
CO-0017	02/19/92	THERMO INDUSTRIES, LTD. TURBINE, GAS FIRED, 5 EACH	25.0000
CO-0018	05/31/92*	BRUSH COGENERATION PARTNERSHIP TURBINE	25.0000
CO-0020	03/25/91	CIMARRON CHEMICAL TURBINE #1, GE FRAME 6	25.0000
FL-0045	07/25/91	CHARLES LARSEN POWER PLANT TURBINE, GAS, 1 EACH	25.0000
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, GAS, 4 EACH	25.0000
FL-0054	11/20/91	LAKE COGEN LIMITED TURBINE, GAS, 2 EACH	25.0000
FL-0074	09/27/93	FLORIDA GAS TRANSMISSION TURBINE, GAS	25.0000
GA-0052	02/12/92	SAVANNAH ELECTRIC AND POWER CO. TURBINES, 8	25.0000
GA-0053	07/28/92	HARTWELL ENERGY LIMITED PARTNERSHIP TURBINE, GAS FIRED (2 EACH)	25.0000
MA-0015	11/30/89	PEABODY MUNICIPAL LIGHT PLANT TURBINE, 38 MW NATURAL GAS FIRED	25.0000
MD-0018	06/25/90	PEPCO - CHALK POINT PLANT TURBINE, 84 MW NATURAL GAS FIRED ELECTRIC	25.0000
PA-0083	05/03/91	NORTHERN CONSOLIDATED POWER TURBINES, GAS, 2	25.0000

Table 4-25. CT NOx RBLC Ranking - Natural Gas (Page 5 of 7)

REPORT DATE: 01/16/97		RANKING BY STANDARD EMISSION LIMIT		PAGE 4
RBLCID	Permit Date	Facility / Process	Emission Limit	
LA-0086	02/24/94	INTERNATIONAL PAPER TURBINE/HRSG, GAS COGEN	25.0000	
LA-0079	08/05/91	ENRON LOUISIANA ENERGY COMPANY TURBINE, GAS, 2	40.0000	
AZ-0010	10/25/91	EL PASO NATURAL GAS TURBINE, GAS, SOLAR CENTAUR H	42.0000	
AZ-0011	10/25/91	EL PASO NATURAL GAS TURBINE, GAS, SOLAR CENTAUR H	42.0000	
AZ-0012	10/18/91	EL PASO NATURAL GAS TURBINE, NAT. GAS TRANSM., GE FRAME 3	42.0000	
CO-0019	05/31/92*	COLORADO POWER PARTNERSHIP TURBINES, 2 NAT GAS & 2 DUCT BURNERS	42.0000	
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, CG, 4 EACH	42.0000	
FL-0053	03/14/91	FLORIDA POWER AND LIGHT TURBINE, GAS, 4 EACH	42.0000	
FL-0056	11/05/91	ORLANDO UTILITIES COMMISSION TURBINE, GAS, 4 EACH	42.0000	
MD-0021	05/31/90	PEPCO - STATION A TURBINE, 124 MW NATURAL GAS FIRED	42.0000	
NM-0021	10/29/93	WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR TURBINE, GAS-FIRED	42.0000	
OR-0007	11/03/89	PACIFIC GAS TRANSMISSION TURBINE, NAT. GAS	42.0000	
PA-0130	05/31/95	PROCTOR AND GAMBLE PAPER PRODUCTS CO (CHARMIN) TURBINE, NATURAL GAS	55.0000	
FL-0109	09/28/95	KEY WEST CITY ELECTRIC SYSTEM TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	75.0000	
MD-0018	06/25/90	PEPCO - CHALK POINT PLANT TURBINE, 105 MW NATURAL GAS FIRED ELECTRIC	77.0000	
AZ-0010	10/25/91	EL PASO NATURAL GAS TURBINE, GAS, SOLAR CENTAUR H	84.9000	

Table 4-25. CT NOx RBLC Ranking - Natural Gas (Page 6 of 7)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 5

RBLCID	Permit Date	Facility / Process	Emission Limit
AZ-0011	10/25/91	EL PASO NATURAL GAS TURBINE, GAS, SOLAR CENTAUR H	85.1000
CO-0021	05/29/92	NORTHWEST PIPELINE CORPORATION TURBINE, SOLAR TAURUS	95.0000
RI-0012	07/31/91	ALGONQUIN GAS TRANSMISSION CO. TURBINE, GAS, 2	100.0000
WA-0274	08/13/92	NORTHWEST PIPELINE COMPANY TURBINE, GAS-FIRED	196.0000
OR-0009	06/19/90	PACIFIC GAS TRANSMISSION COMPANY TURBINE GAS, COMPRESSOR STATION	199.0000
AZ-0012	10/18/91	EL PASO NATURAL GAS TURBINE, NAT. GAS TRANSM., GE FRAME 3	225.0000

Note: Standard emission limits that are zero (i.e., value is missing) are not included in statistics or report above. Refer to Exception report on next page.

* Indicates date initially inserted into RBLC database.

Table 4-25. CT NOx RBLC Ranking - Natural Gas (Page 7 of 7)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

PAGE 6

Process Type: 15.004 Natural Gas

Process Name: TURBINE

Pollutant: NOX

RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
OH-0218	08/12/92	CNG TRANSMISSION TURBINE (NATURAL GAS) (3)	1.6000 G/HP-HR*
AL-0074	08/05/93	FLORIDA GAS TRANSMISSION COMPANY TURBINE, NATURAL GAS	0.5800 GM/HP HR
NJ-0011	01/21/92	LINDEN COGENERATION TECHNOLOGY TURBINE, NATURAL GAS FIRED	33.8000 LB/HR
MD-0017	10/01/89	SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO) TURBINE, NATURAL GAS FIRED ELECTRIC	199.0000 LB/HR
NJ-0009	11/01/90	NEWARK BAY COGENERATION PARTNERSHIP TURBINE, NATURAL GAS FIRED	0.0330 LB/MMBTU
NJ-0010	02/23/90	PEDRICKTOWN COGENERATION LIMITED PARTNERSHIP TURBINE, NATURAL GAS FIRED	0.0440 LB/MMBTU
NM-0022	01/11/95	MARATHON OIL CO. - INDIAN BASIN N.G. PLAN TURBINES, NATURAL GAS (2)	7.4000 LBS/HR

Source: EPA, 1997.

Table 4-26. CT NOx RBLC Ranking - Fuel Oil

REPORT DATE: 01/16/97

RACT/BACT/LAER CLEARINGHOUSE
RANKING BY STANDARD EMISSION LIMIT

PREFACE

Search Criteria:

PROCTYPE = 15.006 (Fuel Oil) AND
PROCESS = TURBINE AND
CAS = 10102

Part 1 presents a ranking based on emission limits expressed in the standard units.

Part 2, if present, is a listing of related processes that have not filed standard units. The processes are grouped by reported units and ranked for like units.

Table 4-26. CT NOx RBLC Ranking - Fuel Oil (Page 2 of 4)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 1

Process Type: 15.006 Fuel Oil

Process Name: TURBINE

Pollutant: NOX

Standard Unit: PPM @ 15% O2

Processes/Pollutants Meeting Criteria: 21

Processes/Pollutants Not Included: (see Note) 3

Average for Processes/Pollutants: 44.6111

Minimum for Processes/Pollutants: 21.0000

Maximum for Processes/Pollutants: 65.0000

RBLCID	Permit Date	Facility / Process	Emission Limit
NJ-0013	04/01/91	LAKWOOD COGENERATION, L.P. TURBINES (#2 FUEL OIL) (2)	21.0000
GA-0053	07/28/92	HARTWELL ENERGY LIMITED PARTNERSHIP TURBINE, OIL FIRED (2 EACH)	25.0000
HI-0013	12/03/91	MAUI ELECTRIC COMPANY, LTD. TURBINE, FUEL OIL #2	42.0000
FL-0045	07/25/91	CHARLES LARSEN POWER PLANT TURBINE, OIL, 1 EACH	42.0000
FL-0054	11/20/91	LAKE COGEN LIMITED TURBINE, OIL, 2 EACH	42.0000
FL-0057	10/18/91	FLORIDA POWER GENERATION TURBINE, OIL, 6 EACH	42.0000
FL-0072	05/17/93	TIGER BAY LP TURBINE, OIL	42.0000
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, FUEL OIL	42.0000
FL-0078	04/07/93	KISSIMMEE UTILITY AUTHORITY TURBINE, FUEL OIL	42.0000
FL-0080	12/14/92	AUBURNDALE POWER PARTNERS, LP TURBINE, OIL	42.0000
FL-0081	02/24/94	TECO POLK POWER STATION TURBINE, FUEL OIL	42.0000

Table 4-26. CT NOx RBLC Ranking - Fuel Oil (Page 3 of 4)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT

PAGE 2

RBLCID	Permit Date	Facility / Process	Emission Limit
FL-0083	08/17/92	FLORIDA POWER CORPORATION TURBINE, OIL	42.0000
FL-0083	08/17/92	FLORIDA POWER CORPORATION TURBINE, OIL	42.0000
FL-0082	02/25/94	FLORIDA POWER CORPORATION POLK COUNTY SITE TURBINE, FUEL OIL (2)	42.0000
NC-0055	12/20/91	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION TURBINE, COMBUSTION	58.0000
FL-0052	06/05/91	FLORIDA POWER AND LIGHT TURBINE, OIL, 2 EACH	65.0000
FL-0053	03/14/91	FLORIDA POWER AND LIGHT TURBINE, OIL, 4 EACH	65.0000
FL-0056	11/05/91	ORLANDO UTILITIES COMMISSION TURBINE, OIL, 4 EACH	65.0000

Note: Standard emission limits that are zero (i.e., value is missing) are not included in statistics or report above. Refer to Exception report on next page.

Table 4-26. CT NOx RBLC Ranking - Fuel Oil (Page 4 of 4)

REPORT DATE: 01/16/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

PAGE 3

Process Type: 15.006 Fuel Oil

Process Name: TURBINE

Pollutant: NOX

RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
HI-0014	02/12/92	HAWAII ELECTRIC LIGHT CO., INC. TURBINE, FUEL OIL #2	42.3000 LB/HR
HI-0015	07/28/92	MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING TURBINE, COMBINED-CYCLE COMBUSTION	42.3000 LB/HR
GA-0052	02/12/92	SAVANNAH ELECTRIC AND POWER CO. TURBINES, 8	N/a SEE NOTES

Source: EPA, 1997.

Table 27. Florida BACT NO_x Emission Limitation Summary for CTs

Permit Date	Source Name	Turbine Size		Fuel Type	NO _x Emission Limit		Control Technology	
		MW	MMBtu/hr		ppmvd	lb/MMBtu		
08/17/92	Orlando Cogeneration, L.P.	79	857	Gas	15	(0.0670)	Dry low-NO _x combustors	
08/17/92	Florida Power Corp. University of Florida	43	348	Gas	25	(0.1006)	Steam injection	
			383	Oil	42	(0.1731)	Steam injection	
08/17/92	Florida Power Corp. Intercession City	93	1,144	Oil	42	(0.1591)	Wet injection	
			186	2,032	Oil	42	(0.1644)	Wet injection
12/17/92	Auburndale Power Partners	104	1,214	Gas	25	(0.1079)	Steam injection	
			1,214	Gas	15*	(0.0647)	Steam injection	
			1,170	Oil	42	(0.1966)	Steam injection	
04/09/93	Kissimmee Utility Authority	40	367	Gas	25	(0.0981)	Water injection	
			367	Gas	15**	(0.0599)	Dry low-NO _x combustors	
			371	Oil	42	(0.1698)	Water injection	
			80	869	Gas	25	(0.1128)	Water injection
			869	Gas	15**	(0.0610)	Dry low-NO _x combustors	
928	Oil	42	(0.1832)	Water injection				
05/17/93	Central Florida Power, L.P. (Tiger Bay - Destec)	184	1,615	Gas	25	(0.1002)	Dry low-NO _x combustors	
			184	1,615	Gas	15†	(0.0602)	Dry low-NO _x combustors
			1,850	Oil	42	(0.1762)	Wet injection	
02/21/94	Polk Power Partners	84	1,013	Gas	25	(0.1063)	Dry low-NO _x combustors	
			1,013	Gas	15†	(0.0701)	Dry low-NO _x combustors	
			1,016	Oil	42	(0.1844)	Wet injection	
02/24/94	Tampa Electric Company Polk Power Station	260	1,755	Syngas	25	(0.1255)	Nitrogen diluent injection	
			1,765	Oil	42	(0.1762)	Wet injection	
02/25/94	Florida Power Corp. Polk County Site	235	1,510	Gas	12	(0.0483)	Dry low-NO _x combustors	
			1,730	Oil	42	(0.1763)	Wet injection	
07/20/94	Pasco Cogen, Limited	42	403	Gas	25	(0.1955)	Wet injection	
			406	Oil	42	(0.3374)	Wet injection	
03/07/95	Orange Cogeneration, L.P.	39	388	Gas	25	(0.0954)	Dry low-NO _x combustors	
			388	Gas	15**	(0.0570)	Dry low-NO _x combustors	

* Effective 09/30/97.

† Effective 12/31/97.

**Effective 01/01/98

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Table 7. Florida BACT NO_x Emission Limitation Summary for CTs (Page 2 of 2)

Permit Date	Source Name	Turbine Size		Fuel Type	NO _x Emission Limit		Control Technology
		MW	MMBtu/hr		ppmvd	lb/MMBtu	
04/11/95	Gainesville Regional Utilities Deerhaven CT3	74	971	Gas	15	(0.0597)	Dry low-NO _x combustors
			991	Oil	42	(0.1857)	Wet injection

Note: () = calculated values.

Source: FDEP, 1997.

Table 4-28. RBLC NO_x Summary - Natural Gas-Fired Duct Burners

STATE	RBLCID	FACILITY NAME	PERMIT DATE	LAST UPDATE	PROCESS DESCRIPTION	BURNER SIZE		NO. EMISSION LIMITS			CONTROL		COST EFFECTIVENESS		BASIS
						VALUE	UNITS	(PPMVD)	(LB/MMBTU)	(LB/HR)	DESCRIPTION	EFF.	(\$)	YEAR	
FL	FL-0054	LAKE COGEN LIMITED	11/20/91	3/24/95	DUCT BURNER, GAS	150.00	MMBTU/HR		0.1000			NOT REQUIRED			BACT-PSD
	FL-0072	TIGER BAY LP	5/17/93	1/13/95	DUCT BURNER, GAS	100.00	MMBTU/HR		0.1000			GOOD COMBUSTION PRACTICES			BACT-PSD
NY	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/18/92	9/13/94	DUCT BURNERS (2)	206.00	MMBTU/HR (EACH)		0.0181			LOW NOX BURNER AND SCR			BACT-OTHER
	NY-0045	SELKIRK COGENERATION PARTNERS, L.P.	6/18/92	9/13/94	DUCT BURNER	123.00	MMBTU/HR		0.0910			LOW NOX BURNER			BACT-OTHER
	NY-0046	SARANAC ENERGY COMPANY	7/31/92	9/13/94	BURNERS, DUCT (2)	553.00	MMBTU/HR EACH		0.0800			SCR			BACT-OTHER
	NY-0048	KAMINE/BESICORP CORNING L.P.	11/5/92	9/13/94	BURNER, DUCT	90.00	MMBTU/HR		0.1000			LOW NOX BURNER			BACT-OTHER
	NY-0057	MEGAN-RACINE ASSOCIATES, INC	8/5/89	3/30/95	COEN DUCT BURNER	40.00	MMBTU/HR		0.1000			FUEL SPEC: NATURAL GAS ONLY			BACT-OTHER
	NY-0061	ANITEC COGEN PLANT	7/7/93	4/27/95	DUCT BURNER EP #00001	70.00	MMBTU/HR		0.1000	7.0000		ZINK LOW NOX DUCT BURNER	30.0000		BACT-OTHER
	NY-0063	TBG COGEN COGENERATION PLANT	8/5/90	4/27/95	COEN DUCT BURNER	161.80	MMBTU/HR		0.2000			FUEL SPEC: NATURAL GAS ONLY			BACT-OTHER
	NY-0064	INDECK-OSWEGO ENERGY CENTER	10/6/94	4/27/95	DUCT BURNER	30.00	MMBTU/HR		0.1170	3.5100		FUEL SPEC: NATURAL GAS ONLY			BACT-OTHER
	NY-0066	INDECK ENERGY COMPANY	5/12/93	3/31/95	DUCT BURNER EP #00001	100.00	MMBTU/HR		0.1000	8.5000		FUEL SPEC: NATURAL GAS ONLY			NSPS
	NY-0073	LOCKPORT COGEN FACILITY	7/14/93	4/27/95	(3) DUCT BURNER (EP #S 00001-00003)	94.10	MMBTU/HR		0.2000	18.8000		FUEL SPEC; NATURAL GAS ONLY			BACT-OTHER
	NY-0075	PILGRIM ENERGY CENTER		4/27/95	(2) DUCT BURNER (EP #S 00001&2)	214.10	MMBTU/HR		0.0120			FUEL SPEC; NATURAL GAS ONLY			BACT-OTHER
	NY-0077	INDECK-YERKES ENERGY SERVICES	6/24/92	3/31/95	DUCT BURNER (EP #00001)	20.00	MMBTU/HR		0.1100	2.2000		FUEL SPEC: NATURAL GAS ONLY			BACT-OTHER
	NY-0080	PROJECT ORANGE ASSOCIATES	12/1/93	3/31/95	STACK (TURBINE AND DUCT BURNER)	715.00	MMBTU/HR	26.0000	0.0965	69.0000		NO CONTROLS FOR NOX ON STACK *SEE TURBINE NOX DATA			BACT-OTHER
							MAXIMUM		26.0000	0.2000	69.0000				
						MINIMUM		26.0000	0.0120	2.2000					
						MEDIAN		26.0000	0.1000	7.7500					
						NUMBER OF ENTRIES		1	15	6					

Source: EPA, 1997.

Table 29. Florida BACT NO_x Emission Limitation Summary for Natural Gas-Fired CT Duct Burners

Permit Date	Source Name	Burner Size (MMBtu/hr)	NO _x Emission Limit		Control Technology
			lb/hr	lb/MMBtu	
08/17/92	Orlando Cogeneration, L.P	122	12.2	0.1	Low-NO _x burner
08/17/92	Florida Power Corporation University of Florida	187	18.7	0.1	Low-NO _x burner
05/17/93	Central Florida Power, L.P. (Tiger Bay - Destec)	100	10	0.1	Low-NO _x burner
07/20/94	Pasco Cogen, Limited	90	18	0.1	Low-NO _x burner

Source: FDEP, 1997.

Table 4-30. Duct Burner NO_x RBLC Ranking - Natural Gas

REPORT DATE: 01/20/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

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Process Type: 11.005 Natural Gas Combustion

Pollutant: NOX

RBLCID	Permit Date	Facility / Process	Primary Emission Limit/Unit
NY-0075	09/14/94*	PILGRIM ENERGY CENTER (2) DUCT BURNER (EP #S 00001&2)	0.0120 LB/MMBTU
NY-0046	07/31/92	SARANAC ENERGY COMPANY BURNERS, DUCT (2)	0.0800 LB/MMBTU
FL-0054	11/20/91	LAKE COGEN LIMITED DUCT BURNER, GAS	0.1000 LB/MMBTU
FL-0072	05/17/93	TIGER BAY LP DUCT BURNER, GAS	0.1000 LB/MMBTU
NY-0048	11/05/92	KAMINE/BESICORP CORNING L.P. BURNER, DUCT	0.1000 LB/MMBTU
NY-0057	08/05/89	MEGAN-RACINE ASSOCIATES, INC COEN DUCT BURNER	0.1000 LB/MMBTU
NY-0063	08/05/90	TBG COGEN COGENERATION PLANT COEN DUCT BURNER	0.2000 LB/MMBTU
NY-0045	06/18/92	SELKIRK COGENERATION PARTNERS, L.P. DUCT BURNERS (2)	0.0181 LB/MMBTU G ⁻
NY-0073	07/14/93	LOCKPORT COGEN FACILITY (3) DUCT BURNER (EP #S 00001-00003)	0.2000 LB/MMBTU, -
NY-0077	06/24/92	INDECK-YERKES ENERGY SERVICES DUCT BURNER (EP #00001)	0.1100 LB/MMBTU, -
NY-0064	10/06/94	INDECK-OSWEGO ENERGY CENTER DUCT BURNER	0.1170 LB/MMBTU, -
NY-0061	07/07/93	ANITEC COGEN PLANT DUCT BURNER EP #00001	0.1000 LB/MMBTU, -
NY-0066	05/12/93	INDECK ENERGY COMPANY DUCT BURNER EP #00001	0.1000 LB/MMBTU, -

Table 4-30. Duct Burner NO_x RBLC Ranking - Natural Gas (Page 2 of 2)

REPORT DATE: 01/20/97

RANKING BY STANDARD EMISSION LIMIT
 *** NONSTANDARD UNITS REPORT ***

PAGE 2

RBLCID	Permit Date	Facility / Process	Emission Limit/Unit
NY-0045	06/18/92	SELKIRK COGENERATION PARTNERS, L.P. DUCT BURNER	0.0910 LB/MMBTU, ~
NY-0080	12/01/93	PROJECT ORANGE ASSOCIATES STACK (TURBINE AND DUCT BURNER)	26.0000 PPM, 69 LB~

Note: * Indicates date initially inserted into RBLC database.

~ Units have been truncated. See RBLC database.-

Source: EPA, 1997.

The use of advanced dry low-NO_x burner technology is considered to represent BACT for the Panda-Kathleen cogeneration facility CT and duct burner for the following reasons:

- Advanced dry low-NO_x burner technology will achieve NO_x concentrations of 15 and 42 ppmvd for natural gas and oil-firing, respectively, for the GE LM6000 PD CT effective June 1999. An emission level of 15 ppmvd NO_x is consistent with recent FDEP BACT determinations for CTs.
- Advanced dry low-NO_x burner technology will achieve low emission rates without the adverse impacts associated with SCR technology; i.e., NH₃ emissions due to ammonia slip, potential of ammonium salt particulate formation with subsequent downstream corrosion and reduced efficiency of heat transfer equipment, hazards associated with the storage of NH₃ and disposal of spent catalyst, and energy penalties due to increased turbine back pressure and additional system downtime for catalyst replacement.
- Use of backup distillate fuel oil will be limited to an annual capacity factor of 5.7 percent (500 hr/yr at baseload).
- Application of SCR to the combined cycle CT/duct burner system is not considered to be feasible due to excessive control costs; cost effectiveness was determined to be \$4,931 per ton of NO_x controlled.

Specific NO_x BACT emission limits proposed for the Panda-Kathleen cogeneration facility are summarized in Table 4-31.

4.6 SUMMARY OF PROPOSED BACT EMISSION LIMITS

Control technologies proposed as BACT for each pollutant subject to BACT review are summarized in Table 4-32. Specific proposed BACT emission limits are summarized in Tables 4-33.

Table 4-31. Proposed NO_x BACT Emission Limits

	Proposed BACT Emission Limits		
	lb/hr	lb/MMBtu	ppmvd
A. GE LM6000 PD CT (Until 6/30/99)			
Natural gas	40.7	0.091	25.0
No. 2 fuel oil	107.3	0.253	65.0
B. GE LM6000 PD CT (After 6/30/99)			
Natural gas	24.4	0.055	15.0
No. 2 fuel oil	69.3	0.164	42.0
C. Duct Burner			
Natural gas	20.1	0.080	N/A

¹ Maximum rates for all operating scenarios.

Sources: Stewart & Stevenson, 1997.
ECT, 1997.

Table 4-32. Summary of BACT Control Technologies

Pollutant	Control Technology
PM/PM ₁₀	<ul style="list-style-type: none">● Use of low-ash and low-sulfur natural gas and distillate oil fuels● Efficient and complete combustion
CO	<ul style="list-style-type: none">● Efficient and complete combustion
NO _x	<ul style="list-style-type: none">● Use of advanced dry low-NO_x combustors (natural gas and distillate fuel oil)

Source: ECT, 1997.

Table 4-33. Summary of Proposed BACT Emission Limits

Pollutant	Fuel Type	Proposed BACT Emission Limits		
		(ppmvd)	(lb/MMBtu)	(lb/hr)
A. GE LM6000 PD CT				
PM/PM ₁₀ *	Natural gas	N/A	0.0088	3.18
PM/PM ₁₀ *	Distillate fuel oil	N/A	0.0168	6.33
PM/PM ₁₀ †	Natural gas	N/A	0.0084	3.00
PM/PM ₁₀ †	Distillate fuel oil	N/A	0.0090	3.00
Arsenic	Distillate fuel oil	N/A	4.2 x 10 ⁻⁶	0.0018
CO	Natural gas	25	0.055	24.8
CO	Distillate fuel oil	25	0.059	25.1
Until 6/30/99				
NO _x	Natural gas	25	0.091	40.7
NO _x	Distillate fuel oil	65	0.253	107.3
After 6/30/99				
NO _x	Natural gas	15	0.055	24.4
NO _x	Distillate fuel oil	42	0.164	69.3

Table 4-33. Summary of Proposed BACT Emission Limits (Page 2 of 2)

Pollutant	Fuel Type	Proposed BACT Emission Limits		
		(ppmvd)	(lb/MMBtu)	(lb/hr)
B. Duct Burner				
PM/PM ₁₀ *	Natural gas	N/A	0.0104	2.62
PM/PM ₁₀ †	Natural gas	N/A	0.0100	2.52
CO	Natural gas	N/A	0.080	20.1
NO _x	Natural gas	N/A	0.080	20.1

Note: lb/MMBtu values based on fuel LHV.

Emission limits based on following fuel properties: (a) maximum ash content of 0.01 weight percent in distillate fuel oil, (b) maximum sulfur content of 1.0 gr S/100 scf for natural gas and 0.05 weight percent sulfur for distillate fuel oil, and (c) maximum FBN of 0.015 weight percent (for FBN levels greater than 0.015 weight percent, emission limits are adjusted in accordance with the FBN allowance contained in 40 CFR 60 [GG]).

*Including H₂SO₄ mist.

†Excluding H₂SO₄ mist.

Sources: Stewart & Stevenson, 1997.
ECT, 1997.

5.0 UPDATE TO AIR QUALITY MODELING- RELATED ANALYSES

5.1 MODELING APPROACH

The approach used to analyze the potential impacts of the Kathleen Cogeneration Facility were described in detail in Section 6.0 of the original application. The general modeling approach was accepted by FDEP staff. The following paragraphs present any updates to or changes in the modeling procedures or model inputs relative to the original analyses.

The area around the Kathleen project site remains more rural than urban. The land use in the immediate vicinity clearly remains less than 50 percent urban, making the continued use of rural dispersion coefficients and mixing heights appropriate.

The following models and model versions were used for the updated analyses; model version changes are indicated, as appropriate:

- SCREEN3, Version 96043.
- ISCST3, Version 96113.
- ISCLT3, Version 96113.

Meteorological data used in the ISC3 models was updated to the years 1987 through 1991, the most recent 5-year data set readily available.

The configuration of the site and its boundaries has not changed. Receptor locations were therefore not changed from the original study.

The plant layout and dimensions of facility structures will, however, change as a result of the modification. Table 5-1 presents the dimensions of structures considered in the updated downwash analysis. Also, the updated downwash analysis employed the

Table 5-1. Dimensions of Modified Facility Structures

Structure	Height (meters)	Length (meters)	Width (meters)
HRSG enclosure	18.29	32.46	6.4
Office	6.1	41.15	19.81
Cooling tower	18.29	52.43	13.72
Fuel oil tank	9.14	9.75*	NA
Raw water tank	7.32	15.24*	NA
Condensate tank	6.1	7.62*	NA
Demineralized water tank	6.1	9.14*	NA
Distilled water storage tank	6.1	9.75*	NA
Fire water pump building	4.57	4.57	6.1
Process plant building	6.1	40.84	18.29

*Diameter.

Source: ECT, 1997.

current Building Profile Input program (BPIP, Version 95086) to determine the appropriate model downwash parameters.

5.2 AIR QUALITY (MONITORING) ANALYSES

For pollutants with specified *de minimis* levels, exemptions from preconstruction monitoring continue to be appropriate, as determined through the updated modeling analyses (see results summarized in Table 5-2). In addition, monitoring exemptions for ozone and inorganic arsenic are still warranted due to VOC emissions less than the trigger level (ozone) and the fact that no *de minimis* level has been established for arsenic.

5.3 SIGNIFICANT IMPACT ANALYSES AND AIR TOXICS ASSESSMENTS

As previously, the SCREEN model was used to determine the worst-case operating configurations for refined modeling. Tables 5-3 through 5-5 present the screening cases and corresponding results. Note that the cases selected for screening reflect the combustion of fuel oil in the CT and natural gas in the duct burner. This would be the worst-case situation for air emissions. All other possible scenarios (e.g., CT firing natural gas and duct burner firing natural gas) would result in lower hourly emission rates and, therefore, would certainly produce lower modeled impacts.

For the configurations shown in the screening analyses to produce the highest impacts, criteria pollutant emissions from the Panda-Kathleen facility were modeled using the ISC3 models. Table 5-6 summarizes the results of the maximum impact modeling runs for the applicable criteria pollutants. As appropriate, the maximum impacts are compared to the modeling significance levels. Table 5-6 shows that NO_x, PM, and CO impacts were again found to be insignificant for all averaging times. Details regarding maximum impacts are provided in Tables 5-7 through 5-9. As these tables show, the maximum facility impacts were found consistently on or close to the property boundary.

Table 5-2. Summary of Projected Facility Impacts Compared to *De Minimis* Levels

Pollutant	Averaging Time	Impact ($\mu\text{g}/\text{m}^3$)		<i>De Minimis</i> Level ($\mu\text{g}/\text{m}^3$)
		High	HSH	
NO _x	Annual	0.92	NA	14
CO	8-hour	25.7	15.5	575
PM ₁₀	24-hour	2.84	1.85	10
Beryllium	24-hour	0.00032	0.00021	0.001

Source: ECT, 1997.

Table 5-3. SCREEN3 Model Inputs and Results, NO_x, GE LM6000 PD CT and Duct Burner

Mode	CT Fuel	Duct Burner	Down-wash	Load (%)	Ambient Temperature (°F)	Standard Emission Rate (g/sec)	Standard Maximum Impact (µg/m ³)	Nitrogen Oxides		
								Emission Rate (g/sec)	Emission Rate Ratio	Maximum Impact (µg/m ³)
CC	Oil	Yes	Yes	100	20	1.0	13.14	15.24	15.24	200.25
CC	Oil	Yes	Yes	100	59	1.0	16.22	14.91	14.91	241.84
CC	Oil	Yes	Yes	100	95	1.0	17.42	14.86	14.86	258.86
CC	Oil	Yes	Yes	90	20	1.0	15.44	14.20	14.20	219.25
CC	Oil	Yes	Yes	90	59	1.0	16.59	13.67	13.67	226.79
CC	Oil	Yes	Yes	90	95	1.0	17.81	13.67	13.67	243.46
CC	Oil	Yes	Yes	80	20	1.0	16.60	13.16	13.16	218.46
CC	Oil	Yes	Yes	80	59	1.0	17.74	12.64	12.64	224.23
CC	Oil	Yes	Yes	80	95	1.0	18.96	12.64	12.64	239.65

Note: Case producing the highest impact is shown in bold type.

Sources: Stewart & Stevenson, 1997.
ECT, 1997.

5-5

Table 5-4. SCREEN3 Model Inputs and Results, CO, GE LM6000 PD CT and Duct Burner

Mode	CT Fuel	Duct Burner	Down-wash	Load (%)	Ambient Temperature (°F)	Standard Emission Rate (g/sec)	Standard Maximum Impact (µg/m³)	Carbon Monoxide		
								Emission Rate (g/sec)	Emission Rate Ratio	Maximum Impact (µg/m³)
CC	Oil	Yes	Yes	100	20	1.0	13.14	4.89	4.89	64.25
CC	Oil	Yes	Yes	100	59	1.0	16.22	5.44	5.44	88.24
CC	Oil	Yes	Yes	100	95	1.0	17.42	5.38	5.38	93.72
CC	Oil	Yes	Yes	90	20	1.0	15.44	4.51	4.51	69.63
CC	Oil	Yes	Yes	90	59	1.0	16.59	4.91	4.91	81.46
CC	Oil	Yes	Yes	90	95	1.0	17.81	4.91	4.91	87.45
CC	Oil	Yes	Yes	80	20	1.0	16.60	4.14	4.14	68.72
CC	Oil	Yes	Yes	80	59	1.0	17.74	4.48	4.48	79.48
CC	Oil	Yes	Yes	80	95	1.0	18.96	4.48	4.48	84.94

Note: Case producing the highest impact is shown in bold type.

Sources: Stewart & Stevenson, 1997.
ECT, 1997.

Table 5-5. SCREEN3 Model Inputs and Results, PM, GE LM6000 PD CT and Duct Burner

Mode	CT Fuel	Duct Burner	Down-wash	Load (%)	Ambient Temperature (°F)	Standard Emission Rate (g/sec)	Standard Maximum Impact (µg/m³)	Particulate Matter		
								Emission Rate (g/sec)	Emission Rate Ratio	Maximum Impact (µg/m³)
CC	Oil	Yes	Yes	100	20	1.0	13.14	1.02	1.02	13.4
CC	Oil	Yes	Yes	100	59	1.0	16.22	1.09	1.09	17.68
CC	Oil	Yes	Yes	100	95	1.0	17.42	1.08	1.08	18.81
CC	Oil	Yes	Yes	90	20	1.0	15.44	0.97	0.97	14.98
CC	Oil	Yes	Yes	90	59	1.0	16.59	1.02	1.02	16.92
CC	Oil	Yes	Yes	90	95	1.0	17.81	1.02	1.02	18.17
CC	Oil	Yes	Yes	80	20	1.0	16.60	0.92	0.92	15.27
CC	Oil	Yes	Yes	80	59	1.0	17.74	0.97	0.97	17.21
CC	Oil	Yes	Yes	80	95	1.0	18.96	0.97	0.97	18.39

Note: Case producing the highest impact is shown in bold type.

Sources: Stewart & Stevenson, 1997.
ECT, 1997.

Table 5-6. Maximum Panda-Kathleen Criteria Pollutant Impacts

Pollutant	Averaging Time	Maximum Impact ($\mu\text{g}/\text{m}^3$)	Significance Level ($\mu\text{g}/\text{m}^3$)
NO _x	Annual	0.92	1.0
CO	8-hour	25.7	500
	1-hour	126.9	2,000
PM	Annual	0.09	1.0
	24-hour	2.84	5.0

Source: ECT, 1997.

Table 5-7. Summary of NO_x Impacts Due to Panda-Kathleen*

	1987	1988	1989	1990	1991
Annual average Highest (mg/m ³)	0.67	0.76	0.92	0.68	0.68
Location					
Distance (meters)	200	200	200	200	200
Radial (°)	240	2240	180	250	240

*Annual average impacts were based on ISCLT3 results using STAR data (1987 through 1991).

Source: ECT, 1997.

Table 5-8. Summary of CO Impacts Due to Panda-Kathleen*

	1987	1988	1989	1990	1991
8-Hour average					
Highest (mg/m ³)	20.66	19.76	17.96	16.05	25.66
Location					
Distance (meters)	100	100	200	200	59
Radial (°)	130	130	180	140	190
Second highest (mg/m ³)	15.52	13.82	14.96	14.85	12.82
Location					
Distance (meters)	200	200	200	200	160
Radial (°)	150	130	180	130	20
1-Hour average					
Highest (mg/m ³)	60.43	81.13	51.34	43.52	126.95
Location					
Distance (meters)	58	59	100	200	59
Radial (°)	180	190	330	330	190
Second highest(mg/m ³)	56.49	51.96	36.24	38.72	50.4
Location					
Distance (meters)	100	66	59	69	64
Radial (°)	180	210	190	150	120

*Short-term average impacts were based on ISCST3 results for the individual years indicated.

Source: ECT, 1997.

Table 5-9. Summary of PM Impacts Due to Panda-Kathleen*

	1987	1988	1989	1990	1991
Annual average					
Highest (mg/m ³)	0.065	0.074	0.09	0.066	0.066
Location					
Distance (meters)	200	200	200	200	200
Radial (°)	240	220	180	250	240
24-Hour average					
Highest (mg/m ³)	2.26	2.47	2.16	1.41	2.84
Location					
Distance (meters)	200	200	200	200	64
Radial (°)	130	130	180	340	120
Second highest (mg/m³)					
Highest (mg/m ³)	1.45	1.64	1.68	1.29	1.85
Location					
Distance (meters)	200	200	200	200	200
Radial (°)	240	130	180	130	120

*Annual average impacts were based on ISCLT3 results using STAR data (1987 through 1991). Short-term average impacts were based on ISCST3 results for the individual years indicated.

Source: ECT, 1997.

Maximum facility impacts relative to FDEP's current ambient reference concentrations were also re-evaluated by extrapolation from modeling runs already described. Table 5-10 summarizes the results and compares the maximum impacts to the ambient reference concentrations. All maximum impacts were again predicted to be below the ambient reference concentrations, indicating that, with an adequate margin of safety, public health in the vicinity of Panda-Kathleen Cogeneration Facility will not be jeopardized.

5.4 ANALYSES OF ADDITIONAL IMPACTS IN THE PLANT VICINITY

Expected impacts on (a) associated industrial/commercial growth, (b) soils and vegetation, and (c) local visibility will remain essentially the same as those found previously. This would be expected given the similar quantities and characteristics of emissions between the original plant and the modified configuration. No significant impacts were predicted before, and none are predicted for the modified facility.

5.5 POTENTIAL IMPACTS ON THE CHASSAHOWITZKA NATIONAL WILDERNESS AREA PSD CLASS I AREA

Potential impacts on the Chassahowitzka NWA were re-evaluated in terms of PSD Class I increments and other air quality related values (AQRVs). Regarding the former, updated results are presented in Tables 5-11, 5-12, and 5-13.

As shown, all NO_x and PM impacts due to the Panda-Kathleen facility were predicted to be less than even the most stringent significance levels. Based on these results, operation of the cogeneration facility will not cause significant deterioration of air quality at the Chassahowitzka NWA.

An updated "Level 1" visibility screening analysis was not considered necessary since potential emissions of PM, NO_x, and H₂SO₄ all decrease relative to the original analysis. The original analysis showed that all impact values were well below the visibility screening thresholds. Therefore, it can still be concluded that the Panda-Kathleen

Table 5-10. Summary of Worst-Case Estimates of Air Toxics Impacts Compared to FDEP Ambient Reference Concentrations

Pollutant	Averaging Time	Maximum Impact ($\mu\text{g}/\text{m}^3$)	Ambient Reference Concentration ($\mu\text{g}/\text{m}^3$)
H ₂ SO ₄	8-hour	1.89	10
	24-hour	1.04	2.4
Fluorides	8-hour	0.0076	25
	24-hour	0.0042	6
Mercury	8-hour	0.00071	0.1
	24-hour	0.00039	0.02
Beryllium	Annual	0.00003	0.0004
Arsenic	Annual	0.00005	0.0002

Source: ECT, 1997.

Table 5-11. Summary of Impact Analysis for PSD Class I Increments

Pollutant	Averaging Time	Maximum Impact ($\mu\text{g}/\text{m}^3$)	Class I Significance Levels ($\mu\text{g}/\text{m}^3$)		
			Previous NPS	Proposed by EPA*	Recommended by FLM*
NO ₂	Annual	0.0091	0.025	0.1	0.03
PM	Annual	0.0009	0.025	0.2	0.08
	24-hour	0.027	0.07	0.3	0.27

Note: FLM = Federal Land Manager.
NPS = National Park Service.

*See 61 Federal Register 38292, July 23, 1996.

Source: ECT, 1997.

Table 5-12. Summary of NO_x Impacts at Chassahowitzka NWA Due to Panda-Kathleen*

	1987	1988	1989	1990	1991
Annual average Highest (µg/m ³)	0.0058	0.0082	0.0091	0.0057	0.0066
Location					
UTMX (km)	340.3	340.3	340.3	340.3	340.3
UTMY (km)	3,165.7	3,165.7	3,165.7	3,165.7	3,165.7

*Annual average impacts were based on ISCLT3 results using STAR data (1987 through 1991).

Source: ECT, 1997.

Table 5-13... Summary of PM (TSP) Impacts at Chassahowitzka NWA Due to Panda-Kathleen*

	1987	1988	1989	1990	1991
Annual average					
Highest ($\mu\text{g}/\text{m}^3$)	0.0006	0.0008	0.0009	0.0006	0.0006
Location					
UTMX (km)	340.3	340.3	340.3	340.3	340.3
UTMY (km)	3,165.7	3,165.7	3,165.7	3,165.7	3,165.7
24-Hour average					
Highest ($\mu\text{g}/\text{m}^3$)	0.024	0.027	0.026	0.018	0.02
Location					
UTMX (km)	343.7	340.3	340.7	340.7	340.3
UTMY (km)	3,178.3	3,165.7	3,171.9	3,171.9	3,169.8

*Annual average impacts were based on ISCLT3 results using STAR data (1987 through 1991). Short-term average impacts were based on ISCST3 results for the individual years indicated.

Source: ECT, 1997.

Cogeneration Facility emissions will not cause impairment of visibility in the Chassahowitzka NWA Class I area.

Finally, it can be seen that the Kathleen facility will, after modification, continue to pose no threat to soils, vegetation, or wildlife at Chassahowitzka, the same conclusion reached previously. The minimal air quality impacts demonstrated with respect to PSD Class I increments support this conclusion once again.

APPENDIX A

**AIR PERMIT APPLICATION
[FDEP FORM NO. 62-210.900(1)]**

Original diskettes provided to FDEP

Facility Name: Panda-Kathleen
Cogeneration
Plant

Facility ID:1050257

Disk #1 of 1
02/06/97

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02/06/97

**Department of
Environmental Protection**

**DIVISION OF AIR RESOURCES MANAGEMENT
APPLICATION FOR AIR PERMIT - LONG FORM**

I. APPLICATION INFORMATION

Identification of Facility Addressed in This Application

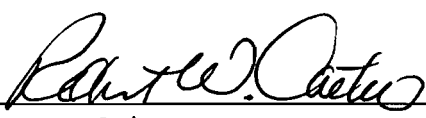
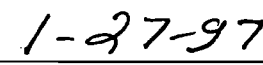
1. Facility Owner/Company Name : Panda-Kathleen, L.P.		
2. Site Name : Kathleen Cogeneration Plant		
3. Facility Identification Number :	1050257	<input type="checkbox"/> Unknown
4. Facility Location : Kathleen Cogeneration Plant 800 McCue Road, Lakeland, Polk County		
Street Address or Other Locator : 800 McCue Road		
City : Lakeland		County : Polk
Zip Code : 33801-		
5. Relocatable Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		6. Existing Permitted Facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Air I.D.# : 1050257-002-AC
P50-FI-216B

Date Rec'd : February 7, 1997

I. Part 1 - 1

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official: Robert W. Carter, Chairman
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: Panda Energy International, Inc. Street Address: 4100 Spring Valley, Suite 1001 City: Dallas State: TX Zip Code: 75244
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: (972) 980-7159 Fax: (972) 980-6815
4. Owner/Authorized Representative or Responsible Official Statement: <i>I, the undersigned, am the owner or authorized representative* of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.</i>  Signature <u>Chairman</u>  Date

* Attach letter of authorization if not currently on file.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type
001	Combustion Turbine #1	ACIA
002	Duct Burner	ACIA
003	Distillate Fuel Oil Storage Tank STR-001	ACIA

Purpose of Application and Category

Category I : All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain :

Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number :

Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed :

Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number :

Operation permit to be revised :

Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application.

Operation permit to be revised/corrected :

Air operation permit revision for a Title V source for reasons other than construction or

I. Part 4 - 1

modification of an emissions unit.

Operation permit to be revised :

Reason for revision :

Category II : All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.

This Application for Air Permit is submitted to obtain :

- Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s) :

- Renewal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed :

- Air operation permit revision for a synthetic non-Title V source.

Operation permit to be revised :

Reason for revision :

Category III : All Air Construction Permit Applications for All Facilities and Emissions Units

This Application for Air Permit is submitted to obtain :

- Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any :

I. Part 4 - 2

Construction Permit AC53-251898, PSD-FL-216A

-] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s) :

-] Air construction permit for one or more existing, but unpermitted, emissions units.

Application Processing Fee

Check one :

[X] Attached - Amount : \$4500.00

[] Not Applicable.

Construction/Modification Information

1. Description of Proposed Project or Alterations :	
The proposed project is a 75-MW combined cycle cogeneration plant. It will consist of one GE LM6000 PD combustion turbine (CT), a duct burner (DB) , an un-fired heat recovery steam generator (HRSG), a steam turbine (ST), and a distillate fuel oil storage tank, along with other ancilliary equipment. The CT will fire natural gas as its primary fuel, with low-sulfur No. 2 distillate fuel oil as backup. The DB will fire only natural gas. The proposed plant represents a modification of the originally permitted facility by: (a) its smaller generation capacity (75 vs. 115 MW), (b) a different CT, (c) addition of a duct burner, (d) a smaller fuel oil storage tank, and (e) adjustments to the site layout. Potential emissions of air pollutants will be decreased as a result of the plant modifications.	
2. Projected or Actual Date of Commencement of Construction :	01-May-1997
3. Projected Date of Completion of Construction :	30-Jun-1998

Professional Engineer Certification

1. Professional Engineer Name : Thomas W. Davis Registration Number : 36777	
2. Professional Engineer Mailing Address :	
Organization/Firm : Environmental Consult. & Tech., Inc Street Address : 3701 NW 98th Street City : Gainesville State : FL Zip Code : 32606-____	
3. Professional Engineer Telephone Numbers :	
Telephone : (352)332-0444	Fax : (352)332-6722

4. Professional Engineer Statement :

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

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollutant control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

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

If the purpose of this application is to obtain a Title V source air operation permit (check here [] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Thom W. Owen
Signature

2/6/97
Date

* Attach any exception to certification statement.

I. Part 6 - 1

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

Application Contact

1. Name and Title of Application Contact :
Name : Jeffrey L. Meling, P.E. Title : Vice President
2. Application Contact Mailing Address :
Organization/Firm : Environmental Consult. & Tech., Inc Street Address : 3701 NW 98th Street City : Gainesville State : FL Zip Code : 32606-
3. Application Contact Telephone Numbers :
Telephone : (352)332-0444 Fax : (352)332-6722

Application Comment

Facility was previously issued FDEP construction permits but has not yet been constructed.

Current facility construction permits are AC53-251898, PSD-FL-216A.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility, Location, and Type

1. Facility UTM Coordinates : Zone : 17 East (km) : 398.65 North (km) : 3101.45			
2. Facility Latitude/Longitude : Latitude (DD/MM/SS) : Longitude (DD/MM/SS) :			
3. Governmental Facility Code : 0	4. Facility Status Code : C	5. Facility Major Group SIC Code : 49	6. Facility SIC(s) : 4911
7. Facility Comment :			

Facility Contact

1. Name and Title of Facility Contact : Kyle Woodruff Project Engineering Manager	
2. Facility Contact Mailing Address : Organization/Firm : Panda Energy International, Inc Street Address : 4100 Spring Valley, Suite 1001 City : Dallas State : TX Zip Code : 75244-_____	
3. Facility Contact Telephone Numbers : Telephone : (972)980-7159 Fax : (972)980-6815	

II. Part 1 - 1

Facility Regulatory Classifications

1. Small Business Stationary Source?	N
2. Title V Source?	Y
3. Synthetic Non-Title V Source?	N
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	Y
5. Synthetic Minor Source of Pollutants Other than HAPs?	N
6. Major Source of Hazardous Air Pollutants (HAPs)?	N
7. Synthetic Minor Source of HAPs?	N
8. One or More Emissions Units Subject to NSPS?	Y
9. One or More Emission Units Subject to NESHAP?	N
10. Title V Source by EPA Designation?	N
11. Facility Regulatory Classifications Comment :	

B. FACILITY REGULATIONS

Rule Applicability Analysis

Not applicable

B. FACILITY REGULATIONS

List of Applicable Regulations

A complete list of applicable requirements will be provided with the facility's Title V permit app.

II. Part 3b - 1

DEP Form No. 62-210:900(1) - Form
Effective : 3-21-96

C. FACILITY POLLUTANTS

Facility Pollutant Information

1. Pollutant Emitted	2. Pollutant Classification
CO	A
NOX	A
PM	B
PM10	B
SO2	B
H015	B

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information

Pollutant 1

1. Pollutant Emitted :	CO	
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment :	Not applicable	

II. Part 4b - 1

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information

Pollutant 2

1. Pollutant Emitted :	NOX	
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment :	Not applicable	

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information

Pollutant 3

1. Pollutant Emitted :	PM	
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment :	Not applicable	

II. Part 4b - 3

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information

Pollutant 4

1. Pollutant Emitted :	PM10	
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment :	Not applicable	

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information

Pollutant 5

1. Pollutant Emitted :	SO2	
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment :	Not applicable	

II. Part 4b - 5

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information

Pollutant 6

1. Pollutant Emitted :	H015	
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment :	Not applicable	

II. Part 4b - 6

D. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location :	Waived
2. Facility Plot Plan :	Fig. 2-1
3. Process Flow Diagram(s) :	NA
4. Precautions to Prevent Emissions of Unconfined Particulate Matter :	NA
5. Fugitive Emissions Identification :	NA
6. Supplemental Information for Construction Permit Application :	See Application

Additional Supplemental Requirements for Category I Applications Only

7. List of Proposed Exempt Activities :
8. List of Equipment/Activities Regulated under Title VI :
9. Alternative Methods of Operation :
10. Alternative Modes of Operation (Emissions Trading) :
11. Identification of Additional Applicable Requirements :
12. Compliance Assurance Monitoring Plan :
13. Risk Management Plan Verification :
14. Compliance Report and Plan :
15. Compliance Certification (Hard-copy Required) :

III. EMISSIONS UNIT INFORMATION

A. TYPE OF EMISSIONS UNIT (Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 1

Combustion Turbine #1

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one :

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one :

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

III. Part 1 - 1

Emissions Unit Information Section 1

**B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)**

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : Combustion Turbine #1		
2. Emissions Unit Identification Number : 001 [] No Corresponding ID [] Unknown		
3. Emissions Unit Status Code : C	4. Acid Rain Unit? [X] Yes [] No	5. Emissions Unit Major Group SIC Code : 49
6. Emissions Unit Comment :		

Emissions Unit Information Section 1
Combustion Turbine #1

Emissions Unit Control Equipment 1

1. Description :	
Dry low-NOx combustors	
2. Control Device or Method Code :	24

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 1
Combustion Turbine #1

Emissions Unit Details

1. Initial Startup Date :		
2. Long-term Reserve Shutdown Date :		
3. Package Unit :		Model Number :
Manufacturer :		
4. Generator Nameplate Rating :	75	MW
5. Incinerator Information :		
Dwell Temperature :		Degrees Fahrenheit
Dwell Time :		Seconds
Incinerator Afterburner Temperature :		Degrees Fahrenheit

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	448	mmBtu/hr
2. Maximum Incinerator Rate :	lb/hr	tons/day
3. Maximum Process or Throughput Rate :		
4. Maximum Production Rate :		
5. Operating Capacity Comment :		
General nameplate rating represents total electrical generation capacity for the cogeneration plant; i.e., combustion and steam turbines.		
Maximum heat input rate provided for natural gas firing at 20 oF.		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :		
24 hours/day	7 days/week	
52 weeks/year	8,760 hours/year	

**D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)**

Emissions Unit Information Section 1
Combustion Turbine #1

Rule Applicability Analysis

Not applicable

Emissions Unit Information Section
Combustion Turbine #1

1

List of Applicable Regulations

A complete list of applicable requirements will be provided with the facility's Title V permit app.

III. Part 6b - 1

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Combustion Turbine #1

Segment Description and Rate : Segment 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Combustion turbine fired with natural gas, 100% load, ambient temperature of 20 oF.	
2. Source Classification Code (SCC) : 2-01-002-01	
3. SCC Units : Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate : 0.42	5. Maximum Annual Rate : 3,709.20
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit : 1,000	
10. Segment Comment :	

III. Part 8 - 1

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Combustion Turbine #1

Segment Description and Rate : Segment 2

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Combustion turbine fired with distillate fuel oil, 100% load, ambient temperature of 20 oF.	
2. Source Classification Code (SCC) : 2-01-001-01	
3. SCC Units : Thousand Gallons Burned (all liquid fuels)	
4. Maximum Hourly Rate : 3.02	5. Maximum Annual Rate : 1,509.30
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur : 0.05	8. Maximum Percent Ash :
9. Million Btu per SCC Unit : 140	
10. Segment Comment : Annual fuel oil usage based on 500 hrs/yr.	

III. Part 8 - 2

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 1
Combustion Turbine #1

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - CO			EL
2 - NOX	024		EL
3 - PM			EL
4 - PM10			EL
5 - SO2			EL
6 - H015			EL
7 - VOC			NS

III. Part 9a - 1

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1
 Combustion Turbine #1

Pollutant Potential/Estimated Emissions : Pollutant 1

1. Pollutant Emitted : CO			
2. Total Percent Efficiency of Control :		%	
3. Potential Emissions :		25.10	lb/hour
		100.00	tons/year
4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
5. Range of Estimated Fugitive/Other Emissions:		to	tons/year
6. Emissions Factor : Reference :			
7. Emissions Method Code : 0			
8. Calculations of Emissions :			
9. Pollutant Potential/Estimated Emissions Comment :			
Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on prorated combustion of natural gas (8,260 hrs/yr) and No. 2 fuel oil (500 hrs/yr), 100% load, and ambient temperature of 59 oF.			

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 1

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	25.00	ppmvd at 15% O2	
4. Equivalent Allowable Emissions :	24.80	lb/hour	108.60 tons/year
5. Method of Compliance :	EPA Reference Method 10.		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 1

Allowable Emissions 2

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	25.00	ppmvd at 15% O2	
4. Equivalent Allowable Emissions :	25.10	lb/hour	6.28 tons/year
5. Method of Compliance :	EPA Reference Method 20		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on combustion of No. 2 fuel oil (500 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1
 Combustion Turbine #1

Pollutant Potential/Estimated Emissions : Pollutant 2

1. Pollutant Emitted : NOX			
2. Total Percent Efficiency of Control :		75.00	%
3. Potential Emissions :		107.30	lb/hour
		179.40	tons/year
4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
5. Range of Estimated Fugitive/Other Emissions:		to	tons/year
6. Emissions Factor : Reference :			
7. Emissions Method Code : 0			
8. Calculations of Emissions :			
9. Pollutant Potential/Estimated Emissions Comment :			
<p>Hourly emission rate based on No. 2 fuel oil combustion and is effective until 6/30/99. After 6/30/99, potential hourly rate is 69.3 lb/hr..</p> <p>Annual emissions based on prorated combustion of natural gas (8,260 hrs/yr) and No. 2 fuel oil (500 hrs/yr), 100% load, and ambient temperature of 59 oF for first year of operation. After 6/30/99, annual rate is 108.8 tpy.</p>			

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 2

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	25.00	ppmvd at 15% O2	
4. Equivalent Allowable Emissions :	40.70	lb/hour	178.30 tons/year
5. Method of Compliance :	EPA Reference Method 20		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate effective until 6/30/99 and based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 2

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 2

Allowable Emissions 2

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :	30-Jun-1999		
3. Requested Allowable Emissions and Units :	15.00	ppmvd at 15% O2	
4. Equivalent Allowable Emissions :	24.40	lb/hour	106.90 tons/year
5. Method of Compliance :	EPA Reference Method 20		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate effective after 6/30/99 and based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 2

Allowable Emissions 3

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	65.00	ppmvd at 15% O2	
4. Equivalent Allowable Emissions :	107.30	lb/hour	26.80 tons/year
5. Method of Compliance :	Reference Method 20		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate effective until 6/30/99 and based on No. 2 fuel oil combustion. Annual emissions based on combustion of No. 2 fuel oil (500 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 4

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 2

Allowable Emissions 4

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :	30-Jun-1999		
3. Requested Allowable Emissions and Units :	42.00	ppmvd at 15% O2	
4. Equivalent Allowable Emissions :	69.30	lb/hour	17.30 tons/year
5. Method of Compliance :	EPA Reference Method 20.		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate effective after 6/30/99 and based on No. 2 fuel oil combustion. Annual emissions based on combustion of No. 2 fuel oil (500 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 5

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1
 Combustion Turbine #1

Pollutant Potential/Estimated Emissions : Pollutant 3

1. Pollutant Emitted : PM			
2. Total Percent Efficiency of Control :		%	
3. Potential Emissions :	6.33	lb/hour	26.10 tons/year
4. Synthetically Limited? . <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
5. Range of Estimated Fugitive/Other Emissions:		to	tons/year
6. Emissions Factor : Reference :			
7. Emissions Method Code : 0			
8. Calculations of Emissions :			
9. Pollutant Potential/Estimated Emissions Comment :			
Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on prorated combustion of natural gas (8,260 hrs/yr) and No. 2 fuel oil (500 hrs/yr), 100% load, and ambient temperature of 59 oF.			

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 3

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	3.18	lb/hr	
4. Equivalent Allowable Emissions :	3.18	lb/hour	13.90 tons/year
5. Method of Compliance :	EPA Reference Method 5 or 17		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 6

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 3

Allowable Emissions 2

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	6.33	lb/hr	
4. Equivalent Allowable Emissions :	6.33	lb/hour	1.58 tons/year
5. Method of Compliance :	EPA Reference Method 5 or 17		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on combustion of No. 2 fuel oil (500 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 7

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1
 Combustion Turbine #1

Pollutant Potential/Estimated Emissions : Pollutant 4

1. Pollutant Emitted : PM10			
2. Total Percent Efficiency of Control :		%	
3. Potential Emissions :	6.33	lb/hour	26.10 tons/year
4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
5. Range of Estimated Fugitive/Other Emissions:		to	tons/year
6. Emissions Factor : Reference :			
7. Emissions Method Code : 0			
8. Calculations of Emissions :			
9. Pollutant Potential/Estimated Emissions Comment :			
Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on prorated combustion of natural gas (8,260 hrs/yr) and No. 2 fuel oil (500 hrs/yr), 100% load, and ambient temperature of 59 oF.			

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 4

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	3.18	lb/hr	
4. Equivalent Allowable Emissions :	3.18	lb/hour	13.90 tons/year
5. Method of Compliance :	EPA Reference Method 5 or 17		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 8

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 4

Allowable Emissions 2

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	6.33	lb/hr	
4. Equivalent Allowable Emissions :	6.33	lb/hour	1.58 tons/year
5. Method of Compliance :	EPA Reference Method 5 or 17		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on combustion of No. 2 fuel oil (500 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 9

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1

Combustion Turbine #1

Pollutant Potential/Estimated Emissions : Pollutant 5

1. Pollutant Emitted : SO2				
2. Total Percent Efficiency of Control :		%		
3. Potential Emissions :				
21.73	lb/hour	12.30	tons/year	
4. Synthetically Limited?				
[X] Yes		[] No		
5. Range of Estimated Fugitive/Other Emissions:				
			to	tons/year
6. Emissions Factor :				
Reference :				
7. Emissions Method Code : 0				
8. Calculations of Emissions :				
9. Pollutant Potential/Estimated Emissions Comment :				
<p>Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on prorated combustion of natural gas (8,260 hrs/yr) and No. 2 fuel oil (500 hrs/yr), 100% load, and ambient temperature of 59 oF.</p>				

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 5

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	ESCPSD		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	0.05	wt % S fuel	
4. Equivalent Allowable Emissions :	21.73	lb/hour	5.43 tons/year
5. Method of Compliance :	Fuel analysis		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on combustion of No. 2 fuel oil (500 hrs/yr). SO2 emissions based on use of 0.05 weight percent S fuel oil.		

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 5

Allowable Emissions 2

1. Basis for Allowable Emissions Code :	ESCPSD		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	0.00	lb/MMBtu	
4. Equivalent Allowable Emissions :	1.17	lb/hour	5.12 tons/year
5. Method of Compliance :	Fuel analysis		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). Proposed limit is below NSPS limit of 0.8 wt % S.		

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 1
 Combustion Turbine #1

Pollutant Potential/Estimated Emissions : Pollutant 6

1. Pollutant Emitted : H015		
2. Total Percent Efficiency of Control :		%
3. Potential Emissions :	0.00 lb/hour	tons/year
4. Synthetically Limited? <input checked="" type="checkbox"/> Yes [] No		
5. Range of Estimated Fugitive/Other Emissions:		to tons/year
6. Emissions Factor : Reference :		
7. Emissions Method Code : 0		
8. Calculations of Emissions :		
9. Pollutant Potential/Estimated Emissions Comment :		
Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on combustion of No. 2 fuel oil (500 hrs/yr), 100% load, and ambient temperature of 59 oF. Annual emission rate is 0.000445 tpy.		

Emissions Unit Information Section 1
Combustion Turbine #1

Pollutant Information Section 6

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	0.00	lb/hr	
4. Equivalent Allowable Emissions :	0.00	lb/hour	0.00 tons/year
5. Method of Compliance :	Fuel analysis		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on combustion of No. 2 fuel oil (500 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 11

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**H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)**

Emissions Unit Information Section 1

Combustion Turbine #1

Pollutant Potential/Estimated Emissions : Pollutant 7

1. Pollutant Emitted : VOC			
2. Total Percent Efficiency of Control :		%	
3. Potential Emissions :	3.45	lb/hour	13.70 tons/year
4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
5. Range of Estimated Fugitive/Other Emissions:		to	tons/year
6. Emissions Factor :		Reference : Vendor data	
7. Emissions Method Code : 2			
8. Calculations of Emissions :			
9. Pollutant Potential/Estimated Emissions Comment :			
Hourly emission rate based on No. 2 fuel oil combustion. Annual emissions based on prorated combustion of natural gas (8,260 hrs/yr) and No. 2 fuel oil (500 hrs/yr), 100% load, and ambient temperature of 59 oF.			

III. Part 9b - 7

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 1
Combustion Turbine #1

Visible Emissions Limitation : Visible Emissions Limitation 1

1. Visible Emissions Subtype :	10
2. Basis for Allowable Opacity :	RULE
3. Requested Allowable Opacity :	
	Normal Conditions : 10 %
	Exceptional Conditions : %
	Maximum Period of Excess Opacity Allowed : min/hour
4. Method of Compliance :	
	EPA Reference Method 9
5. Visible Emissions Comment :	
	FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 1
Combustion Turbine #1

Continuous Monitoring System : Continuous Monitor 1

1. Parameter Code :	2. Pollutant :
3. CMS Requirement :	
4. Monitor Information : Manufacturer : Model Number : Serial Number :	
5. Installation Date :	
6. Performance Specification Test Date :	
7. Continuous Monitor Comment : Data for the facility CEMs will be provided when available.	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION

Emissions Unit Information Section 1

Combustion Turbine #1

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

- [X] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.
- [] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

III. Part 12 - 1

2. Increment Consuming for Nitrogen Dioxide?

- [X] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.
- [] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] The facility addressed in this application is classified as an EPA major source, and the emission unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code :		
PM : C	SO2 : C	NO2 : C
4. Baseline Emissions :		
PM :	lb/hour	tons/year
SO2 :	lb/hour	tons/year
NO2 :		tons/year
5. PSD Comment :		

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 1

Combustion Turbine #1

Supplemental Requirements for All Applications

1. Process Flow Diagram :	NA
2. Fuel Analysis or Specification :	Waived
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	NA
5. Compliance Test Report :	NA
6. Procedures for Startup and Shutdown :	NA
7. Operation and Maintenance Plan :	NA
8. Supplemental Information for Construction Permit Application :	See Application
9. Other Information Required by Rule or Statue :	NA

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operations :
11. Alternative Modes of Operation (Emissions Trading) :

12. Identification of Additional Applicable Requirements :

13. Compliance Assurance Monitoring
Plan :

14. Acid Rain Application (Hard-copy Required) :

Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))

Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)

New Unit Exemption (Form No. 62-210.900(1)(a)2.)

Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)

III. Part 13 - 2

III. EMISSIONS UNIT INFORMATION

A. TYPE OF EMISSIONS UNIT (Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 2

Duct Burner

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one :

- [X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
- [] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one :

- [X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- [] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- [] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

III. Part 1 - 1

**B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)**

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : Duct Burner		
2. Emissions Unit Identification Number : 002 [] No Corresponding ID [] Unknown		
3. Emissions Unit Status Code : C	4. Acid Rain Unit? [X] Yes [] No	5. Emissions Unit Major Group SIC Code : 49
6. Emissions Unit Comment :		

Emissions Unit Information Section 2
Duct Burner

Emissions Unit Control Equipment 1

1. Description :	
Low-NOx burner	
2. Control Device or Method Code :	24

**C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)**

Emissions Unit Information Section 2
Duct Burner

Emissions Unit Details

1. Initial Startup Date :		
2. Long-term Reserve Shutdown Date :		
3. Package Unit :	Model Number :	
Manufacturer :		
4. Generator Nameplate Rating :	MW	
5. Incinerator Information :		
Dwell Temperature :	Degrees Fahrenheit	
Dwell Time :	Seconds	
Incinerator Afterburner Temperature :	Degrees Fahrenheit	

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	252	mmBtu/hr
2. Maximum Incinerator Rate :	lb/hr	tons/day
3. Maximum Process or Throughput Rate :		
4. Maximum Production Rate :		
5. Operating Capacity Comment :		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :		
24 hours/day		7 days/week
52 weeks/year		8,760 hours/year

**D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)**

Emissions Unit Information Section 2
Duct Burner

Rule Applicability Analysis

Not applicable

Emissions Unit Information Section
Duct Burner

2

List of Applicable Regulations

A complete list of applicable requirements will be provided with the facility's Title V permit app.

III. Part 6b - 1

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 2

Duct Burner

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :	DB-001
2. Emission Point Type Code :	2
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking : (limit to 100 characters per point) Not applicable	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common : Combustion turbine (CT-001) and duct burner (DB-001).	
5. Discharge Type Code :	V
6. Stack Height :	100 feet
7. Exit Diameter :	12.0 feet
8. Exit Temperature :	209 °F
9. Actual Volumetric Flow Rate :	301445 acfm
10. Percent Water Vapor :	%
11. Maximum Dry Standard Flow Rate :	dscfm
12. Nonstack Emission Point Height :	feet
13. Emission Point UTM Coordinates :	
Zone :	East (km) :
	North (km) :
14. Emission Point Comment : Stack temperature and flow rate based on combined CT and DB exhaust with the CT and DB fired with natural gas, 100% load, ambient air temperature of 59 oF.	

III. Part 7a - 1

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 2

Duct Burner

Segment Description and Rate : Segment 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Duct burner fired with natural gas.	
2. Source Classification Code (SCC) : 1-02-006-04	
3. SCC Units : Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate : 0.24	5. Maximum Annual Rate : 2,083.50
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit : 1,000	
10. Segment Comment :	

III. Part 8 - 1

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 2
Duct Burner

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - CO			EL
2 - NOX	024		EL
3 - PM			EL
4 - SO2			EL
5 - PM10			EL
6 - VOC			NS

III. Part 9a - 1

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 2
Duct Burner

Pollutant Potential/Estimated Emissions : Pollutant 1

1. Pollutant Emitted : CO			
2. Total Percent Efficiency of Control :		%	
3. Potential Emissions :	20.10	lb/hour	88.20 tons/year
4. Synthetically Limited? [] Yes [X] No			
5. Range of Estimated Fugitive/Other Emissions:		to	tons/year
6. Emissions Factor : Reference : Vendor data			
7. Emissions Method Code : 0			
8. Calculations of Emissions :			
9. Pollutant Potential/Estimated Emissions Comment : Hourly and annual emission rates based on natural gas combustion.			

Emissions Unit Information Section 2
Duct Burner

Pollutant Information Section 1

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	0.08	lb/MMBtu	
4. Equivalent Allowable Emissions :	20.10	lb/hour	88.20 tons/year
5. Method of Compliance :	EPA Reference Method 10.		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly and annual emission rates based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

Emissions Unit Information Section 2
Duct Burner

Pollutant Information Section 2

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	0.08	lb/MMBtu	
4. Equivalent Allowable Emissions :	20.10	lb/hour	88.20 tons/year
5. Method of Compliance :	EPA Reference Method 7E		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly and annual emission rates based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 2

Emissions Unit Information Section 2
Duct Burner

Pollutant Information Section 3

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	0.01	lb/MMBtu	
4. Equivalent Allowable Emissions :	2.62	lb/hour	11.50 tons/year
5. Method of Compliance :	EPA Reference Method 5 or 17		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly and annual emission rates based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

III. Part 9c - 3

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H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 2
 Duct Burner

Pollutant Potential/Estimated Emissions : Pollutant 4

1. Pollutant Emitted : SO2			
2. Total Percent Efficiency of Control :		%	
3. Potential Emissions :			
0.66	lb/hour	2.90	tons/year
4. Synthetically Limited?			
[] Yes [X] No			
5. Range of Estimated Fugitive/Other Emissions:			
		to	tons/year
6. Emissions Factor :			
Reference : Fuel composition			
7. Emissions Method Code : 0			
8. Calculations of Emissions :			
9. Pollutant Potential/Estimated Emissions Comment :			
Hourly and annual emission rates based on natural gas combustion.			

Emissions Unit Information Section 2
Duct Burner

Pollutant Information Section 4

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	ESCPSD		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	0.00	lb/MMBtu	
4. Equivalent Allowable Emissions :	0.66	lb/hour	2.90 tons/year
5. Method of Compliance :	Fuel analysis		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly and annual emission rates based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). Proposed limit is below NSPS limit of 0.2 lb/MM Btu.		

III. Part 9c - 4

**H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)**

Emissions Unit Information Section 2
Duct Burner

Pollutant Potential/Estimated Emissions : Pollutant 5

1. Pollutant Emitted : PM10			
2. Total Percent Efficiency of Control :		%	
3. Potential Emissions :	2.62	lb/hour	11.50 tons/year
4. Synthetically Limited? [] Yes [X] No			
5. Range of Estimated Fugitive/Other Emissions:		to	tons/year
6. Emissions Factor : Reference : Vendor data			
7. Emissions Method Code : 0			
8. Calculations of Emissions :			
9. Pollutant Potential/Estimated Emissions Comment : Hourly and annual emissions based on natural gas combustion.			

Emissions Unit Information Section 2
Duct Burner

Pollutant Information Section 5

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE		
2. Future Effective Date of Allowable Emissions :			
3. Requested Allowable Emissions and Units :	0.01	lb/MMBtu	
4. Equivalent Allowable Emissions :	2.62	lb/hour	11.50 tons/year
5. Method of Compliance :	EPA Reference Method 5 or 17		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) :	Hourly and annual emission rates based on natural gas combustion. Annual emissions based on combustion of natural gas (8,760 hrs/yr). FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).		

**I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)**

Emissions Unit Information Section 2
Duct Burner

Visible Emissions Limitation : Visible Emissions Limitation 1

1. Visible Emissions Subtype :	10
2. Basis for Allowable Opacity :	RULE
3. Requested Allowable Opacity :	
	Normal Conditions : 10 %
	Exceptional Conditions : %
	Maximum Period of Excess Opacity Allowed : min/hour
4. Method of Compliance :	
	EPA Reference Method 9.
5. Visible Emissions Comment :	
	FDEP Rule 62-212.400(5)(c), F.A.C. (BACT).

III. Part 10 - 1

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 2
Duct Burner

Continuous Monitoring System : Continuous Monitor 1

1. Parameter Code :	2. Pollutant :
3. CMS Requirement :	
4. Monitor Information : Manufacturer : Model Number : Serial Number :	
5. Installation Date :	
6. Performance Specification Test Date :	
7. Continuous Monitor Comment : Data for the facility CEMs will be provided when available.	

**K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT
TRACKING INFORMATION**

Emissions Unit Information Section 2

Duct Burner

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

- [X] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.
- [] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
- [] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

- The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.
- The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
- The facility addressed in this application is classified as an EPA major source, and the emission unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
- For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
- None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code :		
PM : C	SO2 : C	NO2 : C
4. Baseline Emissions :		
PM :	lb/hour	tons/year
SO2 :	lb/hour	tons/year
NO2 :		tons/year
5. PSD Comment :		

III. Part 12 - 2

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 2

Duct Burner

Supplemental Requirements for All Applications

1. Process Flow Diagram :	NA
2. Fuel Analysis or Specification :	Waived
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	NA
5. Compliance Test Report :	NA
6. Procedures for Startup and Shutdown :	NA
7. Operation and Maintenance Plan :	NA
8. Supplemental Information for Construction Permit Application :	See Application
9. Other Information Required by Rule or Statue :	NA

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operations :
11. Alternitive Modes of Operation (Emissions Trading) :

III. Part 13 - 1

12. Identification of Additional Applicable Requirements :

13. Compliance Assurance Monitoring
Plan :

14. Acid Rain Application (Hard-copy Required) :

Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))

Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)

New Unit Exemption (Form No. 62-210.900(1)(a)2.)

Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)

III. EMISSIONS UNIT INFORMATION

A. TYPE OF EMISSIONS UNIT (Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 3

Distillate Fuel Oil Storage Tank STR-001

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one :

- The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
- The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one :

- This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
- This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
- This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

III. Part 1 - 1

**B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)**

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : Distillate Fuel Oil Storage Tank STR-001		
2. Emissions Unit Identification Number : 003 <input type="checkbox"/> No Corresponding ID <input type="checkbox"/> Unknown		
3. Emissions Unit Status Code : C	4. Acid Rain Unit? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Emissions Unit Major Group SIC Code : 49
6. Emissions Unit Comment : Estimated annual VOC emissions from distillate storage tank STR-001 are below significant amounts; i.e., << 5 tpy.		

Emissions Unit Information Section 3
Distillate Fuel Oil Storage Tank STR-001

Emissions Unit Control Equipment 1

1. Description :	
Distillate fuel storage tank STR-001 is equipped with a pressure/vacuum conservation vent.	
2. Control Device or Method Code :	88

C: EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 3
 Distillate Fuel Oil Storage Tank STR-001

Emissions Unit Details

1. Initial Startup Date :		
2. Long-term Reserve Shutdown Date :		
3. Package Unit :		Model Number :
Manufacturer :		
4. Generator Nameplate Rating :	MW	
5. Incinerator Information :		
Dwell Temperature :		Degrees Fahrenheit
Dwell Time :		Seconds
Incinerator Afterburner Temperature :		Degrees Fahrenheit

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	mmBtu/hr	
2. Maximum Incinerator Rate :	lb/hr	tons/day
3. Maximum Process or Throughput Rate :		
4. Maximum Production Rate :		
5. Operating Capacity Comment :		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :		
hours/day		days/week
weeks/year		hours/year

**D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)**

Emissions Unit Information Section
Distillate Fuel Oil Storage Tank STR-001

3

Rule Applicability Analysis

--

Emissions Unit Information Section _____

List of Applicable Regulations

III. Part 6b - 1

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section

3

Distillate Fuel Oil Storage Tank STR-001

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :		
2. Emission Point Type Code :		
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking : (limit to 100 characters per point)		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :		
6. Stack Height :		feet
7. Exit Diameter :		feet
8. Exit Temperature :		°F
9. Actual Volumetric Flow Rate :		acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates :		
Zone :	East (km) :	North (km) :
14. Emission Point Comment :		

III. Part 7a - 1

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 3

Distillate Fuel Oil Storage Tank STR-001

Segment Description and Rate : Segment 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Storage of No. 2 distillate fuel oil.	
2. Source Classification Code (SCC) : 4-03-010-21	
3. SCC Units : Thousand Gallons Transferred or Handled	
4. Maximum Hourly Rate :	5. Maximum Annual Rate : 1,509.30
6. Estimated Annual Activity Factor :	
7. Maximum Percent Sulfur :	8. Maximum Percent Ash :
9. Million Btu per SCC Unit :	
10. Segment Comment :	

III. Part 8 - 1

62-210.900(1)

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section _____

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code

III. Part 9a - 1

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section _____

Pollutant Potential/Estimated Emissions : _____

1. Pollutant Emitted :		
2. Total Percent Efficiency of Control :		%
3. Potential Emissions :	lb/hour	tons/year
4. Synthetically Limited? [] Yes [] No		
5. Range of Estimated Fugitive/Other Emissions:	to	tons/year
6. Emissions Factor : Reference :		
7. Emissions Method Code :		
8. Calculations of Emissions :		
9. Pollutant Potential/Estimated Emissions Comment :		

10-11-96

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section _____

Visible Emissions Limitation : Visible Emissions Limitation _____

1. Visible Emissions Subtype :						
2. Basis for Allowable Opacity :						
3. Requested Allowable Opacity : <table style="margin-left: auto; margin-right: auto;"><tr><td>Normal Conditions :</td><td style="text-align: right;">%</td></tr><tr><td>Exceptional Conditions :</td><td style="text-align: right;">%</td></tr><tr><td>Maximum Period of Excess Opacity Allowed :</td><td style="text-align: right;">min/hour</td></tr></table>	Normal Conditions :	%	Exceptional Conditions :	%	Maximum Period of Excess Opacity Allowed :	min/hour
Normal Conditions :	%					
Exceptional Conditions :	%					
Maximum Period of Excess Opacity Allowed :	min/hour					
4. Method of Compliance :						
5. Visible Emissions Comment :						

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section _____

Continuous Monitoring System : Continuous Monitor _____

1. Parameter Code :	2. Pollutant :
3. CMS Requirement :	
4. Monitor Information : Manufacturer : Model Number : Serial Number :	
5. Installation Date :	
6. Performance Specification Test Date :	
7. Continuous Monitor Comment :	

**K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT
TRACKING INFORMATION**

Emissions Unit Information Section 3

Distillate Fuel Oil Storage Tank STR-001

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

-] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.
-] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.
-] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
-] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
-] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

III. Part 12 - 1

2. Increment Consuming for Nitrogen Dioxide?

-] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.
-] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
-] The facility addressed in this application is classified as an EPA major source, and the emission unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
-] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.
-] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code :		
PM : U	SO2 : U	NO2 : U
4. Baseline Emissions :		
PM :	lb/hour	tons/year
SO2 :	lb/hour	tons/year
NO2 :		tons/year
5. PSD Comment :		

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 3

Distillate Fuel Oil Storage Tank STR-001

Supplemental Requirements for All Applications

1. Process Flow Diagram :
2. Fuel Analysis or Specification :
3. Detailed Description of Control Equipment :
4. Description of Stack Sampling Facilities :
5. Compliance Test Report :
6. Procedures for Startup and Shutdown :
7. Operation and Maintenance Plan :
8. Supplemental Information for Construction Permit Application :
9. Other Information Required by Rule or Statue :

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operations :
11. Alterntive Modes of Operation (Emissions Trading) :

12. Identification of Additional Applicable Requirements :

13. Compliance Assurance Monitoring
Plan :

14. Acid Rain Application (Hard-copy Required) :

Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))

Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)

New Unit Exemption (Form No. 62-210.900(1)(a)2.)

Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)

APPENDIX B
VENDOR INFORMATION



STEWART & STEVENSON INTERNATIONAL, INC.

P.O. BOX 1637 • HOUSTON, TEXAS 77251-1637
TEL: (713) 868-7700 • FAX: (713) 868-7697 • TELEX: 794221 / 201448 CPW HOU

February 4, 1997

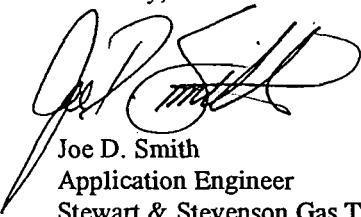
Mr. Jeff Meling
Environmental Consulting & Technology, Inc.
3701 Northwest 98th Street
Gainesville, Fl. 32606

RE: Emission Attachments for the Panda Kathleen Project - Department of Environmental Protection
Permit Number AC 53-251898

Please find the attached information from GE M&I to support the emission calculations. Also attached is Stewart & Stevenson's guarantee and latest support data for this project.

If there is anything that you need to help this process please call or fax me your questions.

Sincerely,



Joe D. Smith
Application Engineer
Stewart & Stevenson Gas Turbine Sales

cc: Jim Prochaska S&S
Jim King S&S
Len Shapiro S&S
Robert Gray GE M&I
Rob Anthony GE M&I



W. H. Millhaem
Manager, Industrial Marketing

General Electric Company
One Neumann Way, S158
Cincinnati, OH 45215-6301
(513) 552-5050; Fx: (513) 552-5001

February 4, 1997

Copy: R. Anthony
R. Gray
L. Shapiro
M. Axford

Mr. Jim King
Stewart & Stevenson, Inc.
Houston, TX

Dear Jim:

GE Marine and Industrial is pleased to provide Performance and Emissions data for the LM6000PD gas turbine as applied for the Panda Energy project in Lakeland, Florida. This will be a dual fuel, natural gas and distillate application that will achieve exhaust gas emissions requirements by GE-developed Dry Low Emissions (DLE) technology.

The emission level guarantees are being provided to cover two phases:

- a) *Initial operation up to mid-1999*
- b) *July 1, 1999 and beyond.*

For the first phase, the emission guarantees are as follows:

Natural Gas Fuel:

$NO_x \leq 25 \text{ ppmvd @ } 15\% O_2$

$CO \leq 25 \text{ ppmvd @ } 15\% O_2$

$Particulate \leq 3 \text{ lb/hr pm}_{10}$

while operating in the power range of 75% to 100% of base load. The ambient temperature range covered is 20 to 100°F, as indicated in the attached cycle cases 3001-3012.

Distillate fuel:

$NO_x \leq 65 \text{ ppmvd @ } 15\% O_2$

$CO \leq 25 \text{ ppmvd @ } 15\% O_2$

$Particulate \leq 3 \text{ lb/hr pm}_{10}$

also while operating in the 75 to 100% load range and for ambient temperatures covering 20 to 100°F, as indicated in the attached cycle cases 1001-1012.

Phase 2 of the emissions guarantee begins July 1, 1999 and requires meeting the following levels:

Natural Gas Fuel:

$NO_x \leq 15 \text{ ppmvd @ } 15\% O_2$

$CO \leq 25 \text{ ppmvd @ } 15\% O_2$

$Particulate \leq 3 \text{ lb/hr pm}_{10}$

For this phase, the load range covered is 95 to 100% of base load, 20 to 100 °F ambient temperature, as indicated in the attached cycle cases 4001-4008.

Distillate fuel:

$NO_x \leq 42 \text{ ppmvd @ } 15\% O_2$

$CO \leq 25 \text{ ppmvd @ } 15\% O_2$

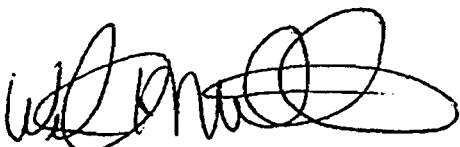
$Particulate \leq 3 \text{ lb/hr pm}_{10}$

Also while operating in the 95 to 100% of base load range and for ambient temperatures covering 20 to 100°F, as indicated in the attached cycle cases 201-208.


Note the emissions guarantees of NO_x and CO are made by GE M&I in units of ppmvd @ 15% O_2 and require natural gas and distillate fuels that are in full compliance with GE M&I Natural Gas and Liquid fuel specifications, MID-TD-0000-1 and MID-TD-0000-2, respectively. Emission guarantees on a volumetric basis, ppmvd, are typical and meet the requirements of most emission limit specifications. Because of limited engine experience to date, translation from volumetric to mass-based emission flow rates cannot be made with absolute certainty. The emissions data provided show both volumetric (ppmvd) and mass (lb/hr), with the mass rates being our best possible estimates as available at present.

Performance and emissions data from the GE M&I cycle deck representing the LM6000PD gas turbine are included by attachment. The Phase 1 data covers 75-100% load and the Phase 2 data covers 95 to 100% load.

Hopefully, this data will provide the information required for successful completion of this portion of the project requirements.

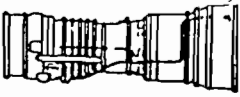


W. H. Millhaem, Manager
M&I Industrial Marketing



Concurred: G. Leonard
LM6000 Product Development

Attachments



SSS0169-2

STEWART & STEVENSON



STEWART & STEVENSON TURBINE GEN SET PERFORMANCE FOR Panda Kathleen

GUARANTEED PARAMETERS

JOBSITE LOCATION: Panda Kathleen

NOx Emissions
25 PPMVD AT 15 %O2

CO Emissions
25 PPMVD AT 15 %O2

GUARANTEE
 JAMES W. KING JR
[Signature] for SWK
 DATE 1-15-97

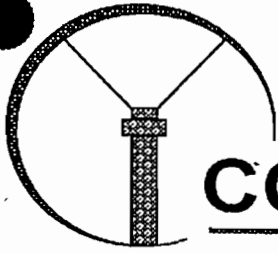
NOT VALID WITHOUT STAMP

BASIS OF GUARANTEE:

NO BLEED OR EXTRACTED POWER

ENGINE:	GE LM6000 PD Gas Turbine	
FUEL:	20,827 BTU/LB (LHV), GAS FUEL	
FUEL TEMP:	≥ 60.00	°F @ S & S BASEPLATE
GENERATOR OUTPUT:	13.8 KV	
POWER FACTOR:	≥ 0.9	
GAS TURBINE LOAD:	75% -100%	
AMBIENT TEMP:	20°F - 95 °F	
AMBIENT RH:	60%	
EVAP COOLER:	NOT FURNISHED	
INLET AIR CHILLER:	FURNISHED	
ANTI ICE INLET HEATER:	NOT FURNISHED	
ALTITUDE:	50 FEET	
INLET FILTER LOSS:	≤ 5.0	INCHES H2O
EXHAUST LOSS:	≤ 12	INCHES H2O
COMPRESSOR BLEED AIR:	NA	
HP STEAM INJ:	NA	
HP STEAM PRESSURE:	NA	
HP STEAM TEMPERATURE:	NA	
WATER INJECTION RATE:	NA	
WATER INJECTION TEMP:	NA	
ENGINE CONDITION:	NEW AND CLEAN	≤ 200 SITE FIRED HOURS
FIELD TEST METHOD:	STEWART & STEVENSON SGTGSPTM R2022592JWK	

THIS GUARANTEE SUPERSEDES ANY
PREVIOUS GUARANTEES PRESENTED



COEN Company, Inc.

Leaders in Combustion Technology

1510 Rollins Road
Burlingame, CA 94010
Direct Phone (415) 579-3211
Facsimile: (415) 579-3255

January 10, 1997

Stewart & Stevenson International, Inc.
Gas Turbine Products Division
2707 North Loop West
Houston, Texas 77008

FAX (713) 868-7697

Attention: Joe D. Smith
(713) 868-7646

Subject: Environmental Consulting & Technology (ECT)
Panda Kathleen Cogen Modification

Dear Joe:

In response to your FAX letter of January 8, is the following:

The letter from ECT asked for emissions rates from the LM6000 PD turbine and the Coen duct burner firing natural gas. ECT requests the emission information to be given in units of stack concentrations and "LB per Million BTU (HHV)". Since we do not have the turbine exhaust gas analysis or the actual duct firing rates, we cannot list the actual stack concentrations, and therefore can only list the emissions on a mass basis. The emissions from the Coen duct burner system would be as follows:

NO _x	0.080 LB per Million BTU (HHV).
CO	0.080 LB per Million BTU (HHV).
VOC	0.020 LB per Million BTU (HHV).
PM-10	0.010 LB per Million BTU (HHV).

Please note that the VOC (Volatile Organic Compounds) are the "Non-Methane" hydrocarbons. We cannot address the emissions of SO_x without a natural gas fuel analysis.

If you have any questions, please give me a call at your earliest convenience.

Sincerely,

COEN COMPANY, INCORPORATED

Richard A. Brown, Sales Application Engineer
Energy Systems

GE LM6000 PD Emission Results for the Panda Kathleen Project.

GE LM6000 PD CT Firing Natural Gas Fuel to 25 ppm of NOx											
Unit Load%	Ambient Temperature (°F)	NOx	NOx	CO	CO	VOC	VOC	Paritculates	Exhaust SCFM	Exhaust Temperature (°F)	
100	20	25 ppm	41 lbs/hr	25 ppm	25 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	214509	831	
	59	25 ppm	37 lbs/hr	25 ppm	23 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	212944	849	
	95	25 ppm	37 lbs/hr	25 ppm	23 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	212944	849	
85	20	25 ppm	35 lbs/hr	25 ppm	21 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	200359	823	
	59	25 ppm	33 lbs/hr	25 ppm	20 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	198503	826	
	95	25 ppm	33 lbs/hr	25 ppm	20 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	198503	826	
75	20	25 ppm	34 lbs/hr	25 ppm	21 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	180810	863	
	59	25 ppm	31 lbs/hr	25 ppm	19 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	179010	866	
	95	25 ppm	31 lbs/hr	25 ppm	19 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	179010	866	

GE LM6000 PD CT Firing Liquid Fuel to 65 ppm of NOx											
.	20	65 ppm	106.9 lbs/hr	25 ppm	25.1 lbs/hr	N/A	N/A	3 lbs/hr	230236	833	
*100	59	65 ppm	91.8 lbs/hr	25 ppm	21.5 lbs/hr	N/A	N/A	3 lbs/hr	202397	877	
.	95	65 ppm	76.3 lbs/hr	25 ppm	17.9 lbs/hr	N/A	N/A	3 lbs/hr	168433	916	
.	20	65 ppm	96.7 lbs/hr	25 ppm	22.7 lbs/hr	N/A	N/A	3 lbs/hr	212644	824	
*85	59	65 ppm	80.5 lbs/hr	25 ppm	18.9 lbs/hr	N/A	N/A	3 lbs/hr	186714	845	
.	95	65 ppm	67.5 lbs/hr	25 ppm	15.8 lbs/hr	N/A	N/A	3 lbs/hr	153543	913	
.	20	65 ppm	89.5 lbs/hr	25 ppm	21 lbs/hr	N/A	N/A	3 lbs/hr	189630	865	
*75	59	65 ppm	75.6 lbs/hr	25 ppm	17.7 lbs/hr	N/A	N/A	3 lbs/hr	166588	891	
.	95	65 ppm	64.6 lbs/hr	25 ppm	15.1 lbs/hr	N/A	N/A	3 lbs/hr	142788	936	

GE LM600 PD CT Firing Natural Gas Fuel to 15 ppm of NOx											
.	20	15 ppm	24.6 lbs/hr	25 ppm	25 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	214509	847	
*100	59	15 ppm	22.2 lbs/hr	25 ppm	23 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	212944	849	
.	95	15 ppm	22.2 lbs/hr	25 ppm	23 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	212944	849	
.	20	15 ppm	21 lbs/hr	25 ppm	21 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	200359	823	
*85	59	15 ppm	19.8 lbs/hr	25 ppm	20 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	198503	826	
.	95	15 ppm	19.8 lbs/hr	25 ppm	20 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	198503	826	
.	20	15 ppm	34 lbs/hr	25 ppm	21 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	180810	863	
*75	59	15 ppm	31 lbs/hr	25 ppm	19 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	179010	866	
.	95	15 ppm	31 lbs/hr	25 ppm	19 lbs/hr	10 ppm	14.7 lbs/hr	3 lbs/hr	179010	866	

GE LM6000 PD CT Firing Liquid Fuel to 42 ppm of NOx											
.	20	42 ppm	69.1 lbs/hr	25 ppm	25.1 lbs/hr	N/A	N/A	3 lbs/hr	230236	833	
*100	59	42 ppm	59.7 lbs/hr	25 ppm	21.5 lbs/hr	N/A	N/A	3 lbs/hr	202397	877	
.	95	42 ppm	49.6 lbs/hr	25 ppm	17.9 lbs/hr	N/A	N/A	3 lbs/hr	168433	916	
.	20	42 ppm	62.9 lbs/hr	25 ppm	22.7 lbs/hr	N/A	N/A	3 lbs/hr	212644	824	
*85	59	42 ppm	52.3 lbs/hr	25 ppm	18.9 lbs/hr	N/A	N/A	3 lbs/hr	186714	845	
.	95	42 ppm	43.9 lbs/hr	25 ppm	15.8 lbs/hr	N/A	N/A	3 lbs/hr	153543	913	
.	20	42 ppm	58.2 lbs/hr	25 ppm	21 lbs/hr	N/A	N/A	3 lbs/hr	189630	865	
*75	59	42 ppm	49.1 lbs/hr	25 ppm	17.7 lbs/hr	N/A	N/A	3 lbs/hr	166588	891	
.	95	42 ppm	42 lbs/hr	25 ppm	15.1 lbs/hr	N/A	N/A	3 lbs/hr	142788	936	

* PRELIMINARY NUMBERS ONLY (NOT GUARANTEED)

N/A TOTAL VOC NUMBERS ARE NOT AVAILABLE AT THIS TIME

Coen Duct Burner Natural Gas Fuel							
Unit Load%	Ambient Temperature (°F)	NOx	CO	VOC	Paritculates	Exhaust SCFM	Exhaust Temperature (°F)
100	20	54.6 lbs/hr	36 lbs/hr	14.7 lbs/hr	4.7 lbs/hr	226253	246
	59	56.8 lbs/hr	42.5 lbs/hr	14.7 lbs/hr	5.5 lbs/hr	208991	209
	95	56.4 lbs/hr	42 lbs/hr	14.7 lbs/hr	5.5 lbs/hr	209053	209
90	20	46.2 lbs/hr	33 lbs/hr	14.7 lbs/hr	5 lbs/hr	206437	213
	59	51.7 lbs/hr	38.4 lbs/hr	14.7 lbs/hr	5.2 lbs/hr	203738	209
	95	51.7 lbs/hr	38.4 lbs/hr	14.7 lbs/hr	5.2 lbs/hr	203738	209
80	20	43.7 lbs/hr	30.6 lbs/hr	14.7 lbs/hr	4.4 lbs/hr	186710	214
	59	48 lbs/hr	35.4 lbs/hr	14.7 lbs/hr	5.0 lbs/hr	184435	210
	95	48 lbs/hr	35.4 lbs/hr	14.7 lbs/hr	5.0 lbs/hr	184435	210

APPENDIX C

**AIR POLLUTANT EMISSION
ESTIMATE DERIVATIONS**

BASIS FOR EMISSION RATES

GE LM6000 PD CT FIRING NATURAL GAS

Emission rates were based on data received from the CT vendor and on fuel specifications, as summarized below:

<u>Pollutant</u>	<u>Basis</u>
SO ₂	Calculated by ECT, based on 1 gr S/100 scf.
NO _x	Provided by vendor, based on 25 and 15 ppmvd.
TSP/PM ₁₀	Non-sulfate PM provided by vendor. Added to H ₂ SO ₄ , as calculated, below.
CO	Provided by vendor, based on 25 ppmvd.
VOC	NMHC provided by vendor, based on 6 ppmvd.
H ₂ SO ₄	Calculated by ECT based on 10 percent conversion of SO ₂ to H ₂ SO ₄ .
Hg	Calculated by ECT based on an emission factor of 0.027 lb/10 ¹² Btu (FDEP, 1992).

GE LM6000 PD CT FIRING DISTILLATE FUEL OIL

Emission rates were based on data received from the CT vendor and on fuel specifications, as summarized below:

<u>Pollutant</u>	<u>Basis</u>
SO ₂	Calculated by ECT, based on 0.05 weight percent S.
NO _x	Provided by vendor, based on 65 and 42 ppmvd.
TSP/PM ₁₀	Non-sulfate PM provided by vendor. Added to H ₂ SO ₄ , as calculated, below.
CO	Provided by vendor, based on 25 ppmvd.
VOC	NMHC provided by vendor, based on 6 ppmvd.

<u>Pollutant</u>	<u>Basis</u>
Pb	Calculated by ECT based on emission factor of 8.9 lb/10 ¹² Btu (EPA, 1996).
H ₂ SO ₄	Calculated by ECT based on 10 percent conversion of SO ₂ to H ₂ SO ₄ .
Hg	Calculated by ECT based on an emission factor of 3.0 lb/10 ¹² Btu (EPA, 1996).
Fluoride	Calculated by ECT based on an emission factor of 32.5 lb/10 ¹² Btu (EPA, 1981).
Beryllium	Calculated by ECT based on an emission factor of 2.5 lb/10 ¹² Btu (EPA, 1996).
Arsenic	Calculated by ECT based on an emission factor of 4.2 lb/10 ¹² Btu (EPA, 1996).
Cadmium	Calculated by ECT based on an emission factor of 11 lb/10 ¹² Btu (EPA, 1996).
Chromium	Calculated by ECT based on an emission factor of 57.5 lb/10 ¹² Btu (EPA, 1996).

COEN DUCT BURNER FIRING NATURAL GAS

Emission rates were based on data received from the duct burner vendor and on fuel specifications, as summarized below:

<u>Pollutant</u>	<u>Basis</u>
SO ₂	Calculated by ECT, based on 1 gr S/100 scf.
NO _x	Provided by vendor, based on 0.080 lb/MMBtu.
TSP/PM ₁₀	Non-sulfate PM provided by vendor, based on 0.010 lb/MMBtu. Added to H ₂ SO ₄ , as calculated, below.
CO	Provided by vendor, based on 0.080 lb/MMBtu.
VOC	NMHC provided by vendor, based on 0.019 lb/MMBtu.

Pollutant

Basis

H₂SO₄

Calculated by ECT based on 10 percent conversion of SO₂ to H₂SO₄.

Hg

Calculated by ECT based on an emission factor of 0.027 lb/10¹² Btu (FDEP, 1992).

NSPS SUBPART GG NO_x CALCULATIONS

A. NSPS SUBPART GG EQUATION

$$\text{NO}_x \text{ STD} = 0.0075 \times (14.4/Y) + F$$

where: STD = allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = manufacturer's rated heat rate in kilojoules per watt hour at manufacturer's rated load, or actual measured heat rate based on LHV of fuel as measured at actual peak load. Y cannot exceed 14.4 kilojoules per watt hour.

F = NO_x emission allowance for fuel-bound nitrogen per:

<u>Fuel Bound Nitrogen</u> (weight percent)	<u>F</u> (NO _x - volume percent)
N ≤ 0.015	0
0.015 < N ≤ 0.1	0.04 x N
0.1 < N ≤ 0.25	0.004 + 0.0067 x (N-0.1)
N > 0.25	0.005

where: N = nitrogen content of fuel; percent by weight.

B. CALCULATIONS

CT	Y* (kilojoules/watt-hr)	FBN (wt %)	F (vol %)	NO _x STD (ppmvd)
GE LM6000 PD	8.596	0.015	0.0	125.6
GE LM6000 PD	8.596	>0.25	0.005	175.6

*Based on oil-firing at 100-percent load, 20°F ambient temperature.

**CALCULATIONS BASED ON
VENDOR DATA**

Panda-Kathleen Exhaust Flow Rates (S&S Faxes dated 1/18/97, 1/20/97)
 GE LM6000 CT - Natural Gas

A. Exhaust MW

Component	MW (lb/mole)	Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
		20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
Ar	39.944	0.9036	0.8974	0.8974	0.9100	0.9000	0.9000	0.9042	0.8986	0.8986	0.9000	0.9000	0.9000	0.9033	0.8975	0.8975
N ₂	28.016	75.5694	75.0519	75.0519	75.7400	75.1800	75.1800	75.6177	75.1517	75.1517	75.6600	75.0900	75.0900	75.5404	75.0544	75.0544
O ₂	32.000	14.2220	14.1832	14.1832	14.7100	14.5500	14.5500	14.3597	14.4693	14.4693	14.4700	14.3000	14.3000	14.1393	14.1902	14.1902
CO ₂	44.010	3.1110	3.0599	3.0599	2.8800	2.8900	2.8900	3.0475	2.9279	2.9279	2.8900	3.0100	3.0100	3.1491	3.0566	3.0566
H ₂ O	17.008	6.1889	6.8026	6.8026	5.7500	6.4800	6.4800	6.0659	6.5477	6.5477	5.9600	6.7000	6.7000	6.2627	6.7963	6.7963
SO ₂	64.066	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	28.010	0.0023	0.0022	0.0022	0.0021	0.0021	0.0021	0.0022	0.0021	0.0021	0.0022	0.0022	0.0022	0.0023	0.0022	0.0022
HC	16.042	0.0006	0.0006	0.0006	0.0001	0.0005	0.0005	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	0.0006
NO	30.008	0.0023	0.0022	0.0022	0.0021	0.0021	0.0021	0.0022	0.0021	0.0021	0.0022	0.0022	0.0022	0.0023	0.0022	0.0022
Exhaust MW (lb/mole)		28.5067	28.4286	28.4286	28.5367	28.4532	28.4532	28.5156	28.4471	28.4471	28.4737	28.4383	28.4383	28.5013	28.4291	28.4291
Exhaust Flow (lb/sec)		307.11	286.85	286.85	279.114	278.387	278.387	284.41	266.82	266.82	253.407	252.428	252.428	254.93	241.13	241.13
Exhaust Temp. (°F)		831	849	849	814	815	815	819	826	826	846	849	849	859	866	866
(K)		717	727	727	708	708	708	710	714	714	725	727	727	733	736	735
Exhaust O ₂ (Vol %, Dry)		15.1603	15.2185	15.2185	15.6074	15.5582	15.5582	15.287	15.4831	15.4831	15.3871	15.3269	15.3269	15.084	15.2249	15.2249

B. Exhaust Flow Rates

Basis	Flow Rates (ft ³ /min)														
	Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
ACFM	608,961	578,302	578,302	545,587	546,190	546,190	558,534	528,126	528,126	508,902	508,734	508,734	516,556	492,434	492,434
Velocity (fps)	89.7	85.2	85.2	80.4	80.5	80.5	82.3	77.8	77.8	75.0	75.0	75.0	76.1	72.6	72.6
Velocity (m/s)	27.4	26.0	26.0	24.5	24.5	24.5	25.1	23.7	23.7	22.9	22.9	22.9	23.2	22.1	22.1
SCFM, Dry ¹	233,642	217,397	217,397	213,113	211,530	211,530	216,589	202,638	202,638	193,481	191,455	191,455	193,829	182,756	182,756
CFM (15% O ₂ , Dry)	555,757	519,007	519,007	461,275	462,473	462,473	499,133	453,135	453,135	447,175	448,349	448,349	477,315	441,469	441,469

¹ At 68 °F.

Panda-Kathleen Exhaust Flow Rates (S&S Faxes dated 1/16/97, 1/20/97)
 GE LM6000 CT - Natural Gas

C. Emission Rates

		Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
		20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
CO	(ppmvd, 15% O ₂)	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	(g/s)	3.12	2.88	2.88	2.63	2.63	2.63	2.83	2.56	2.56	2.48	2.48	2.48	2.63	2.42	2.42
	(lb/hr)	24.79	22.83	22.83	20.85	20.88	20.88	22.47	20.29	20.29	19.71	19.72	19.72	20.84	19.17	19.17
NO _x ¹ (CT @ 25 ppm)	(ppmvd, 15% O ₂)	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	(g/s)	5.13	4.72	4.72	4.31	4.32	4.32	4.65	4.20	4.20	4.08	4.08	4.08	4.31	3.97	3.97
	(lb/hr)	40.70	37.49	37.49	34.24	34.30	34.30	36.90	33.32	33.32	32.38	32.39	32.39	34.22	31.48	31.48
NO _x ¹ (CT @ 15 ppm)	(ppmvd, 15% O ₂)	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	(g/s)	3.08	2.83	2.83	2.59	2.59	2.59	2.79	2.52	2.52	2.45	2.45	2.45	2.59	2.38	2.38
	(lb/hr)	24.42	22.49	22.49	20.54	20.58	20.58	22.14	19.99	19.99	19.43	19.43	19.43	20.53	18.89	18.89
VOC ²	(ppmvd, 15% O ₂)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	(g/s)	0.43	0.40	0.40	0.36	0.36	0.36	0.39	0.35	0.35	0.34	0.34	0.34	0.36	0.33	0.33
	(lb/hr)	3.41	3.14	3.14	2.87	2.87	2.87	3.09	2.79	2.79	2.71	2.71	2.71	2.86	2.63	2.63

¹ Expressed as NO₂.

² Non-methane hydrocarbons (NMHC) expressed as methane.

Panda-Kathleen Exhaust Flow Rates (S&S Fax dated 1/21/97)
 GE LM6000 CT - Distillate Fuel Oil

A. Exhaust MW

Component	MW (lb/mole)	Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
		20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
Ar	39.944	0.9146	0.9081	0.9081	0.9148	0.9086	0.9086	0.9149	0.9088	0.9088	0.9146	0.9084	0.9084	0.9143	0.9080	0.9080
N ₂	28.016	76.4660	75.9300	75.9300	76.4847	75.9693	75.9693	76.4940	75.9890	75.9890	76.4685	75.9535	75.9535	76.4430	75.9180	75.9180
O ₂	32.000	14.5410	14.5030	14.5030	14.6197	14.6763	14.6763	14.6590	14.7630	14.7630	14.5485	14.6060	14.6060	14.4380	14.4490	14.4490
CO ₂	44.010	4.1470	4.0736	4.0736	4.0957	3.9615	3.9615	4.0701	3.9055	3.9055	4.1418	4.0069	4.0069	4.2135	4.1083	4.1083
H ₂ O	17.008	3.9229	4.5771	4.5771	3.8768	4.4766	4.4766	3.8538	4.4264	4.4264	3.9183	4.5173	4.5173	3.9828	4.6082	4.6082
SO ₂	64.066	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	28.010	0.0023	0.0023	0.0023	0.0023	0.0022	0.0022	0.0023	0.0022	0.0022	0.0023	0.0023	0.0023	0.0024	0.0023	0.0023
HC	16.042	0.0007	0.0007	0.0007	0.0007	0.0006	0.0006	0.0007	0.0006	0.0006	0.0007	0.0006	0.0006	0.0007	0.0007	0.0007
NO	30.008	0.0061	0.0060	0.0060	0.0060	0.0058	0.0058	0.0060	0.0057	0.0057	0.0061	0.0059	0.0059	0.0062	0.0060	0.0060
Exhaust MW (lb/mole)		28.936	28.8501	28.8501	28.9361	28.8503	28.8503	28.9361	28.8504	28.8504	28.9361	28.8502	28.8502	28.936	28.8499	28.8499
Exhaust Flow (lb/sec)		307.15	285.53	285.53	291.157	271.33	271.33	283.16	264.23	264.23	268.07	249.84	249.84	252.98	235.45	235.45
Exhaust Temp. (°F)		1,293	1,312	1,312	1,286	1,298	1,298	1,283	1,291	1,291	1,304	1,315	1,315	1,325	1,338	1,338
(K)		974	984	984	970	976	976	968	973	973	980	986	986	991	999	999
Exhaust O ₂ (Vol %, Dry)		15.1347	15.1987	15.1987	15.2093	15.3641	15.3641	15.2466	15.4467	15.4467	15.1418	15.297	15.297	15.0369	15.147	15.147

B. Exhaust Flow Rates

Basis	Flow Rates (ft ³ /min)														
	Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
ACFM	814,722	767,865	767,865	769,361	723,908	723,908	746,802	702,156	702,156	715,523	672,831	672,831	683,285	642,480	642,480
Velocity (fps)	120.1	113.2	113.2	113.4	106.7	106.7	110.1	103.5	103.5	105.4	99.2	99.2	100.7	94.7	94.7
Velocity (m/s)	36.6	34.5	34.5	34.6	32.5	32.5	33.5	31.5	31.5	32.1	30.2	30.2	30.7	28.9	28.9
SCFM, Dry ¹	235,766	218,327	218,327	223,597	207,686	207,686	217,507	202,357	202,357	205,778	191,156	191,156	194,065	179,976	179,976
CFM (15% O ₂ , Dry)	764,888	708,048	708,048	713,299	648,824	648,824	688,014	620,263	620,263	670,963	610,097	610,097	651,969	597,603	597,603

¹ At 68 °F.

Panda-Kathleen Exhaust Flow Rates (S&S Fax dated 1/21/97)
 GE LM6000 CT - Distillate Fuel Oil

C. Emission Rates

		Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
		20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
CO	(ppmvd, 15% O ₂)	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	(g/s)	3.17	2.90	2.90	2.96	2.68	2.68	2.86	2.57	2.57	2.76	2.49	2.49	2.65	2.41	2.41
	(lb/hr)	25.12	23.01	23.01	23.52	21.25	21.25	22.73	20.40	20.40	21.90	19.80	19.80	21.03	19.14	19.14
NO _x ¹ (CT @ 65 ppm)	(ppmvd, 15% O ₂)	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
	(g/s)	13.52	12.38	12.38	12.65	11.43	11.43	12.23	10.97	10.97	11.78	10.65	10.65	11.31	10.30	10.30
	(lb/hr)	107.27	98.23	98.23	100.42	90.73	90.73	97.04	87.09	87.09	93.51	84.52	84.52	89.79	81.71	81.71
NO _x ¹ (CT @ 42 ppm)	(ppmvd, 15% O ₂)	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
	(g/s)	8.73	8.00	8.00	8.18	7.39	7.39	7.90	7.09	7.09	7.61	6.88	6.88	7.31	6.65	6.65
	(lb/hr)	69.31	63.47	63.47	64.88	58.63	58.63	62.70	56.27	56.27	60.42	54.62	54.62	58.02	52.80	52.80
VOC ²	(ppmvd, 15% O ₂)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	(g/s)	0.44	0.40	0.40	0.41	0.37	0.37	0.39	0.35	0.35	0.38	0.34	0.34	0.36	0.33	0.33
	(lb/hr)	3.45	3.16	3.16	3.23	2.92	2.92	3.12	2.80	2.80	3.01	2.72	2.72	2.89	2.63	2.63

¹ Expressed as NO₂.

² Non-methane hydrocarbons (NMHC) expressed as methane.

Note: Data for 90% and 80% loads derived by linear interpolation.

Panda-Kathleen Exhaust Flow Rates (S&S Faxes dated 1/16/97, 1/20/97)
 GE LM6000 CT and Duct Burner Combined Exhaust - Natural Gas

A. Exhaust MW

Component	MW (lb/mole)	Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
		20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
Ar	39.944	0.8900	0.8800	0.8800	0.9000	0.8800	0.8800				0.8900	0.8800	0.8800			
N ₂	28.016	74.7100	73.7200	73.7500	74.8900	73.9700	73.9700				74.8300	73.9000	73.9000			
O ₂	32.000	11.7900	10.3700	10.4500	12.2900	11.0800	11.0800				12.1100	10.9000	10.9000			
CO ₂	44.010	4.2300	4.8200	4.7800	4.0000	4.4900	4.4900				4.0900	4.5700	4.5700			
H ₂ O	17.008	8.3700	10.2000	10.1300	7.9100	9.5700	9.5700				8.0800	9.7300	9.7300			
SO ₂	64.066	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				0.0000	0.0000	0.0000			
CO	28.010	0.0035	0.0041	0.0041	0.0033	0.0038	0.0038				0.0034	0.0039	0.0039			
HC	16.042	0.0014	0.0018	0.0018	0.0013	0.0016	0.0016				0.0013	0.0016	0.0016			
NO	30.008	0.0030	0.0033	0.0033	0.0028	0.0031	0.0031				0.0029	0.0032	0.0032			
Exhaust MW (lb/mole)		28.3464	28.1818	28.1862	28.3812	28.2265	28.2265				28.3714	28.2118	28.2118			
Exhaust Flow (lb/sec)		309.304	290.024	289.957	281.1	281.194	281.194				255.186	254.938	254.938			
Exhaust Temp. (°F)		246	209	209	213	209	209				214	210	210			
(K)		392	371	371	374	371	371				374	372	372			
Exhaust O ₂ (Vol %, Dry)		12.867	11.5479	11.6279	13.3456	12.2526	12.2526				13.1745	12.0749	12.0749			

B. Exhaust Flow Rates

Basis	Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
ACFM	337,295	301,445	301,328	291,851	291,805	291,805				265,432	265,091	265,091			
Velocity (fps)	49.7	44.4	44.4	43.0	43.0	43.0				39.1	39.1	39.1			
Velocity (m/s)	15.2	13.5	13.5	13.1	13.1	13.1				11.9	11.9	11.9			
SCFM, Dry ¹	231,141	213,644	213,729	210,859	208,263	208,263				191,134	188,581	188,581			
CFM (15% O ₂ , Dry)	420,799	429,083	425,579	344,128	386,758	386,758				319,476	357,937	357,937			

¹ At 68 °F.

Panda-Kathleen Exhaust Flow Rates (S&S Faxes dated 1/16/97, 1/20/97)
 GE LM6000 CT and Duct Burner Combined Exhaust - Natural Gas

C. Emission Rates

		Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
		20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
CO	(ppmvd, 15% O ₂)	28.0	29.1	29.0	28.2	29.0	29.0				28.1	28.8	28.8			
	(g/s)	4.85	5.41	5.36	4.18	4.86	4.86				3.86	4.47	4.47			
	(lb/hr)	38.46	42.97	42.53	33.15	38.61	38.61				30.64	35.48	35.48			
NO _x ¹ (CT @ 25 ppm)	(ppmvd, 15% O ₂)	24.1	23.8	23.8	24.1	23.8	23.8				24.2	23.8	23.8			
	(g/s)	6.85	7.26	7.21	5.86	6.56	6.56				5.46	6.07	6.07			
	(lb/hr)	54.37	57.63	57.19	46.54	52.03	52.03				43.31	48.15	48.15			
NO _x ¹ (CT @ 15 ppm)	(ppmvd, 15% O ₂)	16.9	17.6	17.5	17.0	17.5	17.5				16.9	17.4	17.4			
	(g/s)	4.80	5.37	5.32	4.14	4.83	4.83				3.83	4.43	4.43			
	(lb/hr)	38.09	42.63	42.19	32.84	38.31	38.31				30.36	35.19	35.19			
VOC ²	(ppmvd, 15% O ₂)	8.5	9.4	9.3	8.6	9.3	9.3				8.5	9.2	9.2			
	(g/s)	0.84	1.00	0.99	0.73	0.89	0.89				0.67	0.81	0.81			
	(lb/hr)	6.66	7.92	7.82	5.79	7.08	7.08				5.31	6.45	6.45			

¹ Expressed as NO₂.

² Non-methane hydrocarbons (NMHC) expressed as methane.

Panda-Kathleen Exhaust Flow Rates (S&S Faxes dated 1/20/97, 1/21/97)
 GE LM6000 CT and Duct Burner Combined Exhaust - CT (Oil) and Duct Burner (Gas)

A. Exhaust MW

Component	MW (lb/mole)	Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
		20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
Ar	39.944	0.8900	0.8800	0.8800	0.9000	0.8800	0.8800				0.8900	0.8800	0.8800			
N ₂	28.016	74.7100	73.7200	73.7500	74.8900	73.9700	73.9700				74.8300	73.9000	73.9000			
O ₂	32.000	11.7900	10.3700	10.4500	12.2900	11.0800	11.0800				12.1100	10.9000	10.9000			
CO ₂	44.010	4.2300	4.8200	4.7800	4.0000	4.4900	4.4900				4.0900	4.5700	4.5700			
H ₂ O	17.008	8.3700	10.2000	10.1300	7.9100	9.5700	9.5700				8.0800	9.7300	9.7300			
SO ₂	64.066	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				0.0000	0.0000	0.0000			
CO	28.010	0.0035	0.0041	0.0041	0.0033	0.0038	0.0038				0.0034	0.0039	0.0039			
HC	16.042	0.0014	0.0018	0.0010	0.0013	0.0016	0.0016				0.0013	0.0016	0.0016			
NO	30.008	0.0030	0.0033	0.0033	0.0028	0.0031	0.0031				0.0029	0.0032	0.0032			
Exhaust MW (lb/mole)		28.3464	28.1818	28.1862	28.3812	28.2265	28.2265				28.3714	28.2118	28.2118			
Exhaust Flow (lb/sec)		309.304	290.024	289.957	281.1	281.194	281.194				255.186	254.938	254.938			
Exhaust Temp. (°F)		246	209	209	213	209	209				214	210	210			
(K)		392	371	371	374	371	371				374	372	372			
Exhaust O ₂ (Vol %, Dry)		12.867	11.5479	11.6279	13.3456	12.2526	12.2526				13.1745	12.0749	12.0749			

B. Exhaust Flow Rates

Basis	Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
ACFM	337,295	301,445	301,328	291,851	291,805	291,805				265,432	265,091	265,091			
Velocity (fps)	49.7	44.4	44.4	43.0	43.0	43.0				39.1	39.1	39.1			
Velocity (m/s)	15.2	13.5	13.5	13.1	13.1	13.1				11.9	11.9	11.9			
SCFM, Dry ¹	231,141	213,644	213,729	210,859	208,263	208,263				191,134	188,581	188,581			
CFM (15% O ₂ , Dry)	420,799	429,083	425,579	344,128	386,758	386,758				319,476	357,937	357,937			

¹ At 68 °F.

Panda-Kathleen Exhaust Flow Rates (S&S Faxes dated 1/20/97, 1/21/97)
 GE LM6000 CT and Duct Burner Combined Exhaust - CT (Oil) and Duct Burner (Gas)

C. Emission Rates

		Vol % - 100 % Load			Vol % - 90 % Load			Vol % - 85 % Load			Vol % - 80 % Load			Vol % - 75 % Load		
		20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
CO	(ppmv, 15% O ₂)	28.3	29.2	29.2	30.4	29.3	29.3				30.1	28.9	28.9			
	(g/s)	4.89	5.44	5.38	4.51	4.91	4.91				4.14	4.48	4.48			
	(lb/hr)	38.79	43.15	42.71	35.82	38.98	38.98				32.83	35.56	35.56			
NO _x ¹ (CT @ 65 ppm)	(ppmv, 15% O ₂)	53.6	48.8	49.0	58.3	49.6	49.6				58.3	49.6	49.6			
	(g/s)	15.24	14.91	14.86	14.20	13.67	13.67				13.16	12.64	12.64			
	(lb/hr)	120.94	118.37	117.93	112.72	108.46	108.46				104.44	100.28	100.28			
NO _x ¹ (CT @ 42 ppm)	(ppmv, 15% O ₂)	36.8	34.5	34.6	39.9	34.9	34.9				39.8	34.8	34.8			
	(g/s)	10.46	10.53	10.48	9.72	9.62	9.62				8.99	8.87	8.87			
	(lb/hr)	82.98	83.61	83.17	77.18	76.36	76.36				71.35	70.38	70.38			
VOC ²	(ppmv, 15% O ₂)	8.5	9.4	9.3	9.1	9.4	9.4				9.0	9.2	9.2			
	(g/s)	0.84	1.00	0.99	0.77	0.90	0.90				0.71	0.81	0.81			
	(lb/hr)	6.70	7.94	7.84	6.15	7.13	7.13				5.61	6.46	6.46			

¹ Expressed as NO₂.

² Non-methane hydrocarbons (NMHC) expressed as methane.

Note: Exhaust flow rates and temperatures based on CT (gas) and duct burner (gas).

Panda-Kathleen Fuel Flow Rates

A. GE LM6000 - Natural Gas

	100 % Load			90 % Load			85 % Load			80 % Load			75 % Load		
	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
Heat Input - HHV (MMBtu/hr)	448.54	413.09	413.09	420.66	382.57	382.57	406.72	367.30	367.30	391.86	357.08	357.08	377.00	346.85	346.85
Fuel Rate (lb/hr)	19,435	17,899	17,899	18,227	16,576	16,576	17,623	15,915	15,915	16,979	15,472	15,472	16,335	15,029	15,029
Fuel Rate (lb/sec)	5.399	4.972	4.972	5.063	4.605	4.605	4.895	4.421	4.421	4.716	4.298	4.298	4.538	4.175	4.175

B. GE LM6000 - Fuel Oil

	100 % Load			90 % Load			85 % Load			80 % Load			75 % Load		
	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
Heat Input - HHV (MMBtu/hr)	423.90	388.13	388.13	396.96	358.89	358.89	383.49	344.27	344.27	369.13	333.53	333.53	354.78	322.79	322.79
Fuel Rate (lb/hr)	21,734	19,900	19,900	20,353	18,401	18,401	19,662	17,651	17,651	18,926	17,101	17,101	18,190	16,550	16,550
Fuel Rate (lb/sec)	6.037	5.528	5.528	5.654	5.111	5.111	5.462	4.903	4.903	5.257	4.750	4.750	5.053	4.597	4.597

Note: Data for 90% and 80% loads derived by linear interpolation.

C. COEN Duct Burner - Natural Gas

	100 % Load			90 % Load			85 % Load			80 % Load			75 % Load		
	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F	20 °F	59 °F	95 °F
Heat Input - HHV (MMBtu/hr)	170.82	251.80	246.25	153.74	221.63	221.63				136.66	197.00	197.00			
Fuel Rate (lb/hr)	7,406	10,917	10,676	6,665	9,609	9,609				5,925	8,541	8,541			
Fuel Rate (lb/sec)	2.057	3.032	2.966	1.851	2.669	2.669				1.646	2.372	2.372			

**SUMMARIES OF SHORT-TERM
EMISSION RATES**

Panda-Kathleen Emission Rates
 GE LM6000 CT - Natural Gas (CT NO_x @ 25 ppmvd)

Load (%)	Temperature ¹ (°F)	PM/PM ₁₀ ²		SO ₂ ³		NO _x ⁴		CO		VOC ⁵		Pb	
		(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)
100	20	3.18	0.40	1.17	0.15	40.70	5.13	24.79	3.12	3.41	0.43	N/A	N/A
	59	3.17	0.40	1.08	0.14	37.49	4.72	22.83	2.88	3.14	0.40	N/A	N/A
	95	3.17	0.40	1.08	0.14	37.49	4.72	22.83	2.88	3.14	0.40	N/A	N/A
90	20	3.17	0.40	1.10	0.14	34.24	4.31	20.85	2.63	2.87	0.36	N/A	N/A
	59	3.15	0.40	1.00	0.13	34.30	4.32	20.88	2.63	2.87	0.36	N/A	N/A
	95	3.15	0.40	1.00	0.13	34.30	4.32	20.88	2.63	2.87	0.36	N/A	N/A
80	20	3.16	0.40	1.02	0.13	32.38	4.08	19.71	2.48	2.71	0.34	N/A	N/A
	59	3.14	0.40	0.93	0.12	32.39	4.08	19.72	2.48	2.71	0.34	N/A	N/A
	95	3.14	0.40	0.93	0.12	32.39	4.08	19.72	2.48	2.71	0.34	N/A	N/A

GE LM6000 CT - Distillate Fuel Oil (CT NO_x @ 65 ppmvd)

Load (%)	Temperature (°F)	PM/PM ₁₀ ²		SO ₂ ³		NO _x ⁷		CO		VOC ⁵		Pb ⁸	
		(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)
100	20	6.33	0.80	21.73	2.74	107.27	13.52	25.12	3.17	3.45	0.44	0.004	0.0005
	59	6.05	0.78	19.90	2.51	98.23	12.38	23.01	2.90	3.16	0.40	0.003	0.0004
	95	6.05	0.78	19.90	2.51	98.23	12.38	23.01	2.90	3.16	0.40	0.003	0.0004
90	20	6.12	0.77	20.35	2.56	100.42	12.65	23.52	2.96	3.23	0.41	0.004	0.0004
	59	5.82	0.73	18.40	2.32	90.73	11.43	21.25	2.68	2.92	0.37	0.003	0.0004
	95	5.82	0.73	18.40	2.32	90.73	11.43	21.25	2.68	2.92	0.37	0.003	0.0004
80	20	5.90	0.74	18.93	2.38	93.51	11.78	21.90	2.76	3.01	0.38	0.003	0.0004
	59	5.62	0.71	17.10	2.15	84.52	10.65	19.80	2.49	2.72	0.34	0.003	0.0004
	95	5.62	0.71	17.10	2.15	84.52	10.65	19.80	2.49	2.72	0.34	0.003	0.0004

¹ Ambient temperature is conditioned to 45 °F prior to engine inlet for 59 and 95 °F ambient temperatures.

² Including sulfuric acid mist.

³ Based on natural gas sulfur content of 1.0 grain S/100 scf.

⁴ Based on 25 ppmvd concentration, corrected to 15% oxygen.

⁵ Non-methane hydrocarbons (NMHC) expressed as methane.

⁶ Based on fuel oil sulfur content of 0.05 weight percent.

⁷ Based on 65 ppmvd concentration, corrected to 15% oxygen.

⁸ Based on fuel oil lead emission factor of 8.9 lb/10¹² Btu.

Panda-Kathleen Emission Rates
 GE LM6000 CT - Natural Gas (CT NO_x @ 15 ppmvd)

Load (%)	Temperature (°F)	PM/PM ₁₀ ²		SO ₂ ³		NO _x ⁴		CO		VOC ⁵		Pb	
		(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)
100	20	3.18	0.40	1.17	0.15	24.42	3.08	24.79	3.12	3.41	0.43	N/A	N/A
	59	3.17	0.40	1.08	0.14	22.49	2.83	22.83	2.88	3.14	0.40	N/A	N/A
	95	3.17	0.40	1.08	0.14	22.49	2.83	22.83	2.88	3.14	0.40	N/A	N/A
90	20	3.17	0.40	1.10	0.14	20.54	2.59	20.85	2.63	2.87	0.36	N/A	N/A
	59	3.15	0.40	1.00	0.13	20.58	2.59	20.88	2.63	2.87	0.36	N/A	N/A
	95	3.15	0.40	1.00	0.13	20.58	2.59	20.88	2.63	2.87	0.36	N/A	N/A
80	20	3.16	0.40	1.02	0.13	19.43	2.45	19.71	2.48	2.71	0.34	N/A	N/A
	59	3.14	0.40	0.93	0.12	19.43	2.45	19.72	2.48	2.71	0.34	N/A	N/A
	95	3.14	0.40	0.93	0.12	19.43	2.45	19.72	2.48	2.71	0.34	N/A	N/A

GE LM6000 CT - Distillate Fuel Oil (CT NO_x @ 42 ppmvd)

Load (%)	Temperature (°F)	PM/PM ₁₀ ²		SO ₂ ³		NO _x ⁷		CO		VOC ⁸		Pb ⁸	
		(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)
100	20	6.33	0.80	21.73	2.74	69.31	8.73	25.12	3.17	3.45	0.44	0.004	0.0005
	59	6.05	0.76	19.90	2.51	63.47	8.00	23.01	2.90	3.16	0.40	0.003	0.0004
	95	6.05	0.76	19.90	2.51	63.47	8.00	23.01	2.90	3.16	0.40	0.003	0.0004
90	20	6.12	0.77	20.35	2.56	64.88	8.18	23.52	2.96	3.23	0.41	0.004	0.0004
	59	5.82	0.73	18.40	2.32	58.63	7.39	21.25	2.68	2.92	0.37	0.003	0.0004
	95	5.82	0.73	18.40	2.32	58.63	7.39	21.25	2.68	2.92	0.37	0.003	0.0004
80	20	5.90	0.74	18.93	2.38	60.42	7.61	21.90	2.76	3.01	0.38	0.003	0.0004
	59	5.62	0.71	17.10	2.15	54.62	6.88	19.80	2.49	2.72	0.34	0.003	0.0004
	95	5.62	0.71	17.10	2.15	54.62	6.88	19.80	2.49	2.72	0.34	0.003	0.0004

¹ Ambient temperature is conditioned to 45 °F prior to engine inlet for 59 and 95 °F ambient temperatures.

² Including sulfuric acid mist.

³ Based on natural gas sulfur content of 1.0 grain S/100 scf.

⁴ Based on 15 ppmvd concentration, corrected to 15% oxygen.

⁵ Non-methane hydrocarbons (NMHC) expressed as methane.

⁶ Based on fuel oil sulfur content of 0.05 weight percent.

⁷ Based on 42 ppmvd concentration, corrected to 15% oxygen.

⁸ Based on fuel oil lead emission factor of 8.9 lb/10¹² Btu.

Panda-Kathleen Emission Rates
COEN Duct Burner - Natural Gas

Load (%)	Temperature (°F)	Heat Input (MMBtu/hr)	PM/PM ₁₀			SO ₂ ³		NO _x		
			(lb/MMBtu) ¹	(lb/hr) ²	(g/sec) ²	(lb/hr)	(g/sec)	(lb/MMBtu)	(lb/hr)	(g/sec)
100	20	170.82	0.010	1.78	0.22	0.45	0.06	0.080	13.67	1.72
	59	251.80	0.010	2.62	0.33	0.66	0.08	0.080	20.14	2.54
	95	246.25	0.010	2.56	0.32	0.64	0.08	0.080	19.70	2.48
90	20	153.74	0.010	1.60	0.20	0.40	0.05	0.080	12.30	1.55
	59	221.63	0.010	2.30	0.29	0.58	0.07	0.080	17.73	2.23
	95	221.63	0.010	2.30	0.29	0.58	0.07	0.080	17.73	2.23
80	20	136.66	0.010	1.42	0.18	0.36	0.04	0.080	10.93	1.38
	59	197.00	0.010	2.05	0.26	0.51	0.06	0.080	15.76	1.99
	95	197.00	0.010	2.05	0.26	0.51	0.06	0.080	15.76	1.99

Load (%)	Temperature (°F)	Heat Input (MMBtu/hr)	CO			VOC ⁴		
			(lb/MMBtu)	(lb/hr)	(g/sec)	(lb/MMBtu)	(lb/hr)	(g/sec)
100	20	170.82	0.080	13.67	1.72	0.019	3.25	0.41
	59	251.80	0.080	20.14	2.54	0.019	4.78	0.60
	95	246.25	0.080	19.70	2.48	0.019	4.68	0.59
90	20	153.74	0.080	12.30	1.55	0.019	2.92	0.37
	59	221.63	0.080	17.73	2.23	0.019	4.21	0.53
	95	221.63	0.080	17.73	2.23	0.019	4.21	0.53
80	20	136.66	0.080	10.93	1.38	0.019	2.60	0.33
	59	197.00	0.080	15.76	1.99	0.019	3.74	0.47
	95	197.00	0.080	15.76	1.99	0.019	3.74	0.47

¹ Excluding sulfuric acid mist.

² Including sulfuric acid mist.

³ Based on natural gas sulfur content of 1.0 grain S/100 scf.

⁴ Non-methane hydrocarbons (NMHC) expressed as methane.

Panda-Kathleen Cogen Project: Non-Criteria Pollutant Emission Rates

GE LM6000 CT - Natural Gas

Load (%)	Temperature (°F)	Heat Input (MMBtu/hr)	H ₂ SO ₄ ¹		Hg ²	
			(lb/hr)	(g/sec)	(lb/hr)	(g/sec)
100	20	448.54	0.179	0.023	1.21E-05	1.53E-06
	59	413.09	0.165	0.021	1.12E-05	1.41E-06
	95	413.09	0.165	0.021	1.12E-05	1.41E-06
90	20	420.66	0.168	0.021	1.14E-05	1.43E-06
	59	382.57	0.153	0.019	1.03E-05	1.30E-06
	95	382.57	0.153	0.019	1.03E-05	1.30E-06
80	20	391.86	0.157	0.020	1.06E-05	1.33E-06
	59	357.08	0.143	0.018	9.64E-06	1.21E-06
	95	357.08	0.143	0.018	9.64E-06	1.21E-06

COEN Duct Burner - Natural Gas

Load (%)	Temperature (°F)	Heat Input (MMBtu/hr)	H ₂ SO ₄ ¹		Hg ²	
			(lb/hr)	(g/sec)	(lb/hr)	(g/sec)
100	20	170.82	0.068	0.009	4.61E-06	5.81E-07
	59	251.80	0.101	0.013	6.80E-06	8.57E-07
	95	246.25	0.098	0.012	6.65E-06	8.38E-07
90	20	153.74	0.061	0.008	4.15E-06	5.23E-07
	59	221.63	0.089	0.011	5.98E-06	7.54E-07
	95	221.63	0.089	0.011	5.98E-06	7.54E-07
80	20	136.66	0.055	0.007	3.69E-06	4.65E-07
	59	197.00	0.079	0.010	5.32E-06	6.70E-07
	95	197.00	0.079	0.010	5.32E-06	6.70E-07

¹ Based on 10% conversion of SO₂ to H₂SO₄.

² Based on FDEP emission factor of 0.027 lb/10¹² Btu.

Panda-Kathleen Cogen Project: Non-Criteria Pollutant Emission Rates

GE LM6000 CT - Fuel Oil

Load (%)	Temperature (°F)	Heat Input (MMBtu/hr)	H ₂ SO ₄ ¹		Hg ²		Ft ³		Be ⁴	
			(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)
100	20	423.90	3.328	0.419	1.27E-03	1.60E-04	1.38E-02	1.74E-03	1.06E-03	1.34E-04
	59	388.13	3.047	0.384	1.16E-03	1.47E-04	1.26E-02	1.59E-03	9.70E-04	1.22E-04
	95	388.13	3.047	0.384	1.16E-03	1.47E-04	1.26E-02	1.59E-03	9.70E-04	1.22E-04
90	20	396.96	3.117	0.393	1.19E-03	1.50E-04	1.29E-02	1.63E-03	9.92E-04	1.25E-04
	59	358.89	2.818	0.355	1.08E-03	1.36E-04	1.17E-02	1.47E-03	8.97E-04	1.13E-04
	95	358.89	2.818	0.355	1.08E-03	1.36E-04	1.17E-02	1.47E-03	8.97E-04	1.13E-04
80	20	369.13	2.898	0.365	1.11E-03	1.40E-04	1.20E-02	1.51E-03	9.23E-04	1.16E-04
	59	333.53	2.619	0.330	1.00E-03	1.26E-04	1.08E-02	1.37E-03	8.34E-04	1.05E-04
	95	333.53	2.619	0.330	1.00E-03	1.26E-04	1.08E-02	1.37E-03	8.34E-04	1.05E-04

Load (%)	Temperature (°F)	Heat Input (MMBtu/hr)	As ⁵		Cd ⁶		Cr ⁷	
			(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)
100	20	423.90	1.78E-03	2.24E-04	4.66E-03	5.88E-04	2.44E-02	3.07E-03
	59	388.13	1.63E-03	2.05E-04	4.27E-03	5.38E-04	2.23E-02	2.81E-03
	95	388.13	1.63E-03	2.05E-04	4.27E-03	5.38E-04	2.23E-02	2.81E-03
90	20	396.96	1.67E-03	2.10E-04	4.37E-03	5.50E-04	2.28E-02	2.88E-03
	59	358.89	1.51E-03	1.90E-04	3.95E-03	4.97E-04	2.06E-02	2.60E-03
	95	358.89	1.51E-03	1.90E-04	3.95E-03	4.97E-04	2.06E-02	2.60E-03
80	20	369.13	1.55E-03	1.95E-04	4.06E-03	5.12E-04	2.12E-02	2.67E-03
	59	333.53	1.40E-03	1.77E-04	3.67E-03	4.62E-04	1.92E-02	2.42E-03
	95	333.53	1.40E-03	1.77E-04	3.67E-03	4.62E-04	1.92E-02	2.42E-03

¹ Based on 10% conversion of SO₂ to H₂SO₄.

² Based on EPA AP-42 emission factor of 3.0 lb/10¹² Btu.

³ Based on EPA emission factor of 32.5 lb/10¹² Btu.

⁴ Based on EPA AP-42 emission factor of 2.5 lb/10¹² Btu.

⁵ Based on EPA AP-42 emission factor of 4.2 lb/10¹² Btu.

⁶ Based on EPA AP-42 emission factor of 11 lb/10¹² Btu.

⁷ Based on EPA AP-42 emission factor of 57.5 lb/10¹² Btu.

**SUMMARIES OF
ANNUAL EMISSIONS**

Penda-Kathleen Cogen Project
Annual Emission Rates (CT NOx @ 25/65 Gas/Oil)

CT Only (20 °F, 100% Load):

CT	Gas (hrs)	Oil Hrs	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)	Pb ³ (tpy)
GE LM6000	8,260	500	14.7	10.3	194.9	108.6	14.9	0.0009

CT Only (59 °F, 100% Load):

CT	Gas (hrs)	Oil Hrs	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)	Pb ³ (tpy)
GE LM6000	8,260	500	14.6	9.4	179.4	100.0	13.7	0.0009

DB Only (20 °F, 100% Load):

DB	Gas (hrs)	Oil Hrs	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)
COEN	8,760	0	7.8	2.0	59.9	59.9	14.2

DB Only (59 °F, 100% Load):

DB	Gas (hrs)	Oil Hrs	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)
COEN	8,760	0	11.5	2.9	88.2	88.2	21.0

CT & DB (20 °F, 100% Load):

CT + DB	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)	Pb ³ (tpy)
GE + COEN	22.5	12.2	254.8	168.5	29.1	0.0009

CT & DB (59 °F, 100% Load):

CT + DB	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)	Pb ³ (tpy)
GE + COEN	26.1	12.3	267.6	188.3	34.7	0.0009

¹ Including sulfuric acid mist.

² Non-methane hydrocarbons (NMHC) expressed as methane.

³ Based on fuel oil lead emission factor of 8.9 lb/10¹² Btu.

Panda-Kathleen Cogen Project
Annual Emission Rates (CT NOx @ 15/42 Gas/Oil)

CT Only (20 °F, 100% Load):

CT	Gas (hrs)	Oil Hrs	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)	Pb ³ (tpy)
GE LM6000	8,260	500	14.7	10.3	118.2	108.6	14.9	0.0009

CT Only (59 °F, 100% Load):

CT	Gas (hrs)	Oil Hrs	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)	Pb ³ (tpy)
GE LM6000	8,260	500	14.6	9.4	108.8	100.0	13.7	0.0009

DB Only (20 °F, 100% Load):

DB	Gas (hrs)	Oil Hrs	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)
COEN	8,760	0	7.8	2.0	59.9	59.9	14.2

DB Only (59 °F, 100% Load):

DB	Gas (hrs)	Oil Hrs	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)
COEN	8,760	0	11.5	2.9	88.2	88.2	21.0

CT & DB (20 °F, 100% Load):

CT + DB	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)	Pb ³ (tpy)
GE + COEN	22.5	12.2	178.0	168.5	29.1	0.0009

CT & DB (59 °F, 100% Load):

CT + DB	PM/PM ₁₀ ¹ (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC ² (tpy)	Pb ³ (tpy)
GE + COEN	26.1	12.3	197.0	188.3	34.7	0.0009

¹ Including sulfuric acid mist.

² Non-methane hydrocarbons (NMHC) expressed as methane.

³ Based on fuel oil lead emission factor of 8.9 lb/10¹² Btu.

Panda-Kathleen Cogen Project
Annual Emission Rates: Non-Criteria Pollutants, Natural-Gas

CT Only (20 °F, 100% Load):

CT	Gas (hrs)	H ₂ SO ₄ ¹ (tpy)	Hg ² (tpy)
GE LM6000	8,260	0.74	5.00E-05

DB Only (20 °F, 100% Load):

DB	Gas (hrs)	H ₂ SO ₄ ¹ (tpy)	Hg ² (tpy)
COEN	8,760	0.30	2.02E-05

CT & DB (20 °F, 100% Load):

CT + DB	H ₂ SO ₄ ¹ (tpy)	Hg ² (tpy)
GE + COEN	1.04	7.02E-05

¹ Based on 10% conversion of SO₂ to H₂SO₄.

² Based on FDEP emission factor of 0.027 lb/10¹² Btu.

CT Only (59 °F, 100% Load):

CT	Gas (hrs)	H ₂ SO ₄ ¹ (tpy)	Hg ² (tpy)
GE LM6000	8,260	0.68	4.61E-05

DB Only (59 °F, 100% Load):

DB	Gas (hrs)	H ₂ SO ₄ ¹ (tpy)	Hg ² (tpy)
COEN	8,760	0.44	2.98E-05

CT & DB (59 °F, 100% Load):

CT + DB	H ₂ SO ₄ ¹ (tpy)	Hg ² (tpy)
GE + COEN	1.12	7.58E-05

Panda-Kathleen Cogen Project
 Annual Emission Rates: Non-Criteria Pollutants, Fuel Oil
 GE LM6000 CT

CT Only (20 °F, 100% Load):

CT	Oil (hrs)	H ₂ SO ₄ ¹ (tpy)	Hg ² (tpy)	F ³ (tpy)	Be ⁴ (tpy)	As ⁵ (tpy)	Cd ⁶ (tpy)	Cr ⁷ (tpy)
GE LM6000	500	0.83	3.18E-04	3.44E-03	2.65E-04	4.45E-04	1.17E-03	6.09E-03

CT Only (59 °F, 100% Load):

CT	Oil (hrs)	H ₂ SO ₄ ¹ (tpy)	Hg ² (tpy)	F ³ (tpy)	Be ⁴ (tpy)	As ⁵ (tpy)	Cd ⁶ (tpy)	Cr ⁷ (tpy)
GE LM6000	500	0.76	2.91E-04	3.15E-03	2.43E-04	4.08E-04	1.07E-03	5.58E-03

¹ Based on 10% conversion of SO₂ to H₂SO₄.

² Based on EPA AP-42 emission factor of 3.0 lb/10¹² Btu.

³ Based on EPA emission factor of 32.5 lb/10¹² Btu.

⁴ Based on EPA AP-42 emission factor of 2.5 lb/10¹² Btu.

⁵ Based on EPA AP-42 emission factor of 4.2 lb/10¹² Btu.

⁶ Based on EPA AP-42 emission factor of 11 lb/10¹² Btu.

⁷ Based on EPA AP-42 emission factor of 57.5 lb/10¹² Btu.

Panda-Kathleen Cogen Project
 Annual Emission Rates: Non-Criteria Pollutants
 GE LM6000 CT & Duct Burner

CT + DB (20 °F, 100% Load):

CT + DB	H ₂ SO ₄ (tpy)	Hg (tpy)	F (tpy)	Be (tpy)	As (tpy)	Cd (tpy)	Cr (tpy)
GE + COEN	1.87	3.88E-04	3.44E-03	2.65E-04	4.45E-04	1.17E-03	6.09E-03

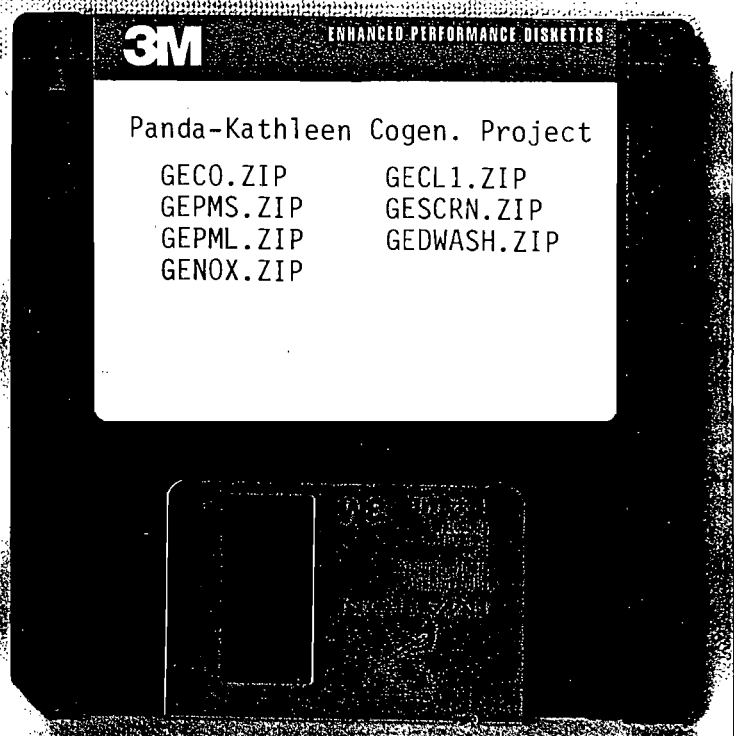
CT + DB (59 °F, 100% Load):

CT + DB	H ₂ SO ₄ (tpy)	Hg (tpy)	F (tpy)	Be (tpy)	As (tpy)	Cd (tpy)	Cr (tpy)
GE + COEN	1.88	3.67E-04	3.15E-03	2.43E-04	4.08E-04	1.07E-03	5.58E-03

APPENDIX D

MODELING OUTPUT FILES

Original diskette provided to FDEP



Archive

Archived Files

GECO.ZIP

GE91CO.OUT
GE90CO.OUT
GE89CO.OUT
GE88CO.OUT
GE87CO.OUT

GEPMS.ZIP

GE91PMS.OUT
GE90PMS.OUT
GE89PMS.OUT
GE88PMS.OUT
GE87PMS.OUT

GEPML.ZIP

GE91PML.OUT
GE90PML.OUT
GE89PML.OUT
GE88PML.OUT
GE87PML.OUT

GENOX.ZIP

GE91NOX.OUT
GE90NOX.OUT
GE89NOX.OUT
GE88NOX.OUT
GE87NOX.OUT

GECL1.ZIP

GE91C1PS.OUT
GE90C1PS.OUT
GE89C1PS.OUT
GE88C1PS.OUT
GE87C1PS.OUT
GE91C1PL.OUT
GE90C1PL.OUT
GE89C1PL.OUT
GE88C1PL.OUT
GE87C1PL.OUT
GE91C1N.OUT
GE90C1N.OUT
GE89C1N.OUT
GE88C1N.OUT
GE87C1N.OUT

GESCRN.ZIP

GELM120.OUT
GELM150.OUT
GELM190.OUT
GELM920.OUT
GELM950.OUT
GELM990.OUT
GELM820.OUT
GELM850.OUT
GELM890.OUT

GEDWASH.ZIP

PANDA_S.OUT
PANDA_L.OUT

TENTATIVE AGENDA

PANDA-KATHLEEN, L.P. PERMIT MODIFICATION MEETING FDEP, TALLAHASSEE THURSDAY, DECEMBER 12, 1996

- Background on Project History
 - Permit issued 1/5/95
 - 115 MW - *Either GEGA or LM-6000*
 - Permit extension granted 6/27/96
- Recent Developments
 - Contractual issues
 - Downsizing to 74.9 MW
- Modifications to Project
 - New CT plus duct burner
 - Emissions changes
- Permitting Issues
 - Modification vs new permit
 - BACT
 - Application requirements
 - Schedule

BRIEFING SHEET

PANDA-KATHLEEN, L.P. PERMIT MODIFICATION

- Existing Permit
 - GE 7EA or ABB 11N1 CT
 - 500 hrs/yr on No. 2 fuel oil (0.0528)
 - BACT limits for natural gas of 15 ppmvd NO_x and 25 ppmvd CO
 - BACT limits for fuel oil of 42 ppmvd NO_x and 30 ppmvd CO
 - Maximum total emissions (gas and oil) of 262 tpy NO_x, 240 tpy CO

- Proposed Modifications
 - GE LM6000 PD CT (Stewart and Stevenson)
 - Supplemental firing with duct burner
 - CT firing natural gas, with No. 2 fuel as backup (500 hrs/yr)
 - Duct burner firing natural gas only (4,000 hrs/yr)
 - BACT limits for CT—25/65 initial NO_x limits with transition to 15/42, no changes to current CO concentration limits
 - BACT limits for duct burner—0.080 lb/MMBtu NO_x, 0.10 lb/MMBtu CO
 - Net emissions changes—decrease in annual NO_x emissions, estimated increase of 125 tpy CO

- Schedule
 - File modification or application by end of January 1997
 - Start construction May 1997
 - Operational by May 1998 (per contract)

ISO corrected?



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

June 27, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert W. Carter, Chairman
Panda-Kathleen, L.P.
4100 Spring Valley, Suite 1001
Dallas, Texas 75244

Dear Mr. Carter:

Re: Permit No. AC53-251898, PSD-FL-216A, Time Extension

The Department received your request to extend the expiration date of the construction permit referenced below. The permit is amended as shown:

Permit No. AC 53-251898, PSD-FL-216, Power Plant

Current Expiration Date: December 31, 1997

New Expiration Date: June 31, 1999

New Construction Commencement Date: January 5, 1998

Additionally, the following specific conditions are also being amended.

Condition 4.

Within 6-months after the initial compliance test (estimated to be by ~~June, 1997~~ **January, 1999**), Panda-Kathleen shall prepare and submit for the Department's review an engineering report containing, as a minimum, the following information:

The report shall include the NO_x concentration achieved during the initial compliance test. It shall also include hourly NO_x concentrations achieved during the 3-months subsequent to the initial compliance test and based on the continuous emissions monitoring (CEM) data. The CEM data shall meet the requirements of 40 CFR 60, Appendix F, quality assurance procedures.

Mr. Robert C. Carter
Page Two
June 27, 1996

The report shall also include results of the testing requirements of 40 CFR 60, Appendix F procedures, unit load (%) during the testing period (daily averages), and the actual CEM data strip chart for the 3-month period.

Condition 5.

After submittal of the engineering report (estimated to be by ~~June, 1997~~ January 1999), the Department will make a determination and may revise the NO_x emission limits. If the data demonstrates that a NO_x concentration of less than 15 ppmvd @ 15% O₂ and ISO conditions is consistently achievable, the NO_x emission limit will be adjusted to 20 percent over the demonstrated concentration, rounded to the next higher number. The adjusted NO_x concentration cannot exceed 15 ppmvd @ 15% O₂ and ISO conditions.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3900. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information;

- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
- (d) A statement of the material facts disputed by Petitioner, if any;

Mr. Robert c. Carter
Page Three
June 27, 1996

- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and,
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application/request have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this intent in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 60Q-2.010, F.A.C.

This letter shall become an attachment to construction Permit No. AC 53-251898, PSD-FL-216.

Sincerely,



Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/sa/t

cc: W. Thomas, SWD
R. Harwood, Polk County
J. Harper, EPA
J. Bunyak, NPS
J. Meling, P.E. ECT

Mr. Robert C. Carter
Page Four
June 27, 1996

CERTIFICATE OF SERVICE

This is to certify that this Permit Amendment and all copies were mailed to the listed persons before the close of business on 6-27-96 to the listed persons.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to Chapter §120.52(11), Florida Statutes, with the designated Deputy Clerk, receipt of which is hereby acknowledgement.

Keri Jober 6-27-96
(Clerk) (Date)

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- 1. Addressee's Address
- 2. Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
 Robert W. Carter
 Panda-Kathleen, LP
 4100 Spring Valley, Suite 1001
 Dallas, TX 75244

4a. Article Number
P 339 251 119

4b. Service Type
 Registered Insured
 Certified COD
 Express Mail Return Receipt for Merchandise

7. Date of Delivery
7/27/96

5. Signature (Addressee)
Robert W. Carter

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)
Meely Galt

PS Form 3811, December 1991 *U.S. GPO: 1983-352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

P 339 251 119

US Postal Service
Receipt for Certified Mail
 No Insurance Coverage Provided.
 Do not use for International Mail (See reverse)

Sent to	<i>Robert Carter</i>
Street & Number	<i>Panda-Kathleen</i>
Post Office, State, & ZIP Code	<i>Dallas, TX</i>
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	<i>6-27-96</i>
	<i>PSD-F1-216.A</i>

PS Form 3800 April 1995

panda- Kathleen



Environmental Consulting & Technology, Inc.

RECEIVED

MAY 03 1996

BUREAU OF
AIR REGULATION

April 30, 1996
ECT No. 94007-1100-1100

Mr. A.A. Linero, P.E.
Administrator, New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Extension of Expiration Date to AC53-251898, PSD-FL-216

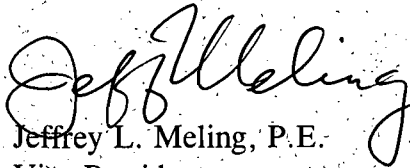
Dear Mr. Linero:

In response to your letter of April 16, 1996, I am enclosing a check in the amount of \$50.00 to cover the processing fee for the referenced request for extension.

We look forward to your response. If any questions arise, please call me at your earliest opportunity.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.


Jeffrey L. Meling, P.E.
Vice President

JLM/dlm

Enclosure

cc: Kyle Woodruff, Panda

3701 Northwest
98th Street
Gainesville, FL
32606

(352)
332-0444

FAX (352)
332-6722

G-PRJ96.3/JLM0430.DOC.1

BEST AVAILABLE COPY

V-D5355

041504

Environmental Consulting & Technology, Inc.

PLEASE DETACH AND RETAIN FOR YOUR RECORDS

INVOICE NUMBER	DATE		VOUCHER NO.	AMOUNT
251898	04/16/96		PO4345	50.00
			* TOTAL	50.00

FOR SECURITY PURPOSES, THE BORDER OF THIS DOCUMENT CONTAINS MICROPRINTING

ECT

Environmental Consulting & Technology, Inc.
 3701 N.W. 98th Street
 Gainesville, FL 32606
 (352) 332-0444

SOUTHTRUST BANK OF GEORGIA, N.A.
 BUFORD, GEORGIA 30518

0415

APR 26 19 96

PAY *****50** DOLLARS AND 00 CENTS \$ *****50.00

TO THE
 ORDER
 OF

DEPT. OF ENVIRONMENTAL PROTECTION
 TWIN TOWERS OFFICE BUILDING
 2600 BLAIR STONE ROAD
 TALLAHASSEE, FL 32399-2400

Environmental Consulting & Technology, Inc.

Barbara D. Deaconis
 AUTHORIZED SIGNATURE

THE REVERSE SIDE OF THIS DOCUMENT INCLUDES AN ARTIFICIAL WATERMARK. HOLD AT AN ANGLE TO VIEW



Environmental Consulting & Technology, Inc.

April 11, 1996
ECT No. 94007-1100

RECEIVED

APR 12 1996

BUREAU OF
AIR REGULATION

Mr. Clair H. Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: AC 53-251898, PSD-FL-216

Dear Mr. Fancy:

On behalf of Panda-Kathleen, Limited Partnership (Panda), I request an extension of the expiration date of the referenced construction permit. The permit addresses the installation of a combined cycle/combustion turbine cogeneration facility near Lakeland, Polk County. Project financing has been delayed due to contractual/legal issues with the utility before the Public Service Commission. These issues have prevented Panda from initiating construction activities. As a result, it is unlikely construction, once begun, could be completed before the permit's current expiration date of December 31, 1997.

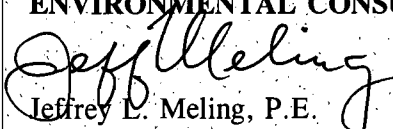
Furthermore, relief is requested from certain federal regulations that address start of construction of subject facilities (i.e., U.S. Environmental Protection Agency [EPA] rules contained in Title 40, Code of Federal Regulations [CFR], Part 52). Specifically, 40-CFR 52.21(r)(2) requires that construction begin within 18 months after receipt of approval, or the approval to construct becomes invalid. The subject permit is dated January 5, 1995. Therefore, construction is required to begin by July 5, 1996. Due to the matters described previously, Panda will be unable to meet this schedule.

In summary, Panda will be unable to commence construction within 18 months of the permit date. As a result, it is unlikely Panda will complete construction before the permit expires on December 31, 1997. Panda, therefore, requests an 18-month extension of the permit. Specifically, Panda requests the construction commencement date be extended to January 5, 1998, and the permit expiration date be extended to June 31, 1999.

Thank you in advance for your attention to this matter.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.


Jeffrey L. Meling, P.E.
Vice President

JLM/dlm

cc: K. Woodruff, Panda

G-PRJ96.2/JLM0411.1

3701 Northwest
98th Street
Gainesville, FL
32606

(352)
332-0444

FAX (352)
332-6722



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

April 16, 1995

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Jeffrey L. Meling, P.E.
Vice President
Environmental Consulting and
Technology, Inc.
3701 NW 98th Street
Gainesville, Florida 32606

RE: Extension of Expiration Date to AC53-251898, PSD-FL-216

Dear Mr. Meling:

The Bureau of Air Regulation received your April 11 request to extend the expiration date of the above referenced permit. Before we can begin processing your request, we will need \$50 processing fee pursuant to Rule 62-4.050(4)(r)3., F.A.C. If you have any questions, please call Patty Adams at (904)488-1344.

Sincerely,

A. A. Linero, P.E.
Administrator
New Source Review Section
Bureau of Air Regulation

AAL/kt

cc: Syed Arif