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MAY 15 2003

BUREAU OF AIR REGULATION

PEAK FIRING MODE PERMIT APPLICATION FLORIDA POWER & LIGHT COMPANY SANFORD POWER PLANT - UNITS 4 AND 5 DEBARY, FLORIDA

1270009-009-AC/PSD-FL-270(0)

May 15, 2003

Prepared For: Florida Power & Light Company 700 Universe Boulevard Juno Beach, Florida 33408

Prepared By: Golder Associates Inc. 6241 NW 23rd Street, Suite 500 Gainesville, Florida 32653-1500

May 2003

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DISTRIBUTION:

- 4 Copies FDEP
- 2 Copy Florida Power & Light Company
- 2 Copy Florida Power & Light Sanford Power Plant
- 1 Copy Golder Associates Inc.



Department of Department of Environmental Protection RECEIVED

Division of Air Resources Management

MAY 15 2003 BUREAU OF AIR REGULATION **APPLICATION FOR AIR PERMIT - TITLE V SOURCE**

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

1.	Facility Owner/Company Name:					
	Florida Power and Light Company					
2.	Site Name:					
	Sanford Plant					
3.	Facility Identification Number: 1270009 [] Unknown					
4.	Facility Location:					
	Street Address or Other Locator: 950 South Highway 17-92					
	City: DeBary County: Volusia - Zip Code: 32713					
5.	Relocatable Facility? 6. Existing Permitted Facility?					
	[] Yes [X] No [X] Yes [] No					
<u>A</u> p	plication Contact					
1.	Name and Title of Application Contact:					
<u></u>	Mary Archer, Principal Environmental Specialist					
2.	Application Contact Mailing Address:					
	Organization/Firm: FPL Environmental Services Dept. [JES/JB]					
	Street Address: 700 Universe Blvd.					
	City: Juno Beach State: FL Zip Code: 33408					
3.	Application Contact Telephone Numbers: 561/758-3760					
	Telephone: (561) 691-7057 Fax: (561) 691-7070 or 691-7049					
<u>A</u> p	Application Processing Information (DEP Use)					
1.	Date of Receipt of Application: 5-15-03					
2.	Date of Receipt of Application: 5-15-03 Permit Number: 1370009 -009-AC					
3.	PSD Number (if applicable):					
4.	Siting Number (if applicable):					

5/14/03

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one) Initial Title V air operation permit for an existing facility which is classified as a Title V source. [] Initial Title V air operation permit 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: 1 Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application. Current construction permit number: Operation permit number to be revised: 1 Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.) Operation permit number to be revised/corrected: Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal. Operation permit number to be revised: Reason for revision: Air Construction Permit Application This Application for Air Permit is submitted to obtain: (Check one) [X] Air construction permit to construct or modify one or more emissions units. Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

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

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:

Roxane Kennedy, Plant General Manager

2. Owner/Authorized Representative or Responsible Official Mailing Address:

Organization/Firm: FPL Sanford Plant

Street Address: 950 South Highway 17-92

City: DeBary State: FL

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:

Telephone: (386) 575-5211 Fax: (386) 575-5233

4. Owner/Authorized Representative or Responsible Official Statement:

I, the undersigned, am the owner or authorized representative*(check here [], if so) or the responsible official (check here [X], if so) 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.

Signature

Date

Professional Engineer Certification

1. Professional Engineer Name: Kennard F. Kosky

Registration Number: 14966

2. Professional Engineer Mailing Address:

Organization/Firm: Golder Associates Inc.*

Street Address: 6241 NW 23rd Street, Suite 500

City: Gainesville State: FL Zip Code: 32653-1500

3. Professional Engineer Telephone Numbers:

Telephone: (352) 336 - 5600 Fax: (352) 336 - 6603

Zip Code: **32713**

^{*} Attach letter of authorization if not currently on file.

^{*}Certification of Authorization # 00001670

4. Professional Engineer Statement:

I, the undersigned, hereby certify, 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 pollution 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 unit 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.

Thomas 7.14 my	5/14/03	
Signature	Date	
(seal)		

^{*} Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit	Processing Fee
		Type	ree
004	Combined Cycle Combustion Turbine Generator 4A CT with Heat Recovery Steam Generator	AC1B	NA
005	Combined Cycle Combustion Turbine Generator 4B CT with Heat Recovery Steam Generator	AC1B	NA
006	Combined Cycle Combustion Turbine Generator 4C CT with Heat Recovery Steam Generator	AC1B	NA
007	Combined Cycle Combustion Turbine Generator 4D CT with Heat Recovery Steam Generator	AC1B	NA
009	Combined Cycle Combustion Turbine Generator 5A CT with Heat Recovery Steam Generator	AC1B	NA
010	Combined Cycle Combustion Turbine Generator 5B CT with Heat Recovery Steam Generator	AC1B	NA
011	Combined Cycle Combustion Turbine Generator 5C CT with Heat Recovery Steam Generator	AC1B	NA
012	Combined Cycle Combustion Turbine Generator 5D CT with Heat Recovery Steam Generator	AC1B	NA

Application Processing Fee

Check one: [] Attached - Amount: \$:	[X] Not Applicable
Chook one. [J Tittached - Timount: 5.	[X] Not rippiicable

Construction/Modification Information

1.	Description of Proposed Project or Alterations:
	This application is requesting a construction permit to operate combustion turbines associated with Units 4A through 4D and Units 5A through 5D in Peak Firing Mode for up to 400 hours per year. See Part II.
2.	Projected or Actual Date of Commencement of Construction: JUNE 1, 2003
3.	Projected Date of Completion of Construction: JULY 1, 2004

Application Comment

		 	 •	
	See Part II.			
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				į

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1.	Facility UTM Coor	dinates:		
	Zone: 17	East (km):	468.3 Nor	th (km): 3190.3
2.	Facility Latitude/Lo Latitude (DD/MM/	•	Longitude (DD/MN	M/SS): 81 / 19 / 32
3.	Governmental Facility Code:	4. Facility Status Code:	5. Facility Major Group SIC Code:	6. Facility SIC(s):
	0	A	49	4911
_	- 111 - 01	41 1 1	·	·

7. Facility Comment (limit to 500 characters):

The existing Sanford facility consists of 1 Fossil-Fired Steam Generators (FFSG) and two combined cycle units. FFSG Unit 3 is fired with No. 6 residual fuel oil, No. 2 fuel oil, and natural gas. The FFSG associated with Units 4 & 5 have been replaced with eight advanced CTs burning natural gas and 8 HRSGs to produce two 4-on-1 combined cycle units. Combined Cycle Units 4 and 5 have commenced operation.

Facility Contact

1.	Name and	Title	of Facility	Contact:
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Mr. Randy Hopkins, Environmental Specialist

2. Facility Contact Mailing Address:

Organization/Firm: FPL Sanford Plant

Street Address: 950 South Highway 17-92

City: DeBary State: FL Zip Code: 32713

3. Facility Contact Telephone Numbers:

Telephone: (386) 575-5385 Fax: (386) 575-5233

Facility Regulatory Classifications

Check	all	that	ap	ply:
-------	-----	------	----	------

1. [] Small Business Stationary Source? [] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?
3. [] Synthetic Minor Source of Pollutants Other than HAPs?
4. [] Major Source of Hazardous Air Pollutants (HAPs)?
5. [] Synthetic Minor Source of HAPs?
6. [X] One or More Emissions Units Subject to NSPS?
7. [] One or More Emission Units Subject to NESHAP?
8. [] Title V Source by EPA Designation?
9. Facility Regulatory Classifications Comment (limit to 200 characters):
The CTs are subject to NSPS Subpart GG.
List of Applicable Regulations
List of Applicable Regulations Facility applicable regulations are listed in the existing Title V permit. No additional facility
Facility applicable regulations are listed in the existing Title V permit. No additional facility
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Facility applicable regulations are listed in the existing Title V permit. No additional facility

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap		4. Basis for Emissions	5. Pollutant Comment
		lb/hour	tons/year	Сар	_
		.0/1.04.	10110/ / 0111		<u> </u>
ļ					

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1.	Area Map Showing Facility Location:
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
2.	Facility Plot Plan:
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
3.	Process Flow Diagram(s):
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
4.	Precautions to Prevent Emissions of Unconfined Particulate Matter:
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
5.	Fugitive Emissions Identification:
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
6.	Supplemental Information for Construction Permit Application:
	[X] Attached, Document ID: Part II [] Not Applicable
7.	Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: [] Attached, Document ID: [X] Not Applicable
9. List of Equipment/Activities Regulated under Title VI:
[] Attached, Document ID:
[] Equipment/Activities On site but Not Required to be Individually Listed
[X] Not Applicable
10. Alternative Methods of Operation:
[] Attached, Document ID: [X] Not Applicable
11. Alternative Modes of Operation (Emissions Trading):
[] Attached, Document ID: [X] Not Applicable
12. Identification of Additional Applicable Requirements:
[] Attached, Document ID: [X] Not Applicable
13. Risk Management Plan Verification:
[] Plan previously submitted to Chemical Emergency Preparedness and Prevention
Office (CEPPO). Verification of submittal attached (Document ID:) or
previously submitted to DEP (Date and DEP Office:)
[] Plan to be submitted to CEPPO (Date required:)
[X] Not Applicable
14. Compliance Report and Plan:
[] Attached, Document ID: [X] Not Applicable
15. Compliance Certification (Hard-copy Required):
[] Attached, Document ID: [X] Not Applicable

Emissions Unit Information Section	1	of 2	Combustion Turbines 4A thru 4D
CHUSSIVHS CHIL IMIULHIAUVH SECCION	•	VI -	

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION (All Emissions Units)

Emissions Unit Description and Status

1.	Type of Emissions Unit Addressed in This Section: (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).						
[x	X] 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.						
[=		on addresses, as a single emis es which produce fugitive em	•			
2.	Regulated or Unr	egulated Emissions Unit	? (Check one)				
[x	The emissions unit.	unit addressed in this Em	nissions Unit Information Sec	ction is a regulated			
[] The emissions unit.	unit addressed in this Em	nissions Unit Information Sec	ction is an unregulated			
3.	 Description of Emissions Unit Addressed in This Section (limit to 60 characters): Combustion Turbines 4A through 4D. 						
4.		lentification Number:	[] No ID			
	ID: 004-007		[] ID Unknown			
5.	Emissions Unit Status Code:	6. Initial Startup Date: MAR 2003	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [X]			
9.	Emissions Unit C	Comment: (Limit to 500 (Characters)				
	natural gas in pea		ric (GE) Frame 7FA Advanced operated in only combined cy same for each CT.				

En	nissions Unit Information Sect	ion1	of	Combustion Turbines 4A	thru 4L
<u>En</u>	nissions Unit Control Equipmo	e <u>nt</u>			
1.	Control Equipment/Method De	escription (Limit	to 200 chara	acters per device or metho	d):
	Dry Low NO _x Combustors				
	•				
2.	Control Device or Method Cod	le(s): 025			
En	nissions Unit Details				
1.	Package Unit:		3.4 1.13.7	1	
2.	Manufacturer: General Electr Generator Nameplate Rating:	182	Model Nui MW	nber: 7FA	
3.	Incinerator Information:		174 77		
	Dwell Temp			°F	
	Dwe Incinerator Afterburner Temp	ell Time: perature:		seconds °F	
1		VIIIIIV.		1	

Emissions Unit Information Section 1 of 2 Combustion Turbines 4A t	Emissions Unit Information Section	1	of	2	Combustion Turbines 4A thr	u 41
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B. EMISSIONS UNIT CAPACITY INFORMATION (Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Heat Input Rate:		1,918	mmBtu/hr
2.	Maximum Incineration Rate:	lb/hr		tons/day
3.	Maximum Process or Through	put Rate:		
4.	Maximum Production Rate:			
5.	Requested Maximum Operation	g Schedule:		
		hours/day		days/week
		weeks/year	400	hours/year
	Maximum heat input for peak fi degrees Fahrenheit (°F), 20% re Value (HHV). Generator namep	elative humidity, and 14.7	psia. Heat inp	out as High Heating

Emissions Unit Information Section1 of2 Combustion Turbines 4A thru 4D
C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)
List of Applicable Regulations
Applicable regulations do not change as a result of this construction permit application.

Emissions Unit Information Section	1	of	2	Combustion Turbines 4A thru 4
Campaiona onicantol manon accion	-	VI.		

D. EMISSION POINT (STACK/VENT) INFORMATION (Regulated Emissions Units Only)

Emission Point Description and Type

Identification of Point on P Flow Diagram?	lot Plan or	2. Emission Po	oint Type Code:				
3. Descriptions of Emission P 100 characters per point):							
	Unit can exhaust through HRSG stack.						
4. ID Numbers or Description	s of Emission Ui	nits with this Emi		n:			
5. Discharge Type Code:	6. Stack Heig	ht: 125 feet	7. Exit Diameter: 19	feet			
8. Exit Temperature: 220 °F	Rate:	umetric Flow 6,915 acfm	10. Water Vapor: 8.6	%			
11. Maximum Dry Standard Flo 738,680		12. Nonstack Er	nission Point Height: f	eet			
13. Emission Point UTM Coord Zone: 17 E	dinates: East (km): 468.3	Nort	h (km): 3190.3				
14. Emission Point Comment (limit to 200 char	acters):					
Stack conditions for combined cycle operation, peak firing, and turbine inlet of 59°F. Stack conditions vary based on turbine inlet temperature. All CTs equipped with inlet foggers. See Part II.							

Emissions Unit Information Section 1 of 2 Combustion Turbines 4A thru 4D

E. SEGMENT (PROCESS/FUEL) INFORMATION (All Emissions Units)

Segment Description and Rate: Segment 1 of 1							
1. Segment Description (Process/Fuel Type) (limit to 500 characters):							
Natural Gas	Natural Gas						
				,			
2. Source Classification Cod 2-01-002-01	le (SCC):	3. SCC Units		not			
4. Maximum Hourly Rate: 1.92	5. Maximum . 718	<u> </u>		Estimated Annual Activity Factor:			
7. Maximum % Sulfur:	8. Maximum	% Ash:	9.	Million Btu per SCC Unit: 1,024			
10. Segment Comment (limit	to 200 characters):					
Maximum Hourly Rate = 1,			5 4-				
Annual based on 59°F turb	ine iniet (1,838 M	MBtu/nrj. Millio	n Bu	1/SCC as HHV.			
Segment Description and Ra	Segment Description and Rate: Segment of						
1. Segment Description (Pro	cess/Fuel Type)	(limit to 500 ch	aract	ers):			
Segment Description (Pro	cess/Fuel Type)	(limit to 500 ch	aract	ers):			
1. Segment Description (Pro	cess/Fuel Type)	(limit to 500 ch	aract	ers):			
1. Segment Description (Pro	cess/Fuel Type)	(limit to 500 ch	aract	ers):			
Segment Description (Pro Source Classification Cod		(limit to 500 ch		ers):			
	le (SCC):	`		Estimated Annual Activity Factor:			
2. Source Classification Cod	le (SCC):	3. SCC Unit	ts:	Estimated Annual Activity			
2. Source Classification Cod4. Maximum Hourly Rate:	le (SCC): 5. Maximum . 8. Maximum .	3. SCC Unit Annual Rate: % Ash:	ts:	Estimated Annual Activity Factor:			
 Source Classification Cod Maximum Hourly Rate: Maximum % Sulfur: 	le (SCC): 5. Maximum . 8. Maximum .	3. SCC Unit Annual Rate: % Ash:	ts:	Estimated Annual Activity Factor:			
 Source Classification Cod Maximum Hourly Rate: Maximum % Sulfur: 	le (SCC): 5. Maximum . 8. Maximum .	3. SCC Unit Annual Rate: % Ash:	ts:	Estimated Annual Activity Factor:			

Emissions Unit Information Section	1	of 2	Combustion Turbines 4A thru 4D
MINISTORS UTIL THIUTHALION SECTION	1	() L	COMBUSTION TO BELLIOUS TA CING TE

F. EMISSIONS UNIT POLLUTANTS (All Emissions Units)

Primary Control Device Code	Secondary Control Device Code	4. Pollutant Regulatory Code
		WP
		WP
025		EL
		EL
		EL
11.1100.0000		
	Device Code	Device Code Device Code

_			_				
Er	nissions Unit Information Section 1	of	2		on Turbines 4A thru 4D		
Po	Ilutant Detail Information Page 1	1 of 5 Particulate Matte					
	G. EMISSIONS UNIT POLLU' (Regulated En Emissions-Limited and Precons	mission	s Unit	s -			
<u>Po</u>	tential/Fugitive Emissions						
1.	Pollutant Emitted:	2. To	tal Per	cent Efficier	ncy of Control:		
	PM						
3,	Potential Emissions:				4. Synthetically		
_	9 lb/hour	1.8	tor	ns/year	Limited? [X]		
5.	Range of Estimated Fugitive Emissions:				,		
-	[] 1 [] 2 [] 3 Emission Factor: 9 lb/hr		to		s/year		
0.					7. Emissions Method Code:		
	Reference: GE, 2000				2		
8.	Calculation of Emissions (limit to 600 chara	cters):					
	See Part II.						
9.	Pollutant Potential/Fugitive Emissions Comm	ment (li	mit to	200 characte	ers):		
	Potential emissions for one (1) CT and peak f	firing m	ode.				
<u>Al</u>	lowable Emissions Allowable Emissions	<u>1</u> of	1	_			
1.	Basis for Allowable Emissions Code: OTHER		uture E		e of Allowable		
3.	Requested Allowable Emissions and Units:	4. E	quivale	ent Allowabl	e Emissions:		
	10% Opacity		9	lb/hour	1.8 tons/year		
5.	Method of Compliance (limit to 60 character	rs):			**		
	EPA Method 9						
6.	Allowable Emissions Comment (Desc. of Op	perating	Meth	od) (limit to	200 characters):		

DEP Form No. 62-210.900(1) - Form Effective: 2/11/99

Peak firing mode with natural gas. Equivalent allowable emissions for one (1) CT.

Emissions Unit Information Section	1	of	2	Combustion Turbines 4A thru 4D
Pollutant Detail Information Page	2	of _	5	Sulfur Dioxide

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Emissions-Limited and Preconstruction Review Pollutants Only)

Po	tential/Fugitive Emissions								
1.	Pollutant Emitted:	2. T	otal	Perc	ent Eff	icie	ncy of Con	trol	:
	so₂								
3.	Potential Emissions:						4. Synthe	tica	ılly
	5.1 lb/hour	1.0	2	ton	s/year		Limite		[X]
5.	Range of Estimated Fugitive Emissions:								
ļ	[] 1 [] 2 [] 3			to		ton	s/year		
6.	Emission Factor: 1 grain S/100 cf Gas						7. Emissi		
	Reference: GE, 2000; Golder, 2003						Metho 2	a C	ode:
8.	Calculation of Emissions (limit to 600 charac	cters):							
	One Post II								
	See Part II.								
9.	Pollutant Potential/Fugitive Emissions Comm	nent (limi	it to 2	200 cha	ract	ers):		•
	Potential emissions for one (1) CT and peak fi	iring n	nod	e .					
									
<u>Al</u>	lowable Emissions Allowable Emissions 1	<u>1</u> c	of	1	-				
1.	Basis for Allowable Emissions Code:	2. I	utu	ire E	ffective	Dat	e of Allow	able	e
	OTHER			ssion					
3.	Requested Allowable Emissions and Units:	4. I	Equ	ivale	nt Allo	wab	le Emission	is:	
				5.1	lb/hour	•	1.02 to	ns/y	ear/
5.	Method of Compliance (limit to 60 character	rs):							•
	Fuel Sampling; Vendor Sampling Pipeline Qua	ality N	atu	ral G	as				
6.	Allowable Emissions Comment (Desc. of Op	peratir	ıg N	1etho	od) (lim	it to	200 charae	cter	s):
	Frankski de die een de een	- 411-				4	•		e i
	Equivalent allowable emissions for one (1) CT sulfur content. Peak firing mode with natural		wat	nie D	asea on	тур	ıcaı maxım	um 1	iuei
	•	•					,		
l									

Emissions Unit Information Section	1	of _		Combustion Turbines 4A thru 4D
Pollutant Detail Information Page	3	of	5	Nitrogen Oxides

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Emissions-Limited and Preconstruction Review Pollutants Only)

<u>P0</u>	tential/Fugitive Emissions						
1.	Pollutant Emitted:	2.	Tota	l Percent Eff	icien	cy of Control:	
	NO _x						
3.	Potential Emissions:					4. Synthetica	lly
	101.2 lb/hour	20.	24	tons/year		Limited?	[X]
5.	Range of Estimated Fugitive Emissions:						
<u> </u>				to		/year	
6.	Emission Factor: 15 ppmvd @ 15% O ₂				7	7. Emissions	
	Reference: GE, 2000					Method Co	oae:
8.	Calculation of Emissions (limit to 600 charac	cters):				
	See Part II						
	•						
}							
						<u>.</u>	
9.	Pollutant Potential/Fugitive Emissions Comm	ment	(lim	it to 200 cha	ıracte	rs):	
	Potential emissions for one (1) CT and peak f	firina	mod	lo.			
	Totalidal chilosions for one (1) or and peak i	9	11100				
Al	lowable Emissions Allowable Emissions	1	of_	1			
1.	Basis for Allowable Emissions Code: OTHER	2.		ure Effective	Date	of Allowable	3
3.		4.			wable	e Emissions:	
	15 ppmvd @ 15% O₂		·	101.2 lb/h	our	20.24 tons/	'year
5.	Method of Compliance (limit to 60 character	 rs):					***
ĺ							
	CEM - Part 75						
6.	Allowable Emissions Comment (Desc. of Op	perat	ing l	Method) (lim	it to ?	200 characters	s):
	Allowable emissions are a 3-hour block avera	age.	CEM	is installed i	n HR	SG stack. Equ	ıivalent
	allowable emissions for one (1) CT. Peak firing						

Emissions Unit Information Section	11	of	2	Combustion Turbines 4A thru 4D
Pollutant Detail Information Page	4	of	5	Carbon Monoxide

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

10	tential/Fugitive Emissions			
1.	Pollutant Emitted:	2. Tota	l Percent Effi	ciency of Control:
	со			
3.	Potential Emissions:			4. Synthetically
	28.9 lb/hour	5.78	tons/year	Limited? [X]
5.	Range of Estimated Fugitive Emissions:			
	[] 1 [] 2 [] 3		to	tons/year
6.	Emission Factor: 9 ppmvd			7. Emissions
	Reference: GE, 2000			Method Code: 2
8.	Calculation of Emissions (limit to 600 chara	icters):		
	See Part II.			
9.	Pollutant Potential/Fugitive Emissions Com	ment (lim	nit to 200 char	racters):
			_	
	Potential emissions for one (1) CT and peak	firing mod	ie.	
L	lovable Emissions Allovable Emissions	4		
	lowable Emissions Allowable Emissions	1 of_	<u>1</u>	
1.	Basis for Allowable Emissions Code: OTHER		ure Effective issions:	Date of Allowable
3.	Requested Allowable Emissions and Units:	4. Equ	ivalent Allov	vable Emissions:
	9 ppmvd		28.9 lb/hour	5.78 tons/year
5.	Method of Compliance (limit to 60 characte	rs):		
	EPA Method 10; Annual Test			
6.	Allowable Emissions Comment (Desc. of O	perating l	Method) (limi	t to 200 characters):
ļ				
	Peak firing mode with natural gas. Equivaler	nt allowati	oie emissions	for one (1) C1.

Emissions Unit Information Section1	of 2 Combus	tion Turbines 4A thru 4D				
Pollutant Detail Information Page 5	of 5 Volatile Organic Compour					
G. EMISSIONS UNIT POLLU (Regulated En Emissions-Limited and Precons	missions Units -					
Potential/Fugitive Emissions						
1. Pollutant Emitted:	2. Total Percent Effici	ency of Control:				
voc						
3. Potential Emissions:		4. Synthetically				
2.81 lb/hour	0.56 tons/year	Limited? [X]				
5. Range of Estimated Fugitive Emissions:	to to	ons/year				
6. Emission Factor: 1.4 ppmvw		7. Emissions				
Reference: GE, 2000		Method Code:				
8. Calculation of Emissions (limit to 600 chara	acters):	1 2				
See Part II.						
9. Pollutant Potential/Fugitive Emissions Com	ment (limit to 200 charac	eters):				
Potential emissions for on (1) CT and peak fi	ring mode.					
Allowable Emissions Allowable Emissions	1 of 1					

1.	Basis for Allowable Emissions Code: OTHER	2.	Future I Emissio	Effective Dans:	ate of A	llowable
3.	Requested Allowable Emissions and Units:	4.	Equival	ent Allowa	ble Emi	ssions:
	1.4 ppmvw		2 21	lb/hour	0.56	tons/year
1	hh		2.01	to/Hour	0.50	toris/year

EPA Method 18 or 25A; Initial Compliance Test only

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

Equivalent allowable emissions for one (1) CT. Peak firing mode with natural gas.

En	nissions Unit Information Section1		of _	2		Co	mbı	ustic	n Tu	rbines 4A thru 4D
	H. VISIBLE EMISS (Only Regulated Emissions U								tatio	n)
<u>Vi</u>	sible Emissions Limitation: Visible Emissi	ons I	Limi	tati	on .	1		of_	2	
1.	Visible Emissions Subtype: VE10	2.	Basi [or A		wab	le O	paci [X]	ty: Other
3.	Requested Allowable Opacity: Normal Conditions: 10 % Ex Maximum Period of Excess Opacity Allower		iona	l Co	ond	itior	ıs:			% min/hour
4.	Method of Compliance: Annual VE Test - EPA Method 9.	•								
5.	Visible Emissions Comment (limit to 200 c	harac	ters):						
	Peak Firing Mode with Natural Gas						·			
	I. CONTINUOUS MO (Only Regulated Emissions Units									oring)
<u>Co</u>	ntinuous Monitoring System: Continuous	Mon	itor		1	_ 0	<u>f</u>	1	_	
1.	Parameter Code: EM	2.	Poll	uta	nt(s	s): I	NO _x			
3.	CMS Requirement:	[X] R	ule				[] O	her
4.	Monitor Information: Manufacturer: To be provided with initial Ti Model Number:		Seri	al N	Vun	ıber				
5.	Installation Date:	6.	Perf	forn	nan	ce S	pec	ifica	ation	Test Date:
7.	Continuous Monitor Comment (limit to 200	cha	racte	rs):	:					
	CEMs meet 40 CFR Part 75.									

missions Unit Information Section	of Combustion Turbines 4A thru 4				
	IONS INFORMATION nits Subject to a VE Limitation)				
sible Emissions Limitation: Visible Emissi	ons Limitation 2 of 2				
Visible Emissions Subtype: VE99	Basis for Allowable Opacity: X Rule Other				
•	sceptional Conditions: 100 % ed: 60 min/hour				
•					
	harastars):				
FDEP Rule 62-210.700(1). Allowed for 2 hours (120 minutes) per 24 hours for start-up, shutdown, and malfunction. (Note: Allowance for cold startup and shutdown specified by Title V permit.)					
	NITOR INFORMATION Subject to Continuous Monitoring) Monitor of				
Parameter Code:	2. Pollutant(s):				
CMS Requirement:	[] Rule [] Other				
Monitor Information: Manufacturer: Model Number: Installation Date:	Serial Number: 6. Performance Specification Test Date:				
	I				
	(Only Regulated Emissions Usible Emissions Limitation: Visible Emissions Subtype: VE99 Requested Allowable Opacity: Normal Conditions: % Ex Maximum Period of Excess Opacity Allowed Method of Compliance: None Visible Emissions Comment (limit to 200 c FDEP Rule 62-210.700(1). Allowed for 2 hourshutdown, and malfunction. (Note: Allowan Title V permit.) I. CONTINUOUS MO (Only Regulated Emissions Units Ontinuous Monitoring System: Continuous Parameter Code: CMS Requirement: Monitor Information: Manufacturer: Model Number:				

Emissions Unit Information Section 1 of	2	Combustion Turbines 4A thru 4D
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J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION (Regulated Emissions Units Only)

Supplemental Requirements

1.	Process Flow Diagram
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
2.	Fuel Analysis or Specification
	[] Attached, Document ID: [] Not Applicable [] Waiver Requested
3.	Detailed Description of Control Equipment
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
4.	Description of Stack Sampling Facilities
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
5.	Compliance Test Report
	[] Attached, Document ID:
	[] Previously submitted, Date:
	[X] Not Applicable
6.	Procedures for Startup and Shutdown
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
7.	Operation and Maintenance Plan
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
8.	Supplemental Information for Construction Permit Application
	[X] Attached, Document ID: Part II [] Not Applicable
9.	Other Information Required by Rule or Statute
	[] Attached, Document ID: [X] Not Applicable
10	Sunday David Company
10	. Supplemental Requirements Comment:

Emissions Unit Information Section	1	of	2	Combustion Turbines 4A thru 4
Cinissions only intol mation occurs		VI	_	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[] Attached, Document ID: [X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading)
[] Attached, Document ID: [X] Not Applicable
13. Identification of Additional Applicable Requirements
[] Attached, Document ID: [X] Not Applicable
14. Compliance Assurance Monitoring Plan
[] Attached, Document ID: [X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required)
[] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:
[] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:
[] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:
[] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:
Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
Attached, Document ID:
[] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
Attached, Document ID:
[X] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION (All Emissions Units)

Emissions Unit Description and Status

_							
1.	. Type of Emissions Unit Addressed in This Section: (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).						
[X	X] 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.						
[n addresses, as a single emis s which produce fugitive em				
2.	Regulated or Unr	egulated Emissions Unit	? (Check one)				
[X	The emissions unit.	unit addressed in this Em	aissions Unit Information Sec	ction is a regulated			
[[] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.						
3.	3. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Combustion Turbines 5A through 5D.						
4.	Emissions Unit Id	dentification Number:	[] No ID			
	ID: 009-012		[] ID Unknown			
5.	Emissions Unit Status Code:	6. Initial Startup Date: FEB 2002	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [X]			
9.	Emissions Unit C	Comment: (Limit to 500 C	Characters)				
	natural gas in pea		ic (GE) Frame 7FA Advanced operated in only combined cy same for each CT.				

En	missions Unit Information Section 2		of 2 Com	oustion Turbines 3A thru 5
<u>Er</u>	missions Unit Control Equipment			
1.	Control Equipment/Method Description (Lin	nit	to 200 characters	per device or method):
	Dry Low NO _x Combustors			
!				
2.	Control Device or Method Code(s): 025			
En	nissions Unit Details			
1.	Package Unit:			
	Manufacturer: General Electric		Model Number:	7FA
2.		82	MW	
3.				°F
	Dwell Temperature: Dwell Time:			r seconds
	Incinerator Afterburner Temperature:			°F

Emissions Unit information Section 2 of 2 combastion furbines 3A th	Emissions Unit Information Section	2	of	2	Combustion Turbines 5A thru	50
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B. EMISSIONS UNIT CAPACITY INFORMATION (Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Heat Input Rate:		1,918	mmBtu/hr
2.	Maximum Incineration Rate:	lb/hr		tons/day
3.	Maximum Process or Throughpu	t Rate:		
4.	Maximum Production Rate:			
5.	Requested Maximum Operating	Schedule:		
		hours/day		days/week
		weeks/year	400	hours/year
6.	Operating Capacity/Schedule Co Maximum heat input for peak firir degrees Fahrenheit (°F), 20% rela Value (HHV). Generator namepla	ng mode using natural tive humidity, and 14.7	gas at turbine psia. Heat inp	
			'F turbine inlet	

Emissions Unit Info	ormation Section	2 of	2	Combustion Turbines 5A thru 5D
	C. EMISSION	IS UNIT RE	GULA	TIONS
	(Regulated	Emissions U	U nits O	only)
List of Applicable l	Regulations			
Applicable regula	ations do not change a	s a result of t	this con	struction permit application.

Emissions Unit Information Section 2 of 2 Combustion Turbines 5A thru 5D

D. EMISSION POINT (STACK/VENT) INFORMATION (Regulated Emissions Units Only)

Emission Point Description and Type

Identification of Point on P. Flow Diagram?	lot Plan or	2. Emission Po	oint Type Code:			
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):						
Unit can exhaust through HRSG stack.						
4. ID Numbers or Description	s of Emission Ur	nits with this Emi	ssion Point in Commo	on:		
5. Discharge Type Code:	6. Stack Heigh		7. Exit Diameter:	C		
		125 feet	19	feet		
8. Exit Temperature:		umetric Flow	10. Water Vapor:			
220 °F	Rate:	6,915 acfm	8.6	%		
11. Maximum Dry Standard Flo 738,680	ow Rate:		mission Point Height:	eet		
13. Emission Point UTM Coord	linates:					
Zone: 17 E	Cast (km): 468.3	North	h (km): 3190.3			
14. Emission Point Comment (limit to 200 char	acters):				
Stack conditions for comb Stack conditions vary base foggers. See Part II.						

Emissions Unit Information Section 2 of 2 Combustion Turbines 5A thru 5D

E. SEGMENT (PROCESS/FUEL) INFORMATION (All Emissions Units)

<u>Se</u>	Segment Description and Rate: Segment 1 of 1					
1.	1. Segment Description (Process/Fuel Type) (limit to 500 characters):					
	Natural Gas					
:						
2.	Source Classification Cod 2-01-002-01	e (SCC):	3. SCC Units		eet	
4.	Maximum Hourly Rate: 1.92	5. Maximum 2 718	Annual Rate:	6.	Estimated Annual Activity Factor:	
7.	Maximum % Sulfur:	8. Maximum 9	% Ash:	9.	Million Btu per SCC Unit: 1,024	
10.	. Segment Comment (limit	to 200 characters):			
	Maximum Hourly Rate = 1,5					
	Annual based on 59°F turb	ine inlet (1,838 Mi	MBtu/ħr). Millio	on Btu	/SCC as HHV.	
<u>Se</u>	gment Description and Ra	nte: Segment	of			
<u>Se</u>	gment Description and Ra Segment Description (Prod			naracto	ers):	
<u>Se</u> ;				naracto	ers):	
<u>Se</u>				naract	ers):	
<u>Se</u>				naract	ers):	
Se: 1.		cess/Fuel Type)			ers):	
2.	Segment Description (Prod	cess/Fuel Type)	(limit to 500 ch	ts:	Estimated Annual Activity Factor:	
2.	Segment Description (Prod	cess/Fuel Type)	(limit to 500 ch	ts:	Estimated Annual Activity	
 2. 4. 7. 	Segment Description (Production Code Maximum Hourly Rate:	e (SCC): 5. Maximum 4	(limit to 500 ch 3. SCC Uni Annual Rate:	ts:	Estimated Annual Activity Factor:	
 2. 4. 7. 	Segment Description (Prod Source Classification Code Maximum Hourly Rate: Maximum % Sulfur:	e (SCC): 5. Maximum 4	(limit to 500 ch 3. SCC Uni Annual Rate:	ts:	Estimated Annual Activity Factor:	
 2. 4. 7. 	Segment Description (Prod Source Classification Code Maximum Hourly Rate: Maximum % Sulfur:	e (SCC): 5. Maximum 4	(limit to 500 ch 3. SCC Uni Annual Rate:	ts:	Estimated Annual Activity Factor:	

Emissions Unit Information Section	2	of 2	Combustion Turbines 5A thru 5D
Limssiums unit ilitui matuul sectium	_	() -	COMPASSION TAILMING OF THE CE

F. EMISSIONS UNIT POLLUTANTS (All Emissions Units)

1. Pollutant Emitted	Primary Control Device Code	Secondary Control Device Code	4. Pollutant Regulatory Code
PM			WP
SO ₂			WP
NO _X	025		EL
со			EL
voc			EL
			,
_			

Emissions Unit Information Section	2	of	2	Combustion Turbines 5A thru 5D
Pollutant Detail Information Page	1	of	5	Particulate Matter - Total

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Emissions-Limited and Preconstruction Review Pollutants Only)

<u>ro</u>	tential/Fugitive Emissions									
1.	1. Pollutant Emitted:			2. Total Percent Efficiency of Control:						
•	PM									
3.	Potential Emissions: 9 lb/hour		1.8	tons/year	4.	Synthetically Limited? [X]				
5.	Range of Estimated Fugitive Emissions:			-	<u> </u>					
	[] 1 [] 2 [] 3 to tons/year									
6.	Emission Factor: 9 lb/hr				7.					
	Reference: GE, 2000					Method Code: 2				
8.	Calculation of Emissions (limit to 600 chara	cters	s):							
	See Part II.									
9.	Pollutant Potential/Fugitive Emissions Com	men	t (lim	it to 200 charac	ters):				
	Potential emissions for one (1) CT and peak f	firinc	mod	la						
	Totalian chinasions for one (1) of and peak i		, 11100							
All	lowable Emissions Allowable Emissions	1	of_	1						
1.	Basis for Allowable Emissions Code: OTHER			2. Future Effective Date of Allowable Emissions:						
3.	Requested Allowable Emissions and Units:	4.	Equ	ivalent Allowa	ble I	Emissions:				
	10% Opacity			9 lb/hour		1.8 tons/year				
5.	5. Method of Compliance (limit to 60 characters):									
	EPA Method 9									
6.	. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):									
 	Peak firing mode with natural gas. Equivalent allowable emissions for one (1) CT.									
						, ,				

Emissions Unit Information Section	2	of	2	Combustion Turbines 5A thru 5D
Pollutant Detail Information Page	2	of	5	Sulfur Dioxide

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Emissions-Limited and Preconstruction Review Pollutants Only)

<u>Po</u>	tential/Fugitive Emissions				
1.	Pollutant Emitted:	2. T	otal	Percent Efficie	ency of Control:
	SO ₂				
3.	Potential Emissions:	· · · · · · · · ·		······································	4. Synthetically
	5.1 lb/hour	1.0	2	tons/year	Limited? [X]
5.	Range of Estimated Fugitive Emissions:				,
_	[] 1 [] 2 [] 3			to to	ns/year 7. Emissions
6.	3 2				Method Code:
<u> </u>	Reference: GE, 2000; Golder, 2003				2
8.	Calculation of Emissions (limit to 600 charac	cters):			
	See Part II.				
9.	Pollutant Potential/Fugitive Emissions Com	mont (lim	it to 200 abarra	itora):
٦.	Foliulant Folential/Fugitive Emissions Comi	nem (11111	it to 200 charac	icis).
	Potential emissions for one (1) CT and peak f	iring n	nod	e.	
<u>Al</u>	lowable Emissions Allowable Emissions	<u>1</u> 0	of	1	
1.	Basis for Allowable Emissions Code: OTHER			re Effective Da	ate of Allowable
3.	Requested Allowable Emissions and Units:	4. I	Equ:	ivalent Allowal	ole Emissions:
				5.1 lb/hour	1.02 tons/year
5.	Method of Compliance (limit to 60 character	:s):			
	Fuel Sampling; Vendor Sampling Pipeline Qu	ality N	atu	ral Gas	
6.	Allowable Emissions Comment (Desc. of Op	peratin	ıg N	fethod) (limit t	o 200 characters):
	Equivalent allowable emissions for one (1) Consultur content. Peak firing mode with natural		wal	ole based on ty	pical maximum fuel

Emissions Unit Information Section	2	_ of _	2	Combustion Turbines 5A thru 5D
Pollutant Detail Information Page	3	of	5	Nitrogen Oxides

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Emissions-Limited and Preconstruction Review Pollutants Only)

<u>Po</u>	tential/Fugitive Emissions								
1.	Pollutant Emitted:	2. Total Percent Efficiency of Control:							
	NO _x								
3.	Potential Emissions: 101.2 lb/hour	4. Synthetically 20.24 tons/year Limited? [X]							
5.	Range of Estimated Fugitive Emissions:								
	[] 1 [] 2 [] 3	totons/year							
6.	Emission Factor: 15 ppmvd @ 15% O ₂	7. Emissions							
	Reference: GE, 2000	Method Code:							
8.	Calculation of Emissions (limit to 600 chara	cters):							
	See Part II								
9.	9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): Potential emissions for one (1) CT and peak firing mode.								
<u>Al</u>	lowable Emissions Allowable Emissions	1 of 1							
1.	Basis for Allowable Emissions Code: OTHER	2. Future Effective Date of Allowable Emissions:							
3.	Requested Allowable Emissions and Units:	4. Equivalent Allowable Emissions:							
	15 ppmvd @ 15% O ₂	101.2 lb/hour 20.24 tons/year							
5.	Method of Compliance (limit to 60 character	rs):							
	CEM - Part 75								
6.	Allowable Emissions Comment (Desc. of Op	perating Method) (limit to 200 characters):							
	Allowable emissions are a 3-hour block avera allowable emissions for one (1) CT. Peak firing	nge. CEM is installed in HRSG stack. Equivalenting mode with natural gas.							

Emissions Unit Information Section	2	of	2	Combustion Turbines 5A thru 5D
Pollutant Detail Information Page	4	of		- Carbon Monoxide
G. EMISSIONS UNIT P (Regul Emissions-Limited and I Potential/Fugitive Emissions	ated En	ission	s Unit	ts -
1. Pollutant Emitted:		2. To	tal Pe	rcent Efficiency of Control:

10	tentian Pugitive Elilissions							
1.	Pollutant Emitted:	2. Tot	al Pe	rcent E	fficie	ncy	of Control	
ł	со							
3.	Potential Emissions:				-	4.	Synthetica	lly
	28.9 lb/hour	5.78	to	ns/year			Limited?	[X]
5.	Range of Estimated Fugitive Emissions:							
	[] 1 . [] 2 [] 3		to	o	to	ns/ye	ear	
6.	Emission Factor: 9 ppmvd					7.	Emissions	
	Reference: GE, 2000						Method Co	ode:
8.	Calculation of Emissions (limit to 600 chara	cters):						
	See Part II.							
9.	Pollutant Potential/Fugitive Emissions Com	ment (li	mit to	200 cł	narac	ters)):	
	Potential emissions for one (1) CT and peak firing mode.							
<u>Al</u>	lowable Emissions Allowable Emissions	1 of	1					
1.	Basis for Allowable Emissions Code: OTHER		iture I nissio		e Da	te o	f Allowable	
3.	Requested Allowable Emissions and Units:	4. Eq	uival	ent All	ował	ole E	missions:	
	9 ppmvd		28.9	lb/ho	ur	5.	. 78 tons/ye	ar
5.	Method of Compliance (limit to 60 characte	rs):						
	EPA Method 10; Annual Test							
6.	Allowable Emissions Comment (Desc. of O	perating	Meth	od) (lir	mit to	200	0 characters	 3):
	Peak firing mode with natural gas. Equivaler	nt allowa	ble er	mission	ıs for	one	(1) CT.	

Emissions Unit Information Section	2	of	2	Combustion Turbines 5A thru 5D
Pollutant Detail Information Page	5	of	5	Volatile Organic Compounds

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units -

Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

<u>Po</u>	tential/Fugitive Emissions						
1.	Pollutant Emitted:	2. To	tal Perc	ent Effic	iency	of Control	·
	voc						
3.	Potential Emissions:				4.	Synthetica	lly
	2.81 lb/hour	0.56	tons	/year	<u> Т</u>	Limited?	[X]
5.	Range of Estimated Fugitive Emissions:						
_	[] 1		to	to	ons/y		
0.	Emission Factor: 1.4 ppmvw				7.	Emissions Method Co	
	Reference: GE, 2000					2	ouc.
8.	Calculation of Emissions (limit to 600 chara	cters):					
	See Part II.						
	Pull-rest Part of 1/E 1/2 E 1 1 C	. (1'		00.1		· · · · · · · · · · · · · · · · · · ·	
9.	Pollutant Potential/Fugitive Emissions Com	ment (11	mit to 2	ou chara	cters)):	
	Potential emissions for on (1) CT and peak fil	ring mod	de.				
Al	Allowable Emissions 1 of 1						
1.	Basis for Allowable Emissions Code: OTHER	1			ate o	f Allowable	?
3.	Requested Allowable Emissions and Units:		mission:	-	hle F	Emissions:	
J.	•	7. 1.	-				
	1.4 ppmvw		2.81	lb/hour	0.	. 56 tons/ye	ar
5.	Method of Compliance (limit to 60 character	rs):					
	EPA Method 18 or 25A; Initial Compliance Te	st only					
6.	Allowable Emissions Comment (Desc. of O	perating	Metho	d) (limit	to 20	0 characters	s):
				_		_	
	Equivalent allowable emissions for one (1) C	T. Peak	firing m	ode with	natu	ral gas.	
L							

Emissions Unit Information Section	2	of _	2	Combustion Turbines 5A thru 5D

H. VISIBLE EMISSIONS INFORMATION (Only Regulated Emissions Units Subject to a VE Limitation)

Vi	sible Emissions Limitation: Visible Emissi	ions Limitation 1 of 2					
1.	Visible Emissions Subtype: VE10	Basis for Allowable Opacity: Rule State					
3.	Requested Allowable Opacity: Normal Conditions: 10 % Ex Maximum Period of Excess Opacity Allower	sceptional Conditions: % ed: min/hour					
4.	Method of Compliance:						
	Annual VE Test - EPA Method 9.						
5.	. Visible Emissions Comment (limit to 200 characters):						
	Peak Firing Mode with Natural Gas						
Co	I. CONTINUOUS MONITOR INFORMATION (Only Regulated Emissions Units Subject to Continuous Monitoring) Continuous Monitoring System: Continuous Monitor 1 of 1						
1.	Parameter Code: EM	2. Pollutant(s): NO _x					
3.	CMS Requirement:	[X] Rule [] Other					
4.	5B= 42CLS-77997-387 01- 5C= 42CLS-77998-387 01-						
5.	Installation Date: 1 JAN 2002 (5A) through 30 APR 2002 (5D) (Original NO _x replaced in 2002)	6. Performance Specification Test Date: 21 APR 2003 (5A); 22 APR 2003 (5B); 23 APR 2003 (5C); Sch. MAY 2003 (5D)					
7.	Continuous Monitor Comment (limit to 200	characters):					
	CEMs meet 40 CFR Part 75.						

Information Section	2	_ of	2	Comb	ustion Turbines 5A thru 5D
					_
is Limitation: Visible E	mission	s Lin	nitation	2	of
sions Subtype:	2				ole Opacity: [] Other
itions: %		•	al Con	ditions:	100 % 60 min/hour
ompliance:					
-210.700(1). Allowed for :	2 hours	(120 r	ninutes		
y Regulated Emissions	Units S	ubjec	t to Co	ntinuo	:
ement:	[]]	Rule		[] Other
rer:			Serial	Numbe	
·					
ate:	•). Pe	11011111	nce Spe	cification Test Date:
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Emissions Unit Information Section 2 of 2 Combustion Turbines 5A thru 5D

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION (Regulated Emissions Units Only)

Supplemental Requirements

1.	Process Flow Diagram
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
2.	Fuel Analysis or Specification
	[] Attached, Document ID: [] Not Applicable [] Waiver Requested
3.	Detailed Description of Control Equipment
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
4.	Description of Stack Sampling Facilities
i	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
5.	Compliance Test Report
	[] Attached, Document ID:
	[] Previously submitted, Date:
	[X] Not Applicable
6.	Procedures for Startup and Shutdown
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
7.	Operation and Maintenance Plan
	[] Attached, Document ID: [X] Not Applicable [] Waiver Requested
8.	Supplemental Information for Construction Permit Application
	[X] Attached, Document ID: Part II [] Not Applicable
9.	Other Information Required by Rule or Statute
	[] Attached, Document ID: [X] Not Applicable
10	. Supplemental Requirements Comment:
I	

Emissions Unit Information Section 2 of 2 Combustion Turbines 5A thru 5D

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation
[] Attached, Document ID: [X] Not Applicable
12. Alternative Modes of Operation (Emissions Trading)
[] Attached, Document ID: [X] Not Applicable
13. Identification of Additional Applicable Requirements
[] Attached, Document ID: [X] Not Applicable
14. Compliance Assurance Monitoring Plan
[] Attached, Document ID: [X] Not Applicable
15. Acid Rain Part Application (Hard-copy Required)
[] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:
[] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:
[] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:
[] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:
[] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:
[] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:
[X] Not Applicable

PART II

APPLICATION FOR AIR CONSTRUCTION PERMIT
SANFORD UNITS 4A THROUGH 4D AND UNITS 5A THROUGH 5D
PEAK FIRING MODE

APPLICATION FOR AIR CONSTRUCTION PERMIT SANFORD UNITS 4A THROUGH 4D AND UNITS 5A THROUGH 5D PEAK FIRING MODE

Introduction

The Florida Power & Light Company (FPL) Sanford Plant is located on approximately 1,700 acres on the St. Johns River about three (3) miles northwest of Sanford, Florida. The site is located within the City of DeBary, Volusia County, Florida. In September 1999, an Air Construction Permit and Prevention of Significant Deterioration (PSD) approval was issued for the installation of eight nominal 170-megawatt (MW) combustion turbines (CTs) with an associated heat recovery steam generators (HRSGs) for repowering two existing steam electric generators [Florida Department of Environmental Protection (FDEP) File No. 1270009-004-AC]. The CTs are designated as Units 4A through 4D associated with the repowering of the existing Unit 4 steam turbine/generator and Units 5A through 5D associated with the repowering of the existing Unit steam turbine/generator. The combustion turbines are General Electric (GE) Frame 7FA (Model PG7241) that are authorized to fire natural gas with distillate oil authorized as backup for Units 5A through 5D. Dry low-nitrogen oxides (NO_x) combustion technology is used to control emissions of NO_x to 9 parts per million by volume dry (ppmvd) corrected to 15-percent oxygen when firing natural gas. The CTs are equipped with inlet evaporative cooling systems.

This application is submitted to request authorization to allow operation in Peak Firing Mode for up to 400 hours per year.

Peak Firing Mode

Peak Firing Mode operation is a computer-controlled increase in firing temperature with greater heat input and output. It is a standard operating feature of the GE Frame 7FA CT when firing natural gas. The increase in power and heat input is about 3.8 percent at ISO conditions. The heat rate of the unit decreases by about 25 British thermal units per kilowatt-hour (Btu/Kw-hr) or about 0.3 percent. This mode of operation has been authorized for more recent projects including Martin Simple Cycle Units 8A and 8B, Fort Myers Simple Cycle Units 3A and 3B, Martin Combined Cycle Unit 8, and Manatee Combined Cycle Unit 3. Operation of up to 400 hours per year operation has been authorized.

Appendix A contains performance and emissions data and calculations for Peak Firing Mode at turbine inlet temperatures of 35 degrees Fahrenheit (°F), 59°F, 75°F, and 95°F. Appendix A also contains the GE estimated performance and emissions for Peak Firing Mode. For comparison, GE estimated performance for base load operation at 59°F is also contained in Appendix A.

Table 1 presents the hourly and annual emissions for particulate matter/particulate matter less than 10 microns (PM/PM₁₀), sulfur dioxide (SO₂), NO_x, carbon monoxide (CO), and volatile organic carbons (VOCs) for Peak Firing Mode and baseload operation. Emissions are presented for each CT and the eight CTs associated with Units 4A through 4D and Units 5A through 5D. As previously noted, Peak Firing Mode is a computer-controlled operation that increases firing temperature from baseload operation. As a result, emission increases are an incremental increase from baseload, since baseload operation must occur when peak mode begins. Peak Firing Mode only provides an incremental increase in power to meet electric demands that could not otherwise be provided by baseload operation.

Regulatory Applicability

Peak Firing Mode is a change in the method of operation of combustion turbines. A modification would occur if there is a net emissions increase pursuant to Rule 62-212.400(2)(e)1 Florida Administrative Code (F.A.C.): "A modification to a facility results in a net emissions increase when, for a pollutant regulated under the Act, the sum of all of the contemporaneous creditable increases and decreases in the actual emissions of the facility, including the increase in emissions of the modification itself and any increases and decreases in quantifiable fugitive emissions, is greater than zero." Pursuant to Rule 62-212.400(2)(e)2: "A significant net emissions increase of a pollutant regulated under the Act is a net emissions increase equal to or greater than the applicable significant emission rate listed in Table 212.400-2, Regulated Air Pollutants - Significant Emission Rates."

The EPA guidance regarding PSD applicability clearly indicates that applicability is pollutant specific. In addition, if the emissions for a project are less than the significant emission rates, then PSD review is not applicable [U.S. Environmental Protection Agency (EPA) Draft New Source Review Workshop Manual, October 1990, Table A-5]. If the significant impact levels are exceeded for that pollutant, then contemporaneous emission increases and decreases are evaluated. Based on Rule 62-212.400(2)(e)3 F.A.C., contemporaneous emissions changes are: "An increase or decrease in the actual emissions or in the quantifiable fugitive emissions of a facility is contemporaneous with a particular modification if it occurs within the period beginning five years prior to the date on which

the owner or operator of the facility submits a complete application for a permit to modify the facility and ending on the date on which the owner or operator of the modified facility projects the new or modified emissions unit(s) to begin operation. The date on which any increase in the actual emissions or in the quantifiable fugitive emissions of the facility occurs is the date on which the owner or operator of the facility begins, or projects to begin, operation of the emissions unit(s) resulting in the increase. The date on which any decrease in the actual emissions or in the quantifiable fugitive emissions of the facility occurs is the date on which the owner or operator of the facility completes, or is committed to complete through a federally enforceable permit condition, a physical change in or change in the method of operation of the facility resulting in the decrease."

Table 1 shows that, with the exception of NO_x, the emissions from the project are below the significant emission rates. This conclusion is evident whether a comparison of project emissions and significant emission rates is made using the difference between peak firing and baseload or by using the total emissions for Peak Firing Mode with all eight CTs.

The Sanford Plant has creditable emission decreases over the last several years resulting from shutting down the existing residual oil and natural gas-fired steam-generating units (i.e., steam generators for Units 4 and 5). The steam generators for Units 4 and 5 were retired in 2002 and 2001, respectively. The emission reductions from these retirements are contemporaneous with the proposed Peak Firing Mode. Peak Firing is scheduled to be completed by June 2004, which is well within the 5-year contemporaneous period for the creditable reductions from the Units 4 and 5 steam generators. Table 2 presents a netting analysis for NO_x. As shown, the large net emissions decreases in NO_x offset the small increases from peak firing.

Table 1. Emissions for Peak Firing and Base Load at a Turbine Inlet Temperature of 59°F FPL Sanford Plant, Units 4A Through 4D and 5A Through 5D

		Peak Firin	g at 59 °F	Base Load	at 59 °F		
Pollutant		per CT	8 CTs	per CT	8 CTs	Difference	SER ^b
PM/PM ₁₀	lb/hr	9	72	9	72		
	TPY	1.8	14.4	1.8	14.4	0	15/25
SO ₂	lb/hr	5.1	40.8	4.9	39.2		
	TPY ^a	1.02	8.16	0.98	7.84	0.32	40
NO _x	lb/hr	101.2	809.6	58.7	469.6		
	TPY ^a	20.24	161.92	11.74	93.92	68	40
СО	lb/hr	28.9	231.2	28.8	230.4		
	TPY ^a	5.78	46.24	5.76	46.08	0.16	100
VOC	lb/hr	2.81	22.48	2.79	22.32	•	
	TPY^a	0.562	4.496	0.558	4.464	0.032	40

^a TPY = tons/year; reflects a maximum of 400 hours per year operation.

Source: GE, 2000; Golder, 2003.

^b SER = significant emission rate from Table 212.400-2 F.A.C.

Table 2. Net NO_x Emission Changes for FPL Sanford Plant

Pollutant	Actual Emissions	Repowering Project ^a	Peak Operation	Net Emission Change	SER ^b	PSD Review Applicable?
NO _x	9,984.0	2,738.0	68.0	-7,178.0	40	No Net Emission Increase

^a FDEP File No. 0710002-004-AC; PSD-FL-270; Sanford Repowering Project.

^b SER = significant emission rate from Table 212.400-2 F.A.C.

APPENDIX A

Table A-1. Design Information and Stack Parameters for GE Frame 7FA, Dry Low NO_x Combustor, Natural Gas Peak Firing Mode

	Ambient Inlet Temperature				
Parameter	35 °F	59 °F	75 °F	95 °F	
Combustion Turbine Performance					
Net power output (MW)	190.3	179.5	169.5	156.1	
Net heat rate (Btu/kWh, LHV)	9,080	9,225	9,370	9,595	
(Btu/kWh, HHV)	10,079	10,240	10,401	10,651	
Heat Input (MMBtu/hr, LHV)	1,728	1,656	1,588	1,498	
(MMBtu/hr, HHV)	1,918	1,838	1,763	1,663	
Fuel heating value (Btu/lb, LHV)	20,835	20,835	20,835	20,835	
(Btu/lb, HHV)	23,127	23,127	23,127	23,127	
(HHV/LHV)	1.110	1.110	1.110	1.110	
CT Exhaust Flow					
Mass Flow (lb/hr)- with no margin	3,713,000	3,558,000	3,413,000	3,238,000	
- provided	3,713,000	3,558,000	3,413,000	3,238,000	
Temperature (°F)	1,109	1,139	1,152	1,172	
Moisture (% Vol.)	7.74	8.59	9.25	10.16	
Oxygen (% Vol.)	12.39	12.20	12.12	11.99	
Molecular Weight	28.48	28.38	28.31	28.21	
Fuel Usage					
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1	,000,000 Btu/MMBtu	(Fuel Heat Conte	ent, Btu/lb (LHV))		
Heat input (MMBtu/hr, LHV)	1,728	1,656	1,588	1,498	
Heat content (Btu/lb, LHV)	20,835	20,835	20,835	20,835	
Fuel usage (lb/hr)- calculated	82,933	79,477	76,228	71,889	
HRSG Stack					
CT- Stack height (ft)	125	125	125	125	
Diameter (ft)	19	19	19	19	
Turbine Flow Conditions					
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,5		i0°F)] / [Molecula			
Mass flow (lb/hr)	3,713,000	3,558,000	3,413,000	3,238,000	
Temperature (°F)	1,109	1,139	1,152	1,172	
Molecular weight	28.48	28.38	28.31	28.21	
Volume flow (acfm)- calculated	2,488,641	2,438,274	2,363,849	2,279,045	
(ft3/s)- calculated	41,477	40,638	39,397	37,984	
Stack Flow Conditions - HRSG					
Velocity (ft/sec) = Volume flow (acfm) / [((diam					
CT Temperature (°F)	220	220	220	220	
CT volume flow (acfm)	1,078,570	1,036,915	997,157	949,602	
Diameter (ft)	19	19	19	19	
Velocity (ft/sec)- calculated	63.4	61.0	58.6	55.8	

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft²; 14.7 lb/ft³

Turbine inlet relative humidity is 20% at 35 °F, 60% at 59 and 75 °F, and 50% at 95 °F.

Source: GE, 2000.

Table A-2. Maximum Emissions for Criteria Pollutants for GE Frame 7FA, Dry Low NOx Combustor, Natural Gas Peak Firing Mode

December		mbient Inlet Ten 59 °F	nperature 75 °F	95 °F
Parameter	35 °F	59 F	/3 F	95 F
Hours of Operation	400	400	400	40
Particulate (lb/hr) = Emission rate (lb/hr) from	n manufacturer			
Basis (excludes H ₂ SO ₄), lb/hr	9	9	10	1
Emission rate (lb/hr)- provided	9.0	9.0	10.0	10.
(TPY)	1.80	1.80	2.00	2.0
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x s	ulfur content(gr/100 cf)	x 1 lb/7000 gr x	(lb \$O ₂ /lb \$) /100	
Fuel density (lb/ft ³)	0.0448	0.0448	0.0448	0.044
Fuel use (cf/hr)	1,851,839	1,774,675	1,702,119	1,605,23
Sulfur content (grains/ 100 cf)	1	1	1	
lb SO₂ /lb S (64/32)	2	2	2	
Emission rate (lb/hr)	5.3	5.1	4.9	4.
(TPY)	1.06	1.01	0.97	0.9
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x 46 (mole. wgt NOx) x 60 min/				
TO (MOIC. WEET NOW) X OO TIME		17 400 17 20	(00)	. 10. pp/j
Basis, ppmvd @15% O₂	15	15	15	1
Moisture (%)	7.74	8.59	9.25	10.1
Oxygen (%)	12.39	12.2	12.12	11.9
Turbine Flow (acfm) Turbine Exhaust Temperature (°F)	2,488,641 1,109	2,438,274 1,139	2,363,849 1,152	2,279,04 1,17
Emission rate (lb/hr)	105.1	101.2	96.5	91.
(TPY)	21.0	20.2	19.3	18.:
Carbon Monoxide (lb/hr) = CO(ppm) x [1 - Mo	nisture(%)/1001 x 2116	8 lb/ft2 x Volume		
28 (mole, wgt CO) x 60 min/r	ъг / [1545 x (СТ temp.(°	'F) + 460°F) x 1	,000,000 (adj. for pp	om)]
28 (mole, wgt CO) x 60 min/r Basis, ppmvd		F) + 460°F) x 1,	,000,000 (adj. for pp 9	
Basis, ppmvd Moisture (%)	nr / [1545 x (CT temp.(° 9 7.74		9 9.25	10.1
Basis, ppmvd Moisture (%) Turbine Flow (acfm)	nr / [1545 x (CT temp.(° 9 7.74 2,488,641	9 8.59 2,438,274	9 9.25 2,363,849	10.1 2,279,0 4
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F)	nr / [1545 x (CT temp.(° 9 7.74 2,488,641 1,109	9 8.59 2,438,274 1,139	9 9.25 2,363,849 1,152	10.1 2,279,04 1,17
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr)	nr / [1545 x (CT temp.(° 9 7.74 2,488,641 1,109 30.3	9 8.59 2,438,274 1,139 28.9	9 9.25 2,363,849 1,152 27.6	9 10.10 2,279,04 1,177 26.0
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY)	nr / [1545 x (CT temp.(* 9 7.74 2,488,641 1,109 30.3 6.1	9 8.59 2,438,274 1,139 28.9 5.8	9 9.25 2,363,849 1,152 27.6 5.5	! 10.1) 2,279,04 1,17: 26.
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY)	nr / [1545 x (CT temp.(197.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac	9 9.25 2,363,849 1,152 27.6 5.5	10.1 2,279,04 1,17 26. 5.
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY) VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(% 16 (mole. wgt as methane) x 60 min	nr / [1545 x (CT temp.(* 9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp.	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x	9 9.25 2,363,849 1,152 27.6 5.5 (fm) x 1,000,000 (adj. for p	10.10 10.10 2,279,04 1,177 26. 5.3 (ppm)]
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY) VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(% 16 (mole. wgt as methane) x 60 min Basis, ppmvw Basis, ppmvd	nr / [1545 x (CT temp.(* 9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp.	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x	9 9.25 2,363,849 1,152 27.6 5.5 efm) x 1,000,000 (adj. for p	10.1(2,279,04) 1,17: 26.(5.: ppm)]
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY) VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(% 16 (mole. wgt as methane) x 60 min Basis, ppmvw Basis, ppmvd Moisture (%)	9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp.	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x 1.4 1.53 8.59	9 9.25 2,363,849 1,152 27.6 5.5 fm) x 1,000,000 (adj. for p 1.4 1.54 9.25	10.1 2,279,04 1,17 26. 5. ppm)]
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY) VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(% 16 (mole. wgt as methane) x 60 min Basis, ppmvw Basis, ppmvd Moisture (%) Turbine Flow (acfm)	9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp. 1.4 1.52 7.74 2,488,641	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x 1.4 1.53 8.59 2,438,274	9 9.25 2,363,849 1,152 27.6 5.5 efm) x 1,000,000 (adj. for p 1.4 1.54 9.25 2,363,849	10.1 2,279,04 1,17 26. 5. ppm)] 1.5 10.1 2,279,04
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY) VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(% 16 (mole. wgt as methane) x 60 min Basis, ppmvw Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F)	9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp. 1.4 1.52 7.74 2,488,641 1,109	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x 1.4 1.53 8.59 2,438,274 1,139	9 9.25 2,363,849 1,152 27.6 5.5 efm) x 1,000,000 (adj. for p 1.4 1.54 9.25 2,363,849 1,152	10.10 2,279,040 1,177 26.0 5.0 ppm)] 1.50 10.10 2,279,040 1,177
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY) VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(% 16 (mole. wgt as methane) x 60 min Basis, ppmvw Basis, ppmvd Moisture (%) Turbine Flow (acfm)	9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp. 1.4 1.52 7.74 2,488,641	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x 1.4 1.53 8.59 2,438,274	9 9.25 2,363,849 1,152 27.6 5.5 efm) x 1,000,000 (adj. for p 1.4 1.54 9.25 2,363,849	10.1 2,279,04 1,17 26. 5. 0pm)] 1. 1.5 10.1 2,279,04 1,17 2.5
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY) VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(% 16 (mole. wgt as methane) x 60 min Basis, ppmvw Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY)	9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp. 1.4 1.52 7.74 2,488,641 1,109 2.92	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x 1.4 1.53 8.59 2,438,274 1,139 2.81	9 9.25 2,363,849 1,152 27.6 5.5 (fm) x 1,000,000 (adj. for p 1.4 1.54 9.25 2,363,849 1,152 2.70	10.1 2,279,04 1,17 26. 5. 0pm)] 1. 1.5 10.1 2,279,04 1,17 2.5
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr)	9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp.) 1.4 1.52 7.74 2,488,641 1,109 2.92 0.58	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x 1.4 1.53 8.59 2,438,274 1,139 2.81 0.56	9 9.25 2,363,849 1,152 27.6 5.5 efm) x 1,000,000 (adj. for p 1.4 1.54 9.25 2,363,849 1,152 2.70 0.54	10.10 2,279,040 1,177 26.0 5.0 (ppm)] 1.5 10.10 2,279,040 1,177 2.5 0.5
Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Ernission rate (lb/hr) (TPY) VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(% 16 (mole. wgt as methane) x 60 min Basis, ppmvw Basis, ppmvw Basis, ppmvd Moisture (%) Turbine Flow (acfm) Turbine Flow (acfm) Turbine Exhaust Temperature (°F) Emission rate (lb/hr) (TPY) Lead (lb/hr)= NA	9 7.74 2,488,641 1,109 30.3 6.1)/100] x 2116.8 lb/ft2 x /hr / [1545 x (CT temp. 1.4 1.52 7.74 2,488,641 1,109 2.92	9 8.59 2,438,274 1,139 28.9 5.8 Volume flow (ac (°F) + 460°F) x 1.4 1.53 8.59 2,438,274 1,139 2.81	9 9.25 2,363,849 1,152 27.6 5.5 (fm) x 1,000,000 (adj. for p 1.4 1.54 9.25 2,363,849 1,152 2.70	10.10 2,279,04 1,177 26. 5.2

Note: ppmvd= parts per million, volume dry; O_2 = oxygen.

Source: GE, 2000; Golder, 2003.

Load Condition		PEAK
Ambient Temp.	Deg F.	35.
Output	kW	190,300.
Heat Rate (LHV)	Btu/kWh	9,080.
Heat Cons. (LHV) X 10 ⁶	Btu/h	1,727.9
Auxiliary Power	kW	560
Output Net	kW	189,740.
Heat Rate (LHV) Net	Btu/kWh	9,110.
Exhaust Flow X 10 ³	lb/h	3713.
Exhaust Temp.	Deg F.	1109.
Exhaust Heat (LHV) X 10 ⁶	Btu/h	1015.9

EMISSIONS

NOx	ppmvd @ 15% O2	15.
NOx AS NO2	lb/h	105.
CO	ppmvd	9.
CO	lb/h	30.
UHC	ppmvw	7.
UHC	lb/h	15.
VOC	ppmvw	1.4
VOC	lb/h	3.
Particulates	lb/h	9.0

EXHAUST ANALYSIS % VOL.

Argon	0.89
Nitrogen	75.00
Oxygen	12.39
Carbon Dioxide	3.98
Water	7.74

SITE CONDITIONS

Elevation	ft.	45.0
Site Pressure	psia	14.68
Inlet Loss	in Water	3.0
Exhaust Loss	in Water	5.5
Relative Humidity	%	20
Fuel Type		Cust Gas
Fuel LHV	Btu/lb	20835 @ 290 °F
Application		7FH2 Hydrogen-Cooled Generator
Combustion System		9/42 DLN Combustor

Load Condition		PEAK
Ambient Temp.	Deg F.	59.
Output	kW	179,500.
Heat Rate (LHV)	Btu/kWh	9,225.
Heat Cons. (LHV) X 106	Btu/h	1,655.9
Auxiliary Power	kW	560
Output Net	kW	178,940.
Heat Rate (LHV) Net	Btu/kWh	9,250.
Exhaust Flow X 103	lb/h	3541.
Exhaust Temp.	Deg F.	1139.
Exhaust Heat (LHV) X 106	Btu/h	983.3

EMISSIONS

NOx	ppmvd @ 15% O2	15.
NOx AS NO2	lb/h	101.
CO	ppmvd	9.
CO	lb/h	29.
UHC	ppmvw	7.
UHC	lb/h	14.
VOC	ppmvw	1.4
VOC	lb/h	2.8
Particulates	lb/h	9.0

EXHAUST ANALYSIS % VOL.

Argon	0.89
Nitrogen	74.34
Oxygen	12.20
Carbon Dioxide	3.98
Water	8.59

SITE CONDITIONS

Elevation	ft.	45.0
Site Pressure	psia	14.68
Inlet Loss	in Water	3.0
Exhaust Loss	in Water	5.5
Relative Humidity	%	60
Fuel Type		Cust Gas
Fuel LHV	Btu/lb	20835 @ 290 °F
Application		7FH2 Hydrogen-Cooled Generator
Combustion System		9/42 DLN Combustor

Load Condition		PEAK
Ambient Temp.	Deg F.	75.
Output	kW	169,500.
Heat Rate (LHV)	Btu/kWh	9,370.
Heat Cons. (LHV) X 106	Btu/h	1,588.2
Auxiliary Power	kW	560
Output Net	kW	168,940.
Heat Rate (LHV) Net	Btu/kWh	9,400.
Exhaust Flow X 103	lb/h	3413.
Exhaust Temp.	Deg F.	1152.
Exhaust Heat (LHV) X 106	Btu/h	952.2

EMISSIONS

NOx	ppmvd @ 15% O2	15.
NOx AS NO2	lb/h	9 7.
CO	ppmvd	9.
CO	lb/h	28.
UHC	ppmvw	7.
UHC	lb/h	14.
VOC	ppmvw	1.4
VOC	lb/h	2.8
Particulates	lb/h	9.0

EXHAUST ANALYSIS % VOL.

Argon	0.89
Nitrogen	73.80
Oxygen	12.12
Carbon Dioxide	3.95
Water	9.25

SITE CONDITIONS

Elevation	ft.	45.0
Site Pressure	psia	14.68
Inlet Loss	in Water	3.0
Exhaust Loss	in Water	5.5
Relative Humidity	%	60
Fuel Type		Cust Gas
Fuel LHV	Btu/lb	20835 @ 290 °F
Application		7FH2 Hydrogen-Cooled Generator
Combustion System		9/42 DLN Combustor

Load Condition		PEAK
Ambient Temp.	Deg F.	95.
Output	kW	156,100.
Heat Rate (LHV)	Btu/kWh	9,595.
Heat Cons. (LHV) X 10 ⁶	Btu/h	1,497.8
Auxiliary Power	kW	560
Output Net	kW	155,540.
Heat Rate (LHV) Net	Btu/kWh	9,630.
Exhaust Flow X 10 ³	lb/h	3238.
Exhaust Temp.	Deg F.	1172.
Exhaust Heat (LHV) X 10 ⁶	Btu/h	910.7

EMISSIONS

NOx	ppmvd @ 15% O2	15.
NOx AS NO2	ľb/h	91.
CO	ppmvd	9.
CO	lb/h	26.
UHC	ppmvw	7.
UHC	lb/h	13.
VOC	ppmvw	1.4
VOC	lb/h	2.6
Particulates	Ib/h	9.0

EXHAUST ANALYSIS % VOL.

Argon	0.88
Nitrogen	73.06
Oxygen	11.99
Carbon Dioxide	3.91
Water	10.16

SITE CONDITIONS

SPEEDTRONIC control system.

Elevation	ft.	45.0
Site Pressure	psia	14.68
Inlet Loss	in Water	3.0
Exhaust Loss	in Water	5.5
Relative Humidity	%	50
Fuel Type		Cust Gas
Fuel LHV	Btu/lb	20835 @ 290 °F
Application		7FH2 Hydrogen-C

Application 7FH2 Hydrogen-Cooled Generator Combustion System 9/42 DLN Combustor

FPL PEAK FIRING - ESTIMATED PERFORMANCE WITH FOGGER ON PG7241(FA)

7 10 to		D.D V.	22.55	DD
Load Condition	ъг	PEAK	PEAK	PEAK
Ambient Temp.	Deg F.	59.	75.	95.
Ambient Relative Humid.	%	60.	60.	50.
Fogger Status	0.4	On	On	On
Fogger Effectiveness	%	95	95	95
Fuel Type	D. (II	Cust Gas	Cust Gas	Cust Gas
Fuel LHV	Btu/lb	20,835	20,835	20,835
Fuel Temperature	Deg F	290	290	290
Output	kW	183,000.	175,200.	166,100.
Heat Rate (LHV)	Btu/kWh	9,185.	9,300.	9,450.
Heat Cons. (LHV) X 10 ⁶	Btu/h	1,680.9	1,629.4	1,569.6
Auxiliary Power	kW	560	560	560
Output Net	kW	182,440.	174,640.	165,540.
Heat Rate (LHV) Net	Btu/kWh	9,210.	9,330.	9,480.
Exhaust Flow X 10 ³	łb/h	3588.	3478.	3356.
Exhaust Temp.	Deg F.	1130.	1145.	1158.
Exhaust Heat (LHV) X 10 ⁶	Btu/h	995.4	972.4	945.9
EMISSIONS				
EMISSIONS				
NOx	ppmvd @ 15% O2	15.	15.	15.
NOx AS NO2	lb/h	103.	99.	96.
CO	ppmvd	9.	9.	9.
CO	lb/h	2 9.	28.	27.
UHC	ppmvw	7.	7.	7.
UHC	lb/h	14.	14.	13.
VOC	ppmvw	1.4	1.4	1.4
VOC	lb/h	2.8	2.8	2.6
Particulates	lb/h	9.0	9.0	9.0
EXHAUST ANALYSIS	% VOL.			
EMIROSI AIVADIOIS	70 VOL.			
Argon		0.89	0.87	0.87
Nitrogen		74.14	73.54	72.64
Oxygen		12.15	12.01	11.81
Carbon Dioxide		3.98	3.97	3.95
Water		8.84	9.61	10.73
SITE CONDITIONS				
STID COMBINE				
Elevation	ft.	45.0		
Site Pressure	psia	14.68		
Inlet Loss	in Water	3.0		
Exhaust Loss	in Water	5.5		
Application		7FH2 Hyd	lrogen-Coo	led Generator
Combustion System			Combusto	

FPL GAS FUEL LOAD AT 59°F AND 60% REL.HUMIDITY – ESTIMATED PERFORMANCE PG7241(FA)

Load Condition		BASE
Ambient Temp.	Deg F.	59.
Fuel Type		Cust Gas
Fuel LHV	Btu/lb	20,835
Fuel Temperature	Deg F	290
Output	kW	173,000.
Heat Rate (LHV)	Btu/kWh	9,250.
Heat Cons. (LHV) X 106	Btu/h	1,600.3
Auxiliary Power	kW	560
Output Net	kW	172,440.
Heat Rate (LHV) Net	Btu/kWh	9,280.
Exhaust Flow X 103	lb/h	3539.
Exhaust Temp.	Deg F.	1116.
Exhaust Heat (LHV) X 106	Btu/h	951.8

EMISSIONS

NOx	ppmvd @ 15% O2	9.
NOx AS NO2	lb/h	59.
CO	ppmvd	9.
CO	lb/h	29.
UHC	ppmvw	7.
UHC	lb/h	14.
VOC	ppmvw	1.4
VOC	lb/h	2.8
Particulates	lb/h	9.0

EXHAUST ANALYSIS % VOL.

Argon	0.88
Nitrogen	74.42
Oxygen	12.44
Carbon Dioxide	3.87
Water	8.39

SITE CONDITIONS

Elevation	ft.	45.0
Site Pressure	psia	14.68
Inlet Loss	in Water	3.0
Exhaust Loss	in Water	5.5
Relative Humidity	%	60

Application 7FH2 Hydrogen-Cooled Generator

Combustion System 9/42 DLN Combustor