Environmental Radiation Studies
Environmental Impact Studies
Radiation Dose Modeling
Risk Assessment

Perigee
Technical Services, Inc.

Atmospheric Dispersion Modeling
Air Pollution Permitting
Landscape Design
Graphic Arts

June 5, 2000

RECEIVED
JUN 06 2000
BUREAU OF AIR REGULATION

Mr. A. A. Linero, P. E.
Department of Environmental Protection
Division of Air Resources Management
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Permit Modification Request
Kissimmee Utility Authority
Cane Island Power Park - Unit 2 - Permit Number: 0970043-002-AV

Dear Mr. Linero: 0970043-008-AC

I have enclosed four (4) copies of the relevant pages of the Application for Air Permit - Title V Source to modify the above referenced permit to install an inlet fogging system to Unit 2. Please call me at (407) 333-7374 if you have any questions regarding this submittal.

Very truly yours,

PERIGEE TECHNICAL SERVICES, INC.

Jerome J. Guidry, P.E., Q.E.P.
President

JJG:emc

cc: A. K. Sharma
Jeff Ling
Larry Mattern

Enclosures

via Federal Express - Airbill number 8132 1390 6504

CC: D. Kaerner, BAR
CD
EPA
NPS

\foggermod.ltr/197.0

3214 Deer Chase Run, Longwood, Florida 32779-3173
Telephone (407) 333-7374 FAX (407) 333-9396

Department of
Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

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

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **Kissimmee Utility Authority**	
2. Site Name: **Cane Island Power Park**	
3. Facility Identification Number: **0970043**	[ ] Unknown
4. Facility Location: Street Address or Other Locator: **6075 Old Tampa Highway** City: **Intercession City** County: **Osceola** Zip Code: **34758**	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No

Application Contact

1. Name and Title of Application Contact: **A. K. Sharma, Director of Power Supply**	
2. Application Contact Mailing Address: Organization/Firm: **Kissimmee Utility Authority** Street Address: **P. O. Box 423219** City: **Kissimmee** State: **Florida** Zip Code: **34742-3219**	
3. Application Contact Telephone Numbers: Telephone: **(407) 933 - 7777** Fax: **(407) 847 - 0787**	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	June 6, 2000
2. Permit Number:	0970043-008-AC
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

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:_____

[ ] 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:_____

[X] 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: 0970043-002-AV .

[ ] 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:
   A. K. Sharma, Director of Power Supply

2. Owner/Authorized Representative or Responsible Official Mailing Address:
   Organization/Firm: **Kissimmee Utility Authority**
   Street Address: **P. O. Box 423219**
   City: **Kissimmee** State: **Florida** Zip Code: **34742-3219**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: **(407) 933 - 7777** Fax: **(407) 847 - 0787**

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 [ ], 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.*

   A K Sharma — Signature

   6/5/2000 — Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **Jerome J. Guidry, P.E., Q.E.P.**
   Registration Number: **32589**

2. Professional Engineer Mailing Address:
   Organization/Firm: **Perigee Technical Services, Inc.**
   Street Address: **3214 Deer Chase Run**
   City: **Longwood** State: **Florida** Zip Code: **32779-3173**

3. Professional Engineer Telephone Numbers:
   Telephone: **(407) 333 - 7374** Fax: **(407) 333 - 9396**

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.

Signature

6-5-2000
Date

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
002	120 MW Combined Cycle Combustion Turbine	AC1D	N/A

Application Processing Fee

Check one: [ ] Attached - Amount: $_____ [X] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations:

   Installation of an inlet fogging system. See Attachment A for detailed information.

2. Projected or Actual Date of Commencement of Construction: **July 2000**

3. Projected Date of Completion of Construction: **July 2000**

Application Comment

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)

[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.

2. 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.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
120 MW Combined Cycle Combustion Turbine

4. Emissions Unit Identification Number:
ID: **002**
[ ] No ID
[ ] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
A	N/A	49	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		mmBtu/hr
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		
Continuous operation of the fogger is requested.		

Attachment A

This modification request is to install an inlet water spray fogger to the Unit 2 combined cycle combustion turbine at the Kissimmee Utility Authority Cane Island Power Park in Intercession City. The installation of this unit will reduce the compressor inlet air temperature, allowing more fuel to be burned in the turbine. The reduction in inlet air temperature is accomplished by spraying a water mist into the inlet air stream. The evaporation of the fine water droplets results in adiabatic cooling of the air stream.

The installation of the fogger in and of itself does not result in an increase in air pollution emissions; the increase in emissions is due to the increase in the amount of fuel combusted. This modification request does not involve an increase in maximum permitted hourly emissions since the emission characteristics of the turbine with the fogger in operation will be similar to the emissions which would normally occur at the inlet temperatures which occur naturally without the fogger in operation. The fogger installation will involve an increase in actual emissions since the unit will operate more hours at a lower inlet air temperature, thereby increasing the amount of fuel burned during hot days.

The amount of this increase in fuel combustion can be determined using the attached performance graph provided by General Electric for the PG7111 gas turbine. This graph relates compressor inlet temperature to heat consumption. Using the attached graph, a compressor inlet air temperature of 95 degrees would translate to a heat consumption rate at 90 percent of design capacity. Assuming a maximum cooling effect of 25 degrees Fahrenheit as provided by the manufacturer, the fogger would reduce the compressor inlet temperature to 70 degrees. At this temperature, the percent heat consumption would be 97 percent, an increase in heat consumption of 7 percent.

The combustion turbine is permitted at a maximum fuel input rate of 928 mmBtu/hr when burning fuel oil and 869 mmBtu/hr when burning natural gas. At 95 degrees Fahrenheit, the actual fuel consumption would be less than this amount without the fogger installed. The fogger is estimated to increase actual fuel consumption by 7 percent of this maximum value, or about 65 MMBtu/hr.

Over the last five years, unit 2 has operated an average of 6018 hours per year; however, operating hours over the last two years averaged 7784 hours, which is more representative of the expected operation of this unit. The following tables list estimated emissions for Unit 2 burning fuel oil for the maximum allowable 1000 hours per year and burning natural gas for the remainind 6784 hours. Based on this analysis, continuous operation of the fogger will not exceed the PSD thresholds. Therefore, Kissimmee Utility Authority requests that no hourly limitation be imposed on the operation of the fogger.

Estimated Emissions from Fuel Oil Combustion

			Increase Only	Past Actuals	Future Potentials	Net Increase
		mmBtu/hr >>>>	65	928	993	
		hr/yr >>>>	1000	1000	1000	
Pollutant	lb/hr	lb/mmBtu	Ton/yr	Ton/yr	Ton/yr	Ton/yr
CO	65	0.0700	2.28	32.50	34.78	2.28
NO_x	170	0.1832	5.95	85.00	90.95	5.95
PM_{10}	15	0.0162	0.53	7.50	8.03	0.53
SO_2	52	0.0560	1.82	26.00	27.82	1.82
VOC	5	0.0054	0.18	2.50	2.68	0.18

Estimated Emissions from Natural Gas Combustion

			Increase Only	Past Actuals	Future Potentials	Net Increase
		mmBtu/hr >>>>	65	869	934	
		hr/yr >>>>	6784	6784	6784	
Pollutant	lb/hr	lb/mmBtu	Ton/yr	Ton/yr	Ton/yr	Ton/yr
CO	54	0.0621	13.70	183.17	196.87	13.70
NO_x	53	0.0610	13.45	179.78	193.22	13.45
PM_{10}	8.7	0.0100	2.21	29.51	31.72	2.21
SO_2	0	0.0000	0.00	0.00	0.00	0.00
VOC	2	0.0023	0.51	6.78	7.29	0.51

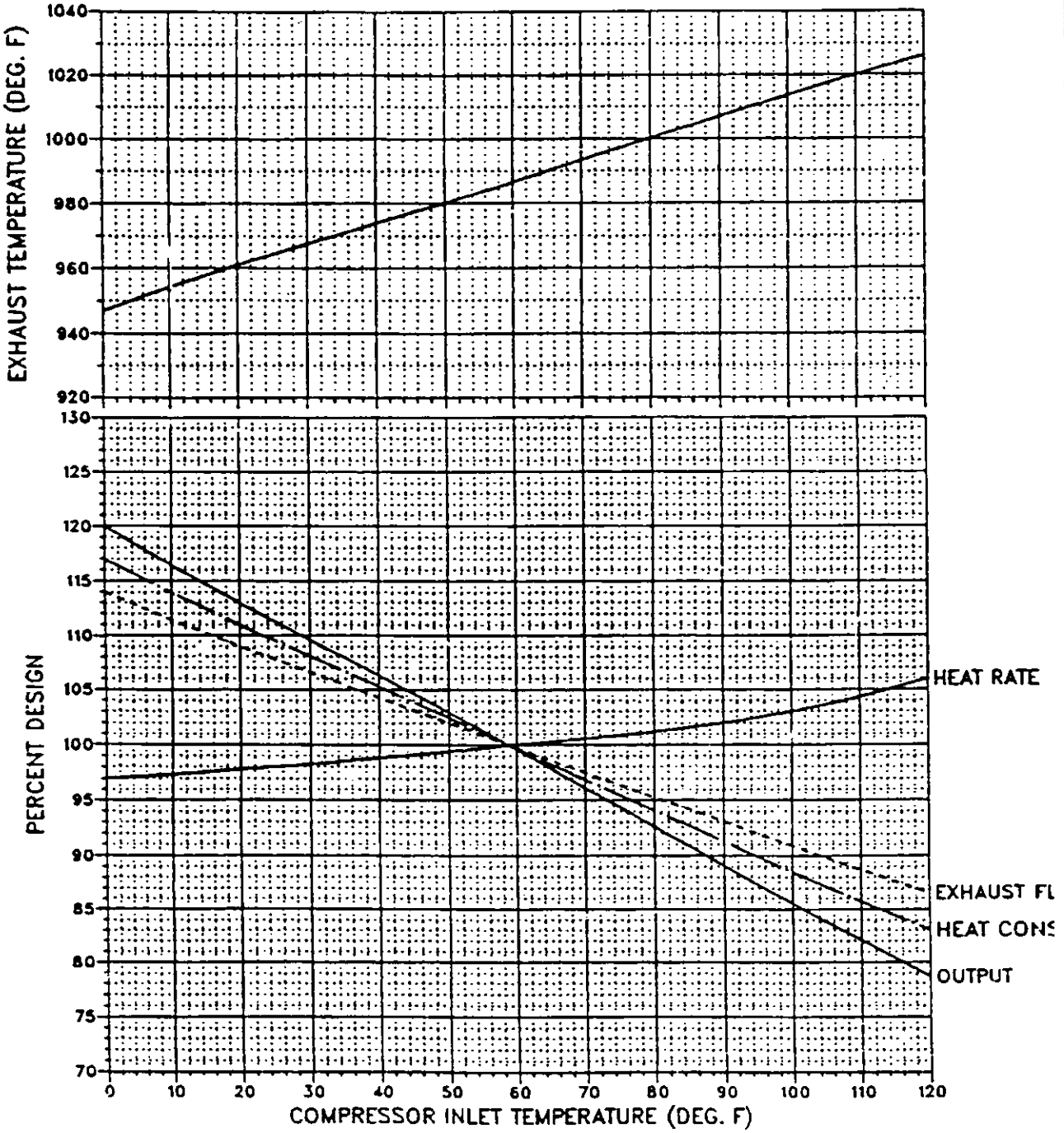
Estimated Total Emissions

Pollutant	Past Actuals	Future Potentials	Net Increase	PSD Thresholds
	Ton/yr	Ton/yr	Ton/yr	Ton/yr
CO	215.67	231.65	15.98	100
NO_x	264.78	284.18	19.40	40
PM_{10}	37.01	39.75	2.74	15
SO_2	26.00	27.82	1.82	40
VOC	9.28	9.97	0.69	40

GENERAL ELECTRIC MODEL PG7111(EA) GAS TURBINE

EFFECT OF COMPRESSOR INLET TEMPERATURE ON OUTPUT, HEAT RATE, HEAT CONSUMPTION, EXHAUST FLOW AND EXHAUST TEMPERATURE AT 100% SPEED

FUEL: NATURAL GAS AND DISTILLATE OIL
MODE: BASE LOAD



DATE 07/06/88

C.N. MULLER

CNM

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