

Farzie Shelton, chE; REM

Manager of Environmental Affairs - Energy Supply

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NOV 15 2000

BUREAU OF AIR REGULATION

November 14, 2000

Mr. C.H. Fancy, P.E.
Chief Bureau of Air Regulation
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road, Mail Station #5505
Tallahassee, Florida 32399-2400

Re: **Larsen Memorial Power Plant Facility Identification Number 1050003-004-AV**
Request for Administrative change to Title V Permit - Unit No. 8 - PSD-FL-116C

Dear Mr. Fancy:

Project No - 1050003-009-AV

The City of Lakeland Department of Electric Utilities (Lakeland) requests an administrative change to the above Title V Unit at Larsen Power Plant to include operation of the inlet fogging system. Therefore, we are enclosing application/supporting document signed and sealed by Mr. Ken Kosky P.E. and Mr. Ron Tomlin (Responsible Official) certification for your review

As always we appreciate your cooperation in this matter. If you should have any questions, please do not hesitate to contact me.

Sincerely,

Farzie Shelton

Cc: Ken Kosky, Golder

City of Lakeland • Department of Electric Utilities

RECEIVED

NOV 15 2000

BUREAU OF AIR REGULATION

APPLICATION AND AIR PERMIT
FOR
INSTALLATION OF DIRECT WATER
SPRAY FOGGING SYSTEM
LARSEN UNIT 8

Prepared For:

Lakeland Electric
501 East Lemon Street
Lakeland, Florida 33801-5079

Prepared By:

Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653

November 2000
0037503Y/F1/WP

DISTRIBUTION:

2 Copies - Lakeland Electric
1 Copy - Golder Associates Inc.

**AIR CONSTRUCTION PERMIT
FOR UNIT 8
FOGGING SYSTEM**

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF PERMIT

In the Matter of an
Application for Permit Modification by:

Mr. Ronald W. Tomlin
Assistant Managing Director
City of Lakeland, Electric Utilities
501 E. Lemon Street
Lakeland, Florida 33801-5079

DEP File No. 1050003-007-AC (PSD-FL-166C)
Combined Cycle Combustion Turbine 008
Inlet Foggers Installation
Larsen Power Plant
Polk County

Enclosed is the Final Permit Number 1050003-007-AC (PSD-FL-166C) for an air construction permit to install an evaporative cooling system on the existing 120MW combined cycle General Electric PG7111EA combustion turbine-electrical generator designated as Larsen Unit # 8. This unit is located at the City of Lakeland Larsen Power Plant in Polk County. This permit is issued pursuant to Chapter 403, Florida Statutes.

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

Executed in Tallahassee, Florida.



C. H. Fancy, P.E., Chief
Bureau of Air Regulation

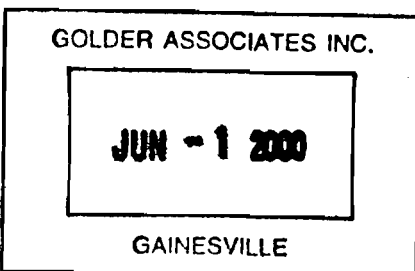
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 5-30-00 to the person(s) listed:

Ronald W. Tomlin, City of Lakeland*
Farzie Shelton, City of Lakeland
Ken Kosky P.E., Golder Associates
Bill Thomas, DEP SW
Gregg Worley, EPA

Clerk Stamp

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




(Clerk)

5-30-00
(Date)

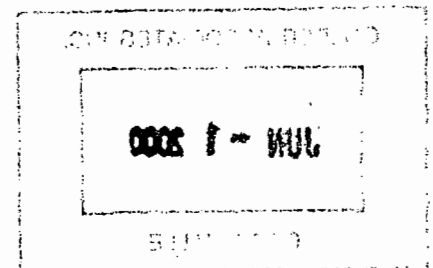
FINAL DETERMINATION

City of Lakeland Department of Electric Utilities
Charles Larsen Power Plant, Polk County
Inlet Foggers Installation
DEP File No: 1050003-007-AC

An Intent to Issue an air construction permit, authorizing the installation of an evaporative cooling system on the existing 120 MW combined cycle General Electric PG7111EA Combustion turbine-electrical generator designated as Larsen Unit # 8 at the Charles Larsen Power Plant was distributed on April 13, 2000. This facility is located at 2002 Hwy 92 East, Lakeland, Polk County, Florida.

The Public Notice of Intent to Issue Air Construction Permit was published in The Ledger on April 19, 2000. No comments were received as a result of the Public Notice period.

The final action of the Department will be to issue the permit as noted during the Public Notice period.





Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

PERMITTEE:

City of Lakeland, Electric Utilities
501 E. Lemon Street
Lakeland, Florida 33801-5079

Authorized Representative:

Ronald W. Tomlin
Assistant Managing Director

DEP File No.	PSD-FL-166 C
Permit No.	1050003-007-AC
Project	Evaporative Cooling System
SIC No.	4911
Expires:	November 30, 2000

PROJECT AND LOCATION:

Installation of an evaporative cooling system on the existing 120 MW combined cycle General Electric PG7111EA combustion turbine-electrical generator designated as Larsen Unit 8. This permit is a re-issuance of the original air construction permit authorizing the construction of Unit 8 and incorporating subsequent modifications including the present project.

The unit is located at the City of Lakeland Larsen Power Plant, 2002 Hwy 92 East, Lakeland, Polk County.

The UTM coordinates are: Zone 17; 408.9 km E and 3102.5 km N.

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

ATTACHED APPENDICES MADE A PART OF THIS PERMIT:

Appendix GC	Construction Permit General Conditions
Appendix SC	Specific Conditions including Permits PSD-FL-166 (AC53-190437), PSD-FL-166A (1050003-001-AC) and PSD-FL-166B (1050003-005-AC)

Howard L. Rhodes, Director
Division of Air Resources
Management

"More Protection, Less Process"

Printed on recycled paper.

APPENDIX SC
SPECIFIC CONDITIONS

1. This permit, PSD-FL-166C (DEP File 1050003-007-AC), supersedes PSD permit PSD-FL-166B (DEP File 1050003-005-AC) issued on April 17, 1998.
2. The provisions of air construction permit PSD-FL-166 (AC53-190437) issued on 7/26/91 to construct Unit 8 and subsequent revisions PSD-FL-166A (1050003-001-AC) issued on 12/22/95 and PSD-FL-166B (1050003-005-AC) issued on 4/17/98 are attached and incorporated into this air construction permit in addition to the change that follows in Specific Condition 3 below.
3. An evaporative cooling system may be installed at the compressor inlet of Larsen Unit 8. The system may be operated at any time that Unit 8 is in operation.

APPENDIX GC
GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

- G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
- G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
- G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
- G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
- G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
- G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
- a) Have access to and copy and records that must be kept under the conditions of the permit;
 - b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
 - c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.
- Reasonable time may depend on the nature of the concern being investigated.
- G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
- a) A description of and cause of non-compliance; and
 - b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

APPENDIX GC
GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

- G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This re-issued permit incorporates previous determinations for:
- a) Best Available Control Technology (X)
 - b) Prevention of Significant Deterioration (X); and
 - c) New Source Performance Standards (X).
- G.14 The permittee shall comply with the following:
- a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
 - b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
 - c) Records of monitoring information shall include:
 - 1. The date, exact place, and time of sampling or measurements;
 - 2. The person responsible for performing the sampling or measurements;
 - 3. The dates analyses were performed;
 - 4. The person responsible for performing the analyses;
 - 5. The analytical techniques or methods used; and
 - 6. The results of such analyses.
- G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.



Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

PERMITTEE:

Lakeland Electric and Water
501 East Lemon Street
Lakeland, Florida 33801-5050

Permit No.	AC53-190437
PSD No.	PSD-FL-166B
File No.	1050003-005-AC
Expires	December 31, 1998
Facility	Charles Larsen Memorial Plant
Unit No.	Combined Cycle Combustion Turbine, Unit 8

Authorized Representative:

Ms. Farzie Shelton
Environmental Coordinator

LOCATED AT:

Charles Larsen Memorial Plant
Standard Industrial Classification Code (SIC): 4911
Polk County, Florida

Directions: Located on the south side of Lake Parker on US Highway 92 in Lakeland, Polk County

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297. The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

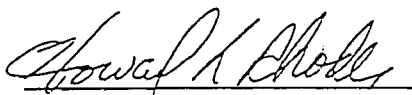
Attached Appendices and Tables made a part of this permit:

Original construction permit: AC53-190437 / PSD-FL-166 issued 7/25/91

Modification: Dated 12/18/95, added a custom fuel monitoring schedule, clarified ISO correction, and adjusted SO₂ and H₂SO₄ limits

Table 1: Revised Emission limits

Curves: Oil Input vs Compressor Inlet Temperature


Howard L. Rhodes, Director
Division of Air Resources
Management

AIR CONSTRUCTION PERMIT AC53-190437 / PSD-FL-166B
SPECIFIC CONDITIONS

SPECIFIC CONDITIONS:

I. This permit supersedes permit AC53-190437 / PSD-FL-166 dated July 25, 1991, as changed by amendment dated December 18, 1995.

II. The provisions of permit AC53-190437 / PSD-FL-166 are incorporated into this permit except for the following changes:

Specific Condition #1:

Table 1 referenced in this condition shall be replaced with the attached Table 1 (revised December 18, 1995 and April 13, 1998).

Specific Condition #2:

This condition is replaced with the following:

2. Emissions of mercury shall be limited by firing only natural gas or No. 2 fuel oil.

Specific Condition #6:

From:

6. The permitted materials and utilization rates for the combined cycle gas turbine shall not exceed the values as follows:

- Maximum No. 2 fuel oil consumption shall not exceed either of the following limitations: 9190 gal/hr; 23,914,800 gals/yr.
- Maximum annual firing using No. 2 fuel oil shall not exceed 1/3 of the annual capacity factor.
- Maximum sulfur (S) content in the No. 2 fuel oil shall not exceed 0.20 percent by weight.
- Maximum heat input shall not exceed 1055 MMBtu/hr (gas) or 1040 MMBtu/hr No. 2 fuel (oil).

TO:

6. The permitted materials and utilization rates for the combined cycle gas turbine shall not exceed the values as follows:

- Maximum No. 2 fuel oil consumption shall not exceed either of the following limitations: the values in the attached Oil Input VS Compressor Inlet Temperature curve and 23,914,800 gals/yr.
- Maximum annual firing using No. 2 fuel oil shall not exceed 1/3 of the annual capacity factor.
- Maximum sulfur (S) content in the No. 2 fuel oil shall not exceed 0.20 percent by weight.
- Maximum heat input shall not exceed 1055 MMBtu/hr (gas) or 1040 MMBtu/hr No. 2 fuel (oil).

AIR CONSTRUCTION PERMIT AC53-190437 / PSD-FL-166B
SPECIFIC CONDITIONS

Specific Condition #7:

From:

7. Any change in the method of operation, equipment or operating hours shall be submitted to the DER's Bureau of Air Regulation and Southwest District Offices.

TO:

7. The owner or operator shall submit to the Permitting Authority(s), for review any changes in, or modifications to: the method of operation; process or pollution control equipment; increased equipment capacities; or any change which would result in an increase in potential or actual emissions. Depending on the size and scope of the modification, it may be necessary to submit an application for, and obtain, an air construction permit prior to making the desired change. *Routine maintenance of equipment will not constitute a modification of this permit.* [Rule 62-4.030, 62-210.300 and 62-4.070(3), F.A.C.]

Specific Condition #19:

FROM:

This source shall comply with all applicable provisions of Chapter 403, Florida Statutes and Chapters 17-2 and 17-4, Florida Administrative Code.

TO:

This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-210, 62-212, 62-213, 62-214, 62-296, and 62-297, Florida Administrative Code. During each federal fiscal year (October 1 - September 30), unless otherwise specified by rule, order, or permit, the owner or operator of each emissions unit shall have a formal compliance test conducted for:

- a. Visible emissions, if there is an applicable standard;
- b. Each of the following pollutants, if there is an applicable standard, and if the emissions unit emits or has the potential to emit: 5 tons per year or more of lead or lead compounds measured as elemental lead; 30 tons per year or more of acrylonitrile; or 100 tons per year or more of any other regulated air pollutant; and
- c. Each NESHAP pollutant, if there is an applicable emission standard.

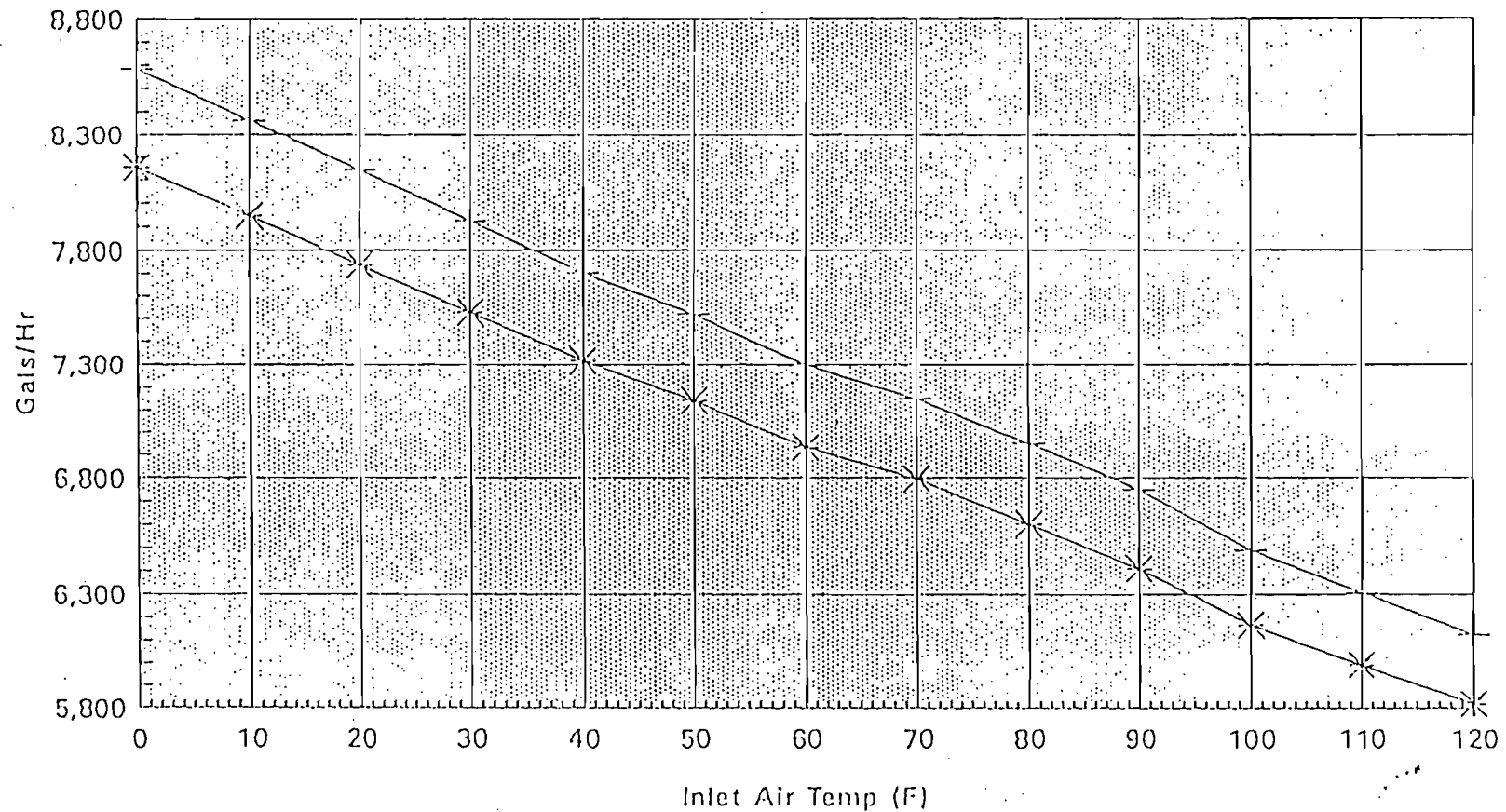
TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine
(Revised 12/18/95 and 4/13/98)

Pollutant	Gas Firing	<u>Standards</u>	<u>Gas Turbine and HRSG ^(a)</u>		Basis
			Gas	Tons Per Year Oil	
NO _x	25 PPM at 15% oxygen on a dry basis	42 ppmv at 15 percent oxygen on a dry basis	425	244	BACT
SO ₂	Natural gas a fuel	0.20 percent S by weight	8.6	307	BACT
PM/PM ₁₀	0.006 lb/MMBtu	0.025 lb/MMBtu	22	22	BACT
VOC	-	-	9	6.7	BACT
CO	25 ppmv at 15 percent oxygen on a dry basis	25 ppmv at 15 percent oxygen on a dry basis			BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil			BACT

(a) Emissions rates based on 100 percent capacity factor for natural gas and 1/3 capacity factor for oil firing.

Unit 8

Oil Input vs Compressor Inlet Temperature



+ Design Input #2 Oil X 95% Design Input #2 Oil

Peak Mode

Using LHV of #2 Oil

2/25/97

BEST AVAILABLE COPY
Department of

Environmental Protection

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

Virginia B. Wetherell
Secretary

Lawton Chiles
Governor

December 18, 1995

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Ms. Farzie Shelton
Environmental Coordinator
Department of Electric and Water Utilities
501 East Lemon Street
Lakeland, Florida 33801-5050

Dear Ms. Shelton:

Re: Charles Larson Power Plant Unit 8--Combustion Turbine
PSD-FL-166/AC53-190437
Request to amend permit

The Department is in receipt of your June 27, 1995 request to amend the above referenced permit. You requested a customized fuel monitoring schedule for the sulfur and nitrogen content of the natural gas fired in the turbine. You also requested that the sulfur dioxide and sulfuric acid mist permit limits be changed. In addition, you requested clarification of the nitrogen oxides compliance testing requirements, i.e. the ISO correction, specified in the above referenced permit.

The Department acknowledges your oversight in neglecting the sulfur from mercaptans (which are added to the natural gas for safety reasons) in your estimate of annual SO₂ emissions. The Department also agrees that a typographical error was apparently made in the annual emission limits for sulfuric acid mist, both for natural gas and oil.

The Department hereby incorporates each of the following amendments to the above referenced permit:

Custom Fuel Monitoring Schedule

The proposed custom fuel monitoring schedule (attached) has been approved by EPA and is included as an attachment to the above referenced permit. This fuel monitoring schedule supersedes AC53-190437 / PSD-FL-166 condition 23 which

Ms. Farzie Shelton
December 18, 1995
page 2

requires annual reports for nitrogen content of the fuel being fired, as this condition applies to the firing of natural gas.

Annual Sulfur Dioxide And Sulfuric Acid Mist Limits

The annual sulfur dioxide and sulfuric acid mist limits is changed as follows:

TABLE 1

FROM:

SO₂..... 2.6 (tpy on gas)

Sulfuric Acid Mist..... - (tpy on gas).... 3.3×10^{-3} (tpy on oil)

TO:

SO₂..... 8.6 (tpy on gas)

Sulfuric Acid Mist..... 0.8 (tpy on gas)... 9.13 (tpy on oil)

Correction of NO_x Emissions to ISO Conditions

Based on the recent guidance memorandum on combustion turbines the Department hereby removes the requirement to correct the test data to ISO conditions for comparison with the NO_x emission limits established pursuant to the BACT determination for gas and oil firing. To institute this change, Permit PSD-FL-166/AC53-190437 Specific Condition 13 is amended as follows:

During the initial performance tests, to determine compliance with the proposed NSPS NO_x standard, measured NO_x emission at 15 percent oxygen will be adjusted to ISO

A copy of this amendment letter shall be attached to and

CUSTOMED FUEL MONITORING SCHEDULE


1. Monitoring of natural gas nitrogen content shall not be required in accordance with page 2 of the EPA guidance memorandum, attached.
2. Sulfur Monitoring
 - a. Analysis for sulfur content of the natural gas shall be conducted using one of the EPA-approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternate method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR § 60.335(b)(2).
 - b. Effective on the approval date of the customized fuel monitoring schedule, sulfur monitoring shall be conducted twice a month for six months. If this monitoring shows little variability in the sulfur content and indicates consistent compliance with 40 CFR § 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.
 - c. If the sulfur content monitoring required for natural gas by 2(b) above shows little variability and the calculated sulfur dioxide emissions represent consistent compliance with the sulfur dioxide emission limits specified under 40 CFR § 60.333, sample analysis shall be conducted twice per year. This monitoring shall be conducted during the first and third quarters of each calendar year.
 - d. Should any sulfur analysis as required by items 2(b) or 2(c) above indicate noncompliance with 40 CFR § 60.333, the City will notify the Department of Environmental Protection of such excess emission and the customized fuel monitoring schedule shall be reexamined. The sulfur content of the natural gas will be monitored weekly during the interim period while this monitoring schedule is being reexamined.
3. The City will notify the Department of Environmental Protection of any change in natural gas supply for reexamination of this monitoring schedule. A substantial change in natural gas quality (i.e., sulfur content varying greater than 10 grains/1000 cf gas) shall be considered as a change in natural gas supply. Sulfur content of the natural gas will be monitored weekly during the interim period when this monitoring schedule is being reexamined.
4. Records of sampling analysis and natural gas supply pertinent to this monitoring schedule shall be retained by the City for a period of three years, and shall be available for inspection by appropriate regulatory personnel.
5. The City will obtain the sulfur content of the natural gas from Florida Gas Transmission Company. (The data presented in Attachment B is based upon representative samples of natural gas taken by Florida Gas Transmission.)

ATTACHMENT

Ms. Farzie Shelton
December 18, 1995
page 3

shall become a part of Air Construction Permit PSD-FL-166 /
AC53-190437.

Sincerely,



for Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this PERMIT AMENDMENT and all copies were mailed by certified mail before the close of business on 12-22-95 to the listed persons.

Clerk Stamp
FILING AND ACKNOWLEDGMENT FILED,
on this date, pursuant to
120.52(11), Florida Statutes,
with the designated Department
Clerk, receipt of which is hereby
acknowledged.

Lynn J. J. J. 12-22-95
Clerk Date

Copies to be furnished to:

Jerry Kissel, SWD
Jewell Harper, EPA
Roy Harwood, Polk Co.



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
City of Lakeland
501 E. Lemon Street
Lakeland, Florida 32961

Permit Number: AC 53-190437
Expiration Date: March 30, 1993
County: Polk
Latitude/Longitude: 28°02'56"N
81°55'25"W
Project: 120 MW Combined Cycle
Gas Turbine

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of a 120 MW combined cycle gas turbine to be located at the City of Lakeland-Charles Larsen Power Plant in Lakeland, Florida. The turbine will fire natural gas as the primary fuel and have limited hours firing No. 2 fuel oil. The turbine is a GE PG7111 (EA) Frame 7 unit with water injection to reduce NOx emissions. Fuel flow rate for natural gas is 17,333 scfm @ ISO and 124.2 gal/min @ ISO for No. 2 fuel oil. The UTM coordinates are 409.185 km East and 3102.754 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. City of Lakeland-Charles Larsen Power Plant's letter dated April 3, 1991.
2. EPA Region IV letter dated April 4, 1991.
3. National Park Service's letter dated May 3, 1991.
4. City of Lakeland's letter dated May 15, 1991.

PERMITTEE:
City of Lakeland

Permit Number: AC 53-190437
Expiration Date: March 30, 1993

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

PERMITTEE:
City of Lakeland

Permit Number: AC 53-190437
Expiration Date: March 30, 1993

GENERAL CONDITIONS:

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

- a. Have access to and copy any records that must be kept under the conditions of the permit;
- b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

PERMITTEE:
City of Lakeland

Permit Number: AC 53-190437
Expiration Date: March 30, 1993

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

PERMITTEE:
City of Lakeland

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GENERAL CONDITIONS:

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

Emission Limits

1. The maximum allowable emissions from this facility shall not exceed the emission rates listed in Table 1.

2. Unless the Department has determined other concentrations are required to protect public health and safety, predicted acceptable ambient air concentrations (AAC) of the following pollutants shall not be exceeded:

PERMITTEE:
City of Lakeland

Permit Number: AC 53-190437
Expiration Date: March 30, 1993

SPECIFIC CONDITIONS:

Pollutant	Acceptable Ambient Concentrations		
	8-hrs	24-hrs	Annual
Beryllium	0.02	0.005	0.0004
Lead	1.5	0.36	0.09
Inorganic mercury compounds, all forms of vapor, as Hg	-	-	0.3

3. Visible emissions shall not exceed 10% opacity.

Operating Rates

4. This source is allowed to operate continuously (8760 hours per year).

5. This source is allowed to use natural gas as the primary fuel and No. 2 distillate oil as the secondary fuel (limited as shown in Specific Condition 6 below).

6. The permitted materials and utilization rates for the combined cycle gas turbine shall not exceed the values as follows:

- Maximum No. 2 fuel oil consumption shall not exceed either of the following limitations: 8,190 gals/hr; 23,914,800 gals/yr.
- Maximum annual firing using No. 2 fuel oil shall not exceed 1/3 of the annual capacity factor.
- Maximum sulfur (S) content in the No. 2 fuel oil shall not exceed 0.20 percent by weight.
- Maximum heat input shall not exceed 1055 MMBtu/hr (gas) or 1040 MMBtu/hr No. 2 fuel (oil).

7. Any change in the method of operation, equipment or operating hours shall be submitted to the DER's Bureau of Air Regulation and Southwest District offices.

8. Any other operating parameters established during compliance testing and/or inspection that will ensure the proper operation of this facility shall be included in the operating permit.

PERMITTEE:
City of Lakeland

Permit Number: AC 53-190437
Expiration Date: March 30, 1993

SPECIFIC CONDITIONS:

Compliance Determination

9. Initial (I) compliance tests shall be performed on each CT using both fuels. The stack test for each turbine shall be performed within 10 percent of the maximum heat rate input for the tested operating temperature. Annual (A) compliance tests shall be performed on each CT with the fuel(s) used for more than 400 hours in the preceding 12-month period. Tests shall be conducted using EPA reference methods in accordance with the November 2, 1989, version of 40 CFR 60 Appendix A:

- a. 5 or 17 for PM (I, A, for oil only)
- b. 10 for CO (I)
- c. 9 for VE (I, A)
- d. 20 for NO_x (I, A)
- e. Trace elements of Beryllium (Be) shall be tested (I, for oil only) using EMTIC Interim Test Method. As an alternative, Method 104 may be used; or Be may be determined from fuel sample analysis using either Method 7090 or 7091, and sample extraction using Method 3040 as described in the EPA solid waste regulations SW 846.
- f. Mercury (Hg) shall be tested using EPA Method 101 (40 CFR 61, Appendix B) (I, for oil only) or fuel sampling analysis using methods acceptable to the Department.

Other DER approved methods may be used for compliance testing after prior Departmental approval.

10. Method 5 or 17 must be used to determine the initial compliance status of this unit. Thereafter, the opacity emissions test may be used unless 10% opacity is exceeded.

11. Compliance with the SO₂ emission limit can also be determined by calculations based on fuel analysis using ASTM D2880-71 for the sulfur content of liquid.

12. Compliance with the total volatile organic compound emission limits will be assumed, provided the CO allowable emission rate is achieved; specific VOC compliance testing is not required.

PERMITTEE:
City of Lakeland

Permit Number: AC 53-190437
Expiration Date: March 30, 1993

SPECIFIC CONDITIONS:

13. During performance tests, to determine compliance with the proposed NO_x standard, measured NO_x emission at 15 percent oxygen will be adjusted to ISO ambient atmospheric conditions by the following correction factor:

$$\text{NO}_x = (\text{NO}_x \text{ obs}) \left(\frac{P_{\text{ref}}}{P_{\text{obs}}} \right)^{0.5} e^{19(H_{\text{obs}} - 0.00633)} \left(\frac{288^\circ\text{K}}{T_{\text{AMB}}} \right)^{1.53}$$

where:

NO_x = Emissions of NO_x at 15 percent oxygen and ISO standard ambient conditions.

NO_x obs = Measured NO_x emission at 15 percent oxygen, ppmv.

P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.

P_{obs} = Measured combustor inlet absolute pressure at test ambient pressure.

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718).

T_{AMB} = Temperature of ambient air at test.

14. Test results will be the average of 3 valid runs. The Southwest District office will be notified at least 30 days in advance of the compliance test. The source shall operate between 90% and 100% of permitted capacity during the compliance test. Compliance test results shall be submitted to the Southwest District office no later than 45 days after completion.

15. Water injection shall be utilized for NO_x control. The water to fuel ratio at which compliance is achieved shall be incorporated into the permit and shall be continuously monitored. In addition, the Permittee shall install a duct module suitable for future installation of SCR equipment.

16. To determine compliance with the capacity factor condition for oil firing, the Permittee shall maintain daily records of fuel usage. All records shall be maintained for a minimum of three years after the date of each record and shall be made available to representatives of the Department upon request.

PERMITTEE:
City of Lakeland

Permit Number: AC 53-190437
Expiration Date: March 30, 1993

SPECIFIC CONDITIONS:

17. Sulfur, nitrogen content and lower heating value of the fuel being fired in the gas turbine shall also be recorded per fuel oil shipment. These records shall also be kept by the company for at least three years and made available for regulatory agency's inspection.

18. Compliance with the acceptable ambient concentrations for Be, Lead, and Hg emissions shall be demonstrated based on calculations certified by a Professional Engineer registered in Florida, using actual operating conditions. Determination of the ambient concentrations for chemical compounds shall be determined by Department approved dispersion modeling. This compliance determination shall be made available upon request.

Rule Requirements

19. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes and Chapters 17-2 and 17-4, Florida Administrative Code.

20. This source shall comply with all requirements of 40 CFR 60, Subpart GG and F.A.C. Rule 17-2.660(2)(a), Standards of Performance for Stationary Gas Turbines.

21. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-2.210(1)).

22. This source shall comply with F.A.C. Rule 17-2.700, Stationary Point Source Emission Test Procedures.

23. Pursuant to F.A.C. Rule 17-2.210(2), Air Operating Permits, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur, nitrogen content and lower heating value of the fuel being fired, fuel usage, hours of operation, air emissions limits, etc. Annual reports shall be sent to the Department's Southwest District office.

24. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

PERMITTEE:
City of Lakeland

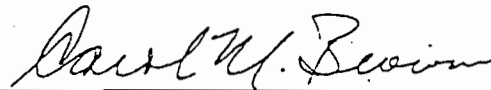
Permit Number: AC 53-190437
Expiration Date: March 30, 1993

SPECIFIC CONDITIONS:

25. An application for an operation permit must be submitted to the Southwest District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 25th day
of July, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION



Carol M. Browner, Secretary

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standards		Gas Turbine and HRSG ^(a)		Basis
	Gas Firing	No. 2 Fuel Oil Firing	Tons Per Year		
			Gas	Oil	
NO _x	25 ppm at 15% oxygen on a dry basis	42 ppmv at 15 percent oxygen on a dry basis	425	244	BACT
SO ₂	Natural gas as fuel	0.2 percent S by weight	2.6	307	BACT
PM/PM ₁₀	0.006 lb/MMBtu	0.025 lb/MMBtu	22	22	BACT
VOC	-	-	9	6.7	BACT
CO	-	-	232	79	BACT
Mercury (Hg)	-	3.0 x 10 ⁻⁶ lbs/MMBtu	-	.003	Est. by Appl.
Lead (Pb)	-	2.8 x 10 ⁻⁵ lbs/MMBtu	-	0.03	" "
Beryllium (be)	-	2.5 x 10 ⁻⁶ lbs/MMBtu	-	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	-	3.2 x 10 ⁻³	BACT

(a) Emissions rates based on 100 percent capacity factor for natural gas and 1/3 capacity factor for oil firing.

Best Available Control Technology (BACT) Determination
City of Lakeland-Charles Larsen Power Plant
Polk County

The applicant proposes to install a combustion turbine generator at their facility in Lakeland. The generator system will consist of a single nominal 80 megawatt (MW) combustion turbine, and a single heat recovery steam generator (HRSG) which will be used to repower an existing nominal 40 MW steam turbine.

The combustion turbine will be capable of both combined cycle and simple cycle operation. The applicant requested that the combustion turbine use either natural gas or distillate oil. The applicant has indicated the maximum annual tonnage of regulated air pollutants emitted from the facility based on 100 percent capacity and type of fuel fired at ISO conditions to be as follows:

Pollutant	Potential Emissions (tons/yr)		PSD Significant Emission Rate (tons/yr)
	Natural Gas	Fuel Oil	
NOx	425	732	40
SO ₂	2.6	920	40
PM	22.0	66	25
PM ₁₀	22.0	66	15
CO	232	237	100
VOC	9	20.0	40
H ₂ SO ₄	0.8	27.4	7
Be	0.0	0.01	0.0004
Hg	0.0	0.01	0.1
Pb	0.0	0.12	0.6

Florida Administrative Code Rule 17-2.500(2)(f)(3) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

Date of Receipt of a BACT Application

December 17, 1990

BACT Determination Requested by the Applicant

<u>Pollutant</u>	<u>Determination</u>
NOx	25 ppmvd @ 15% O ₂ (natural gas burning) 42 ppmvd @ 15% O ₂ (diesel oil firing)
SO ₂	Firing of natural gas or No. 2 fuel oil with a maximum sulfur content of 0.20%
PM and PM ₁₀	Combustion control
H ₂ SO ₄	Firing of No. 2 fuel oil with a maximum sulfur content of 0.20%.
Be	Firing of No. 2 fuel oil

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

- (a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).
- (b) All scientific, engineering, and technical material and other information available to the Department.
- (c) The emission limiting standards or BACT determinations of any other state.
- (d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

The air pollutant emissions from combined cycle power plants can be grouped into categories based upon what control equipment and techniques are available to control emissions from these facilities. Using this approach, the emissions can be classified as follows:

- o Combustion Products (Particulates and Heavy Metals). Controlled generally by good combustion of clean fuels.
- o Products of Incomplete Combustion (CO, VOC, Toxic Organic Compounds). Control is largely achieved by proper combustion techniques.
- o Acid Gases (SOx, NOx, HCl, F1). Controlled generally by gaseous control devices.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "nonregulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., particulates, sulfur dioxide, fluorides, sulfuric acid mist, etc.), if a reduction in "nonregulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

Combustion Products

The City of Lakeland's projected emissions of particulate matter, PM₁₀, and beryllium surpass the significant emission rates given in Florida Administrative Code Rule 17-2.500, Table 500-2 for No. 2 fuel oil firing only.

A PM/PM₁₀ emissions limitation of .025 lb/MMBtu for No. 2 fuel oil firing is reasonable as BACT for the Lakeland facility.

In general, the BACT/LAER Clearinghouse does not contain specific emission limits for beryllium from turbines. BACT for these heavy metals is typically represented by the level of particulate control. As this is the case, the emission factor of .025 lb/MMBtu for particulate matter PM₁₀ is judged to also represent BACT for beryllium.

Products of Incomplete Combustion

The emissions of carbon monoxide exceeds the significant level and therefore requires a BACT analysis.

At the proposed BACT NO_x emissions of 25/42 ppmvd (gas/oil) the turbine will be capable of maintaining CO emission rates of 25 ppmvd for either natural gas or No. 2 fuel oil. The applicant states that catalytic reduction could be installed at a levelized cost of 1.0 million/year to further reduce the CO emissions by 140 tons/year while burning natural gas (8760 hrs/yr). The incremental removal cost of using such control would be approximately \$7340/ton of CO removed. This cost exceeds that which is consistent with BACT and is not economically justifiable.

Acid Gases

The emissions of sulfur dioxide, nitrogen oxides, and sulfuric acid mist, represent a significant proportion of the total emissions and need to be controlled if deemed appropriate. Sulfur dioxide emissions from combustion turbines are directly related to the sulfur content of the fuel being combusted.

The applicant has proposed the use of natural gas and No. 2 fuel oil with a maximum sulfur content of 0.20% to control sulfur dioxide emissions. A review of the latest edition (1990) of the BACT/LAER Clearinghouse indicates that sulfur dioxide emissions from combustion turbines have been controlled by limiting fuel oil sulfur content to a range of 0.1 to 0.3%, with the average for the facilities listed being approximately 0.24 percent. As this is the case, the applicant's proposal to use No. 2 fuel oil with a maximum sulfur content of 0.20% is judged to represent BACT.

The applicant has stated that BACT for nitrogen oxides will be met by using wet (water or steam) injection necessary to limit emissions to 42 ppmvd or 25 ppmvd at 15% oxygen when burning No. 2 fuel oil or natural gas, respectively.

A review of the EPA's BACT/LAER Clearinghouse indicates that the lowest NO_x emission limit established to date for a combustion turbine is 4.5 ppmvd at 15% percent oxygen. This level of control was accomplished through the use of water injection and a selective catalytic reduction (SCR) system.

Selective catalytic reduction is a post-combustion method for control of NO_x emissions. The SCR process combines vaporized ammonia with NO_x in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90% reduction of NO_x with a new catalyst. As the catalyst ages, the maximum NO_x reduction will decrease to approximately 86 percent.

Given the applicant's proposed BACT level for nitrogen oxides control stated above, an evaluation can be made of the cost and associated benefit of using SCR as follows:

The applicant has indicated that the total levelized annual cost (operating plus amortized capital cost) to install SCR for natural gas firing at 100 percent capacity factor is \$2,190,000. Taking into consideration the total levelized annual cost, a cost/benefit analysis of using SCR can now be developed.

Based on the information supplied by the applicant, it is estimated that the maximum annual NOx emissions with wet injection from the Lakeland facility will be 425 tons/year. Assuming that SCR would reduce the NOx emissions by an additional 80-85%, the SCR would control at least 340 tons of NOx annually for natural gas firing. When this reduction is taken into consideration with the total levelized annual cost of \$2,190,000, the cost per ton of controlling NOx is \$6,441. This calculated cost is higher than has previously been approved as BACT.

Since SCR has been determined to be BACT for several combined cycle facilities, the EPA has clearly stated that there must be unique circumstances to consider the rejection of such control on the basis of economics.

In a recent letter from EPA Region IV to the Department regarding the permitting of a combined cycle facility (Tropicana Products, Inc.), the following statement was made:

"In order to reject a control option on the basis of economic considerations, the applicant must show why the costs associated with the control are significantly higher for this specific project than for other similar projects that have installed this control system or in general for controlling the pollutant."

A review of the combined cycle facilities in which SCR has been established as a BACT requirement indicates that the majority of these facilities are also intended to operate at high capacity factors. As this is the case, the proposed project is similar to other facilities in which SCR has been established as BACT, thereby supporting SCR as BACT for the proposed facility.

For fuel oil firing, the cost associated with controlling NOx emissions must take into account the potential operating problems that can occur with using SCR in the oil firing mode.

A concern associated with the use of SCR on combined cycle projects is the formation of ammonium bisulfate. For the SCR process, ammonium bisulfate can be formed due to the reaction of sulfur in the fuel and the ammonia injected. The ammonium bisulfate formed has a tendency to plug the tubes of the heat recovery steam generator leading to operational problems. As this is the case, SCR has been judged to be technically infeasible for oil firing in some previous BACT determinations.

The latest information available now indicates that SCR can be used for oil firing provided that adjustments are made in the ammonia to NOx injection ratio. For natural gas firing operation NOx emissions can be controlled with up to a 90 percent efficiency using a 1 to 1 or greater injection ratio. By lowering the injection ratio for oil firing, testing has indicated that NOx can be controlled with efficiencies ranging from 60 to 75 percent. When the injection ratio is lowered there is not a problem with ammonium bisulfate formation since essentially all of the ammonia is able to react with the nitrogen oxides present in the combustion gases.

Based on this strategy SCR has been both proposed and established as BACT for oil fired combined cycle facilities with NOx emission limits ranging from 11.7 to 25 ppmvd depending on the efficiency of control established.

Assuming that the lowered ammonia injection ratio strategy was used to control NOx emissions by 65%, the SCR would control 386 tons of NOx annually for oil/gas firing, assuming a maximum capacity factor of 33 percent on oil. When this reduction is taken into consideration with the total annual cost of \$2,190,000, the cost per ton of controlling NOx is \$5,674. This cost is lower than that determined for natural gas firing alone; however, it is still higher than what has been previously accepted as BACT.

Environmental Impact Analysis

The predominant environmental impacts associated with this proposal are related to the use of SCR for NOx control. The use of SCR results in emissions of ammonia, which may increase with increasing levels of NOx control. In addition, some catalysts may contain substances which are listed as hazardous waste, thereby creating an additional environmental burden. Although the use of SCR does have some environmental impacts, the disadvantages do not outweigh the benefit which would be provided by reducing nitrogen oxide emissions by 80 percent. The overwhelming benefit of NOx control by using SCR is substantiated by the fact that nearly one half of all BACT determinations have established SCR as the control measure for nitrogen oxides over the last five years.

In addition to the criteria pollutants, the impacts of toxic pollutants associated with the combustion of natural gas and No. 2 fuel oil have been evaluated. Beryllium for oil fired operation exceeds PSD significant levels. Other toxics are expected to be emitted in minimal amounts, with the total emissions combined to be less than 0.1 tons per year.

Although the emissions of the toxic pollutants could be controlled by particulate control devices such as a baghouse or scrubber, the amount of emission reductions would not warrant the added expense. As this is the case, the Department does not believe that the BACT determination would be affected by the emissions of the toxic pollutants associated with the firing of natural gas or No. 2 fuel oil.

Potentially Sensitive Concerns

With regard to controlling NOx emissions with SCR, the applicant has identified the following technical limitations:

1. SCR would reduce output of combustion turbines by one percent.
2. SCR could result in the release of unreacted quantities of ammonia to the atmosphere.
3. SCR would require handling of ammonia by plant operators. Since it is a hazardous material, there is a concern about safety and productivity of operators.
4. SCR results in contaminated catalyst from flue gas trace elements which could be considered hazardous. Safety of operators and disposal of spent catalyst is a concern.

BACT Determination by DER

NOx Control

A review of the permitting activities for combined cycle proposals across the nation indicates that SCR has been required and most recently proposed for installations with a variety of operating conditions (i.e., natural gas, fuel oil, capacity factors ranging from low to high). However, the cost and other concerns expressed by the applicant are valid.

The information that the applicant presented and Department calculations indicates that the incremental cost of controlling NOx (\$6,441/ton) for natural gas is high compared to other BACT determinations which require SCR. However, the cost of controlling NOx emissions for oil firing (\$4,600/ton) could be considered reasonable. Based on the information presented by the applicant and the studies conducted, the Department believes that the use of SCR for NOx control is not justifiable at this time as BACT. Therefore, the Department is willing to accept low NOx combustors with the firing of natural gas as the primary fuel. However, No. 2 distillate oil firing must be limited to 1/3 of the annual capacity factor. The applicant is also expected to design the facility to accomodate SCR should additional oil usage become necessary and SCR becomes a BACT requirement in the future.

SO₂ Control

For sulfur dioxide BACT is represented by firing natural gas or No. 2 fuel oil with an average sulfur content not to exceed 0.20 percent.

Other Emissions Control

The emission limitations for PM and PM₁₀, are based on previous BACT determinations for similar facilities, with the heavy metal beryllium being addressed through the particulate limitation and sulfuric acid mist being addressed through the sulfur dioxide limitation.

The emission limits for the City of Lakeland project are thereby established as follows:

<u>Pollutant</u>	<u>Emission Limit</u>	
	<u>Natural Gas Firing</u>	<u>No. 2 Fuel Oil Firing</u>
NOx	25 ppmvd @ 15% O ₂	42 ppmvd @ 15% O ₂ *
SO ₂	Natural gas as fuel	Sulfur content not to exceed 0.20%
CO	25 ppmvd @ 15% O ₂	25 ppmvd @ 15% O ₂
PM & PM ₁₀	0.006 lb/MMBtu	0.025 lb/MMBtu
Sulfuric Acid Mist	Emissions limited by natural gas and No. 2 fuel oil firing	
Beryllium	Emissions limited by natural gas and No. 2 fuel oil firing	

* No. 2 fuel oil usage limited to 1/3 of the total heat input on an annual basis.

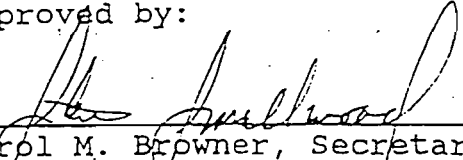
Details of the Analysis May be Obtained by Contacting:

Preston Lewis, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

Approved by:


C. H. Fancy, P.E., Chief
Bureau of Air Regulation


Carol M. Browner, Secretary
Dept. of Environmental Regulation

Date

July 14, 1991

Date

July 26, 1991

**AIR CONSTRUCTION APPLICATION
FOR UNIT 8
FOGGING SYSTEM**

APPLICATION FOR AIR PERMIT
INSTALLATION OF DIRECT WATER
SPRAY FOGGING SYSTEM
LARSEN UNIT 8

Prepared For:

Lakeland Electric
501 East Lemon Street
Lakeland, Florida 33801-5079

Prepared By:

Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653

February 2000
0037503Y/F1/WP

DISTRIBUTION:

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1 Copy - Golder Associates Inc.

PART I
APPLICATION FOR AIR PERMIT
LONG FORM



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: City of Lakeland, Department of Electric Utilities	
2. Site Name: Charles Larsen Memorial Power Plant	
3. Facility Identification Number: 1050003 [] Unknown	
4. Facility Location: Street Address or Other Locator: 2002 East Hwy 92 City: Lakeland County: Polk Zip Code: 33802	
5. Relocatable Facility? [] Yes [X] No	6. Existing Permitted Facility? [X] Yes [] No

Application Contact

1. Name and Title of Application Contact: Ms. Farzie Shelton, Manager of Environmental Licensing and Permitting	
2. Application Contact Mailing Address: Organization/Firm: Lakeland Electric Street Address: 501 E. Lemon Street City: Lakeland State: FL Zip Code: 33801-5079	
3. Application Contact Telephone Numbers: Telephone: (834) 499 - 6603 Fax: (834) 603 - 6335	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Permit Number:	
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: _____
- ☐ 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)

- ☒ 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: Ronald W. Tomlin, Assistant Managing Director
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: Lakeland Electric Street Address: 501 East Lemon Street City: Lakeland State: FL Zip Code: 33801-5079
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: (834) 499 - 6300 Fax: (834) 499 - 6344
4. Owner/Authorized Representative or Responsible Official Statement: <i>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.</i> _____ Signature _____ Date

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: Kennard F. Kosky Registration Number: 14996
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

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

Date

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
008	Combined Cycle Combustion Turbine	AC1B	

Application Processing Fee

Check one: ☐ Attached - Amount: \$: _____ ☒ Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations:

Installation of direct water spray inlet fogging systems. Since the facility holds a Title V permit pursuant to Chapter 62-213 F.A.C., a permit fee is not required. Refer to Part II for discussion.

2. Projected or Actual Date of Commencement of Construction: Apr 2000

3. Projected Date of Completion of Construction: Jun 2000

Application Comment

The combustion turbine associated with Larsen Unit 8 will be installed with a direct water spray fogging system that will reduce the turbine inlet air temperature. The temperature reduction will improve the heat rate and increase power due to the cooler-denser inlet air. The net emissions change from this project will not result in an increase of any regulated pollutant greater than the PSD significant emission rates. PSD review does not apply to proposed project. Discussed in Part II.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: 17 East (km): 408.9 North (km): 3102.5			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): 28 / 2 / 56 Longitude (DD/MM/SS): 81 / 55 / 25			
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s): 4911
7. Facility Comment (limit to 500 characters): The existing Larsen plant consists of 2 Fossil Fuel Fired Steam Generators (Units 6 and 7), 3 simple cycle gas turbines, and 1 Combined Cycle Unit (Unit 8). The combined cycle unit consists of a combustion turbine and an associated heat recovery steam generator (HRSG). The primary fuel for the combustion turbine is natural gas with the distillate oil as back-up. Refer to Part II for discussion.			

Facility Contact

1. Name and Title of Facility Contact: Farzie Shelton, Manager, Environmental Licensing and Permitting			
2. Facility Contact Mailing Address: Organization/Firm: Lakeland Electric Street Address: 501 East Lemon-Street City: Lakeland State: FL Zip Code: 33801-5079			
3. Facility Contact Telephone Numbers: Telephone: (834) 499 - 6603 Fax: (834) 603 - 6335			

Facility Regulatory Classifications**Check all that apply:**

1. <input type="checkbox"/> Small Business Stationary Source?	<input type="checkbox"/> Unknown
2. <input checked="" type="checkbox"/> Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. <input type="checkbox"/> Synthetic Minor Source of Pollutants Other than HAPs?	
4. <input type="checkbox"/> Major Source of Hazardous Air Pollutants (HAPs)?	
5. <input type="checkbox"/> Synthetic Minor Source of HAPs?	
6. <input checked="" type="checkbox"/> One or More Emissions Units Subject to NSPS?	
7. <input type="checkbox"/> One or More Emission Units Subject to NESHAP?	
8. <input checked="" type="checkbox"/> Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters): NSPS Subpart GG applies to the combustion turbine for Unit 8.	

List of Applicable Regulations

Facility emissions covered under existing Title V permit, no additional facility or emission unit applicable requirements as a result of the proposed change.	
See Attachment B for specific conditions for Unit 8.	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. <u>Requested Emissions Cap</u>		4. Basis for Emissions Cap	5. Pollutant Comment
		lb/hour	tons/year		

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): [X] Attached, Document ID: <u>Part II</u> [] 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: <u>Part II</u> [] Not Applicable
7. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
9. List of Equipment/Activities Regulated under Title VI: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Equipment/Activities On site but Not Required to be Individually Listed <input type="checkbox"/> Not Applicable
10. Alternative Methods of Operation: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading): <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
12. Identification of Additional Applicable Requirements: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
13. Risk Management Plan Verification: <input type="checkbox"/> 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: _____) <input type="checkbox"/> Plan to be submitted to CEPPO (Date required: _____) <input type="checkbox"/> Not Applicable
14. Compliance Report and Plan: <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
15. Compliance Certification (Hard-copy Required): <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable

PART II
SUPPORTING INFORMATION

Part II

Application for Air Permit Installation of Direct Water Spray Fogging Systems Martin Plant

Introduction

Lakeland Electric is proposing to install direct water spray fogging system in the inlet duct of the combustion turbine in combined cycle configuration at the Larsen Plant. The purpose of the inlet fogger is to provide adiabatic inlet air cooling which increases turbine output and decreases heat rate. The project is part of increasing capacity in a cost effective manner.

Description

Direct inlet fogging systems achieve adiabatic cooling using water to form fine droplets (fog). The fog is produced by injection grids placed in the turbine inlet duct that use nozzles that produce a fine spray. The small fog particles (about 10 to 20 microns) extract the latent heat of vaporization from the gas stream when the water droplet is converted to gas. Heat is removed at a rate of 1,075 Btu/lb of water. The result of the fogging is a cooler more moisture laden air stream. Figure 1 presents a schematic of a typical fogging system.

The amount of heat removed is highly dependent upon the ambient air conditions. The two most important parameters are the dry bulb temperature and relative humidity. As moisture is added to the inlet air by the fogging, the vaporization of the fog droplets cools the air toward the wet-bulb temperature. For typical design condition of 95°F and 50 percent relative humidity for ambient air, the wet bulb temperature, based on psychrometric charts is 79°F. At 100 percent saturation the inlet cooling system would result in a 16°F decrease of the turbine inlet air.

While adiabatic cooling is most efficient for dry climates, adiabatic cooling in Florida can be an effective means of inlet air cooling during the late morning to evening hours. This period is typically 8 to 10 hours per day from about 10 am to 8 pm. In the early morning hours and evening hours, the typical relative humidity in Florida is 70 to 90 percent depending on the

climatic conditions. Because of the highly variable nature of ambient air conditions, the annual average inlet cooling was assumed to be 10°F. This average was reviewed against a 30 year record of meteorological data for Tampa and found to be representative of the range in conditions that occur over an annual period. This includes cooling associated with the typical mid-afternoon summer days and early morning/evening periods that occur year-round. The typical mid-afternoon cooling for Tampa would be 12°F and would occur in June with a mid-afternoon temperature of 90°F and 60 percent relative humidity. During January, the mid-afternoon cooling would be about 8°F. The typical cooling that would occur in the summer during early morning hours with temperatures of about 75°F and a relative humidity of 80 percent would be 4°F. This cooling also assumes that the gas stream can be 100 percent saturated. The average minimum temperatures for the months of November through April range from 49.5°F to 61.6°F with relative humidities ranging from 87 to 83 percent. The amount of adiabatic cooling would range from 1 to 2°F. The ambient air conditions that are modified by the fogging system occur naturally but are more frequent with the fogging system. The annual average temperature reduction assumed for on 24 hours operation is 10°F.

Turbine Performance and Emission Estimates

The effect of decreasing the turbine inlet air through the use of fogging will be to increase the mass flow of air that can go through the turbine which allows higher heat input and power output. The combustion turbine is also more efficient since the heat rate decreases with decreasing temperature. For the GE Model PG7111 (Frame 7EA) combustion turbine at the Larsen plant, a 10°F decrease in temperature for gas firing would result in a 3.3 percent increase in power and an associated 0.6 percent decrease in heat rate. Thus, while power increases, the production of power is more efficient with concomitant lower emissions per MW-hr generated. The increase in heat rate as a function of temperature decrease is a linear function and for the Larsen Unit 8 turbine would be 2.5 mmBtu/hr/°F when firing natural gas. The data were determined using GE supplied data (see Attachment A).

Because the turbine is operating on its original power curve, the emission characteristics do not change from what would normally occur at that temperature and relative humidity. An

evaluation of emissions from the fogging tests conducted at several facilities in Florida did not result in any statistically significant differences in emission rates. The increase in emissions of criteria pollutants associated with fogging were determined using emission limits contained in the Title V Permit for the facility. This provides an estimate of the maximum potential emissions and would conservatively estimate annual increases in emission. Tables 1 and 2 presents a summary of the operating conditions and emission increases resulting from fogging when firing natural gas and distillate fuel oil, respectively.

The annual emissions were determined by multiplying the heat input increase per degree Fahrenheit (°F) times the emissions rate in lb/mmBtu for the number of °F-hours proposed for the turbine. The °F-hours/year is the total amount of annual temperature reduction proposed for fogging and was calculated by using the average temperature reduction multiplied by the hours of year assumed. For example, the °F-hours for gas firing are calculated by multiplying 8,760 hours times 10°F or 87,600°F-hours. The turbine inlet is equipped with temperature probes and will monitor the amount of inlet cooling. This reduction will be recorded for each hour of fogger operation. For Larsen Unit 8, a maximum of 58,400°F-hours of operation when firing natural gas and 29,200°F-hours of operation when firing distillate fuel oil was used as the basis for annual emission estimates for the turbine (see Tables 1 and 2).

Regulatory Applicability

A modification is defined in Rule 62-210.200 Florida Administrative Code (F.A.C.) as any physical change in, or a change in the method of operation of, or addition to a facility which would result in an increase in the actual emissions of any air pollutant subject to regulation under the Clean Air Act. A modification to a major source of air pollution, such as the Larsen Plant, may be subject to review under the Department's Prevention of Significant Deterioration (PSD) rules codified in Rule 62-212.400 F.A.C.

The proposed installation of direct water spray fogging system is a modification according to Rule 62-212.200 (188) F.A.C., since annual emissions will potentially increase as a result of the

increased power and heat input. This has been confirmed by the Department in recent permitting actions.

Based on the available data, it is concluded that the emission rate does not change as a result of inlet fogging. Therefore, increase in annual potential emissions can be conservatively determined through the use of increases in heat input associated with the use of the fogging systems. For Larsen, the maximum potential annual increase in emissions is presented in Table 3.

These maximum potential emission rates are less than the significant emission rates in Table 62-212.400-2 in Rule 62-212.400 F.A.C. and, therefore, PSD would not apply. The pollutant closest to the PSD significant emission rates when firing natural gas is NO_x and is 13.2 tons per year (TPY) compared to the significant emission rate of 40 TPY. Emissions of SO_2 are 7.4 TPY and are primarily associated with distillate fuel oil, which is only used a backup to natural gas. Emission rates for CO and VOC on each fuel are similar in lb/mmBtu with maximum potential emissions less than 10 percent of the significant emission rates for those pollutants.

An amount of 87,600°F-hours provides a conservatively high basis for determining potential emissions from firing natural gas at 58,400°F-hours and distillate oil at 29,200°F-hours. Since natural gas is the primary fuel, with distillate oil backup, actual emission increases, assuming mostly gas firing, would be less than that shown in Table 3. As seen in Table 1, potential emissions at 8,760 hours operation on gas are less than those estimated with both fuels.

In addition, during periods when the fogging system is not used, the operation of the CTs will not be affected by this request and will be operated according to the Department's previous approvals (e.g., authorized to operate 8,760 hours/year/CT).

The inlet fogging system monitoring is proposed for a duration not to exceed 5 years as provided in Rule 62-210.200 (12) (d).

Table 1 Emission Estimates of the City of Lakeland Larsen Plant Unit 8 - Combustion Turbine with Inlet Air Cooling System with Direct Water Spray Inlet Fogging (Natural Gas Firing - 8,760 hours/year).

Performance Basis			
Temperature Decrease	°F (1)	10	
Power Increase		3.32%	Average of GE Data for Frame 7E
Heat Rate Decrease		-0.61%	Average of GE Data for Frame 7E
Heat Input Increase		2.49%	Average of Heat Input vs. Temperature
Heat Input Change	mmBtu/ °F	2.5	Average from 20 °F to 90 °F turbine inlet
Hours/year		8,760 (2)	
Hours-°F/year		87,600	hours/year times temperature decrease
Pollutants	Units	Emissions	Comments
PM	lb/MMBtu	0.0060	from Title V Application ⁽³⁾
	TPY	0.65	
NO _x	lb/MMBtu	0.0995	from Title V Application ⁽³⁾
	TPY	10.78	
SO ₂	lb/MMBtu	0.0028	from Title V Application ⁽³⁾
	TPY	0.31	
CO	lb/MMBtu	0.0550	from Title V Application ⁽³⁾
	TPY	5.95	
VOC	lb/MMBtu	0.0018	from Title V Application ⁽³⁾
	TPY	0.20	

Legend - TPY: tons per year

- (1) Temperature decrease is average temperature differential of ambient temperature to compressor inlet temperature utilizing representative of average daytime conditions.
- (2) Hours of fogger operation based on estimate of 24 hours per day and 365 days per year.
- (3) Emission factor references - Title V Permit Application and Permit based on maximum hourly emissions and 25 °F turbine inlet conditions. PM = 0.006 lb/MMBtu; NO_x = 105 lb/hr x hr/1055 MMBtu = 0.0995 lb/MMBtu; SO₂ = 3 lb/hr x hr/1055 MMBtu = 0.0028 lb/MMBtu; CO = 58 lb/hr x hr/1055 MMBtu = 0.0550 lb/MMBtu; VOC = 1.9 lb/hr x hr/1055 MMBtu = 0.0018 lb/MMBtu.

Example calculation for tons/year:

$$PM = 0.0060 \text{ lb/MMBtu} \times 2.5 \text{ MMBtu/°F} \times 10^\circ\text{F} \times 8,760 \text{ hours/year} \times \text{ton}/2,000 \text{ lb} = 0.65 \text{ lb/MMBtu}$$

NOTE: Calculation performed by computer spreadsheet which accounts for greater accuracy than calculating using rounded-off data in table.

Table 2 Emission Estimates of the City of Lakeland Larsen Plant Unit 8 - Combustion Turbine with Inlet Air Cooling System with Direct Water Spray Inlet Fogging (Distillate Oil Firing - 2,920 hours/year).

Performance Basis			
Temperature Decrease	°F (1)	10	
Power Increase		3.32%	Average of GE Data for Frame 7E
Heat Rate Decrease		-0.61%	Average of GE Data for Frame 7E
Heat Input Increase		2.49%	Average of Heat Input vs. Temperature
Heat Input Change	mmBtu/°F	2.4	Average from 20 °F to 90 F turbine inlet
Hours/year		2,920 (2)	
Hours-°F/year		29,200	hours/year times temperature decrease
Pollutants	Units	Emissions	Comments
PM	lb/MMBtu TPY	0.0250 0.89	from Title V Application ⁽³⁾
NO _x	lb/MMBtu TPY	0.1692 6.02	from Title V Application ⁽³⁾
SO ₂	lb/MMBtu TPY	0.2029 7.22	from Title V Application ⁽³⁾
CO	lb/MMBtu TPY	0.0567 2.02	from Title V Application ⁽³⁾
VOC	lb/MMBtu TPY	0.0087 0.31	from Title V Application ⁽³⁾

Legend - TPY: tons per year

- (1) Temperature decrease is average temperature differential of ambient temperature to compressor inlet temperature utilizing representative of average daytime conditions.
- (2) Hours of fogger operation based on limit of 2,920 hours per year.
- (3) Emission factor references - Title V Permit Application and Permit based on maximum hourly emissions and 25 °F turbine inlet conditions. PM = 26 lb/hr x hr/1,040 MMBtu = 0.0250 lb/MMBtu; NO_x = 176 lb/hr x hr/1,040 MMBtu = 0.1692 lb/MMBtu; SO₂ = 211 lb/hr x hr/1,040 MMBtu = 0.2029 lb/MMBtu; CO = 59 lb/hr x hr/1,040 MMBtu = 0.0567 lb/MMBtu; VOC = 9 lb/hr x hr/1,040 MMBtu = 0.0087 lb/MMBtu

Table 3 Maximum Annual Emissions of the City of Lakeland Larsen Plant Unit 8 - Combustion Turbine with Inlet Air Cooling System with Direct Water Spray Inlet Fogging (Natural Gas Firing - 5,840 hours/year and Oil Firing 2,920 hours/year).

Pollutants	Annual Emissions (tons/year)			PSD SERs ⁽¹⁾ (tons/year)
	Gas Firing	Oil Firing	Total	
PM	0.43	0.89	1.32	15 & 25 ⁽²⁾
NO _x	7.19	6.02	13.21	40
SO ₂	0.21	7.22	7.43	40
CO	3.97	2.02	5.99	100
VOC	0.13	0.31	0.44	40

(1) PSD = Prevention of Significant Deterioration; SERs - Significant Emission Rates; Rule 62-212.400(2)(e)2.

(2) 15 tons/year is for PM10 and 25 tons/year is for PM.

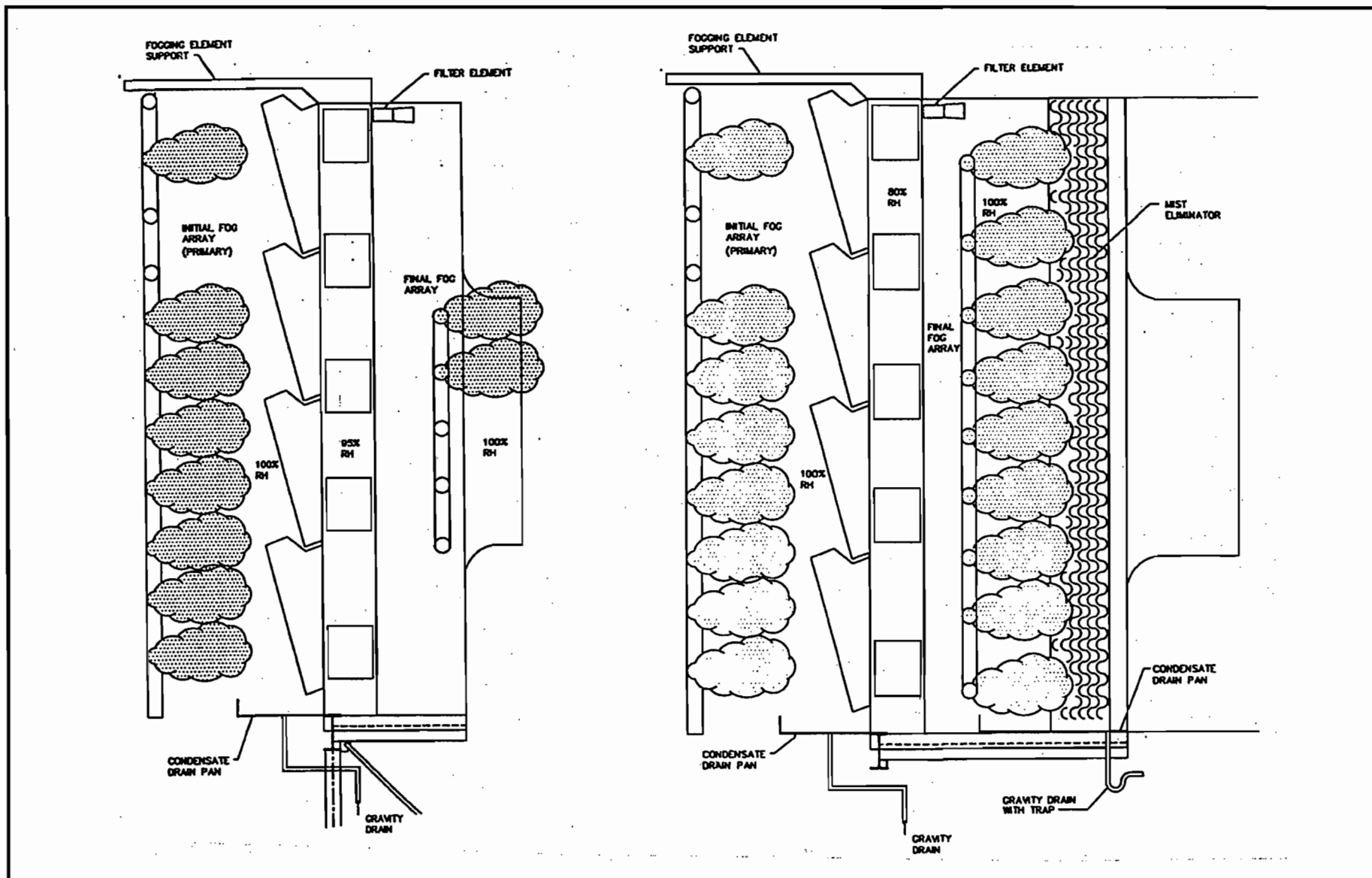


Figure 1. Illustrative Fogging System Schematic

Source: Caldwell Energy and Environmental, Inc. 1999.

ATTACHMENT A
TURBINE PERFORMANCE DATA

Table A-1. Combustion Turbine Performance Data - General Electric Model PG7111(EA) Gas Turbine Firing Natural Gas

Temp. (oF)	Heat Input (mmBtu/hr)	Increase (mmBtu/hr)	Increase (%)	Average mmBtu/hr per oF	Capacity (MW)	Increase (MW)	Increase (%)	Average Increase(MW) per oF	Heat Rate (Btu/kWhr)	Decrease (Btu/kWhr)	Decrease (%)	Average Decrease per oF
90	890				80.278				10,659			
70	940	50	5.62%	2.50	86.592	6.314	7.87%	0.32	10,555	-104.50	-0.98%	-5.23
59	965	25	2.66%	2.27	90.2	3.608	4.17%	0.33	10,450	-104.50	-0.99%	-9.50
40	1010	45	4.66%	2.37	95.612	5.412	6.00%	0.28	10,346	-104.50	-1.00%	-5.50
20	1065	55	5.45%	2.75	101.926	6.314	6.60%	0.32	10,241	-104.50	-1.01%	-5.23
Average:	995.00	43.75	4.60%	2.47	93.5825	5.412	6.16%	0.31	10,398	-104.50	-1.00%	-6.36

Source: GE, 1988 and 1989.

Table A-2. Combustion Turbine Performance Data - General Electric Model PG7111(EA) Gas Turbine Firing Distillate Oil

Temp. (oF)	Heat Input (mmBtu/hr)	Increase (mmBtu/hr)	Increase (%)	Average mmBtu/hr per oF	Capacity (MW)	Increase (MW)	Increase (%)	Average Increase(MW) per oF	Heat Rate (Btu/kWhr)	Decrease (Btu/kWhr)	Decrease (%)	Average decrease per oF
90	875				78.96				10,730			
70	925	50	5.71%	2.50	85.17	6.2104	7.87%	0.31	10,625	-105.20	-0.98%	-5.26
59	946	21	2.27%	1.91	88.72	3.5488	4.17%	0.32	10,520	-105.20	-0.99%	-9.56
40	1000	54	5.71%	2.84	94.04	5.3232	6.00%	0.28	10,415	-105.20	-1.00%	-5.54
20	1050	50	5.00%	2.50	100.25	6.2104	6.60%	0.31	10,310	-105.20	-1.01%	-5.26
Average:	980.25	43.75	4.67%	2.44	92.047	5.3232	6.16%	0.31	10,467	-105.20	-1.00%	-6.41

Source: GE, 1988 and 1989.

ATTACHMENT B
TITLE V SPECIFIC CONDITIONS
FOR LARSEN UNIT 8

Section III. Emissions Unit(s) and Conditions.

Subsection D. This section addresses the following emissions unit.

E.U. ID

<u>No.</u>	<u>Brief Description</u>
-008	Combined Cycle Combustion Turbine

The emission unit is a 120 megawatt combined cycle combustion gas turbine with a heat recovery steam generator (HRSG) designated as Larsen Unit #8. The combustion turbine fires natural gas as the primary fuel, and No. 2 distillate oil with a maximum sulfur content of 0.20 percent by weight as a limited auxiliary fuel. The combustion turbine is a GE Model PG7111 (EA) Frame 7 unit equipped with water injection to reduce nitrogen oxides emissions. The HRSG powers an existing steam turbine. The emissions unit can exhaust through the HRSG or through a by-pass stack. Turbine #8 began commercial service in July, 1992.

{Permitting note(s): The emissions unit is regulated under Acid Rain, Phase II; NSPS - 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines; adopted and incorporated by reference in Rule 62-204.800(7), F.A.C.; Prevention of Significant Deterioration (PSD) in Rule 62-212.400, F.A.C.; and Best Available Control Technology (BACT), dated July 26, 1991, in Rule 62-212.410, F.A.C.}

The following conditions apply to the emissions unit(s) listed above:

Essential Potential to Emit (PTE) Parameters

D.1. Permitted Capacity. The maximum process/operation rate, at an inlet temperature of 25 degrees F, is 1055 MMBtu per hour (lower heating value) heat input firing natural gas or 1040 MMBtu per hour (lower heating value) heat input firing No. 2 distillate oil.
[Rules 62-4.160(2) and 62-210.200(PTE), F.A.C.]

D.2. Methods of Operation. Fuels.

- This emissions unit fires natural gas as the primary fuel and No. 2 distillate oil as the secondary fuel.
 - The consumption of No. 2 distillate oil shall not exceed 8,190 gallons per hour and 23,914,800 gallons per year.
 - The maximum annual firing of No. 2 distillate oil shall not exceed 1/3 of the annual capacity factor.
 - The maximum sulfur content of the No. 2 distillate oil shall not exceed 0.20 percent by weight.
- [Rules 62-210.200(PTE), 62-212.400, and 62-212.410, F.A.C.; and, PSD-FL-166]

D.3. Hours of Operation. This emissions unit may operate continuously, i.e., 8,760 hours/year.
[Rule 62-210.200(PTE), F.A.C.]

Emission Limitations and Standards

{Permitting note: Table 1-1, Summary of Air Pollutant Standards and Terms, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

D.4. Nitrogen Oxides. The NO_x emissions shall not exceed 25 ppmv at 15 percent oxygen on a dry basis and 425 tons per year when firing natural gas.
[Rule 62-212.400(6), F.A.C.; and, PSD-FL-166]

D.5. Nitrogen Oxides. The NO_x emissions shall not exceed 42 ppmv at 15 percent oxygen on a dry basis and 244 tons per year when firing No. 2 distillate oil.
[Rule 62-212.400(6), F.A.C.; and, PSD-FL-166]

{Permitting note: Since the BACT limit established for nitrogen oxides is more stringent than the NSPS limit, compliance with the nitrogen oxides BACT limits of specific conditions D4. and D.5. is assumed to show compliance with the nitrogen oxides limit of 40 CFR 60.332.}

D.6. Sulfur Dioxide. The SO₂ emissions shall not exceed 8.6 tons per year when firing natural gas.
[Rule 62-212.400(6), F.A.C.; and, PSD-FL-166]

D.7. Sulfur Dioxide. The SO₂ emissions shall not exceed 307 tons per year when firing No. 2 distillate oil. The maximum sulfur content of the No. 2 distillate oil shall not exceed 0.20 percent by weight.
[Rule 62-212.400(6), F.A.C.; and, PSD-FL-166]

D.8. PM/PM₁₀. The PM/PM₁₀ emissions shall not exceed 0.006 pound per MMBtu heat input and 22 tons per year when firing natural gas.
[Rule 62-212.400(6), F.A.C.; and, PSD-FL-166]

D.9. PM/PM₁₀. The PM/PM₁₀ emissions shall not exceed 0.025 pound per MMBtu heat input and 22 tons per year when firing No. 2 distillate oil.
[Rule 62-212.400(6), F.A.C.; and, PSD-FL-166]

D.10. Sulfuric Acid Mist. The sulfuric acid mist emissions shall not exceed 0.8 ton per year when firing natural gas.
[Rule 62-212.400(6), F.A.C.; and, PSD-FL-166]

D.11. Sulfuric Acid Mist. The sulfuric acid mist emissions shall not exceed 9.13 ton per year when firing No. 2 distillate oil. The maximum sulfur content of the No. 2 distillate oil shall not exceed 0.20 percent by weight.

[Rule 62-212.400(6), F.A.C.; and, PSD-FL-166]

D.12. Visible Emissions. Visible emissions shall not exceed 10 percent opacity.

[Requested in initial Title V permit application dated June 14, 1996; and, AC 53-190437 and PSD-FL-166]

D.13. Volatile Organic Compounds. Volatile Organic Compounds emissions shall not exceed 9 tons per year when firing natural gas or 22 tons per year when firing oil.

[AC 53-190437 and PSD-FL-166]

D.14. Carbon Monoxide. Carbon Monoxide emissions shall not exceed 25 ppmv at 15 percent oxygen on a dry basis and 232 tons per year when firing natural gas or 79 tons per year when firing oil.

[AC 53-190437 and PSD-FL-166]

D.15. Mercury. Mercury emissions shall not exceed 3.0×10^{-6} pounds per million Btu heat input and 0.003 ton per year when firing oil.

[AC 53-190437 and PSD-FL-166]

D.16. Lead. Lead emissions shall not exceed 2.8×10^{-5} pounds per million Btu heat input and 0.03 ton per year when firing oil.

[AC 53-190437 and PSD-FL-166]

D.17. Beryllium. Beryllium emissions shall not exceed 2.5×10^{-6} pounds per million Btu heat input and 0.003 ton per year when firing oil.

[AC 53-190437 and PSD-FL-166]

Excess Emissions

D.18. Excess emissions from this emissions unit resulting from startup, shutdown or malfunction shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration.

[Rule 62-210.700(1), F.A.C.]

D.19. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown or malfunction shall be prohibited.

[Rule 62-210.700(4), F.A.C.]

Monitoring of Operations

D.20. At all times, including periods of startup, shutdown and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

[40 CFR 60.11(d)]

D.21. The owner or operator of any stationary gas turbine subject to the provisions of 40 CFR 60, Subpart GG and using water injection to control NO_x emissions shall operate a continuous monitoring system to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine. This system shall be accurate to within ± 5.0 percent and shall be approved by the Administrator.

[40 CFR 60.334(a)]

D.22. The owner or operator of any stationary gas turbine subject to the provisions of 40 CFR 60, Subpart GG shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:

(1) If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source.

(2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners, operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with 40 CFR 60.334(b).

[40 CFR 60.334(b)(1) & (2)]

{Permitting note: No. 2 distillate oil is only supplied with intermediate bulk storage; and, a custom fuel schedule has been established for natural gas.}

D.23. This emissions unit is also subject to the conditions contained in **Subsection E. Common Conditions.**

D.24. The permittee shall monitor sulfur content and nitrogen content of natural gas fired in the turbine as follows:

Custom Fuel Monitoring Schedule for Natural Gas

1. Monitoring of fuel nitrogen content shall not be required when firing natural gas.
2. Sulfur Monitoring:
 - a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the EPA approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are ASTM D1072-90(94)E-1; ASTM D3031-81(86); ASTM D3246-92; and ASTM D4084-94 as referenced in 40 CFR 60.335(b)(2).
 - b. Sulfur monitoring shall be conducted once per quarter for six quarters, beginning on July 1, 1996.
 - c. If the sulfur monitoring required for natural gas by 2(b) above shows little variability and the calculated sulfur dioxide emissions represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis shall be conducted twice per year. This monitoring shall be conducted during the first and third quarters of each calendar year.
 - d. Should any sulfur analysis as required by items 2(b) or 2(c) above indicate noncompliance with 40 CFR 60.333 the City will notify the Department of Environmental Protection of such excess emission and the customized fuel monitoring schedule shall be re-examined.
3. The City will notify the Department of Environmental Protection of any change in natural gas supply for reexamination of this monitoring schedule. A substantial change in natural gas quality (i.e., sulfur content varying greater than 10 grains/1000 cf gas) shall be considered as a change in natural gas supply. Sulfur content of the natural gas will be monitored weekly during the interim period when this monitoring schedule is being reexamined.
4. Records of sampling analysis and natural gas supply pertinent to this monitoring schedule shall be retained by the City for a period of five (5) years, and shall be available for inspection by appropriate regulatory personnel.
5. The City will obtain the sulfur content of the natural gas from Florida Gas Transmission Company. [40 CFR 60.334(b)(2); Rule 62-213.400, F.A.C.; and, AC 53-190437 and PSD-FL-166]

Test Methods and Procedures

{Permitting note: Table 2-1, Summary of Compliance Requirements, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

D.25. To compute the nitrogen oxides emissions, the owner or operator shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the Department to determine the nitrogen content of the fuel being fired.

[40 CFR 60.335(a)]

D.26. When determining compliance with 40 CFR 60.332, Subpart GG - Standards of Performance for Stationary Gas Turbines, the monitoring device of 60.334(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with the permitted NO_x standard at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

[40 CFR 60.335(c)(2)]

D.27. The owner or operator shall determine compliance with the nitrogen oxides and sulfur dioxide standards in 40 CFR 60.332 as follows:

c. U.S. EPA Method 20 (40 CFR 60, Appendix A) shall be used to determine the nitrogen oxides, sulfur dioxide, and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NO_x emissions shall be determined at each of the load conditions specified in 40 CFR 60.335(c)(2).

[40 CFR 60.335(c)(3)]

D.28. Initial compliance with the nitrogen oxides limit pursuant to 40 CFR 60.8 was conducted August 3-7, 1992. For annual compliance purposes, compliance with the nitrogen oxides limits of specific conditions **D.4.** and **D.5.** will be determined using EPA Method 20 and testing at capacity as defined by specific condition **D.36.** Correction to ISO conditions is not required for these annual compliance tests.

[Rule 62-297.310, F.A.C.]

D.29. The owner or operator shall determine compliance with the sulfur content standard of 0.20 percent, by weight, as follows: ASTM D 2880-96 shall be used to determine the sulfur content of liquid fuels and ASTM D 1072-90(94)E-1, D 3031-81(86), D 4084-94, or D 3246-92 shall be used for the sulfur content of gaseous fuels (incorporated by reference-see 40 CFR 60.17). The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Administrator.

[40 CFR 60.335(d)]

D.30. To meet the requirements of 40 CFR 60.334(b), the owner or operator shall use the methods specified in 40 CFR 60.335 (a) and 40 CFR 60.335(d) of 40 CFR 60.335 to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency. [40 CFR 60.335(e)]

D.31. PM/PM₁₀. The test methods for PM/PM₁₀ emissions when firing oil shall be EPA Methods 5, 5B or 17, incorporated by reference in Chapter 62-297, F.A.C. The opacity emissions test may be used unless 10% opacity is exceeded.
[Rules 62-213.440, 62-297.310, and 62-297.401, F.A.C.; and, PSD-FL-166]

D.32. Sulfuric Acid Mist. Compliance with the sulfuric acid mist standard shall be demonstrated by using natural gas or 0.2 percent sulfur, by weight, No. 2 distillate oil.
[Rules 62-213.440, 62-297.310, and 62-297.401, F.A.C.; and, PSD-FL-166]

D.33. Visible Emissions. The test method for visible emissions shall be EPA Method 9, incorporated by reference in Chapter 62-297, F.A.C.
[Rules 62-213.440, 62-297.310, and 62-297.401, F.A.C.; and, PSD-FL-166]

D.34. Volatile Organic Compounds. Carbon Monoxide. Mercury. Lead and Beryllium. The initial compliance test requirement for these pollutants has been satisfied and no further tests are required.
[AC 53-190437 and PSD-FL-166]

D.35. Frequency of Compliance Tests. General Compliance Testing. Any combustion turbine that does not operate for more than 400 hours per year shall conduct a visible emissions compliance test once per each five-year period, coinciding with the term of its air operation permit.
[Rule 62-297.310(7)(a)8., F.A.C.]

D.36. Operating Rate During Testing. Not federally enforceable. Testing of emissions shall be conducted with the source operating at capacity. Capacity is defined as 95-100 percent of the manufacturer's rated heat input achievable for the average ambient (or conditioned) air temperature during the test. If it is impracticable to test at capacity, then sources may be tested at less than capacity. In such cases, the entire heat input vs. inlet temperature curve will be adjusted by the increment equal to the difference between the design heat input value and 105 percent of the value reached during the test. Data, curves, and calculations necessary to demonstrate the heat input rate correction at both design and test conditions shall be submitted to the Department with the compliance test report. When testing shows that NO_x emissions exceed the standard when operating at capacity, the permittee shall recalibrate the NO_x emission control system using emission testing at four loads as required in Subpart GG.
[Requested in a letter dated February 7, 1997.]

D.37. This emissions unit is also subject to the conditions contained in **Subsection E. Common Conditions**.

Record Keeping and Reporting Requirements

D.38. For the purpose of reports required under 40 CFR 60.7(c), periods of excess emissions that shall be reported are defined as follows:

a. *Nitrogen oxides.* Any one-hour period during which the average water-to-fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with the permitted nitrogen oxide standard by the initial performance test required in 40 CFR 60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the initial performance test. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under 40 CFR 60.335(a).

[Rule 62-296.800, F.A.C.; and, 40 CFR 60.334(c)(1)]

D.39. The owner or operator required to install a continuous monitoring system (CMS) or monitoring device shall submit an excess emissions and monitoring systems performance report (excess emissions are defined in applicable subparts) and/or a summary report form [see 40 CFR 60.7(d)] to the Administrator semiannually, except when: more frequent reporting is specifically required by an applicable subpart; or, the CMS data are to be used directly for compliance determination, in which case quarterly reports shall be submitted; or, the Administrator, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. All reports shall be postmarked by the 30th day following the end of each calendar half (or quarter, as appropriate).

Written reports of excess emissions shall include the following information:

- (1) The magnitude of excess emissions computed in accordance with 40 CFR 60.13(h), any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions. The process operating time during the reporting period.
- (2) Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventative measures adopted.
- (3) The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.
- (4) When no excess emissions have occurred or the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be stated in the report.

[40 CFR 60.7(c)(1), (2), (3), & (4)]

D.40. The summary report form shall contain the information and be in the format shown in Figure 1 (attached) unless otherwise specified by the Administrator. One summary report form shall be submitted for each pollutant monitored at each affected facility.

(1) If the total duration of excess emissions for the reporting period is less than 1 percent of the total operating time for the reporting period and CMS downtime for the reporting period is less than 5 percent of the total operating time for the reporting period, only the summary report form shall be submitted and the excess emission report described in 40 CFR 60.7(c) need not be submitted unless requested by the Administrator.

(2) If the total duration of excess emissions for the reporting period is 1 percent or greater of the total operating time for the reporting period or the total CMS downtime for the reporting period is 5 percent or greater of the total operating time for the reporting period, the summary report form and the excess emission report described in 40 CFR 60.7(c) shall both be submitted.

[40 CFR 60.7(d)(1) & (2)]

D.41. This emissions unit is also subject to the conditions contained in Subsection E. Common Conditions.

Miscellaneous Requirements.

D.42. Unless the Department has determined that other ambient concentrations are required to protect the public health and safety, predicted ambient air concentrations (AAC) shall not exceed the following levels for the pollutants shown:

Pollutant	Florida Air Reference Concentrations (ug/cubic meter)		
	8 hr. avg.	24 hr. avg.	Annual avg.
Beryllium	0.02	0.005	0.0004
Lead	1.5	0.36	0.09
Inorganic mercury compounds, all forms of vapor, as Hg	---	---	0.3

[AC 53-190437 and PSD-FL-166]

D.43. Definitions. For the purposes of Rule 62-204.800(7), F.A.C., the definitions contained in the various provisions of 40 CFR 60, shall apply except that the term "Administrator" when used in 40 CFR 60, shall mean the Secretary or the Secretary's designee.

[40 CFR 60.2; and, Rule 62-204.800(7)(a), F.A.C.]

D.44. Circumvention. No owner or operator subject to the provisions of 40 CFR 60 shall build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere.
[40 CFR 60.12]