Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

NOTICE OF PERMIT AMENDMENT

CERTIFIED MAIL

February 1, 1996

Mr. Charles D. Garing, Manager
Charles Larsen Power Plant
City of Lakeland
Department of Electric & Water
501 East Lemon Street
Lakeland, FL 33801-5050

RECEIVED
FEB 20 1996
BUREAU OF
AIR REGULATION

Dear Mr. Garing:

Re: Polk County - Air Permit
DEP File No. 1050003-002-AO
Permit AO53-219296
(Larsen Unit No. 8)

Enclosed is an amendment to AO53-219296, for the combined-cycle combustion turbine designated Charles Larsen Power Plant Unit No. 8, located at 2002 E. U.S. Hwy 92, Lakeland, Polk County. The Department, pursuant to Florida Administrative Code Rule 62-4.070, hereby amends the permit as follows:

CHANGE SPECIFIC CONDITION NO. 5 FROM:

5. The maximum allowable emissions from this source shall not exceed the emission rates shown in the table below:

Pollutant	Standards		Tons/year	
	Natural Gas	No. 2 Oil	Gas	Oil
NOx	25 ppm (a)	42 ppm (a)	425	244
SO2	-	-	2.6	307
PM/PM10	0.006 lb/MMBtu	0.025 lb/MMBtu	22	22
VOC	-	-	9	6.7
CO	-	-	232	79
Mercury(Hg)	-	0.000003 (b)	-	0.003
Lead (Pb)	-	0.000028 (b)	-	0.03
Beryllium	-	0.0000025 (b)	-	0.003
S.Acid Mist	-	-	-	0.0032

Printed on recycled paper.

Specific Condition No. 5 - continued:

Notes: (a) @ 15% oxygen on a dry basis (b) lbs/MMBtu
[Const. Permit No. AC53-190437 and BACT Determination of 7/26/91].

CHANGE SPECIFIC CONDITION NO. 5 TO:

5. The maximum allowable emissions from this source shall not exceed the emission rates shown in the table below:

Pollutant	Standards		Tons/year	
	Natural Gas	No. 2 Oil	Gas	Oil
NOx	25 ppm (a)	42 ppm (a)	425	244
SO2	-	-	8.6	307
PM/PM10	0.006 lb/MMBtu	0.025 lb/MMBtu	22	22
VOC	-	-	9	6.7
CO	-	-	232	79
Mercury(Hg)	-	0.000003 (b)	-	0.003
Lead (Pb)	-	0.000028 (b)	-	0.03
Beryllium	-	0.0000025 (b)	-	0.003
S.Acid Mist	-	-	0.8	9.13

Notes: (a) @ 15% oxygen on a dry basis (b) lbs/MMBtu

[Const. Permit No. AC53-190437, BACT Determination of 7/26/91, and amendment request dated October 19, 1995].

CHANGE SPECIFIC CONDITION NO. 13 FROM:

13. Test the gas turbine exhaust stack for emissions of the following annually on or during the 60 day period prior to August 6. Copies of the test data shall be submitted to the Air Program of the SW District Office of the Department within 45 days of such testing:

(X) Visible Emissions (VE) (See also Specific Condition No. 21)
(this also serves as demonstration of compliance with the particulate emission limit)
(X) Nitrogen Oxides (NOx)

[Construction Permit No. AC53-190437 and Rules 17-297.340 and 17-297.570, F.A.C.].

CHANGE SPECIFIC CONDITION NO. 13 TO:

13. Test the gas turbine exhaust stack for emissions of the following annually on or during the 60 day period prior to **December 31st. The initial compliance test using this new anniversary date shall be conducted beginning in 1996.** Copies of the test data shall be submitted to the Air Program of the SW District Office of the Department within 45 days of such testing:

(X) Visible Emissions (VE) (See also Specific Condition No. 21) (this also serves as demonstration of compliance with the particulate emission limit)
(X) Nitrogen Oxides (NOx)

[Rules 62-297.340 and 62-297.570, F.A.C.].

CHANGE SPECIFIC CONDITION NO. 19 FROM:

19. For purposes of documenting compliance with the NOx limitation of Specific Condition No. 5 based on the results of the Method 20 stack test results, the NOx emission rate shall be computed for each run in accordance with 40 CFR 60.335(c)(1) (or 60.335(f)(1) if appropriate approvals are obtained).
[Rule 17-296.800, F.A.C., and 40 CFR 60.335].

CHANGE SPECIFIC CONDITION NO. 19 TO:

19. For purposes of documenting compliance with the NOx limitation of Specific Condition No. 5 based on the results of the Method 20 stack test results, the NOx emission rate shall be computed for each run in accordance with the requirements of the Method. ISO correction is not required.
[Rule 62-296.800, F.A.C., 40 CFR 60.335, and H. Rhodes memorandum dated November 22, 1995].

A person whose substantial interests are affected by this permit amendment may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of receipt of these Permits. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in these permits. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This Permit Amendment is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 62-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this Permit Amendment will not be effective until further Order of the Department.

When the Order (Permit Amendment) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate procedure, with the Clerk of the

Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; 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 days from the date the Final Order is filed with the Clerk of the Department.

This Permit Amendment replaces the amendment dated January 18, 1996. This letter must be attached to and becomes a part of Permit No. AO53-219296. If you should have any questions, please call Bill Schroeder of my staff at (813)744-6100 extension 104.

Executed in Tampa, Florida.

Sincerely,

W. C. Thomas, P.E.
District Air Program Administrator

WCT/WES

cc: Farzie Shelton, City of Lakeland
Martin Costello, DARM

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT AMENDMENT and all copies were mailed by certified mail before the close of business on FEB 13 1996 to the listed persons.

Clerk Stamp

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

Marilyn Quispe (Clerk) FEB 13 1996 (Date)

FLORIDA

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

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 SO_2 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

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:

SO_2..... 2.6 (tpy on gas)

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

TO:

SO_2..... 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

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.

Clerk 12-22-95
Date

Copies to be furnished to:

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

Florida Department of
Environmental Protection

Memorandum

TO: C. H. Fancy

FROM: A. A. Linero m.c. for A. Linero

DATE: December 18, 1995

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

Attached for your review and approval is a permit amendment which:

Adds a customized fuel monitoring schedule
Changes the permit limits for SO_2 and H_2SO_4
Removes the ISO correction from the NO_x standard established under BACT

This amendment has been published and no comments were received.

If you have any questions, Martin Costello and I will be glad to discuss the details.

AAL/mc/t

RETURN ADDRESS completed on the reverse

... additional services.

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

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

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

Consult postmaster for fee.

3. Article Addressed to:

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

4a. Article Number
Z 127 633 230

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

7. Date of Delivery
0108 12/24/95

5. Sign

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

Thank you for using Return Receipt Service.

PSD-FI-166A

Z 127 633 230

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Farzie Shelton	
Street and No. City of Lakeland	
P.O., State and ZIP Code Lakeland, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 12-22-95 PSD-FI-166 AC53-190437	

PS Form 3800, March 1993

HOPPING GREEN SAMS & SMITH
PROFESSIONAL ASSOCIATION
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551
FAX (904) 425-3415

JAMES S. ALVES
BRIAN H. BIBEAU
KATHLEEN BLIZZARD
ELIZABETH C. BOWMAN
RICHARD S. BRIGHTMAN
PETER C. CUNNINGHAM
RALPH A. DEMEO
THOMAS M. DEROSE
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KAREN M. PETERSON
MICHAEL P. PETROVICH
LISA K. RUSHTON
R. SCOTT RUTH
JULIE R. STEINMEYER
T. KENT WETHERELL, II

OF COUNSEL
CARLOS ALVAREZ
W. ROBERT FOKES

Writer's Direct Dial No.
(904) 425-2258

RECEIVED
DEC 5 1995
BUREAU OF
AIR REGULATION

December 4, 1995

BY HAND DELIVERY

Kenneth Plante, Esquire
Office of the General Counsel
Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee FL 32399-2400

RE: City of Lakeland; Larsen Power Plant, Unit No. 8
Notice of Permit Amendment
Permit No. AO53-219296
Polk County, Florida
OGC Case No. 95-2411

Dear Mr. Plante:

On September 25, 1995, the City of Lakeland, Department of Electric & Water Utilities ("Lakeland") received the above-referenced Notice of Permit Amendment for its Larsen Power Plant, Unit No. 8, located in Polk County, Florida. The Notice of Permit Amendment was signed by William C. Thomas, P.E., Air Program Administrator, Southwest District Office, Department of Environmental Protection. Pursuant to Rule 62-103.155(3)(a), Florida Administrative Code, (F.A.C.), and Order of the Department dated October 17, 1995, Lakeland has until December 9, 1995, to file a petition for administrative proceedings regarding the Notice of Permit Amendment.

On behalf of Lakeland, I hereby request, pursuant to Rule 62-103.070, F.A.C., an extension to and including February 9, 1996, in which to file a petition for administrative proceedings regarding the Notice of Permit Amendment. As good cause for granting the request for extension of time for filing, Lakeland states the following:

1. The Permit Amendment contains provisions which appear to warrant clarification or correction.

2. Lakeland representatives have correspondence with the Southwest District air staff regarding these provisions, and at least one of the issues should be resolved when the proposed construction permit amendment is finalized by the Department's Tallahassee office.

3. This request is filed simply as a protective measure to avoid waiver of Lakeland's right to challenge the Permit Amendment. Granting of this request will not prejudice either party, but will further their mutual interests and likely avoid the need to initiate formal administrative proceedings.

4. I hereby certify that I have attempted without success to contact W. Douglas Beason of the Department's Office of General Counsel regarding this request to determine whether he has an objection to the extension of time.

Accordingly, I hereby request that you formally extend the time for filing of a petition for administrative proceedings in regards to the Notice of Permit Amendment for Permit No. AO53-219296 to and including February 9, 1996.

Sincerely,

Angela R. Morrison

cc: W. Douglas Beason, Esquire, DEP
Clair Fancy, BAR, DEP
Martin Costello, BAR, DEP
William D. Thomas, DEP SW District
William E. Schroeder, DEP SW District
Farzie Shelton, City of Lakeland

LAKELAND
ELECTRIC & WATER

(813) 499-6603

Excellence Is Our Goal, Service Is Our Job

Farzie Shelton
ENVIRONMENTAL COORDINATOR, Ch E.

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

November 14, 1995

RECEIVED
NOV 28 1995
BUREAU OF
AIR REGULATION

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

Dear Mr. Fancy:

Re: Amendment of PSD-FL-166/AC53-190437
City of Lakeland, Larson Power Plant Unit 8

We are in receipt of your communication dated September 21, and October 31, 1995 and attached Proposed Permit Amendment, Intent to Issue, Public Notice of Intent to Issue Permit Amendment for the above referenced facility.

Pursuant to Section 403.815, Florida Statutes and DEP Rule 62-103.150, F.A.C., on November 10, 1995 we published the "Notice of Intent to Issue Permit Amendment". Therefore, enclosed please find Affidavit of Publication confirming publication of the Department's notice.

If you should have any questions, please do not hesitate to contact me at (941) 499-6603.

Sincerely

Farzie Shelton
Environmental Division

Enclosure

BEST AVAILABLE COPY

AFFIDAVIT OF PUBLICATION

THE LEDGER
Lakeland, Polk County, Florida

e No .....

'E OF FLORIDA)
NTY OF POLK)

Before the undersigned authority personally appeared Nelson Kirkland, who on oath says that he is Classified Advertising Manager of The Ledger, a daily newspaper published at Lakeland in Polk County, Florida: that the attached copy of advertisement, being a

Notice of Intent

.....

natter of .....

To Issue Permit

.....

.....

.....

was published in said newspaper in the issues of .....

November 10;

1995

Affiant further says that said The Ledger is a newspaper published at Lakeland, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, daily, and has been entered as second class matter at the post office in Lakeland, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement or publication in the said newspaper.

Signed .....
Nelson Kirkland
Classified Advertising Manager

by Nelson Kirkland who is personally known to me

Sworn to and subscribed before me this 10th

day of November A.D. 19 95

(Seal) Barbara L. Dunlap
Notary Public

Commission Expires 10-25-99

City of Lakeland

BARBARA L. DUNLAP
MY COMMISSION # CC 505659
EXPIRES: October 25, 1999
Bonded Thru Notary Public Underwriters

F 507

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF INTENT TO ISSUE PERMIT AMENDMENT
PSD-FL-166/AC53-190437

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit amendment to the City of Lakeland, Department of Electric and Water Utilities, 501 East Lemon Street, Lakeland, Florida 33801-5050. The amendment is of certain specific conditions related to fuel monitoring, sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4) emissions, and nitrogen oxides (NO_x) reporting applicable to the Charles Larson Power Plant Unit No. 8.

The U.S. Environmental Protection Agency reviewed and concurred with the customized fuel monitoring schedule. The changes in SO_2 and H_2SO_4 limits are actually corrections and are not significant. The Department will remove the requirement in the PSD/air construction permit to correct compliance test data to ISO conditions for comparison with the NO_x emission limit of 25 ppm (firing natural gas) provided there will not be an increase in either lb/hr or tons/yr of NO_x emission rates. The applicant is required to submit an analysis of continuous emission monitoring data which shows that this action will not cause reductions in the water injection with corresponding increases in NO_x emissions. Therefore, this change will not cause or contribute to a violation of any air pollution ambient air standard or adversely affect the environment.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes (F.S.). The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information; (a) The name address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number, and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and, (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application/request have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, Florida Administrative Code.

The application file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environment Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Department of Environmental Protection
Southwest District
8407 Laurel Fair Circle
Tampa, Florida 33619

Polk County Natural Resources Division
4189 Ben Durrance Road
Bartow, Florida 33830

Any person may send written comments on the proposed action to Administrator, New Source Review, at the Department's Tallahassee address. All comments received within 30 days of the publication of this notice will be considered in the Department's final determination.

F-507 - 11-10; 1995

Mailed 11/14 -
w/ Invoice
Rec Stamp

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

November 16, 1995

CERTIFIED MAIL
Mr. Charles D. Garing, Manager
Charles Larsen Power Plant
City of Lakeland
Department of Electric & Water
Utilities
501 East Lemon Street
Lakeland, FL 33801-5050

Dear Mr. Garing:

Re: Polk County - Air Permit
DEP File No. 1050003-008-002AO
Revisions to Larsen Unit 8
PSD-FL-166; AC53-190437; AO53-219296

On October 23, 1995, the Department received your request for amendments to the above permits covering Larsen Unit No. 8, located in Lakeland, Polk County. In order to continue processing the application, the Department will need the following additional information pursuant to Rule 62-4.070(1), F.A.C.:

1. All compliance test reports in our files indicate that testing of Larsen Unit 8 was conducted in the summer months only. Please provide reasonable assurance that the combustion turbine will meet NOx emissions standards under less favorable conditions (i.e. winter months) when emissions are adjusted only to 15% excess oxygen.

2. Please note that the Southwest District will also consider the application for amendments to Permits AC53-190437 and AO53-219296 incomplete until approval of amendments to Permit PSD-FL-166.

Rule 62-4.050 F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. **As a result, your response to items above should be certified by a professional engineer just as the original application was.**

"NOTICE: Pursuant to the provisions of Section 120.60, F.S. and Chapter 62-12.070(5), F.A.C., if the Department does not

DEP ROUTING AND TRANSMITTAL SLIP

TO: (NAME, OFFICE, LOCATION)

1. Martin Costello
2. ARM - Tallahassee
3. MS 5505
4. DEP
5.

PLEASE PREPARE REPLY FOR:

_____ SECRETARY'S SIGNATURE

_____ DIV/DIST DIR SIGNATURE

_____ MY SIGNATURE

_____ YOUR SIGNATURE

_____ DUE DATE _____

ACTION/DISPOSITION

_____ DISCUSS WITH ME

_____ COMMENTS/ADVISE

_____ REVIEW AND RETURN

_____ SET UP MEETING

_____ FOR YOUR INFORMATION

_____ HANDLE APPROPRIATELY

_____ INITIAL AND FORWARD

_____ SHARE WITH STAFF

_____ FOR YOUR FILES

COMMENTS:

RECEIVED
NOV 20 1995
BUREAU OF
AIR REGULATION

FROM: W. Schroeder DATE: NOV 17 1995 PHONE: SC 542-6100 Ext. 104

DEP 15-026 (12/93)

receive a response to this request for information within 90 days of the date of this letter. If the response will require longer than 90 days to develop, an application for new construction should be withdrawn and resubmitted when completed information is available. Or for operating permits, you should develop a specific time table for the submission of the requested information for Department review and consideration. Failure to comply with a time table accepted by the Department will be grounds for the Department to issue a Final Order of Denial for lack of timely response. A denial for lack of information or response will be unbiased as to the merits of the application. The applicant can reapply as soon as the requested information is available."

If you should have any questions, please call me at (813)744-6100 X104.

Sincerely,

William E. Schroeder

William E. Schroeder
Air Permitting Engineer

WES/ws

cc: Martin Costello, DARM
Ms. Farzie Shelton, City of Lakeland

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

October 31, 1995

Ms. Farzie Shelton
Environmental Coordinator
Department of Electric and
Water Utilities
501 East Lemon Street
Lakeland, FL 32801-5050

Dear Ms. Shelton:

The Department has reviewed your letter dated October 13, 1995 which included a request to change the public notice for the permit amendment on Larson Unit 8. Your letter requested to omit the language allowing a 30 day period in which to request a public hearing. The Department hereby grants your request. Please omit the last sentence on the public notice prior to publication.

If you have any questions or comments please contact Al Linero, Administrator for the New Source Review Section, or myself at (904) 488-1344.

Sincerely,

Martin Costello

Martin Costello, P.E.
Bureau of Air Regulation

cc: Angela Morrison, HGSS

LAKELAND
ELECTRIC & WATER

(813) 499-6603

Excellence Is Our Goal, Service Is Our Job

Farzie Shelton
ENVIRONMENTAL COORDINATOR, Ch E.

District letter

October 19, 1995

RECEIVED
OCT 20 1995
BUREAU OF
AIR REGULATION

William C. Thomas, P.E.
District Air Program Administrator
Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa FL 33619-8318

RE: Charles Larsen Power Plant Unit No. 8--Combined Cycle Gas Turbine System Permits Nos. PSD-FL-166; AC53-190437; AO53-219296; Sulfur Dioxide/Sulfuric Acid Mist Limits and Nitrogen Oxides Compliance Testing

Dear Mr. Thomas:

The City of Lakeland submitted to the Department a request for revision of the above-referenced permits and for approval of a customized fuel monitoring schedule on June 27, 1995. Subsequently, the Southwest District Office issued a Notice of [Operation] Permit Amendment on September 22, 1995, which was received by the City on September 25, 1995. In addition, the Department's Tallahassee office issued a Notice of Intent to Issue a Proposed [PSD/Construction] Permit Amendment on September 21, 1995, which was also received by the City on September 25, 1995.

In reviewing the Permit Amendment sent to us by your office, the City has noted two provisions which should be corrected or revised. An outline of those issues, along with a discussion and the City's justification for revision, follows. A separate letter was sent to the Department's Tallahassee office regarding its Proposed Permit Amendment, and a copy of that letter is attached for your information.

1. *Annual Sulfur Dioxide and Sulfuric Acid Mist Limits*--While the annual sulfur dioxide emission limits have been corrected, one incorrect sulfuric acid mist limit remains. The City again respectfully requests that the correct sulfuric acid mist limit for natural gas of 0.8 tons per year be included in a revised permit amendment. All of the other corrections were made, as requested, except for this apparent inadvertent omission. As stated in the City's earlier submittal, the incorrect limits for sulfuric acid mist emissions, for both oil and gas, were included in the PSD/construction permit, apparently as a typographical error. These incorrect limits were later transferred to the operation permit. The Department's Tallahassee office has corrected the limits in the PSD/construction permit, and the Permit Amendment issued by your office corrected the oil limit. The natural gas limit, however, remains incorrect. The City therefore respectfully requests that your office correct the natural gas limit for sulfuric acid mist to 0.8 tons per year.

2. *Correction of Nitrogen Oxides Emissions to ISO Conditions*--Consistent with the Proposed Permit Amendment to the PSD/construction permit for Unit 8, the operation permit should not include a requirement to correct annual nitrogen oxides compliance test data to ISO conditions for comparison with the nitrogen oxides emission limits. Specifically, Condition No. 19 should be deleted in its entirety. New Source Performance Standard (NSPS) references included in Condition No. 19 and the corresponding requirement to correct test data to ISO conditions are appropriate *only* for initial performance testing for determining compliance with the NSPS emission limits. As noted in the City's earlier submittal, the NSPS limits are higher than the permitted "Best Available Control Technology" limits in the City's current permit. It is inappropriate to require correction of nitrogen oxides test data to ISO conditions for any purpose other than to demonstrate compliance with the NSPS limits, and any references to the NSPS provisions requiring such correction would be inappropriate for the operation permit. The PSD/construction permit is being revised to delete any requirement to correct data to ISO conditions, and the City respectfully request that the District Office also delete any such requirement in the operation permit.

Thank you again for your response to the City's June 27 request for permit revision, and for your consideration of our comments above. We would like to see these issues amicably resolved and a final permit amendment issued as quickly as possible. If you or your staff have any questions regarding these issues, please call me at (941) 499-6603.

Sincerely,

Farzie Shelton

Farzie Shelton
Environmental Coordinator
Department of Electric and Water Utilities

cc: Martin Costello, DEP Tallahassee
David McNeal, Region IV, EPA
Angela Morrison, HGSS

LAKELAND
ELECTRIC & WATER

Excellence Is Our Goal, Service Is Our Job

(813) 499-6603

Farzie Shelton
ENVIRONMENTAL COORDINATOR, Ch E.

October 13, 1995

RECEIVED
OCT 13 1995
BUREAU OF
AIR REGULATION

VIA HAND DELIVERY

Clair H. Fancy, Chief
Bureau of Air Regulation
Department of Environmental Protection
Magnolia Park Courtyard
Tallahassee, FL 32399

RE: Charles Larsen Power Plant Unit No. 8--Combined Cycle Gas Turbine System
Permit Nos. PSD-FL-166; AC53-190437; AO53-219296; Customized Fuel
Monitoring Schedule and Sulfur Dioxide/Sulfuric Acid Mist Limits

Dear Clair:

The City of Lakeland submitted to the Department a request for revision of the above-referenced permits and for approval of a customized fuel monitoring schedule on June 27, 1995. Subsequently, the Department issued a Notice of Intent to Issue a Proposed Permit Amendment on September 21, 1995, which was received by the City on September 25, 1995. In addition, the Southwest District Office issued a Notice of Permit Amendment on September 22, 1995, which was also received by the City on September 25, 1995.

In reviewing the Proposed Permit Amendment sent to us by your office, the City has noted a few issues which it would like to see resolved in the final Permit Amendment. An outline of those issues, along with a discussion and the City's justification for revision, follows. A separate letter will be addressed to the Southwest District regarding the Notice of Permit Amendment it issued on September 22.

Notice of Intent to Issue--The Department's notice, which must be published in a newspaper within 30 days, includes language allowing any person to request a public hearing within 30 days of the notice. While the City understands that the 30-day period for public comments is required for emission units subject to Prevention of Significant Deterioration or Nonattainment-Area Preconstruction Review, this comment period is *not required* for revisions of such permits. The permit amendments being made are relatively minor and did not trigger PSD review. The 30-day public comment period and opportunity for hearing should therefore not apply. The City therefore respectfully requests that the language in the last paragraph of the second page of the notice be deleted and not included in the publication.

Annual Sulfur Dioxide and Sulfuric Acid Mist Limits--The "Table 1" attached to the Proposed Permit Amendment is inconsistent with the table attached to the original PSD permit. For example, the mercury, lead, and beryllium standards are located in the wrong column, the sulfuric acid mist limits are incorrect, and the footnote includes the incorrect capacity factor limitation. A copy of the correct "Table 1" is attached to this letter for use by the Department. In addition, a *revised* version of Table 1 is also attached that shows the changes being made as a result of the permit amendment.

Correction of Nitrogen Oxides Emissions to ISO Conditions--The Proposed Permit Amendment removes the requirement to correct test data to ISO conditions for comparison with the nitrogen oxides emission limit of 25 ppm *provided* there is no increase in either pound-per-hour or ton-per-year nitrogen oxide emission rates. The Proposed Amendment also requires the City to submit an analysis of emission changes, including continuous emissions monitoring data and associated water injection rates, for at least one month prior to and after the change.

First, the requirement to correct test data to ISO conditions should be deleted not only for comparison to the 25 ppm nitrogen oxides limit for natural gas firing but also the 42 ppm limit for oil firing. Second, as set forth in our June 27 letter to the Department, the City requested only that Specific Condition No. 13 be changed to clarify that a correction of nitrogen oxide test data to ISO ambient conditions would be required only when determining initial compliance with the New Source Performance Standard limits under Subpart GG (performance test). The annual compliance test data should *not* be adjusted to ISO conditions to determine compliance with the much lower "Best Available Control Technology" (BACT) limits of 25 ppm for gas and 42 ppm for oil. The emission limits of 25 ppm and 42 ppm were not changed, and the City was not proposing to make any physical or operational changes to Unit No. 8 as a result of not adjusting test data to ISO conditions. Neither the water injection rates nor the nitrogen oxide emissions from Unit No. 8 will change as a result of annual compliance test data not being adjusted to ISO conditions. Any fluctuations in nitrogen oxide emissions would be due to combustion conditions--*not* because test data will no longer be adjusted to ISO conditions. The City therefore respectfully requests that the final permit amendment simply clarify that test data will not need to be adjusted to ISO conditions for determining compliance with the 25 and 42 ppm nitrogen oxide emission limits. The requirement to submit an analysis of emission changes should not be required and the proposed condition containing such a requirement should be deleted.

Thank you again for your response to the City's June 27 request for permit revision, and for your consideration of our comments above. We would like to see these issues amicably

resolved and a final permit amendment issued as quickly as possible. If you or your staff have any questions regarding these issues, please call me at (941) 499-6603.

Sincerely,

Farzie Shelton /arm

Farzie Shelton
Environmental Coordinator
Department of Electric and Water Utilities

cc: Bill Thomas, FDEP Southwest District
David McNeal, Region IV, EPA
Angela Morrison, HGSS

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standards		Gas Turbine and HRSG[a] Tons Per Year		Basis
	Gas Firing	No. 2 Fuel Oil Firing	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)	-	3.0×10^{-6} lbs/MMBtu	—	.003	Est. by Appl.
Lead (Pb)	-	2.8×10^{-5} lbs/MMBtu	—	0.03	" "
Beryllium (be)	-	2.5×10^{-6} lbs/MMBtu	—	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	—	3.2×10^{-3}	BACT

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

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine
(Revised October 13, 1995)

Pollutant	Standards		Gas Turbine and HRSG[(a)] Tons Per Year		Basis
	Gas Firing	No. 2 Fuel Oil Firing	Gas	Oil	
NO_x	25 ppm at 15% oxygen on a dry basis	42 ppmb 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~~ 8.6	307	BACT
PM/PM_{10}	0.06 lb/mmBtu	0.025 lb/MMBtu	22	22	BACT
VOC	-	-	9	6.7	BACT
CO	-	-	232	79	BACT
Mercury (Hg)	-	3.0×10^{-6} lbs/MMBtu	-	.003	Est. by Appl.
Lead (Pb)	-	2.8×10^{-5} lbs/MMBtu	-	0.03	" "
Beryllium (be)	-	2.5×10^{-6} lbs/MMBtu	-	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	--- 0.8	~~3.2×10^{-3}~~ 9.13	BACT

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

HOPPING GREEN SAMS & SMITH
PROFESSIONAL ASSOCIATION
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551
FAX (904) 425-3415

JAMES S. ALVES
BRIAN H. BIBEAU
KATHLEEN BLIZZARD
ELIZABETH C. BOWMAN
RICHARD S. BRIGHTMAN
PETER C. CUNNINGHAM
RALPH A. DEMEO
THOMAS M. DEROSE
WILLIAM H. GREEN
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FRANK E. MATTHEWS
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JONATHAN T. JOHNSON
ROBERT A. MANNING
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GARY V. PERKO
KAREN M. PETERSON
MICHAEL P. PETROVICH
DOUGLAS S. ROBERTS
LISA M. RUSHTON
R. SCOTT RUTH
JULIE R. STEINMEYER

OF COUNSEL
CARLOS ALVAREZ
W. ROBERT FOKES

RECEIVED
OCT 6 1995
Bureau of Air Regulation

Writer's Direct Dial No.
(904) 425-2258

October 6, 1995

BY HAND DELIVERY

Kenneth Plante, Esquire
Office of the General Counsel
Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee FL 32399-2400

RE: City of Lakeland; Larsen Power Plant, Unit No. 8
Notice of Intent to Issue Proposed Amendment to
Permit No. PSD-FL-166/AC53-190437
Polk County, Florida

Dear Mr. Plante:

On September 25, 1995, the City of Lakeland, Department of Electric & Water Utilities ("Lakeland") received the above-referenced Notice of Intent to Issue a Proposed Amendment to the PSD/Construction Permit for its Larsen Power Plant,Unit No. 8, located in Polk County, Florida. The Notice of Intent to Issue was signed by C. H. Fancy, P.E., Chief of the Department's Bureau of Air Regulation. Pursuant to Rule 62-103.155(3)(a), Florida Administrative Code, (F.A.C.), Lakeland has until October 9, 1995, to file a petition for administrative proceedings regarding the Notice of Intent to Issue the Proposed Permit Amendment.

On behalf of Lakeland, I hereby request, pursuant to Rule 62-103.070, F.A.C., an extension to and including December 9, 1995, in which to file a petition for administrative proceedings regarding the Notice of Intent to Issue the Proposed Permit Amendment. As good cause for granting the request for extension of time for filing, Lakeland states the following:

1. The Proposed Permit Amendment contains several specific conditions which appear to warrant clarification or correction.

2. Lakeland representatives are in the process of discussing the pending issues with the Department's Bureau of Air Regulation staff.

3. This request is filed simply as a protective measure to avoid waiver of Lakeland's right to challenge the Proposed Permit Amendment. Granting of this request will not prejudice either party, but will further their mutual interests and likely avoid the need to initiate formal administrative proceedings.

4. I hereby certify that I have contacted W. Douglas Beason of the Department's Office of General Counsel regarding this request, and he has no objection to this request for extension of time.

Accordingly, I hereby request that you formally extend the time for filing of a petition for administrative proceedings in regards to the Notice of Intent to Issue a Proposed Amendment to Permit No. PSD-FL-166/AC53-190437, to and including December 9, 1995.

Sincerely,

Angela R. Morrison

Angela R. Morrison

cc: W. Douglas Beason, Esquire, DEP
Clair Fancy, BAR, DEP
Martin Costello, BAR, DEP
Farzie Shelton, City of Lakeland

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

SEP 22 1995

NOTICE OF PERMIT AMENDMENT

Refer to PSD-FL-166A

CERTIFIED MAIL

Ms. Farzie Shelton, Environmental Coordinator
City of Lakeland, Dept. of Electric and Water Utilities
501 East Lemon St.
Lakeland, FL 33801-5050

Dear Ms. Shelton:

Re: Larsen Unit 8 - Combined Cycle Gas Turbine
Air Pollution Permit No. AO53-219296
DEP Processing No. 273307

On June 29, 1995 the Department received your request to amend the above-referenced permit. The Department hereby amends the above listed permit as follows:

CHANGE VALUES IN THE TABLE IN SPECIFIC CONDITION 5 FROM:

Pollutant	Tons/year	
	Gas	Oil
SO_2	2.6	307
S. Acid Mist	-	0.0032

CHANGE VALUES IN THE TABLE IN SPECIFIC CONDITION 5 TO:

Pollutant	Tons/year	
	Gas	Oil
SO_2	8.6	307
S. Acid Mist	-	9.13

A person whose substantial interests are affected by this permit amendment may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of receipt of this permit amendment. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

Printed on recycled paper.

DEP ROUTING AND TRANSMITTAL SLIP

TO: (NAME, OFFICE, LOCATION)

1. Martin Costello
2. Tallahassee - DEP
3. MS 5505
4.
5.

PLEASE PREPARE REPLY FOR:

_____ SECRETARY'S SIGNATURE

_____ DIV/DIST DIR SIGNATURE

_____ MY SIGNATURE

_____ YOUR SIGNATURE

_____ DUE DATE _____

ACTION/DISPOSITION

_____ DISCUSS WITH ME

_____ COMMENTS/ADVISE

_____ REVIEW AND RETURN

_____ SET UP MEETING

_____ FOR YOUR INFORMATION

_____ HANDLE APPROPRIATELY

_____ INITIAL AND FORWARD

_____ SHARE WITH STAFF

_____ FOR YOUR FILES

COMMENTS:

RECEIVED
SEP 25 1995
Bureau of
Air Regulation

FROM: Jerry Kissel DATE: SEP 22 1995 PHONE: _____

DEP 15-026 (12/93)

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this permit amendment. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This permit amendment is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this permit amendment will not be effective until further Order of the Department.

When the Order (Permit Amendment) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; 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 days from the date the Final Order is filed with the Clerk of the Department.

This letter must be attached to and becomes a part of Permit No. AO53-219296. If you have any questions, please call Mr. Gerald Kissel of my staff at (813)744-6100 extension 107.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

William C. Thomas, P.E.
District Air Program Administrator

cc: M. Costello, DEP

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT AMENDMENT and all copies were mailed by certified mail before the close of business on SEP 22 1995 to the listed persons.

Clerk Stamp

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

(Clerk) SEP 22 1995 (Date)

c:\lakel995

Department of Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

September 21, 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

PSD-FL-166A

Dear Ms. Shelton:

Re: Amendment of PSD-FL-166/AC53-190437, Specific Conditions
City of Lakeland, Larson Power Plant Unit 8

Attached is one copy of the proposed permit amendment, Intent to Issue, Public Notice of Intent to Issue Permit Amendment (for publication by the City), and Preliminary Determination changing the Specific Conditions applicable to the Charles Larson Power Plant Unit No. 8.

Please submit any comments you may have concerning the Department's proposed action to Mr. A. A. Linero, P.E., Administrator, New Source Review Section, at the above address. If you have any questions, please call Mr. Martin Costello, P.E. or Mr. Linero at (904) 488-1344.

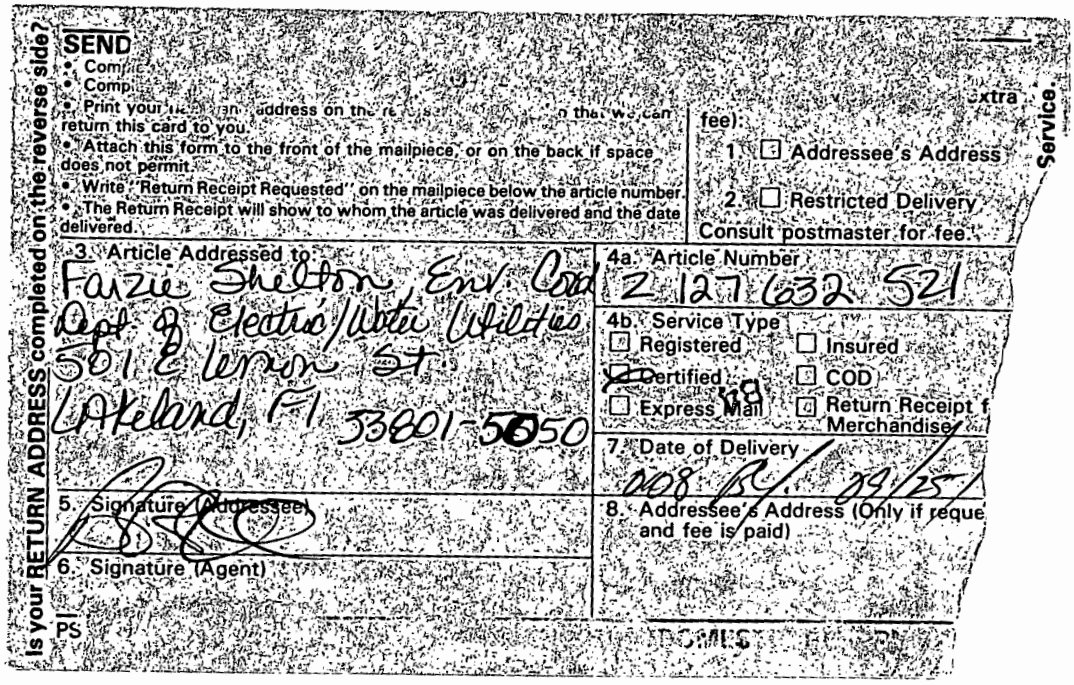
Sincerely,

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

CHF/mc/t

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

BEST AVAILABLE COPY



Is your RETURN ADDRESS completed on the reverse side?

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

...extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

Service.

3. Article Addressed to:
Farzie Shelton, Env. Coord
Dept of Electric/Water Utilities
501 E Lemon St
Lakeland, Fl 33801-5050

4a. Article Number
Z 127 632 521

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt f... Merchandise

7. Date of Delivery
2008 BC 09/25

5. Signature (Addressee)

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

6. Signature (Agent)

PS

Z 127 632 521

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

PSD-F1-166A

Sent to Farzie Shelton	
Street and No. City of Lakeland	
P.O., State and ZIP Code Dept of E & W Util	
Postage Lakeland, Fl	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 9-21-95 AC 53190437 PSD-F1-166 Unit 8	

PS Form 3800, March 1993

Technical Evaluation
and
Preliminary Determination

City of Lakeland
Department of Electric and Water Utilities
Polk County, Florida

Charles Larson Power Plant
Unit 8--Combustion Turbine

Department File No. PSD-FL-166/AC53-190437
Request to Amend Permit

Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation

September 21, 1995

On June 27, 1995 the Department received a request to amend construction permit No. AC53-190437 / PSD-FL-166. The request included the incorporation of a customized fuel monitoring schedule for the sulfur and nitrogen content of the natural gas fired in the turbine, corrections to the sulfur dioxide and sulfuric acid mist permit limits, and clarification of the nitrogen oxides compliance testing requirements (when the ISO correction should be applied).

Custom Fuel Monitoring Schedule

The proposed custom fuel monitoring schedule, as corrected by the applicant's letter dated August 10, 1995 (attached), will be included as an attachment to the construction permit. EPA has approved this fuel monitoring schedule. This fuel monitoring schedule supersedes AC53-190437 / PSD-FL-166 condition 17, which specifies records of daily sulfur and nitrogen content of the fuel and condition 23, which requires annual reports for nitrogen content of the fuel being fired, as these conditions apply to the firing of natural gas.

Increased Emission Limits for SO_2 and H_2SO_4

The Department acknowledges the applicant's oversight in neglecting the sulfur from mercaptans (which are added to the natural gas for safety reasons) in the estimate of annual SO_2 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 sulfur dioxide and sulfuric acid mist limits will be adjusted as requested.

Correction of NO_x Emissions to ISO Conditions

The Bureau of Air Regulation has evaluated the request to remove the requirement to correct the compliance test data to ISO conditions for comparison with the NO_x emission limit of 25 ppm @ 15 percent oxygen. The Department will grant this request provided there will not be an increase in either lb/hr or tons/yr of NO_x emission rates. If there is a NO_x emissions increase due to less water injection for NO_x control, then pursuant to Rule 62-212.400(2)(g) F.A.C.:

> (g) Relaxations of Restrictions on Pollutant Emitting Capacity. If a previously permitted facility or modification becomes a facility or modification which would be subject to the preconstruction review requirements of this section if it were a proposed new facility or modification solely by virtue of a relaxation in any federally enforceable limitation on the capacity of the facility or modification to emit a pollutant (such as a restriction on hours of operation), which limitation was established after August 7, 1980, then at the time of such relaxation the preconstruction review requirements of this section shall apply to the facility or modification as though

construction had not yet commenced on it.

For verification of emissions changes associated with removing the ISO correction from the permit, the City of Lakeland shall submit an analysis of emissions changes (lbs/hr and tpy), including continuous NO_x monitoring data and associated water injection rates for at least one month prior to and after the change, to the Bureau of Air Regulation. This report shall be submitted to the Bureau of Air Regulation within 13 months from issuance of this amendment.

It is the Department's determination that the proposed changes will not cause or contribute to violations of any ambient air quality standard or allowable increment. The Department intends to issue the permit amendment pending publication by the City of Lakeland of the Notice of Intent to Issue Permit Amendment and consideration of comments.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CERTIFIED MAIL

In the Matter of an
Application for Permit Amendment DEP File No. PSD-FL-166
AC53-190437
Polk County

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

INTENT TO ISSUE

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit amendment for the proposed changes as detailed in the application/request specified, above and the Department's Preliminary Determination (copy attached), for the reasons stated in the application/request.

The applicant, City of Lakeland Department of Electric and Water Utilities, applied on June 27, 1995, to the Department to amend of their PSD/air construction permit applicable to the Charles Larson Power Plant, Unit No. 8. The request is to remove the ISO correction which is applied to measured NO_x emissions for comparison with the nitrogen oxides (NOx) limit established in the PSD permit (25 ppm); implement a customized fuel monitoring schedule; and correct the permit limits for sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4). The combustion turbine is Unit 8 and is located at the Charles Larson Power Plant. The facility is located in Polk County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-212 and 62-4, Florida Administrative Code (F.A.C.). The project is not exempt from permitting procedures. The Department has determined that a permit amendment is required for the proposed work.

Pursuant to Section 403.815, F.S., and Rule 62-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit Amendment. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of

general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit amendment.

The Department will issue the permit amendment with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of their receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and,
(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this intent. Persons whose substantial interests will be affected by any decision of the Department with regard to the application/ request have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this intent in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this **INTENT TO ISSUE PERMIT AMENDMENT** all copies were mailed by certified mail before the close of business on 9-21-95 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.

Clerk

9-21-95
Date

Copies furnished to:

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

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF INTENT TO ISSUE PERMIT AMENDMENT
PSD-FL-166/AC53-190437

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit amendment to the City of Lakeland, Department of Electric and Water Utilities, 501 East Lemon Street, Lakeland, Florida 33801-5050. The amendment is of certain specific conditions related to fuel monitoring, sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4) emissions, and nitrogen oxides (NO_x) reporting applicable to the Charles Larson Power Plant Unit No. 8.

The U. S. Environmental Protection Agency reviewed and concurred with the customized fuel monitoring schedule. The changes in SO_2 and H_2SO_4 limits are actually corrections and are not significant. The Department will remove the requirement in the PSD/air construction permit to correct compliance test data to ISO conditions for comparison with the NO_x emission limit of 25 ppm (firing natural gas) provided there will not be an increase in either lb/hr or tons/yr of NO_x emission rates. The applicant is required to submit an analysis of continuous emission monitoring data which shows that this action will not cause reductions in the water injection with corresponding increases in NO_x emissions. Therefore, this change will not cause or contribute to a violation of any air pollution ambient air standard or adversely affect the environment.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes (F.S.). The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action

or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by Petitioner, if any; (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and, (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application/ request have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, Florida Administrative Code.

The application/request is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Department of Environmental Protection
Southwest District
8407 Laurel Fair Circle
Tampa, Florida 33619

Polk County Natural Resources Division
4189 Ben Durrance Road
Bartow, Florida 33830

Any person may send written comments on the proposed action to Administrator, New Source Review at the Department's Tallahassee address. All comments received within 30 days of the publication of this notice will be considered in the Department's final determination.

Further, a public hearing can be requested by any person(s). Such requests must be submitted within 30 days of this notice.

Department of
Environmental Protection

DRAFT

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

October XX, 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: Amendment of PSD-FL-166/AC53-190437
City of Lakeland, Larson Power Plant Unit 8

The Department has evaluated your request and hereby incorporate each of the following amendments to the above referenced permit.

Custom Fuel Monitoring Schedule

The proposed custom fuel monitoring schedule, as corrected by your letter dated August 10, 1995 (attached), is included as an attachment to the above referenced permit. This fuel monitoring schedule supersedes AC53-190437/PSD-FL-166 condition 17, which specifies daily sulfur and nitrogen records and condition 23, which requires annual reports for nitrogen content of the fuel being fired, as these conditions apply 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 (attached)

FROM:

SO_2..... 2.6 (tpy on gas)

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

DRAFT

TO:

SO_2..... 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

The Department hereby removes the requirement to correct the test data to ISO conditions for comparison with the NO_x emission limit of 25 ppm provided there will not be an increase in either lb/hr or tons/yr of NO_x emission rates.

For verification of emissions changes associated with removing the ISO correction from the permit, the City of Lakeland shall submit an analysis of emissions changes (lbs/hr and tpy), including continuous NO_x monitoring data and associated water injection rates for at least one month prior to and after the change, to the Bureau of Air Regulation. This report shall be submitted to the Bureau of Air Regulation within 13 months from issuance of this amendment.

A copy of this amendment letter shall be attached to and shall become a part of Air Construction Permit AC53-190437/PSD-FL-166.

Sincerely,

Howard L. Rhodes, Director
Division of Air Resources
Management

DRAFT

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 _____ 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.

_____ _____
Clerk Date

Copies to be furnished to:

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

Incorrect values old version of this Table, see final Permit 7/19/94

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standards: Gas Firing	Standards: No. 2 Fuel Oil Firing	Gas Turbine and HRSG[a] Tons Per Year: Gas	Gas Turbine and HRSG[a] Tons Per Year: Oil	Basis
NO_x	25 ppm at 15% oxygen on a dry basis	42 ppmv at 15 percent oxygen on a dry basis	425	181	BACT
SO_2	Natural gas as fuel	0.2 percent S by weight	2.6	230	BACT
PM/PM_{10}	0.006 lb/MMBtu	0.025 lb/MMBtu	22	16.5	BACT
VOC	-	-	9	5.0	BACT
CO	-	-	232	59.3	BACT
Mercury (Hg)	-	-	3.0×10^{-6} lbs/MMBtu	.003	Est. by Appl.
Lead (Pb)	-	-	2.8×10^{-6} lbs/MMBtu	0.03	" "
Beryllium (be)	-	-	2.5×10^{-6} lbs/MMBtu	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	1.9×10^{-5} lbs/MMBtu	1.7×10^{-3}	BACT

(a) Emissions rates based on 100 percent capacity factor for natural gas and 25 percent capacity factor for oil firing.

Attachment

Florida Department of
Environmental Protection

Memorandum

TO: C. H. Fancy

THRU: A. A. Linero 9/20

FROM: Martin Costello mc 9/20/95

DATE: September 20, 1995

SUBJ: City of Lakeland, Larson Power Plant Unit 8
Amendment of PSD-FL-166/AC53-190437, Specific Conditions

Attached for your review and approval is an amendment to the existing City of Lakeland, Larson Power Plant Unit No. 8 (CT) which adds a customized fuel monitoring schedule; changes the permit limits for SO_2 and H_2SO_4 and removes the ISO correction from the NO_x standard.

The City is required to submit an analysis confirming that NOx emissions increases associated with removing the ISO correction are below significant levels with respect to PSD and major source permitting. EPA has approved the customized fuel monitoring schedule. The corrections in SO_2/H_2SO_4 emissions are not significant. The ISO requirement is consistent with our present draft Guidance Memo.

If you have any questions, Martin Costello and/or I will be glad to discuss the details.

AAL/mc/t

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

September 5, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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

Dear Ms. Shelton:

This is in reply to your August 10 letter requesting a refund of the $250 fee paid for pending permit modifications.

Both the statute you referred to (Section 403.0872(11)(a)(10), F.S.) and the applicable rule (F.A.C. Rule 62-4.050(4)(a)2.), state that to be exempt from the fee, the Title V permit must already be issued. Therefore, since the Title V permit has not been issued, the $250 fee will be required.

We trust that this clears up any misunderstanding that may have arisen about fees.

Sincerely,

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

CHF/aal/t

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

4APT-AEB

AUG 28 1995

RECEIVED
SEP 1 1995
Bureau of
Air Regulation

Clair H. Fancy, P.E.
Chief
Bureau of Air Regulation
Florida Department of
Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SUBJ: Approval of NSPS Custom Fuel Monitoring Schedule for Lakeland Electric & Water Plant Larsen (LEPL), Unit 8, Combined Cycle Gas Turbine System, Permit Nos. AC53-190437 and PSD-FL-166

Dear Mr. Fancy:

This is to acknowledge receiving a copy of June 27, 1995, letter from Ms. Farzie Shelton of LEPL (this letter was addressed to you), requesting approval of a customized fuel monitoring schedule for the above referenced project.

Since the authority for approving custom fuel monitoring plans under 40 CFR Part 60, Subpart GG has not been delegated to the State of Florida, we have reviewed LEPL's custom fuel monitoring schedule. Based on our review, we have determined that the proposed schedule is acceptable, since it complies with all items of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987. A copy of this memo was included with LEPL's request as an enclosure.

However, please note that in the proposed monitoring plan the reference methods were incorrectly listed as: ASTM D3245-81, and ASTM D4048-82. The approved methods are: ASTM D3246-81, and ASTM D4084-82, respectively. In their August 10, 1995, letter, the company acknowledged incorrectly identifying these methods, but failed to make the necessary correction in the attached revised monitoring plan.

If you have any questions regarding this letter, please contact Mr. Mirza P. Baig of my staff at 404/347-3555, vmn 4147.

Sincerely yours,

Jewell A. Harper
Chief
Air Enforcement Branch
Air, Pesticides, & Toxics
Management Division

LAKELAND
ELECTRIC & WATER

(813) 499-6603

Excellence Is Our Goal, Service Is Our Job

Farzie Shelton
ENVIRONMENTAL COORDINATOR, Ch E.

August 10, 1995

RECEIVED
AUG 10 1995
Bureau of
Air Regulation

Clair H. Fancy, Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

Re: Charles Larsen Power Plant Unit No. 8--Combined Cycle Gas Turbine System
Permit Nos. PSD-FL-166; AC53-190437; AO53-219296; Customized Fuel
Monitoring Schedule and Sulfur Dioxide/Sulfuric Acid Mist Limits

Dear Clair:

On June 27, 1995, the City of Lakeland submitted a request for approval of a customized fuel monitoring schedule under 60 CFR §60.335, based on a U.S. Environmental Protection Agency guidance memorandum, for the above-referenced unit. Two typographical errors have been identified in the monitoring schedule proposed by the City and a corrected schedule is attached.

Specifically, two ASTM test methods were incorrectly identified. Test method "ASTM D3245-81" should be "ASTM D3246-81," and ASTM D4048-82" should be ASTM D4084-82."

We apologize for any inconvenience that these inadvertent errors may have caused. Thank you for your careful review and attention to the City's request, and please call me if you have any questions at (941) 499-6603.

Sincerely,

Farzie Shelton

Farzie Shelton
Environmental Coordinator
Department of Electric and Water Utilities

Attachment

cc: John Reynolds, FDEP (via fax)
Bill Thomas, FDEP Southwest District
David McNeal, Region IV, EPA
Mirza Baig, Region IV, EPA (via fax)
Angela Morrison, HGSS

LAKELAND
ELECTRIC & WATER

(813) 499-6603

Excellence Is Our Goal, Service Is Our Job

Farzie Shelton
ENVIRONMENTAL COORDINATOR, Ch E.

August 10, 1995

RECEIVED
AUG 10 1995
Bureau of
Air Regulation

Clair H. Fancy, Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

RE: Charles Larsen Power Plant Unit No. 8--Combined-Cycle Gas Turbine System
Permit Nos. PSD-FL-166; AC53-190437; AO53-219296; Customized Fuel
Monitoring Schedule and Sulfur Dioxide/Sulfuric Acid Mist Limits

Dear Clair:

The City of Lakeland recently requested approval of a customized fuel monitoring schedule for the Charles Larsen Power Plant combined-cycle gas turbine system and approval of two minor permit corrections for the three permits identified above. These requests were made by letter dated June 27, 1995. The City understands that the Department has reviewed the requests and is in the process of preparing a response. The City appreciates the Department's timely review of the requests, but the City would like for the Department to reconsider the fee submitted by the City along with the requests.

When the requests were submitted in late June, a check in the amount of $250 was enclosed based on the Department's Rule 62-4.050(4)(q)5, Florida Administrative Code, because revisions were being requested to an air construction permit. Since then, the City of Lakeland has learned that the Department's fee rule regarding air construction permit revisions for Title V sources has been superseded by a fairly recent statutory amendment. Specifically, Section 403.0872(11)(a)10, Florida Statutes, as amended in 1994 (copy attached), provides that the Department may not require fees for changes or additions to a Title V source unless the activity triggers federal new source review. The statutory amendment provides that the costs for reviewing such changes or additions will be covered by the annual air emission fees paid by Title V sources. The City of Lakeland has requested only minor corrections to its air construction permit, and the changes do not trigger new source review. Since the City of Lakeland's Larsen Power Plant is a Title V source and new source review is not triggered, no fee should be required for the requested corrections to the Plant's air construction permit. The City of Lakeland therefore requests a refund of the $250 paid on June 27, 1995.

Thank you for your continued assistance and cooperation in this matter. If you have any questions or would like any additional information, please do not hesitate to contact me at (941) 499-6603.

Sincerely,

Farzie Shelton/am

Farzie Shelton
Environmental Coordinator
Department of Electric and Water Utilities

August 24, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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

Dear Ms. Shelton:

This is in reply to your August 10 letter requesting a refund of the $250 fee paid for pending permit modifications.

Both the statute you referred to (Section 403.0872(11)(a)(10), F.S.) and the applicable rule (F.A.C. Rule 62-4.050(4)(a)2.) state that to be exempt from the fee, the Title V permit must already be issued. Therefore, since the Title V permit has not been issued, the $250 fee will be required.

We trust that this clears up any misunderstanding that may have arisen about fees.

Sincerely,

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

CHF/aal/t

sions monitoring method which has been approved by the United States Environmental Protection Agency under the regulations implementing 42 U.S.C. ss. 7651 et seq., or from a method approved by the department for purposes of this section.

6. The amount of each regulated air pollutant in excess of 4,000 tons per year allowed to be emitted by any source, or group of sources belonging to the same Major Group as described in the Standard Industrial Classification Manual, 1987, may not be included in the calculation of the fee. Any source, or group of sources, which does not emit any regulated air pollutant in excess of 4,000 tons per year, is allowed a one-time credit not to exceed 25 percent of the first annual licensing fee for the prorated portion of existing air-operation permit application fees remaining upon commencement of the annual licensing fees.

7. If the department has not received the fee by February 15 of the calendar year, the permittee must be sent a written warning of the consequences for failing to pay the fee by March 1. If the department has not received the fee by March 1 of the calendar year, the department shall impose, in addition to the fee, a penalty of 50 percent of the amount of the fee, plus interest on such amount computed in accordance with s. 220.807. The department may revoke any major air pollution source operation permit if it finds that the permitholder has failed to timely pay any required annual operation license fee, penalty, or interest.

8. During the years 1993 through 1999, inclusive, no fee shall be required to be paid under this section with respect to emissions from any unit which is an affected unit under 42 U.S.C. s. 7651c.

9. Notwithstanding the computational provisions of this subsection, the annual operation license fee for any source subject to this section shall not be less than $250, except that the annual operation license fee for sources permitted solely through general permits issued under s. 403.814 shall not exceed $50 per year.

10. Notwithstanding the provisions of s. 403.087(5)(a)4.a., authorizing air pollution construction permit fees, the department may not require such fees for changes or additions to a major source of air pollution permitted pursuant to this section, unless the activity triggers permitting requirements under Title I, Part C or Part D, of the federal Clean Air Act, 42 U.S.C. ss. 7470-7514a. Costs to issue and administer such permits shall be considered direct and indirect costs of the major stationary source air-operation permit program under s. 403.0873. The department shall, however, require fees pursuant to the provisions of s. 403.087(5)(a)4.a. for the construction of a new major source of air pollution that will be subject to the permitting requirements of this section once constructed and for activities triggering permitting requirements under Title I, Part C or Part D, of the federal Clean Air Act, 42 U.S.C. ss. 7470-7514a.

(b) Annual operation license fees collected by the department must be sufficient to cover all reasonable direct and indirect costs required to develop and administer the major stationary source air-operation permit program, which shall consist of the following elements to the extent that they are reasonably related to the regulation of major stationary air pollution sources, in accordance with United States Environmental Protection Agency regulations and guidelines:

1. Reviewing and acting upon any application for such a permit.

2. Implementing and enforcing the terms and conditions of any such permit, excluding court costs or other costs associated with any enforcement action.

3. Emissions and ambient monitoring.

4. Preparing generally applicable regulations or guidance.

5. Modeling, analyses, and demonstrations.

6. Preparing inventories and tracking emissions.

7. Implementing the Small Business Stationary Source Technical and Environmental Compliance Assistance Program.

8. The study conducted under subparagraph (a)1. and any audits conducted under paragraph (c).

(c) An audit of the major stationary source air-operation permit program must be conducted 2 years after the United States Environmental Protection Agency has given full approval of the program, or by the end of 1996, whichever comes later, to ascertain whether the annual operation license fees collected by the department are used solely to support any reasonable direct and indirect costs as listed in paragraph (b). A program audit must be performed biennially after the first audit.

(12) Permits issued under this section must allow changes within a permitted facility without requiring a permit revision, if the changes are not physical changes in, or changes in the method of operation of, the facility which increase the amount of any air pollutant emitted by the facility or which result in the emission of any air pollutant not previously emitted by the facility, and the changes do not exceed the emissions allowable under the permit (whether expressed therein as a rate of emissions or in terms of total emissions), provided that the facility provides the administrator and the department with 30 days' written, advance notice of the proposed changes. The department shall adopt rules implementing this flexibility requirement.

(13)(a) In order to ensure statewide consistency in the implementation of the national Acid Deposition Control Allowance Transfer System, a department district office or local pollution control program may not issue or administer permits under this section for any electrical power plant or any source that participates in the allowance transfer system.

(b) For emission units that are subject to continuous monitoring requirements under 42 U.S.C. ss. 7661-7661f or 40 C.F.R. part 75, compliance with nitrogen oxides emission limits shall be demonstrated based on a 30-day rolling average, except as specifically provided by 40 C.F.R. part 60 or part 76.

(14) In order to ensure statewide consistency in the permitting of major sources, a local pollution control program may not issue permits under this section for sources that belong to Major Group 26, Paper and Allied Products; for sources that belong to Major Group 28, Chemicals and Allied Products; or for sources that belong to Industry Number 2061, Cane Sugar, Except Refining, as defined in the Standard Industrial Classification Manual, 1987. This subsection expires July 1, 1997.

08-24-95P03:43 RCVD

sions monitoring method which has been approved by the United States Environmental Protection Agency under the regulations implementing 42 U.S.C. ss. 7651 el seq., or from a method approved by the department for purposes of this section.

6. The amount of each regulated air pollutant in excess of 4,000 tons per year allowed to be emitted by any source, or group of sources belonging to the same Major Group as described in the Standard Industrial Classification Manual, 1987, may not be included in the calculation of the fee. Any source, or group of sources, which does not emit any regulated air pollutant in excess of 4,000 tons per year, is allowed a one-time credit not to exceed 25 percent of the first annual licensing fee for the prorated portion of existing air-operation permit application fees remaining upon commencement of the annual licensing fees.

7. If the department has not received the fee by February 15 of the calendar year, the permittee must be sent a written warning of the consequences for failing to pay the fee by March 1. If the department has not received the fee by March 1 of the calendar year, the department shall impose, in addition to the fee, a penalty of 50 percent of the amount of the fee, plus interest on such amount computed in accordance with s. 220.807. The department may revoke any major air pollution source operation permit if it finds that the permitholder has failed to timely pay any required annual operation license fee, penalty, or interest.

8. During the years 1993 through 1999, inclusive, no fee shall be required to be paid under this section with respect to emissions from any unit which is an affected unit under 42 U.S.C. s. 7651c.

9. Notwithstanding the computational provisions of this subsection, the annual operation license fee for any source subject to this section shall not be less than $250, except that the annual operation license fee for sources permitted solely through general permits issued under s. 403.814 shall not exceed $50 per year.

10. Notwithstanding the provisions of s. 403.087(5)(a)4.a., authorizing air pollution construction permit fees, the department may not require such fees for changes or additions to a major source of air pollution permitted pursuant to this section, unless the activity triggers permitting requirements under Title I, Part C or Part D, of the federal Clean Air Act, 42 U.S.C. ss. 7470-7514a. Costs to issue and administer such permits shall be considered direct and indirect costs of the major stationary source air-operation permit program under s. 403.0873. The department shall, however, require fees pursuant to the provisions of s. 403.087(5)(a)4.a. for the construction of a new major source of air pollution that will be subject to the permitting requirements of this section once constructed and for activities triggering permitting requirements under Title I, Part C or Part D, of the federal Clean Air Act, 42 U.S.C. ss. 7470-7514a.

(b) Annual operation license fees collected by the department must be sufficient to cover all reasonable direct and indirect costs required to develop and administer the major stationary source air-operation permit program, which shall consist of the following elements to the extent that they are reasonably related to the regulation of major stationary air pollution sources, in accordance with United States Environmental Protection Agency regulations and guidelines:

1. Reviewing and acting upon any application for such a permit.

2. Implementing and enforcing the terms and conditions of any such permit, excluding court costs or other costs associated with any enforcement action.

3. Emissions and ambient monitoring.

4. Preparing generally applicable regulations or guidance.

5. Modeling, analyses, and demonstrations.

6. Preparing inventories and tracking emissions.

7. Implementing the Small Business Stationary Source Technical and Environmental Compliance Assistance Program.

8. The study conducted under subparagraph (a)1. and any audits conducted under paragraph (c).

(c) An audit of the major stationary source air-operation permit program must be conducted 2 years after the United States Environmental Protection Agency has given full approval of the program, or by the end of 1996, whichever comes later, to ascertain whether the annual operation license fees collected by the department are used solely to support any reasonable direct and indirect costs as listed in paragraph (b). A program audit must be performed biennially after the first audit.

(12) Permits issued under this section must allow changes within a permitted facility without requiring a permit revision, if the changes are not physical changes in, or changes in the method of operation of, the facility which increase the amount of any air pollutant emitted by the facility or which result in the emission of any air pollutant not previously emitted by the facility, and the changes do not exceed the emissions allowable under the permit (whether expressed therein as a rate of emissions or in terms of total emissions), provided that the facility provides the administrator and the department with 30 days' written, advance notice of the proposed changes. The department shall adopt rules implementing this flexibility requirement.

(13)(a) In order to ensure statewide consistency in the implementation of the national Acid Deposition Control Allowance Transfer System, a department district office or local pollution control program may not issue or administer permits under this section for any electrical power plant or any source that participates in the allowance transfer system.

(b) For emission units that are subject to continuous monitoring requirements under 42 U.S.C. ss. 7661-7661f or 40 C.F.R. part 75, compliance with nitrogen oxides emission limits shall be demonstrated based on a 30-day rolling average, except as specifically provided by 40 C.F.R. part 60 or part 76.

(14) In order to ensure statewide consistency in the permitting of major sources, a local pollution control program may not issue permits under this section for sources that belong to Major Group 26, Paper and Allied Products; for sources that belong to Major Group 28, Chemicals and Allied Products; or for sources that belong to Industry Number 2061, Cane Sugar, Except Refining, as defined in the Standard Industrial Classification Manual, 1987. This subsection expires July 1, 1997.

sions monitoring method which has been approved by the United States Environmental Protection Agency under the regulations implementing 42 U.S.C. ss. 7651 et seq., or from a method approved by the department for purposes of this section.

6. The amount of each regulated air pollutant in excess of 4,000 tons per year allowed to be emitted by any source, or group of sources belonging to the same Major Group as described in the Standard Industrial Classification Manual, 1987, may not be included in the calculation of the fee. Any source, or group of sources, which does not emit any regulated air pollutant in excess of 4,000 tons per year, is allowed a one-time credit not to exceed 25 percent of the first annual licensing fee for the prorated portion of existing air-operation permit application fees remaining upon commencement of the annual licensing fees.

7. If the department has not received the fee by February 15 of the calendar year, the permittee must be sent a written warning of the consequences for failing to pay the fee by March 1. If the department has not received the fee by March 1 of the calendar year, the department shall impose, in addition to the fee, a penalty of 50 percent of the amount of the fee, plus interest on such amount computed in accordance with s. 220.807. The department may revoke any major air pollution source operation permit if it finds that the permitholder has failed to timely pay any required annual operation license fee, penalty, or interest.

8. During the years 1993 through 1999, inclusive, no fee shall be required to be paid under this section with respect to emissions from any unit which is an affected unit under 42 U.S.C. s. 7651c.

9. Notwithstanding the computational provisions of this subsection, the annual operation license fee for any source subject to this section shall not be less than $250, except that the annual operation license fee for sources permitted solely through general permits issued under s. 403.814 shall not exceed $50 per year.

10. Notwithstanding the provisions of s. 403.087(5)(a)4.a., authorizing air pollution construction permit fees, the department may not require such fees for changes or additions to a major source of air pollution permitted pursuant to this section, unless the activity triggers permitting requirements under Title I, Part C or Part D, of the federal Clean Air Act, 42 U.S.C. ss. 7470-7514a. Costs to issue and administer such permits shall be considered direct and indirect costs of the major stationary source air-operation permit program under s. 403.0873. The department shall, however, require fees pursuant to the provisions of s. 403.087(5)(a)4.a. for the construction of a new major source of air pollution that will be subject to the permitting requirements of this section once constructed and for activities triggering permitting requirements under Title I, Part C or Part D, of the federal Clean Air Act, 42 U.S.C. ss. 7470-7514a.

(b) Annual operation license fees collected by the department must be sufficient to cover all reasonable direct and indirect costs required to develop and administer the major stationary source air-operation permit program, which shall consist of the following elements to the extent that they are reasonably related to the regulation of major stationary air pollution sources, in accordance with United States Environmental Protection Agency regulations and guidelines:

1. Reviewing and acting upon any application for such a permit.

2. Implementing and enforcing the terms and conditions of any such permit, excluding court costs or other costs associated with any enforcement action.

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4. Preparing generally applicable regulations or guidance.

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(c) An audit of the major stationary source air-operation permit program must be conducted 2 years after the United States Environmental Protection Agency has given full approval of the program, or by the end of 1996, whichever comes later, to ascertain whether the annual operation license fees collected by the department are used solely to support any reasonable direct and indirect costs as listed in paragraph (b). A program audit must be performed biennially after the first audit.

(12) Permits issued under this section must allow changes within a permitted facility without requiring a permit revision, if the changes are not physical changes in, or changes in the method of operation of, the facility which increase the amount of any air pollutant emitted by the facility or which result in the emission of any air pollutant not previously emitted by the facility, and the changes do not exceed the emissions allowable under the permit (whether expressed therein as a rate of emissions or in terms of total emissions), provided that the facility provides the administrator and the department with 30 days' written, advance notice of the proposed changes. The department shall adopt rules implementing this flexibility requirement.

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(b) For emission units that are subject to continuous monitoring requirements under 42 U.S.C. ss. 7661-7661f or 40 C.F.R. part 75, compliance with nitrogen oxides emission limits shall be demonstrated based on a 30-day rolling average, except as specifically provided by 40 C.F.R. part 60 or part 76.

(14) In order to ensure statewide consistency in the permitting of major sources, a local pollution control program may not issue permits under this section for sources that belong to Major Group 26, Paper and Allied Products; for sources that belong to Major Group 28, Chemicals and Allied Products; or for sources that belong to Industry Number 2061, Cane Sugar, Except Refining, as defined in the Standard Industrial Classification Manual, 1987. This subsection expires July 1, 1997.

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 D3245-81; and ASTM D4048-82 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

LAKELAND
ELECTRIC & WATER

(813) 499-6603

Excellence Is Our Goal, Service Is Our Job

Farzie Shelton
ENVIRONMENTAL COORDINATOR, Ch E.

June 27, 1995

RECEIVED
JUN 27 1995
Bureau of
Air Regulation

Clair H. Fancy, Chief
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

RE: Charles Larsen Power Plant Unit No. 8--Combined Cycle Gas Turbine System
Permit Nos. PSD-FL-166; AC53-190437; AO53-219296; Customized Fuel
Monitoring Schedule and Sulfur Dioxide/Sulfuric Acid Mist Limits

Dear Clair:

As you may recall, the City of Lakeland's Charles Larsen Power Plant Unit No. 8 is a new 120-megawatt combined cycle gas turbine system that was permitted in 1991 under Rule 17-2.500, Florida Administrative Code (now Chapter 62-212, Florida Administrative Code). After the unit was constructed and the initial performance tests had been conducted, an air operation permit was issued by the Southwest District, as referenced above.

The Unit No. 8 gas turbine is subject to New Source Performance Standard (NSPS) Subpart GG (40 CFR §§ 60.330-60.335), which requires the owner or operator to monitor the sulfur and nitrogen content of the fuel it burns. By this letter, the City of Lakeland (the City) is requesting a customized fuel monitoring schedule for the natural gas it burns in the Larsen Unit No. 8 gas turbine. The City is also requesting that the sulfur dioxide and sulfuric acid mist limits be changed. In addition, the City is requesting clarification of the nitrogen oxides compliance testing requirements as set forth in the construction permit. In support of its requests, the City provides the following information.

Customized Fuel Monitoring Schedule-- NSPS Subpart GG requires that the sulfur and nitrogen content of fuel be monitored as follows. (1) If the turbine fuel is supplied by a bulk storage tank, then the sulfur and nitrogen content are to be determined whenever new fuel is transferred into the bulk storage tank. (2) If the turbine fuel is supplied without an intermediate bulk storage tank, then daily monitoring of the sulfur and nitrogen contents of the fuel is required. 40 CFR § 60.334(b). Since the natural gas used by the gas turbine does not pass through an intermediate bulk storage tank, the City is hereby requesting a customized fuel monitoring schedule as allowed by 40 CFR § 60.334(b)(2) for the Larsen Unit No. 8 gas turbine, while firing natural gas. Therefore, the City requests the following customized fuel

monitoring schedule that was developed based on an EPA guidance memorandum (Attachment A):

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 D3245-81; and ASTM D4048-82 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.)

Annual Sulfur Dioxide Limit--As a result of recent information, the City has identified the need to change the annual sulfur dioxide limit for the combined cycle gas turbine when firing natural gas. The City has obtained information which suggests that the sulfur content of 2 grains per 1000 cubic feet (cf) of natural gas, used in permitting the gas turbine, represented only the hydrogen sulfide in the gas and not the total sulfur. The total sulfur content includes the sulfur from the mercaptans which are added for safety reasons. The City is therefore requesting that the annual sulfur dioxide emission limit for the gas turbine emissions from the combustion of natural gas be changed from 2.6 tons per year to 8.6 tons per year, based on a sulfur content of 10 grains per 1000 cf in the natural gas.

While the maximum amount of sulfur allowed by the Department of Energy regulations is 10 grains per 100 cf (i.e., 100 grains per 1000 cf) of natural gas, natural gas in Florida rarely contains this amount of sulfur. In 1990, KBN Engineering and Applied Sciences, Inc., obtained eight months of sulfur data from Florida Gas Transmission Company. (Attachment C). The total sulfur ranged from 0.05 to 0.8 grains per 100 cf (i.e., 0.5 to 8 grains per 1000 cf) of gas. Because of the potential variability of sulfur concentrations from both hydrogen sulfide and mercaptan, KBN has suggested using 1 grain per 100 cf (i.e., 10 grains per 1000 cf) as a maximum value representative of natural gas in Florida. Reviews of data since 1990 indicate that while the average sulfur content may vary, individual maximum sulfur concentrations from year-to-year fall within 1 grain per 100 cf (i.e., 10 grains per 1000 cf).

The City therefore believes that the requested 10 grains per 1000 cf is an appropriate basis upon which to establish an annual sulfur dioxide limit for the Larsen gas turbine. It should be noted that the increase in annual emissions when firing natural gas will in no way affect the air quality impact analysis previously performed, since it was performed based on sulfur dioxide emissions from the combustion of No. 2 fuel oil.

Since there will be no increase in the total annual emissions or an increase in fuel consumed by the Larsen gas turbine, no formal modification to the PSD permit is required for the change in the annual emission limit when natural gas is fired. The City therefore

respectfully requests that Table 1 of Permit No. PSD-FL-166 be revised to reflect the more accurate limit for annual sulfur dioxide emissions from natural gas, as follows:

	Gas Turbine and HRSG Tons Per Year	
	Gas	Oil
SO_2 . . .	~~2.6~~ 8.6	307

The City also requests that the same type of revision be made to Specific Condition 5 of Permit No. AO53-219296, as follows:

	Tons Per Year	
	Gas	Oil
SO_2	~~2.6~~ 8.6	307

Sulfuric Acid Mist Annual Limits--When the PSD permit was originally issued, a typographical error was apparently made in the annual emission limits for sulfuric acid mist, for both natural gas and oil. This error was subsequently repeated when the operation permit was issued. Both the application submitted by the City *and* the "Best Available Control Technology" (BACT) determination attached to and made a part of the PSD permit provide for sulfuric acid mist limits of 0.8 tons per year for gas and 27.4 tons per year for oil. Because oil use was ultimately limited to one-third of the annual capacity factor, the appropriate limit for oil would be 9.13 tons per year. It is unclear how limits of "__" for gas and "0.0032" tons per year for oil were established in Table I of the PSD permit. (Copies of excerpts from the PSD permit are included as Attachment D.) All of the analyses for permit issuance were based on the higher limits. Because this was apparently a simple typographical error and oversight, and no physical or operational change is being made that would result in increased emissions, the City respectfully requests that the PSD and operation permits be corrected to include the appropriate sulfuric acid mist limits, as follows:

PSD Permit Table I:

	Gas Turbine and HRSG Tons Per Year			
	Gas			Oil
Sulfuric Acid Mist . . .	----	0.8	~~3.2 x 10^{-3}~~	9.13

Air Operation Permit Specific Condition 5:

	Tons Per Year			
	Gas		Oil	
S. Acid Mist	----	0.8	~~0.0032~~	9.13

Correction of NOx Emissions to ISO Conditions--Specific condition 13 of the PSD permit requires that when performance tests are conducted to determine compliance with the nitrogen oxides (NOx) standard, the measured NOx must be adjusted to ISO ambient atmospheric conditions according to a specified correction factor. This correction to ISO conditions is only required under NSPS Subpart GG to determine compliance with the NSPS limit and is not required to determine compliance with the much lower BACT limit of 25 ppm for gas and 42 ppm for oil. The City therefore respectfully requests that Specific Condition 13 be revised to clarify that the correction must be done only for the initial performance test to determine compliance with the NSPS limit, as follows:

> During the initial performance tests, to determine compliance with the ~~proposed~~ NSPS NOx standard, . . .

As required under Rule 62-4.050(4)(q)5., Florida Administrative Code, we have enclosed a check in the amount of $250. In addition, four copies of the request are enclosed for use by the Department. Thank you for your consideration of this request. If you or you staff have any questions about this request please call me at (941) 499-6603.

Sincerely,

Farzie Shelton/arm

Farzie Shelton
Environmental Coordinator
Department of Electric and Water Utilities

cc: Bill Thomas, FDEP Southwest District
David McNeal, Region IV, EPA
Angela Morrison, HGSS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 14 1987

OFFICE OF AIR AND RADIATION

MEMORANDUM

SUBJECT: Authority for Approval of Custom Fuel Monitoring Schedules Under NSPS Subpart GG

FROM: John B. Rasnic, Chief
Compliance Monitoring Branch

TO: Air Compliance Branch Chiefs
Regions II, III, IV, V, VI and IX

Air Programs Branch Chiefs
Regions I-X

The NSPS for Stationary Gas Turbines (Subpart GG) at 40 CFR 60.334(b)(2) allows for the development of custom fuel monitoring schedules as an alternative to daily monitoring of the sulfur and nitrogen content of fuel fired in the turbines. Regional offices have been forwarding custom fuel monitoring schedules to the Stationary Source Compliance Division (SSCD) for consideration since it was understood that authority for approval of these schedules was not delegated to the Regions. However, in consultation with the Emission Standards and Engineering Division, it has been determined that the Regional Offices do have the authority to approve Subpart GG custom fuel monitoring schedules. Therefore it is no longer necessary to forward these requests to Headquarters for approval.

Over the past few years, SSCD has issued over twenty custom schedules for sources using pipeline quality natural gas. In order to maintain national consistency, we recommend that any schedules Regional Offices issue for natural gas be no less stringent than the following: Sulfur monitoring should

be bimonthly, followed by quarterly, then semiannual, given at least six months of data demonstrating little variability in sulfur content and compliance with §60.333 at each monitoring frequency; nitrogen monitoring can be waived for pipeline quality natural gas, since there is no fuel-bound nitrogen and since the free nitrogen does not contribute appreciably to NO_x emissions. Please see the attached sample custom schedule for details. Given the increasing trend in the use of pipeline quality natural gas, we are investigating the possibility of amending Subpart GG to allow for less frequent sulfur monitoring and a waiver of nitrogen monitoring requirements where natural gas is used.

Where sources using oil request custom fuel monitoring schedules, Regional Offices are encouraged to contact SSCD for consultation on the appropriate fuel monitoring schedule. However, Regions are not required to send the request itself to OSCD for approval.

If you have any questions, please contact Sally K. Farrell at FTS 382-2875.

Attachment

cc: John Cronshaw
George Walsh
Robert Ajax
Earl Salo

Conditions for Custom Fuel Sampling Schedule for Stationary Gas Turbines

1. Monitoring of fuel nitrogen content shall not be required while natural gas is the only fuel fired in the gas turbine.

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measuremant of sulfur in gaseous fuels, or an approved alternative 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 the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel 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 after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample anaylsis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

   d. Should any sulfur analysis as required in items 2(b) or 2(c) above indicate noncompliance with 40 CFR 60.333, the owner or operator shall notify the State Air Control Board) of such excess emissions and the custom schedule shall be re-examined by the Environmental Protection Agency. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being re-examined.

3. If there is a change in fuel supply, the owner or operator must notify the State of such change for re-examination of this custom schedule. A substantial change in fuel quality shall be considered as a change in fuel supply. Sulfur monitoring shall be conducted weekly during the interim period when this custom schedule is being re-examined.

4. Records of sample analysis and fuel supply pertinent to this custom schedule shall be retained for a period of three years, and be available for inspection by personnel of federal, state, and local air pollution control agencies.

ANALYSIS

DATE: 06/14/85 ANALYSIS TIME: 345 STREAM SEQUENCE: 1
TIME: 14:11 CYCLE TIME: 360 STREAM#: 1
ANALYZER#: 1 MODE: RUN CYCLE START TIME: 14:05

COMP NAME	COMP CODE	MOLE %	GAL/MCF**	B.T.U.*	REL DEN*
HEXANE +	151	0.060	0.0280	3.06	0.0018
PROPANE	152	0.384	0.1057	9.68	0.0058
I-BUTANE	153	0.099	0.0325	3.24	0.0020
N-BUTANE	154	0.078	0.0246	2.55	0.0016
IPENTANE	155	0.031	0.0112	1.23	0.0008
NPENTANE	156	0.018	0.0063	0.70	0.0004
NITROGEN	157	0.325	0.0356	0.00	0.0031
METHANE	158	96.189	16.3006	973.52	0.5327
CO2	159	0.802	0.1367	0.00	0.0122
ETHANE	160	2.036	0.5445	36.11	0.0211
TOTALS		100.000	17.2238	1030.08	0.5817

* @ 14.730 PSIA & UNCORRECTED FOR COMPRESSIBILITY

** @ 14.730 & 60 DEG. F

COMPRESSIBILITY FACTOR (1/Z) = 1.0022
DRY B.T.U. @ 14.730 PSIA & 60 DEG. F CORRECTED FOR (1/Z) = 1032.3
REAL RELATIVE DENSITY = 0.5827
UNNORMALIZED TOTAL = 99.87
ANALOG INPUT CHANNEL 1 = H 2 S 140 = 7.9374 E-02
ANALOG INPUT CHANNEL 2 = WATER 144 = 4.8690

ACTIVE ALARMS

NONE

FLORIDA GAS TRANSMISSION CO.
BROOKER LAB- MAINLINE
STANDARD GAS 1042.0/0.5940
CERTIFIED VALUE BTU 1042.0 GRAV. 0.5940
TOTAL SULFUR 0.15 GR/CCF H^2S 0.06 GR/CCF
H^2O 4.5 #/MMCF BY Bill Lin
TOTAL SULFUR DOWNSTREAM 0.30 GR/CCF

Attachment B

Sulfur Content, Heat Content, and SO_2 Emission Factors for Natural Gas

Date	Sulfur Content (gr/100 cf)	Heat Content (Btu)	SO_2 Emission Factor (lb/10^6 Btu)	SO_2 Emission Factor (lb/10^6 cf)
2/6/90	0.30	1,031	0.00083	0.857
2/13/90	0.05	1,028	0.00014	0.143
2/20/90	0.35	1,025	0.00098	1.000
2/27/90	0.45	1,024	0.00126	1.286
3/6/90	0.45	1,025	0.00125	1.286
3/13/90	0.30	1,026	0.00084	0.857
3/20/90	0.35	1,026	0.00097	1.000
3/27/90	0.35	1,025	0.00098	1.000
4/3/90	0.60	1,026	0.00167	1.714
4/10/90	0.25	1,022	0.00070	0.714
4/17/90	0.40	1,026	0.00111	1.143
4/24/90	0.30	1,022	0.00084	0.857
5/1/90	0.40	1,020	0.00112	1.143
5/8/90	0.25	1,034	0.00069	0.714
5/15/90	0.20	1,023	0.00056	0.571
6/5/90	0.45	1,020	0.00126	1.286
6/12/90	0.40	1,018	0.00112	1.143
6/19/90	0.70	1,017	0.00197	2.000
6/26/90	0.45	1,019	0.00126	1.286
7/3/90	0.55	1,022	0.00154	1.571
7/10/90	0.35	1,022	0.00098	1.000
7/17/90	0.45	1,021	0.00126	1.286
7/30/90	0.30	1,021	0.00084	0.857
8/7/90	0.50	1,024	0.00140	1.429
8/14/90	0.45	1,022	0.00126	1.286
8/21/90	0.40	1,022	0.00112	1.143
8/28/90	0.70	1,022	0.00196	2.000
9/4/90	0.55	1,029	0.00153	1.571
9/11/90	0.40	1,025	0.00111	1.143
9/18/90	0.45	1,026	0.00125	1.286
9/25/90	0.40	1,026	0.00111	1.143
10/2/90	0.45	1,029	0.00125	1.286
10/9/90	0.45	1,025	0.00125	1.286
10/16/90	0.70	1,028	0.00195	2.000
10/28/90	0.80	1,024	0.00223	2.286
Average:	0.43	1,024	0.00119	1.216
Maximum:	0.80	1,034	0.00223	2.286
Minimum:	0.05	1,017	0.00014	0.143
Std. Dev.	0.15	4	0.00042	0.427

Source: Florida Gas Transmission Company, 1990.

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standards: Gas Firing	Standards: No. 2 Fuel Oil Firing	Gas Turbine and HRSG[a] Tons Per Year: Gas	Gas Turbine and HRSG[a] Tons Per Year: Oil	Basis
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)	-	3.0×10^{-6} lbs/MMBtu	—	.003	Est. by Appl.
Lead (Pb)	-	2.8×10^{-5} lbs/MMBtu	—	0.03	" "
Beryllium (be)	-	2.5×10^{-6} lbs/MMBtu	—	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	—	3.2×10^{-3}	BACT *

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

Attachment D

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_2SO_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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

clair file 6

RECEIVED

MAY 25 1993

4APT-AEB

RECEIVED

MAY 28 1993

Division of Air
Resources Management

RECEIVED

JUN 01 1993

Division of Air
Resources Management

Mr. Howard Rhodes, Interim Director
Air Resources Management Division
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 323989-2400

RE: Determining Compliance for Gas Turbine Unit No. 8 at the City of Lakeland Department of Electric Water and Utilities

Dear Mr. Rhodes:

The purpose of this letter is to provide you with the EPA Region IV perspective on a modification request submitted by the referenced utility. A copy of the April 21, 1993, request from the Lakeland Utilities is enclosed, and we are providing a determination to you, rather than responding directly to Lakeland Utilities, since the applicable regulations for Unit No. 8 (40 C.F.R. Part 60, Subpart GG - Standards of Performance for Stationary Gas Turbines) have been delegated to your agency.

In their request, Lakeland Utilities asked for approval for an exemption from the requirement to calculate turbine emission rates using the equation in 40 C.F.R. §60.335(c)(1). Although 40 C.F.R. §60.335(f)(1) provides source owners and operators with the opportunity to petition to use other equations as an alternative to the one in 40 C.F.R. §60.335(c)(1), we do not believe that the submittal from Lakeland Utilities contains enough information to justify approval of an alternative equation. Furthermore, based upon telephone conversations between Mr. David McNeal of my staff and Ms. Farzie Shelton of Lakeland Utilities, we believe that, while the company may be experiencing operating problems with respect to water-to-fuel ratios established during the initial performance test conducted on Unit 8, use of an alternative equation would not remedy these operating problems.

The purpose of the equation in 40 C.F.R. §60.335(c)(1) is to correct measured NO_x emissions during a performance test to ISO standard conditions (280 degrees Kelvin, 60 percent relative humidity, and 101.3 kilopascals pressure). An initial performance test was performed on Unit 8, and when the equation in 40 C.F.R. §60.335(c)(1) was used to correct emissions to ISO standard conditions, it was determined that the unit was in compliance with applicable NO_x limits at four unit loads (30%, 50%, base, and peak load) when burning either natural gas or oil.

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Based upon these results, it is unclear why the company would need to use an alternative equation to calculate emission rates for the performance test. This is especially true since any alternative equation should express results on the same basis and should yield identical or nearly identical results to those calculated with the equation in 40 C.F.R. §60.355(c)(1). If Lakeland Utilities still wants to pursue approval of an alternative equation, our recommendation would be that the company submit a report comparing emission rates calculated with both the equation in 40 C.F.R. §60.335(c)(1) and the proposed alternative equation.

Based upon telephone conversations with Ms. Farzie Shelton of Lakeland Utilities, the difficulties that prompted their April 21, 1993, letter seem to be related to demonstrating continuous compliance for Unit No. 8 and not to demonstrating initial compliance. Under the provisions of Subpart GG, the water-to-fuel ratio needed to comply at each of four turbine loads is established during the initial performance test, and this ratio is used as an indicator of compliance following the initial test. According to Ms. Shelton, the company applied for approval of an alternative to the equation in 40 C.F.R. §60.335(c)(1) because of concerns that they may be currently using too much water for NO_x control on Unit No. 8 and that any excess water in the system will damage the turbine. While we would be willing to evaluate any proposed solutions to the problems experienced by Lakeland Utilities, we cannot understand how the specific proposal made in their April 21 letter (use of an alternate equation for adjusting performance test results to ISO standard conditions) will solve problems associated with the use of too much water for NO_x control.

If you have any questions about the information included in this letter, please contact Mr. David McNeal of my staff at 404/347-5014.

Sincerely yours,

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides and Toxics
Management Division

Enclosure

cc: Mike Harley, FL DER w/enclosure
Charles Logan, FL DER w/enclosure
D. Lewis

BEALS

LAKELAND ELECTRIC & WATER

Excellence Is Our Goal, Service Is Our Job

(813) 499-6603

Farzie Shelton
ENVIRONMENTAL COORDINATOR, Ch E.

April 21, 1993

Mr. David McNeal
United States Environmental Protection Agency
Region IV
345 Courtland Street N.E
Atlanta, Georgia 30365

Dear Mr. McNeal:

Pursuant to our telephone conversation today, enclosed please find a copy of our communication with the Florida Department of Environmental Regulation (FDER) requesting modification of our unit No. 8 (a combined cycle gas turbine GE Frame 7E) construction permit. The enclosure contained with this communication is the data supplied to us by the GE (manufacturer of this gas turbine) to enable us to obtain exemption from 40 CFR Part 60 Subpart GG 60.335(b)(1) requirement in accordance with Section 60.335(f)(1).

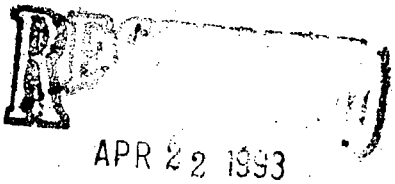
Although we have requested that FDER, under their NSPS authorization, to grant us this exemption we think that EPA has not authorized the State to implement Section 60.335(f)(1). Therefore we are writing to request this exemption from EPA.

We appreciate if you would expedite this request at your earliest convenience. If you should have any questions, please do not hesitate to contact me at (813) 499-6603.

Sincerely

Farzie Shelton

Enc.


APR 22 1993
Air
EPA-Region IV
Atlanta, GA

LAKELAND
ELECTRIC & WATER

(813) 499-6603

Excellence Is Our Goal, Service Is Our Job

Farzie Shelton
ENVIRONMENTAL COORDINATOR, Ch E.

March 10, 1993

Mr. Preston Lewis P.E
Department of Environmental Regulation
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee Florida 32399-2400

Re: Modification of Construction Permit No. AC53-190437 - Larsen Power Plant Unit No. 8

Dear Mr. Lewis:

We are in the process of obtaining an air operating permit for our Unit No. 8 (a combined cycle gas turbine) at Larsen Power Plant. To that end, we have received from DER Southwest District office a draft permit, encompassing all conditions covered by our construction permit. We have approached the Department and have requested certain minor changes to be incorporated in this permit. Although Mr. David Zell, the permitting Engineer, has no objection to these changes he is of the opinion that our construction permit needs to be modified to reflect these changes. we also understand that he has confirmed this in a telephone conversation with you and that you see no problem to accommodate these changes. Therefore, we are writing to request the changes as per enclosure.

Additionally, we would like to request the refund of $2000.00 application fee we submitted for the operation permit on September 17, 1993 (check No. 00116920). In accordance with Rule 17-213.210 F.A.C. (Annual Operation Licensing Fee) "no permit application processing fee, renewal fee, modification fee or amendment fee is required for an operation permit for a major source of air pollution".

We would appreciate if you would process our request expeditiously as the faith of our operating permit must be decided upon by May 28, 1993 unless a further request for extension of time is filled by us.

If you should have any questions, please do not hesitate to contact me at (813) 499-6603.

Sincerely

Farzie Shelton

Enc.

xc: David Zell - DER Tampa office
Bill Rodriguez
Chuck Garing

RECEIVED
MAR 16 1993
Division of Air
Resources Management

Permit No: AC53-190437
PSD-FL-166

The following modifications are in relation to the pages contained in the above referenced permit. Deleted material is represented by ~~strike through~~ and new material is represented by underline:

Page 6 of 10 - Specific Condition:

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 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.~~

Rational: **The operation of this unit utilizing gas or oil should not be limited to the combined cycle only.**

The maximum annual fuel oil could be construed 1/3 capacity in relation to gas burned. Therefore if there is a curtailment of gas no fuel oil can be burned and the unit would be unoperational. Also the previous condition limits the burning of fuel oil to 1/3 capability of the unit during any given year. Therefore it should not be necessary to limit it any further.

Page 8 of 10 - Specific Condition:

13. During performance tests, to determine compliance with the proposed Nox standard, measured Nox emission at 15 percent oxygen will be adjusted to Iso ambient atmospheric conditions by the gas turbines built in automatic control ~~following correction factor:~~

    Delete the formula and units.

Rationale: **Please see enclosed case justification furnished by GE (gas turbine manufactures) attesting to the capability of the controls.**

Table 1 - allowable emission limits:

	Standards		Gas Turbine Tons per year	
Pollutant	Gas Firing	No. 2 Oil	Gas	Oil
SO2	Natural Gas	0.2 % S by Wt	~~2.6~~	307

Rational: **The tons/yr of SO2 for gas should be left blank (with no limit) as the 2.6 tons/yr has not been verified by our consulting engineers (Black & Veatch) to be achievable. The 2.6 tons/yr was given as an estimate and we do not have confidence that these estimates of SO2 emissions can be demonstrated if the need should arise to demonstrate compliance during operation. Furthermore, neither the Department nor the EPA under the Clean Air Act (CAA) are concerned about the amount of SO2 emitted while burning gas.**

BEST AVAILABLE COPY

GE Power Generation

cc: ~~B.H. Rodriguez~~
Ed McDonald

General Electric Company
7650 Courtney Campbell Causeway
Suite 900
Tampa, FL 33607
Mail Address: P.O. Box 10577, Tampa, FL 33679

(813)286-4829

February 23, 1993

Mr. Charles D. Garing
City of Lakeland- Larsen Power Plant
2002 U.S. Hwy. 92 East
Lakeland, Florida 33801

Subject: Air Permit Modification for Humidity Correction Formula

Dear Chuck:

Attached you will find a copy of Mr. Ron Pavris' letter and report on the above subject matter.

If I can be of any further assistance please, do not hesitate to call me at (813) 286-4829.

Leo

Leo Molina
Manager-Engineering Services

Att.

cc: Al Dodd/COL ←
D. Shultz/B&V
L. Webb/B&V

THE DEVELOPMENT OF CONTROL ALGORITHMS FOR CONTROLLING NOx ON GE HEAVY-DUTY GAS TURBINES

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This document was prepared by the General Electric Company (GE) as a summary of NOx control characteristics of certain GE heavy duty gas turbines. The information presented is not warranted, expressed or implied, with respect to accuracy, completeness or usefulness. Guarantees and warranties of certain data based on specific project requirements are available upon request.

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R.E. Pavri
Schenectady, NY
November, 1988

THE DEVELOPMENT OF CONTROL ALGORITHMS FOR CONTROLLING NOx ON GE HEAVY-DUTY GAS TURBINES

I. INTRODUCTION

Since the early 1970's, with the promulgation of the Clean Air Act, all gas turbine manufacturers installing machines in the USA have had to develop and implement methods to control NOx emissions from their turbines. The method most widely used is diluent (water or steam) injection in the flame zone of the combustor. To meet the New Source Performance Standards (NSPS), (Ref.1) simple methods were developed which relied on controlling the direct diluent injection as a function of fuel flow rate. As the codes became progressively more stringent, controls algorithms had to be developed to minimize the effect of diluent injection on hardware integrity, combustion stability, and other emissions.

The purpose of this document is to describe the basis of GE's control algorithm and how it is used in conjunction with the turbine instrumentation to limit NOx to a specified limit.

II. BACKGROUND

In any combustion process involving air, oxides of nitrogen (NOx) are formed. NOx formed from oxidation of free molecular nitrogen in the combustion air or fuel is called thermal NOx. For a given combustion system, thermal NOx is primarily a function of combustor residence time and the adiabatic flame temperature of the fuel which is the temperature reached by burning a theoretically correct mixture of fuel and air in an insulated vessel.

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II. BACKGROUND

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The following general relationships exist between diffusion flame combustor operating conditions and thermal NOx production:

- NOx increases directly with fuel/air ratio
- NOx increases exponentially with combustor inlet air temperature
- NOx increases approximately as the square root of combustor inlet pressure
- NOx decreases exponentially as the total moisture of the combustion air increases, either because of specific humidity of the inlet air, steam injection, or water injection.

The current industry accepted method for abating thermal NOx formation is to reduce the combustor flame temperature by introducing a thermal heat sink into the flame zone. Water or steam are extremely effective at achieving this goal within limits. A penalty in overall efficiency must be paid for the additional fuel required to heat the water or steam to combustor temperature, although gas turbine output is enhanced because of the additional mass flow through the turbine. There are practical limits to the amount of water or steam that can be injected into a standard single fuel nozzle diffusion flame combustor before operating problems develop. The practical limits are determined by:

- Combustor dynamic pressure oscillations
- Carbon monoxide emissions
- Combustor operating stability
- Combustor flame blow-off and/or blow-out (flame extinguished)

Dynamic pressure oscillations occur in all diffusion flame combustors and are produced by the combustion process. Dynamic pressures can be defined as pressure oscillations within the combustor. These dynamic pressures can couple with the combustor acoustic mode and be amplified, thus causing increasing mechanical wear rates of the combustion system hardware. Injection of water or steam to reduce NOx will further increase the dynamic pressure oscillations. (Ref.2). Dynamic pressure limits have been empirically established by field measurement and parts' life experience for GE machines. Exceeding these dynamic pressure limits will impact the recommended maintenance intervals for the combustor hardware.

As more and more water or steam is added to the combustor, a point is reached at which a sharp increase in carbon monoxide is observed. This sharp increase in CO indicates that the combustor efficiency is beginning to decrease. On liquid fuels, as more diluent is injected, CO will begin to increase leading to combustor stability problems and if enough diluent is injected, the flame will be extinguished. On gaseous fuels, once a sharp increase in CO begins because of high diluent injection, further increases also lead to the flame being extinguished.

III. NOx CONTROL TO NSPS LEVEL

In September 1979, the EPA promulgated the NSPS for stationary gas turbines for NOx emissions. By then, GE had developed the diluent injection method of controlling gas turbine exhaust NOx to proper levels as dictated in the NSPS. This diluent is injected into the flame zone of the combustor which reduces the flame temperature and hence, thermal NOx.

The NSPS NOx code as per Subpart GG of 40CFR60 (Ref. 2) but written in British units is:

$$NOx_a = 75(13652/Y) + F \qquad \text{III-1}$$

NOx_a = Allowable NOx in PPMVD @ 15% O_2

Where Y = Manufacturers' rated Heat Rate (HR) in Btu/KWH

F = Allowance for fuel bound nitrogen

It also required that the measured NOx, after HR adjustment, be adjusted to ISO standard day conditions by the following ambient condition correction factor (correct form).

$$NOx_{iso} = NOx_{obs}\left[\frac{Pref}{Pobs}\right]^{0.5} e^{19(Hobs-.00633)\left[\frac{288}{Tamb}\right]^{1.53}} \qquad \text{III-2}$$

Where:

NOx_{iso} = emissions of NOx at 15 percent oxygen and ISO standard ambient conditions.

NOx_{obs} = measured NOx emissions at 15 percent oxygen, PPMV.

Pref = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, PSIA.*

Pobs = measured combustor inlet absolute pressure at test ambient pressure, PSIA.*

Hobs = specific humidity of ambient air at test, lbs. water/lbs. air.

e = transcendental constant (2.718).

Tamb = temperature of ambient air at test, °K

* The units on pressure terms are not defined in Ref. 1. They may be different than PSIA but must be consistant for both terms.

For the MS6001B, MS7001EA and MS9001E, the HR correction increases the allowable NOx to the 90-100 PPMVD range. The amount of steam injection to meet these levels of NOx on a typical MS6001B on natural gas or distillate oil fuels is shown in Figure 1.

The ISO adjustment allows the measured, raw NOx value from a gas turbine exhaust to be either above or below the required value. For an MS6001B on natural gas, the required NOx with HR adjustment is 95 PPMVD. On a day with ambient temperature of 100°F, 60% relative humidity and a normal barometric pressure of 14.7 PSIA, the required NOx with ISO correction is 74 PPMVD. If the ambient temperature is 80°F with relative humidity of 20% and again a normal barometric pressure of 14.7 PSIA, the required NOx is 105 PPMVD.

As discussed earlier, diluent injection can have detrimental effects on gas turbine operations. Even though the ISO adjustment can require the measured raw NOx to be below the required value, the amount of steam/water injection to meet it is relatively low and experience has shown it to have minimal effect on other turbine operating parameters. Consequently, a simple algorithm was developed to control only the injected steam/water into the combustor as a function of fuel flow rate. A single control line of diluent (steam/water) injection flow rate vs. fuel (gas/oil) flow rate was developed. Figure 2 shows a typical control curve for a standard MS6001B for NOx control to the NSPS level for steam injection with gas fuel. In algebraic form, this curve is:

$$Sr = m(F - Fo) + Smin \qquad \text{III-3}$$

Sr = Required steam flow, lbs/sec

F = Fuel flow, lbs/sec

Fo = Fuel flow offset, lbs/sec

m = Steam/gas slope

Smin = Minimum steam flow, lbs/sec

$$S = Sr + So \qquad \text{III-4}$$

S = Actual steam flow, lbs/sec

So = Steam flow offset, lbs/sec

See Figures 2 and 5 for the definition of fuel flow offset. The steam flow offset is the minimum controllable steam flow. This is set by valve tolerances and control instrument sensitivity. A typical value of So is 0.3 lbs/sec. Once this curve is adjusted (if necessary) after the field test, demonstrating compliance is relatively simple. It only requires that actual diluent injection flow be higher than that called for by the curve at the measured fuel flow. A dedicated controls routine in the gas turbine control system has a standard "Wet Low NOx Display" which helps the customer in keeping records to demonstrate compliance. A brief description of Wet Low Nox Display is given in Figure 3.

IV. NOx CONTROL FOR MORE STRINGENT NOx CODES (e.g., NOx = 42 PPMVD @ 15% O_2)

As the NOx codes, in Japan and California, became more stringent in the early 1980's, it became apparent that a more complex control mechanism would be necessary to meet the lower NOx emissions limits (e.g. 42 PPMVD @ 15% O_2) and yet strike the balance to maintain the turbine hardware integrity and keep CO emissions manageable.

Figure 1 also shows the estimated steam injection required to meet NOx = 42 PPMVD @ 15% O_2 (no corrections) on gas and NOx = 65 PPMVD @ 15% O_2 (no corrections) on oil for a typical MS6001B. At or below this level of NOx, the effect of diluents entering the combustion reaction zone from any source on combustor dynamics, stability, flame blow-off, turbine hardware life, and CO emissions cannot be neglected as it could at the higher NSPS level. Starting with the sale of MS6001B to Crown-Zellerbach (now Gaylord Container Corp. in Antioch, California) in late 1981 (commercial operation December, 1982), a new control algorithm was developed to control the diluent injection into the combustor. In essence, this algorithm accounts for <u>all</u> sources of diluent(s), viz.

1. Direct combustor head-end steam or water injection
2. Water vapor as inlet humidity that enters the gas turbine compressor inlet
3. Power augmentation steam (if present) added to the compressor discharge.

IV A. ALGORITHM DERIVATION

The technical basis of the non-NSPS NOx control algorithm is the NSPS ISO correction, viz:

$$\frac{NOx_{iso}}{NOx_{obs}} = \left[\frac{Pref}{Pobs}\right]^{0.5} e^{19(Hobs-.00633)} \left[\frac{Tamb}{288}\right]^{-1.53} \quad (1)$$

Within the usual range of ambient conditions, the pressure correction term is usually 5% or less and is neglected. With this assumption and using Tamb in °R, equation (1) becomes:

$$\frac{NOx_{iso}}{NOx} \approx e^{19(H-.00633)} \left[\frac{Tamb}{519}\right]^{-1.53} \quad (2)$$

Where $NOx = NOx_{obs}$: $H = Hobs$

$$\text{Now } \frac{Tamb}{519} = 1 + \frac{Tamb-519}{519} \quad (3)$$

Then $\left[\frac{Tamb}{519}\right]^{-1.53} = \left[1 + \frac{Tamb-519}{519}\right]^{-1.53}$, which by series expansion

$$\approx 1 - \frac{1.53}{519}(Tamb-519)$$

$$= 1 - .00295(Tamb-519) \quad (4)$$

Expressing temperature in °F, Equation (2) then becomes:

$$\frac{NOx_{iso}}{NOx} = e^{19(H-.00633)\,[1-.00295(Tamb-59)]} \quad (5)$$

The natural logorithm of Equation (5) gives:

$$\ln \frac{NOx_{iso}}{NOx} = 19\,(H-.00633) + \ln\,[1-.00295(Tamb-59)] \quad (6)$$

Since the term .00295 (Tamb -59) is of the order of ±.1, and the ln[1-.00295 (Tamb -59)] is also of the order of ±.1, Equation (6) simplifies to:

$$\ln \frac{NOx_{iso}}{NOx} = 19\,(H-.00633) - .00295\,(Tamb - 59) \quad (7)$$

Equation (7) shows the variation in NOx due to changes in the ambient temperature and humidity.

As discussed earlier, injecting any diluent into the flame of a diffusion flame combustor exponentially reduces thermal NOx (Ref 2). Figure 4 shows the effect of steam/water injection on thermal NOx for typical GE heavy-duty gas turbines. In mathematical form, these curves could be written as:

$$RNOx_S = e^{-m_S\,(S/F)} \quad \text{for steam injection} \quad (8)$$

$$RNOx_W = e^{-m_W\,(W/F)} \quad \text{for water injection} \quad (9)$$

Where:

RNOx = Ratio of $\frac{\text{NOx with diluent injection}}{\text{NOx without diluent injection}}$

S = Steam flow, lbs/sec

F = Fuel flow, lbs/sec

W = Water flow, lbs/sec

m_S = Slope of the steam injection line

m_W = Slope of the water injection line

Since energy is required to vaporize liquid water, it is a more effective diluent in lowering the combustion temperature, than steam and $m_W > m_S$

In logarithmic form, Equations (8) and (9) become:

$$\ln\ RNOx_S = -m_S\,(S/F) \quad (10)$$

$$\ln\ RNOx_W = -m_W\,(W/F) \quad (11)$$

Equations (10) and (11) show the variation in NOx due to steam and water injection respectively.

Equating Equations (10) or (11) to (7) shows the necessary variation in injected steam or water as the ambient humidity and temperature deviates from humidity = .00633 lbs water/lbs dry air and 59°F (standard reference conditions).

Equating (10) to (7):

$$-m_s \left(\frac{s}{F}\right) = 19\ (H - .00633) - .00295\ (Tamb - 59) \qquad (12)$$

$$\text{or } \frac{s}{F} = \frac{.00295}{m_s}\ (Tamb - 59) - \frac{19}{m_s}\ (H - .00633) \qquad (13)$$

Similarly, equating (11) to (7):

$$\frac{w}{F} = \frac{.00295}{m_w}\ (Tamb - 59) - \frac{19}{m_w}\ (H - .00633) \qquad (14)$$

Lab and field tests have shown that the typical value of $m_s = 1.06$ and $m_w = 1.58$ for GE heavy-duty gas turbines. Substituting $m_s = 1.06$ in Equation (13) gives:

$$\frac{s}{F} = .0028\ (Tamb - 59) - 17.95\ (H - .00653) \qquad (15)$$

Adding Equation (15) to the NSPS control curve (Equation III-3) gives:

$$S_R = m\ (F - Fo) + F\ [.0028\ (Tamb - 59) - 17.95\ (H - .0063)] + S_{min} \qquad (16)$$

Equation (16) shows how the required steam injection must vary with ambient humidity and temperature to hold NOx at a preset value, e.g., 42 PPMVD @ 15% O_2.

For those turbines where power augmentation steam is present, its contribution towards NOx abatement must be accounted for. The general form of Equation (16) reads:

$$S_R = m\ (F - Fo) + F\ [.0028\ (Tamb - 59) - 17.95\ (H - .0063)] + S_{min} - qS_p \qquad (17)$$

Where S_p = Power augmentation steam flow, lbs/sec
q = Fraction of power augmentation steam flow entering the flame zone.

Equation (17) is THE algorithm that is used to control the steam injection flow on all GE heavy-duty gas turbines that must meet NOx levels less than the NSPS.

Note that the actual steam flow is higher than required steam flow from Equation (17) by the steam flow offset, So.

For water injection, the equation is:

$$W_R = m' (F-Fo) + F [.0019 (Tamb -59) -12 (H -.0063)] + W_{min} - q (ms/mw) S_p \quad (18)$$

and $$W = W_R + W_o \quad (19)$$

W_R = Required water flow, lbs/sec

W_{min} = Minimum water flow, lbs/sec

W = Actual water flow, lbs/sec

W_o = Water flow offset, lbs/sec

Other terms are the same as for steam injection.

The algorithm for steam injection is shown in the graphical form in Figure 5a-5c. Figure 5a shows the very strong effect of humidity on a high ambient temperature day. On cold days, e.g. 30°F, where the specific humidity is very low, the ambient humidity effects are negligible, Figure 5b. The ambient temperature effects are quite sizable and are shown in Figure 5C.

All GE manufactured gas turbines come equipped with documentation on control specifications which show in detail (among other things), the NOx control algorithm. The specification shows the algorithm in controls language, and Figure 6 compares the algebraic terms of the algorithm with the controls language terms and also shows typical values of the constants.

IV B. Special Instrumentation

Since the NOx control algorithm needs inputs for turbine inlet humidity and temperature, all GE gas turbines that control NOx to these levels are equipped with:

- Inlet humidity sensor.
- Inlet temperature sensor.

Included in the Appendix A are typical arrangement drawings which show the standard locations of these sensors. Appendix A also contains literature on the humidity sensor describing the scientific principle behind it. Specifications on the inlet temperature sensor are also included.

IV C. Demonstrating Compliance

It is important to recognize that the NOx control algorithm is no longer a single curve but a family of curves depending on the ambient conditions. However, demonstrating compliance is still straightforward. Appendix B shows the steps necessary to demonstrate compliance.

The GE control system "Wet Low NOx Display" again helps the customer's record keeping on showing continuous compliance. The required steam/water flow is now compensated for ambient humidity and temperature.

IV D. Field Experience

Starting with the Crown Zellerbach (now Gaylord Container Corp.) MS6001B which began commercial operation in 1982 in Antioch, California, there are 48 GE gas turbine units operating, installed or shipped (as of the end of 1988) that control NOx using this algorithm. All these units have to meet stringent NOx codes with either water or steam injection. Some units also have power augmentation steam. A list of these units is given in Appendix C.

The field experience, mostly in California, has clearly proven that the algorithm works in maintaining the NOx at or below the required value. Appendix D includes actual data, as reported to the local air district, demonstrating continuous compliance with the permit NOx limit over a number of different ambient temperature conditions and humidity.

REFERENCES

1. Code of Federal Regulations, Title 40, Article 60, Subpart GG.

2. E.J. Walsh, "GE Heavy-Duty Gas Turbine Multiple-Combustion System" GER 3435A.

EFFECT OF STEAM INJECTION ON NOx CONTROL

MS6001B/STANDARD COMBUSTION SYSTEM

NOx (PPMVD)	GAS S/F	OIL S/F
NSPS		
95	.4	—
94	—	.88
42	1.16	—
65	—	1.20

NOx IN PPMVD @ 15% O_2

S = STEAM FLOW LBS/SEC

F = FUEL FLOW LBS/SEC

FIGURE 1

TYPICAL

PG6541(B)
STEAM INJECTION COMPLIANCE CURVE
EPA 75 PPMVD NOx (NSPS)

Notes: 1. Control Curve set 1000 lb/h above Compliance Curve

2. To adjust curve to site elevation multiply Heat Consumption and Steam Injection by the altitude correction factor $\left(\frac{\text{site bar. press.}}{14.7 \text{ psia}}\right)$ and redraw curve.

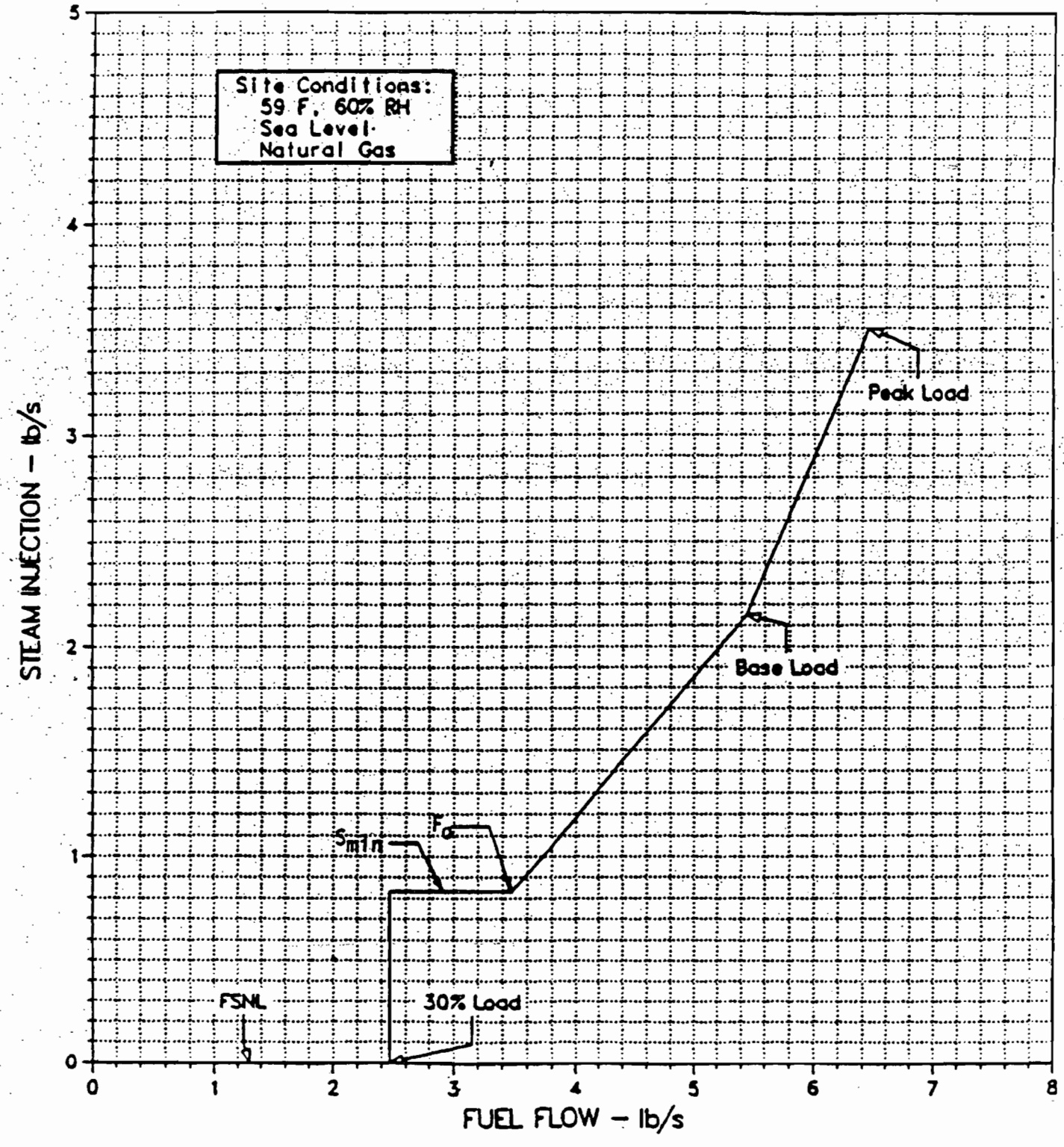

FIGURE 2

a. WET LOW NOx DISPLAY

DATA.LIST 07 displays the data required to verify the compliance with low nitrous oxide emission regulations.

This data list consists of the hourly average and the minute averages.

Each set of data, which is displayed on one line, consists of the following:

- Date and Time of the average calculation
- Average Fuel Flow: for example, GAS FUEL LBS/SEC
- Average Injection Flow: for example, STEAM LBS/SEC
- Average Actual Injection to Fuel Ratio: labeled ACTUAL RATIO
- Average Required Injection to Fuel Ratio: labeled REQUIRED RATIO
- Average Ambient Temperature: DEG F or DEG C

1. The minute average is the average of the inputs during each minute and is calculated when:

   - the WET LOW NOx control is enabled.

   DATA LIST 07 displays the last 10 sets of minute averages with the latest data at the top of the list.

2. The hourly average is the average of the last 60 minute averages and is calculated each minute when:

   - WET LOW NOx control is enabled and
   - Qty. 60 minute averages have been accumulated.

   DATA LIST 07 displays the last calculated hourly average which consists of one set of data.

- Wet Low NOx Display

DATA LIST 07 WET LOW NOx DATA 14 MAR 84 20:29:26

HOUR AVERAGE TIME	GAS FUEL LBS/SEC	STEAM LBS/SEC	ACTUAL RATIO	REQUIRED RATIO	AMBIENT TEMP°F
14 MAR 84 20:29:00	5.000	1.000	0.200	0.190	75

MINUTE AVERAGES
TIME

	GAS FUEL LBS/SEC	STEAM LBS/SEC	ACTUAL RATIO	REQUIRED RATIO	AMBIENT TEMP°F
14 MAR 84 20:29:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:28:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:27:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:26:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:25:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:24:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:23:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:22:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:21:00	5.000	1.000	0.200	0.190	75
14 MAR 84 20:20:00	5.000	1.000	0.200	0.190	75

FIGURE 3

TYPICAL CURVE OF

NO_x ABATEMENT WITH DILUENT INJECTION

GE HEAVY DUTY GAS TURBINES

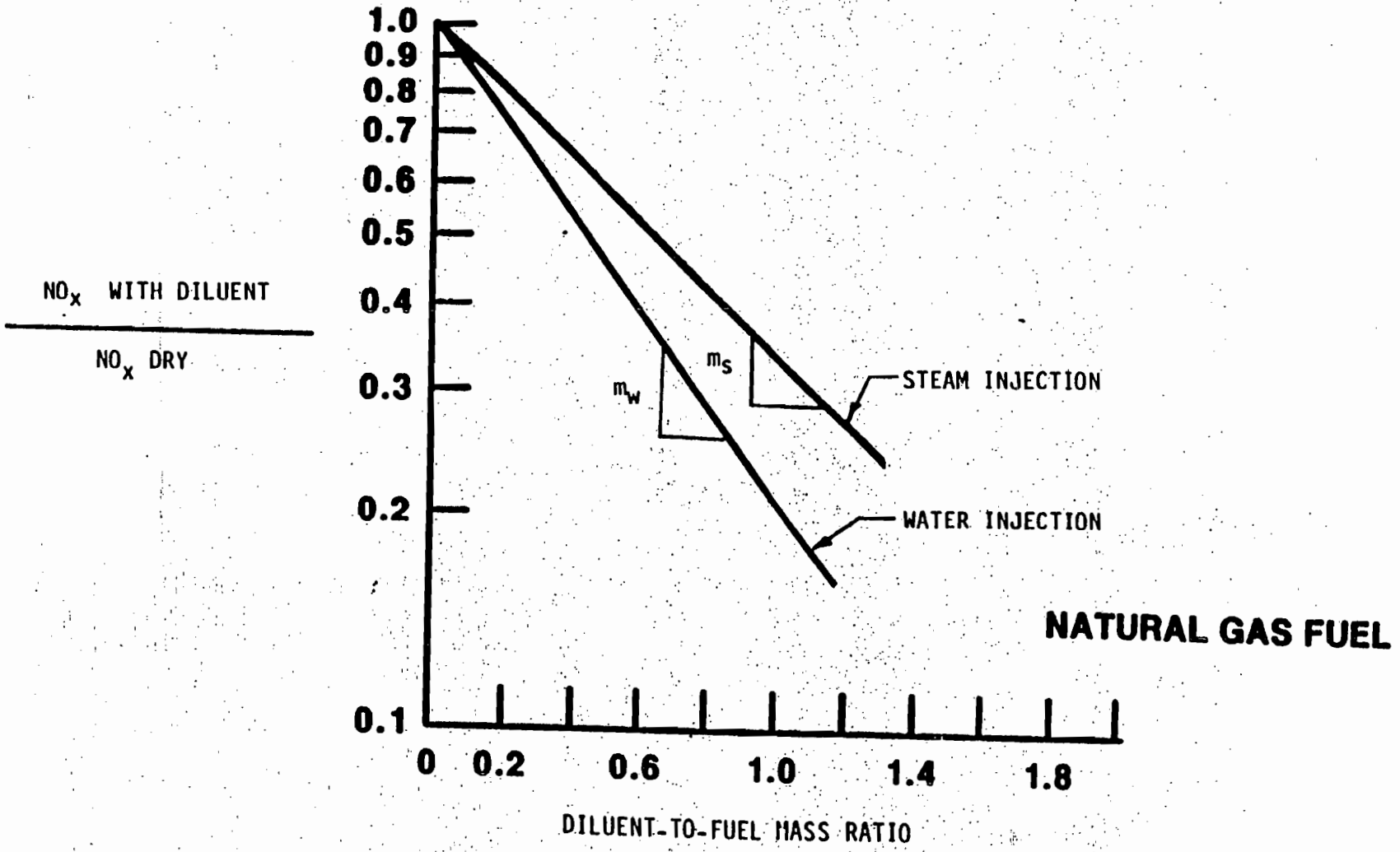

FIGURE 4

TYPICAL

GENERAL ELECTRIC - PG6541(B) GAS TURBINE STEAM TO FUEL FLOW SCHEDULE

STEAM INJECTION TO LIMIT NOx TO 42 PPMVD @ 15% O2

FUEL: NATURAL GAS
ELEVATION: SEA LEVEL

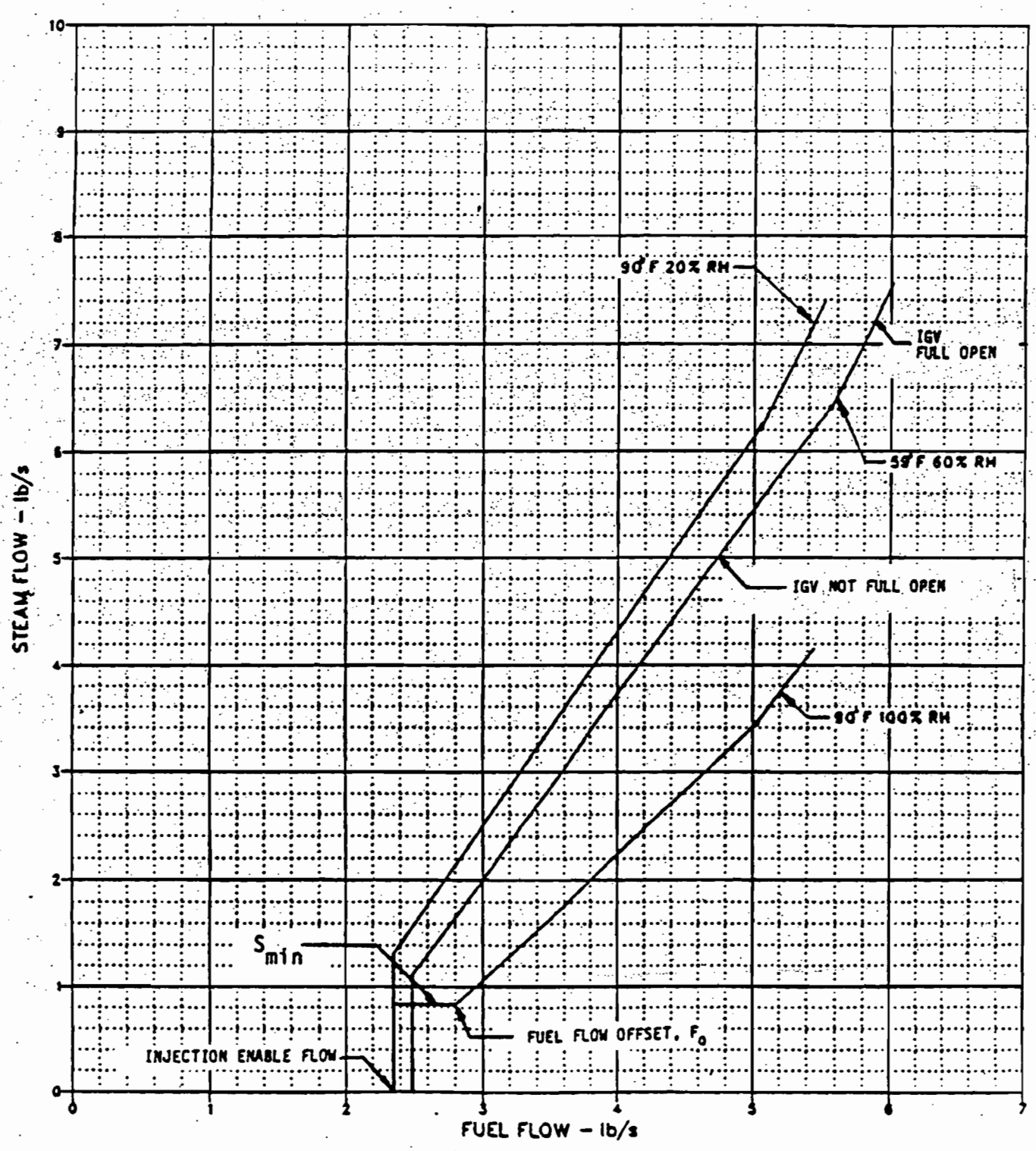

FIGURE 5a

TYPICAL

GENERAL ELECTRIC - PG6541(B) GAS TURBINE STEAM TO FUEL FLOW SCHEDULE

STEAM INJECTION TO LIMIT NOx TO 42 PPMVD @ 15% O2

FUEL: NATURAL GAS
ELEVATION: SEA LEVEL

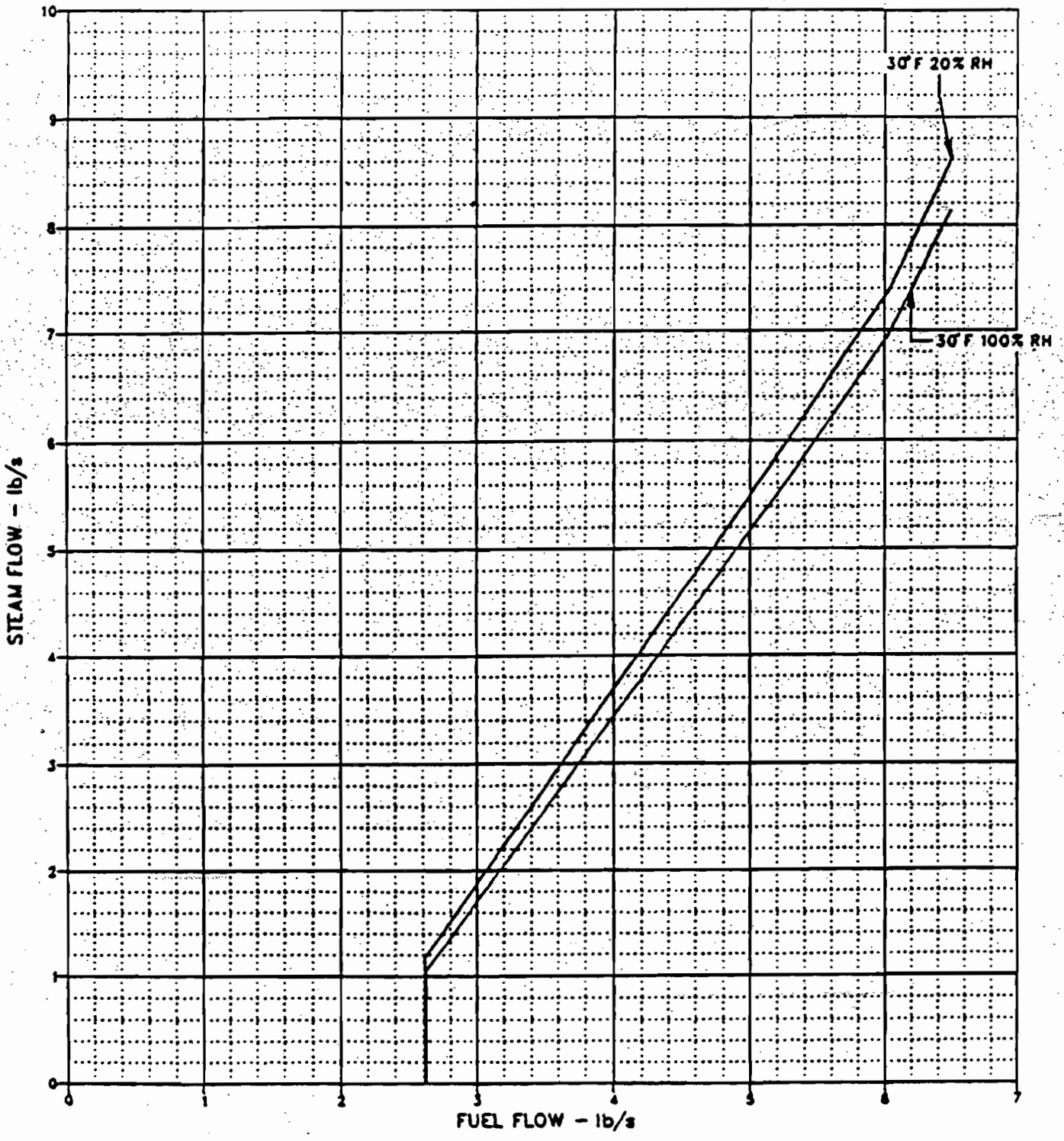

FIGURE 5b

TYPICAL

GENERAL ELECTRIC - PG6541(B) GAS TURBINE STEAM TO FUEL FLOW SCHEDULE

STEAM INJECTION TO LIMIT NOx TO 42 PPMVD @ 15% O2

FUEL: NATURAL GAS
ELEVATION: SEA LEVEL

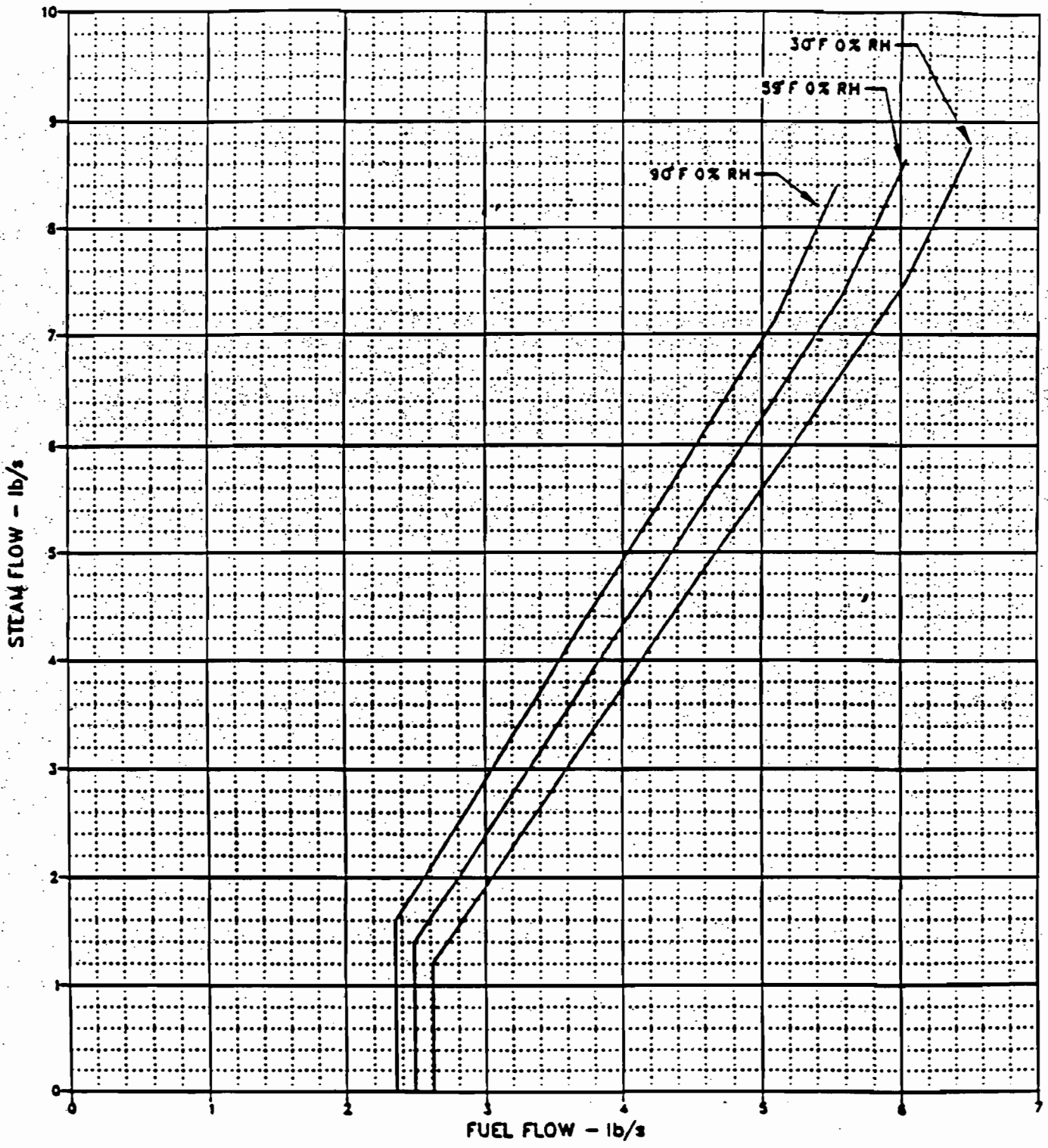

FIGURE 5c

STEAM INJECTION FLOW REFERENCE
ALGORITHM: MK4_WQRV1_01 STM/INJ

REQUIRED STEAM FLOW IS SCHEDULED AS A FUNCTION OF FUEL FLOW, WITH COMPENSATION FOR AMBIENT TEMPERATURE (CTIM), SPECIFIC HUMIDITY (CMHUM), AND IF USED, POWER AUGMENTED STEAM FLOW (WQKn_A).

THE EQUATION FOR THE REQUIRED STEAM FLOW USED IS BASED ON:

SR = [F-FO]m + F[.0028(Tamb-59) - 17.95(H-.0063)] + Smin - q(Sp)

IN MKIV, THIS BECOMES:

WQR = [FQT - WQKn_B]WQKn_K + FQT[WQKn_T(CTIM-59F) -
WQKn_H(CMHUM - 0.0063)] + WQKn_N - (WQKn_A) WQJA

WHERE:	FQT	= F,	TOTALIZED GAS FUEL FLOW	(LB/SEC)
	CMHUM	= H,	SPECIFIC HUMIDITY	(LB WATER/LB AIR)
	CTIM	= Tamb,	AMBIENT TEMPERATURE	(DEG F)
	WQR	= SR,	STEAM FLOW REF.	(LB/SEC)

NOTE: WQKn_*, WHEN n=0; GAS FUEL < LK83WK1 SELECT L83WK0
WQKn_*, WHEN n=1; GAS FUEL > LK83WK1 SELECT L83WK1

INITIAL CONTROL SPEC SETTINGS ARE PREDICTED FOR THE ALLOWED EMISSIONS LEVEL. AS EMISSIONS TEST DATA IS AVAILABLE, CONSTANTS SHOULD BE READJUSTED TO COMPLY WITH REQUIREMENTS. HOWEVER, IN THE INTEREST OF MINIMIZING GAS TURBINE MAINTENANCE COSTS, INJECTION CONTROL CURVES SHOULD BE SET TO REDUCE EMISSIONS NO MORE THAN 10% BELOW ALLOWABLE.

WATER INJECTION FLOW REFERENCE
ALGORITHM: MK4_WQRV1_01 H2O/INJ

REQUIRED WATER FLOW IS SCHEDULED AS A FUNCTION OF FUEL FLOW, WITH COMPENSATION FOR AMBIENT TEMPERATURE (CTIM), SPECIFIC HUMIDITY (CMHUM), AND IF USED, POWER AUGMENTED STEAM (WQK_A).

THE EQUATION FOR THE REQUIRED WATER FLOW IS BASED ON:

WR = [F-FO]m' +F[.0019(Tamb-59) -12(H-.0063)] + Wmin-q(ms/mw)Sp

IN MKIV THIS BECOMES:

WQR = [FQT - WQKnB]WQKn_K + FQT[WQKn_T(CTIM-59) -
WQKn_H(CMHUM - 0.0063)] + WQKn_N - WQJA(WQKn_A).

WHERE:	WQR	= WR,	REQUIRED WATER FLOW	(LB/SEC)
	FQT	= F,	TOTALIZED FUEL FLOW	(LB/SEC)
	CMHUM	= H,	SPECIFIC HUMIDITY	(LB WATER/LB AIR)
	CTIM	= Tamb,	AMBIENT TEMPERATURE	DEG F

NOTE: WQK(n)_ : n=0 (GAS OR MIXED FUEL L83WK0)
WQK(n)_ : n=1 (LIQUID FUEL ONLY SELECT L83WK1)

FIGURE 6a: ALGORITHM DEFINITION

NAME MKIV	NAME ALGEBRAIC	TYPICAL VALUE 6001B	TYPICAL VALUE 7001EA	UNITS	DESCRIPTION
WQKO_A	q	0.265	0.265	#/#	POWER AUG. STEAM CORRECTION
WQKO_B	Fo	2.200	5.470	#/SEC	FUEL FLOW OFFSET
WQKO_E		1.80	4.910	#/SEC	INJECTION ENABLE FLOW
WQKO_H		17.950	17.950	#/#H	HUMIDITY CORRECTION COEFF.
WQKO_K	ms	1.700	1.6120	RATIO	STEAM/GAS SLOPE
WQKO_M	Smin	1.000	3.110	#/SEC	MINIMUM INJECTION FLOW LIMIT
WQKO_T		0.0028	0.00280	/F	AMB. TEMPERATURE CORRECTION COEFF.
WQKR3	So	0.300	0.300	#/SEC	ADJ. STEAM FLOW OFFSET

NOTES

1. These values are typical. Each unit in the field has its site specific values.

2. The MKIV algorithm includes protective limiting values for maximum and minimum on many parameters as well as logic switching points.

3. The water/gas slope changes depending on the position of the inlet guide vanes (2 values of the slope). Values of these constants differ depending on the slope.

FIGURE 6b: TYPICAL VALUES FOR STEAM INJECTION

NAME MKIV	ALGEBRAIC	TYPICAL VALUE 6001B	7001EA	UNITS	DESCRIPTION
WQKO_A	q(ma/mw)	0.1778	0.1778	#/#	AUG STM RATIO INTO FLAME
WQKO_B	Fo	2.20	5.470	#/SEC	FUEL FLOW OFFSET
WQKO_E		1.80	4.900	#/SEC	INJECTION ENABLE FLOW
WQKO_H		12.000	12.000	#/#H	HUMIDITY CORRECTION COEFF.
WQKO_K	m'	1.334	1.1700	RATIO	WATER/GAS SLOPE
WQKO_N	Wmin	1.000	1.000	#/SEC	MINIMUM INJECTION FLOW LIMIT
WQKO_T		0.00190	0.00190	/F	AMB. TEMPERATURE CORRECTION COEFF.
WQKR3	Wo	0.300	0.300	#/SEC	ADJ. WATER FLOW OFFSET

NOTES

1. These values are typical. Each unit in the field has its site specific values.

2. The MKIV algorithm includes protective limiting values for maximum and minimum on many parameters as well as logic switching points.

3. The water/gas slope changes depending on the position of the inlet guide vanes (2 values of the slope). Values of these constants differ depending on the slope.

FIGURE 6c: TYPICAL VALUES FOR WATER INJECTION

APPENDIX A

INLET HUMIDITY & TEMPERATURE SENSORS

STANDARD LOCATIONS & SPECS.

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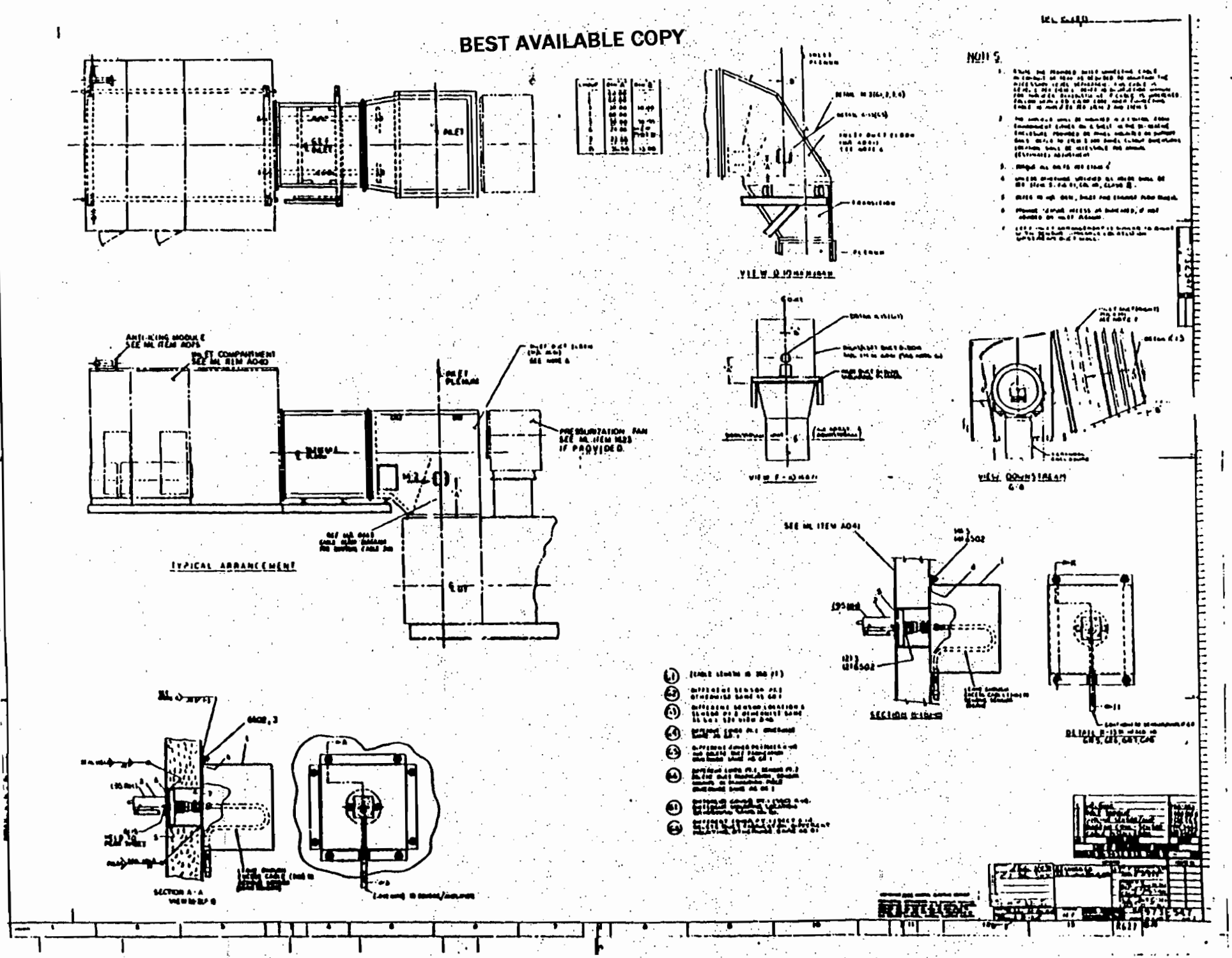
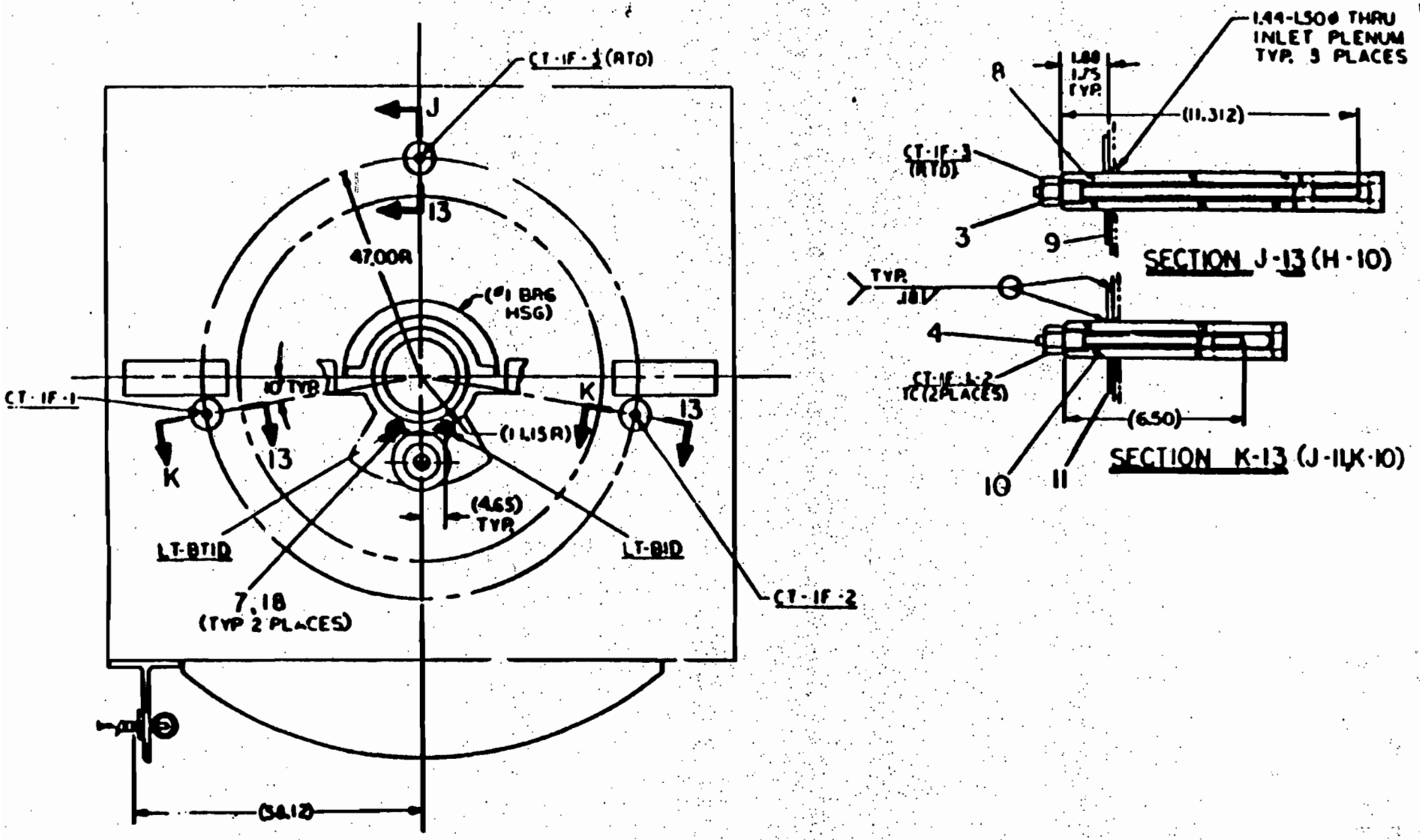


FIGURE A1: STANDARD ARRANGEMENT FOR INLET HUMIDITY SENSOR



TURBINE INLET
(Looking from front).

FIGURE A2: STANDARD ARRANGEMENT FOR INLET TEMPERATURE SENSOR

Infrared System Detects Condensation, Icing Conditions

Instrument uses infrared bandwidth with selective absorption properties to give fast, accurate dew point measurements

E. J. Stefanides, Central States Editor

Sterling Heights, MI—A new anti-ice and absolute moisture control system protects gas turbines and large antennas from condensation and ice. This system uses an infrared method of dew point measurement that is very accurate and insensitive to the effects of contamination, ambient light, and environmental temperature excursions. Its method of operation is based on the fact that certain bands within the infrared spectrum are absorbed by water. There is in fact one band, the 935 nanometer band, whose absorption is exclusively limited to water. The system generates and detects moisture by generating and monitoring infrared energy of this band's wavelength.

The system is a patent-protected development of the Environmental & Process Controls Company. It includes an electronic controller, a sensor unit, and a connecting cable. The sensor generates conditions that cause a moisture film to be produced then dissipated; and measures the temperatures at which the moisture appears and disappears. It also measures ambient temperature. The electronic controller contains logic for control of the sensor and interpretation of the temperature data. It also provides for digital display of the temperatures, and furnishes a relay contact-type output signal. The output signal activates ancillary equipment, which provides the actual protection against formation of condensation or ice.

The sensor is a box-like structure with an air opening that includes a thermomodule, a Light Emitting Diode(LED), a phototransistor, and two matched thermistors. The thermomodule contains a solid-state thermocooler and one of the two thermistors. The hot side of the thermocooler is fixed to the sensor housing, and uses the housing as a heat sink. The cold side is equipped with a reflective surface that is part of the infrared optical system. The thermistor is embedded beneath this attached reflective surface, and measures its temperature. The other thermistor is either installed

Sensor contains infrared monitoring system with LED and phototransistor, and thermomodule with reflective surface.

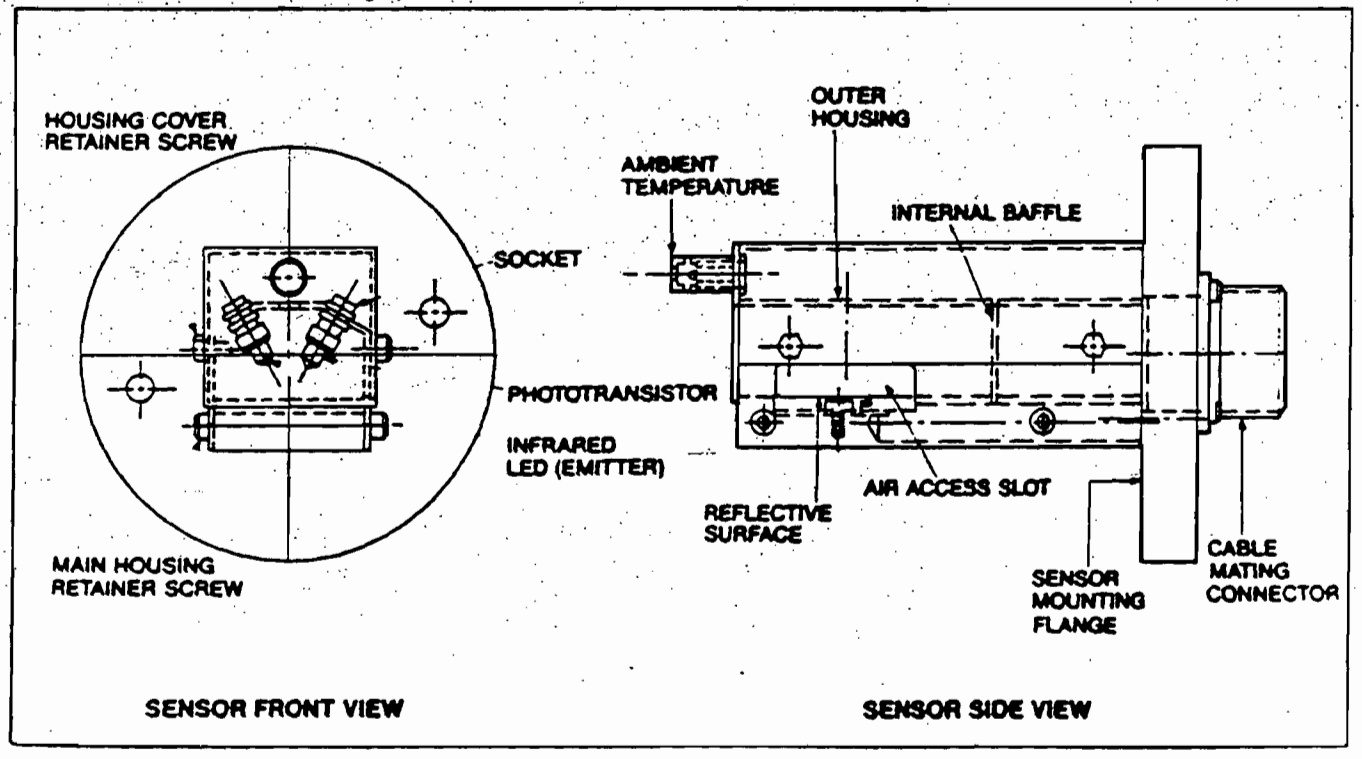


FIGURE A3: INLET HUMIDITY SENSOR

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on the exterior of the sensor housing, or when possible, is mounted on the surface of the protected equipment.

The LED and photo transistor are selected to and applied in a manner that causes them to operate in the 935 nanometer band. They are located in the housing, and are inclined at 30-deg angles to and are focused on the reflective surface. This arrangement is such that virtually all the infrared energy emitted by the LED is reflected to and impinges on the phototransistor.

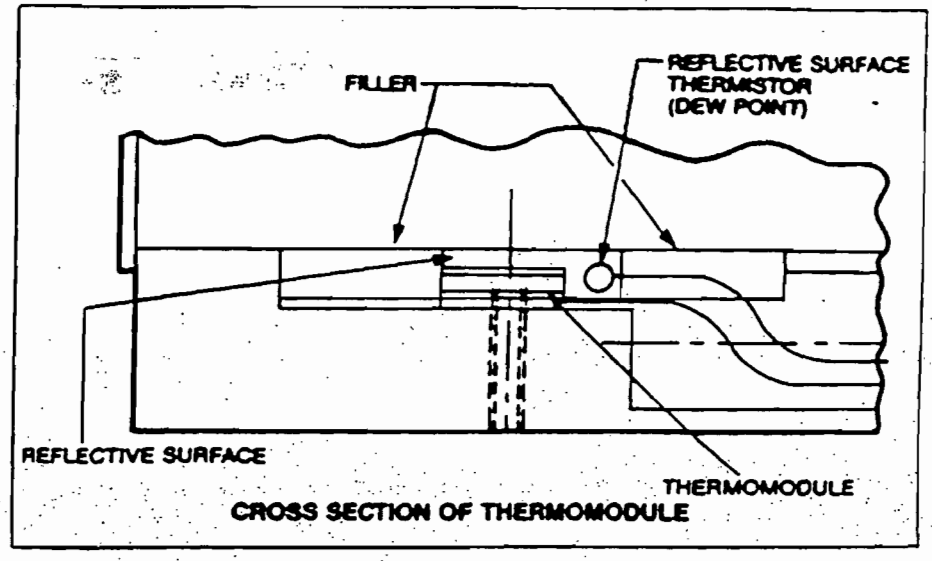
In operation, the thermomodule in the sensor is turned on by the electronic logic within the controller. Its activation produces a chilling effect, which causes a thin film of dew or condensation to accumulate on the attached reflective surface. The thin film of moisture absorbs all of the infrared energy emitted by the LED. This absorption eliminates reflection of any infrared energy to the phototransistor, causing it to be turned off. The turnoff signal informs the electronic controller that moisture is present on the reflective surface.

The phototransistor's turnoff signal, indicating the presence of moisture, produces two related actions. It activates the circuit that receives input from the reflective surface's embedded thermistor, causing it to begin monitoring the temperature of that surface. Also, it stops flow of current to the thermomodule, thereby allowing warming of the reflective surface.

As the reflective surface warms, its moisture film is quickly dissipated, causing the phototransfer to turn back on. This turn on signal also produces two related actions. It causes the thermistor circuit's monitoring of the reflective surface's temperature to be temporarily terminated. Also, it causes current to flow to the thermomodule, producing a chilling effect for the next measuring cycle.

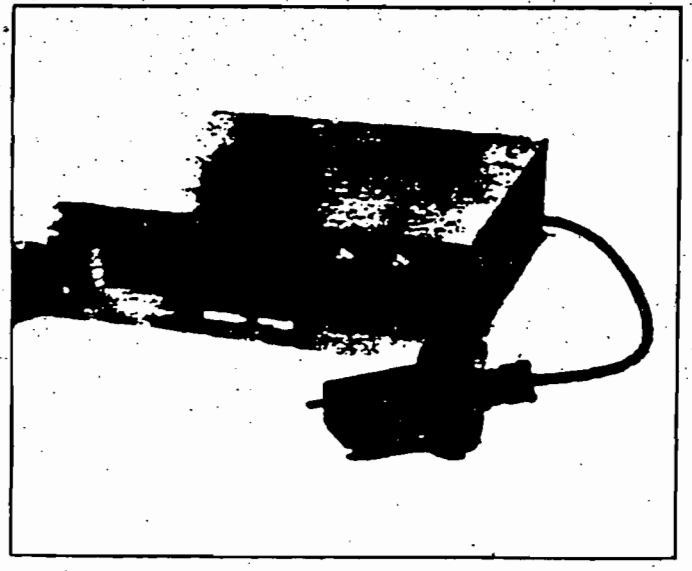
The monitoring of the temperature of the reflective surface furnishes the data for the dew point determination. The dew point is taken as an average of the temperatures at which moisture appears and disappears. The difference between these two temperatures is usually less than 0.5F; so a very accurate, high-resolution dew point temperature measurement is obtained.

The instrument's second thermistor circuit measures ambient or surface (of the protected equipment) temperature. The dew point temperature and ambient or surface temperature measurements, are available within the instrument in both digital and analog form. The



Thermomodule allows chilling and heating of reflective surface, has embedded thermistor.

System detects conditions that cause condensation and ice.



Sensor's solid-state components generate/dissipate moisture film.

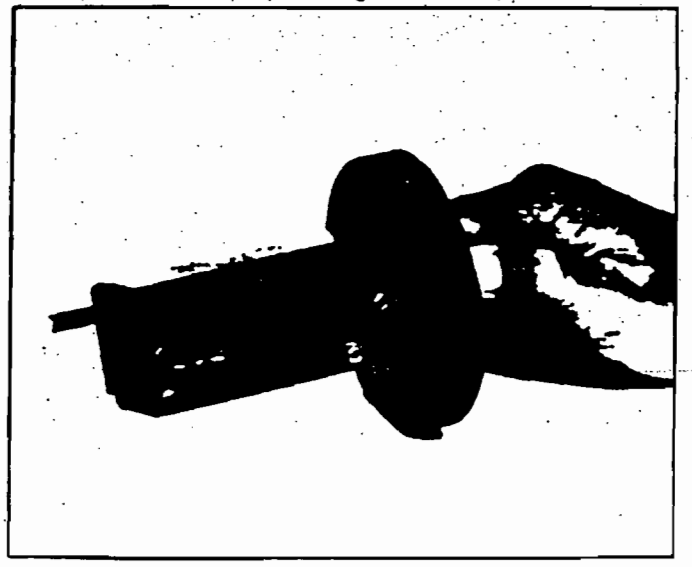


FIGURE A3 (Continued)

INFRARED SYSTEM

digital form allows their selectable readout on an LED digital display unit on the front panel of the controller. The analog form allows their use by logic that provides control and alarm functions. The instrument also includes circuitry for digital storage of the two readings, and for output of these readings and control signals to a computer or other microprocessor-based control unit.

In systems used for protection against ice, detection of conditions that cause formation of ice is obtained from data processing provided by a pair of comparator circuits. One circuit compares the ambient temperature to a reference signal that corresponds to the 41F ambient temperature, at which ice formation becomes a threat. This circuit is activated by an ambient temperature of 41F or less, and arms the second comparator circuit. The second circuit compares ambient and dew point temperatures, and is activated when dew point temperatures are 4F lower than ambient temperature. This activation provides warning and control outputs, which indicate that conditions for formation of ice exist. The control signals activate devices that protect against ice, and are provided by a control relay built into the controller.

The controller logic also provides for generation of a dry cycle. It is used at startup and periodically to remove moisture or ice from the reflective surface. During the dry cycle, the polarity of current supplied to the thermocooler is reversed to heat the reflective surface. To facilitate readout and control functions during this interval, the previous temperature readings are stored in the controller's memory.

Additional details . . . Contact Environmental & Process Controls Co., 35523 Dunston Dr., Sterling Heights, MI 48077, 313-979-4512.

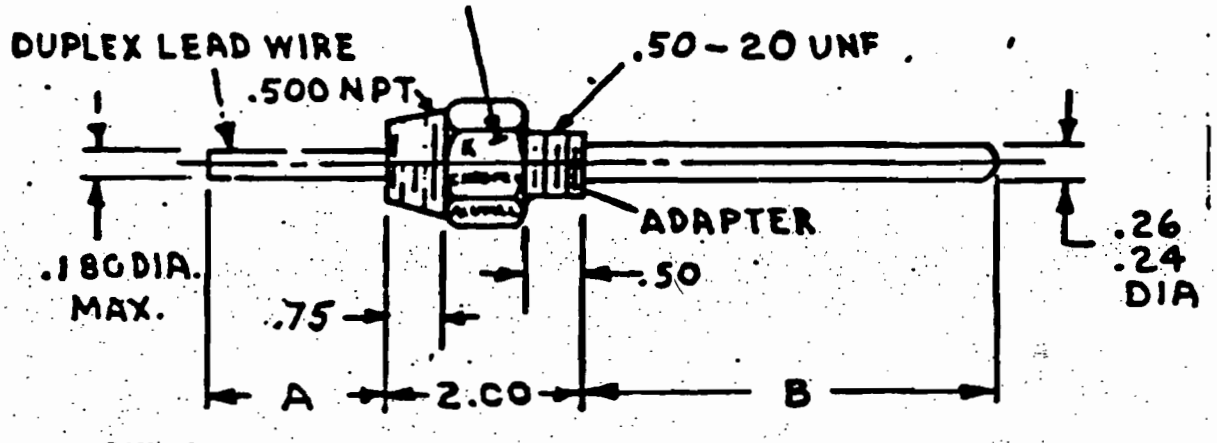
FIGURE A3 (Concluded)

GENERAL ELECTRIC

248A4123

FIG. #1

STAMP DWG, PART & REV. NOS, TYPE & CALIBRATION, MFG, AND DATE ON THIS SURFACE.



REQUIREMENTS:

1. Thermocouple must be of swaged construction using 321 OR 347 STN. Steel sheath, inert high temperature insulation (MgO or approved equal) Chromel-Alumel thermocouple wires, ISA calibration "K", B & S #22 gage or larger.

2. Lead wires shall be Chromel-Alumel B & S #18 gage or larger stranded thermocouple wire with insulation good for 1000° F service ISA calibration "K", Chromel-yellow (+), Alumel-red (-). with hot junction insulated.

3. Splice between thermocouple & lead must be protected from mechanical damage due to abrasion & lead wire stresses.

4. Adaptor to be of .875 Hex Stainless Steel.

5. Thermocouple & well P1 thru 60 to be provided as one unit.

6. Insulation resistance between the sheath and either wire of the T/C shall not be < 5 megohms using a 100 volt megger.

This may be purchased from: Lewis Engineering Co.
550 Spring St.
Naugatuck, Conn. 06770

or

Meco Inc.
1401 South Marshall
Paris, Illinois 61944
or equal

D

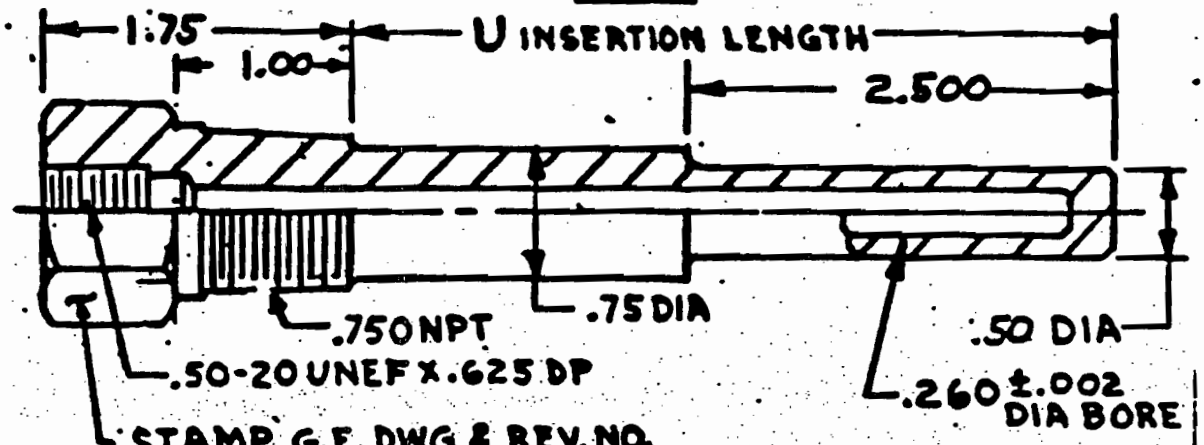
248A4123

FIGURE A4: INLET TEMPERATURE SENSOR

GENERAL ELECTRIC

248A4123

FIG. 2



STAMP G.E. DWG & REV. NO. AND FIG. NO. ON HEX.

SIMILAR TO STD SERIES W602 (LEWIS ENG. CO.)

MATERIAL 304 STAINLESS STEEL.

D

248A4123

FIGURE A4 (Concluded)

APPENDIX B

DEMONSTRATING COMPLIANCE FOR NOx LESS THAN NSPS

To check-out the NOx control algorithm and certify the gas turbine for proper compliance requires several steps.

1. Gas Turbine Start-up and Check-out

   The first step is go through all the start-up checks and have the unit up and running. The turbine must be checked out for proper operation up to full load. This step usually requires several weeks.

2. Diluent Injection System Check-out

   The steam/water injection system needs to be checked before injection into the turbine. For water injection, most of the equipment is usually on a skid and must be checked for proper calibration, feedback, etc.

   If the turbine is equipped with steam injection, the steam generator has to be up and running. All steam lines must be blown out, traps checked and controls set.

3. Instrumentation Calibration

   All instrumentation must be properly calibrated. This includes exhaust thermocouples, inlet humidity and temperature sensors, all flow meters (fuel and diluent) etc.

4. Software Checks

   The software needs to be checked for proper feedback commands, set points, etc. One way to do this is to type in representative values of the parameters and checking the output.

5. Set-up and Check-out of Emissions Equipment

   The emissions test vendor is charged to perform this function. Depending on the contract, the vendor is hired by GE or the customer.

   This step requires setting up and calibrating the emissions measurement trains as specified in the permit. Special protocol has to be followed in gathering the sample exhaust gas, processing it and its measurement to the required accuracy.

   All test vendors are quite familiar with these procedures.

6. Preliminary Emissions Test

   The next step is to run a preliminary emissions test. The test must duplicate accurate operating conditions and the data needs to be gathered at the required loads specified in the permit. The diluent injection system should be in manual mode. The exhaust gases could be sampled from only one location.

   During the test, the diluent flow may need to be adjusted manually to meet the required NOx.

The data to be recorded:

a. Gaseous Emissions: NOx, CO, etc. (as required in the permit)
b. Exhaust O_2
c. Ambient Conditions: Temperature, humidity, pressure
d. Machine Parameters: Output, exhaust temperature, fuel flow, steam/water flow, fuel heating valve (LHV), exhaust gas flow rate (if required)

7. Adjust Control Constants

From the new data of step 6, the required steam flow at reference conditions is calculated using the algorithm. This is the steam flow vs. fuel flow reference line that meets the permitted NOx. If the constants of the original controls setting differ from the values calculated from the test data, these constants must be readjusted.

8. Retest to Check the Adjusted Constant(s)

The adjusted algorithm must be rechecked across the load range to validate the changes. The test procedure is similar to step 6, except the controls are in auto (not manual) mode.

9. Compliance Test

The next step is to perform the official compliance test. Again, the test vendors are usually quite familiar with all the protocols and test procedures.

10. Compliance Test Report

The test vendor prepares the test report using proper procedures.

11. Continuous Compliance

The Wet Low NOx Display is available on all turbines to assist the customer in monitoring and recording the continuous NOx compliance requirement. The required diluent flow is automatically compensated for ambient humidity and temperature.

APPENDIX C

GE HEAVY DUTY GAS TURBINES OPERATING OR SHIPPED

(as of the end of 1988)

USING THE NOx CONTROL ALGORITHM AS DESCRIBED

IN THIS DOCUMENT FOR CONTROLLING NOx LESS THAN NSPS

SHIPPING DATE	NAME LOCATION (# UNITS)	FUEL USED	DILUENT	NOx PPMVD
MS7001				
1984	FLUOR/KRCC	NG	WTR	42 (1)
	BAKERSFIELD, CA (4)	OIL		42
1986	FLUOR/SYCAMORE	NG	WTR	42
	BAKERSFIELD, CA (4)	OIL		42
1986	GILROY FOODS *	NG	STM	25
	GILROY, CA (1)	OIL		55
1987	FLUOR/ARCO	NG	STM	42
	WATSON, CA (4)	BUT		65
1988	ENCOGEN	NG	STM	42
	SWEETWATER, TX (2)			
1988	HARBOR COGEN/CHAPLIN	NG	WTR	42
	TORRANCE, CA (1)			
1988	MIDWAY SUNSET COGEN *	NG	WTR	25
	TAFT, CA (3)	OIL		42
1988	BASIC AMERICAN FOODS	NG	STM	42
	KING CITY, LA (1)	OIL		65
1988	SMITH/FIRESTONE			
	OKLAHOMA CITY, OK (1)	NG	STM	42
1988	HSPE/TENASKA	NG	STM	42
	PARIS, TX (2)	OIL		65
MS6001				
1982	CROWN ZELLERBACH			
	(GAYLORD CONTAINER)	NG	STM	42
	ANTIOCH, CA (1)	OIL	STM	65
1984	INLAND CONTAINER	NG	WTR	42
	ONTARIO, CA (1)	OIL	WTR	65
1986	CHEVRON	NG	STM	42
	EL SEGUNDO, CA (2)	BUT	STM	65
		PROP	STM	65
1986	KAISER/GE	NG	STM	42
	SAN JOSE, CA (1)	OIL	STM	65
1986	UNIVER. ENERGY	NG	WTR	42
	TAFT, CA (1)			
1986	CARDINAL COGEN	NG	STM	42 (1)
	PALO ALTO, CA (1)	OIL	STM	65

SHIPPING DATE	NAME LOCATION (# UNITS)	FUEL USED	DILUENT	NOx PPMVD
MS6001 (cont.)				
1987	ANR VENTURE	NG	STM	42
	HARTFORD, CT (1)	OIL	STM	62
1987	KOCH REFINARY	NG	STM	42
	CORPUS CHRISTI, TX (1)	RG	STM	65
1988	CELANESE	NG	STM	42
	BISHOP, TX (1)	OIL	STM	65
1988	ENCOGEN	NG	STM	42
	SWEETWATER, TX (1)			
1988	EXXON CHEM CO	NG	STM	42
	BAYTOWN, TX (3)			
1988	FINA OIL CO	NG	STM	50
	PORT ARTHUR, TX (1)	RG	STM	65
1988	ORLANDO UTILITIES	NG	STM	50
	INDIAN RIV, FL (2)			
1988	PRITCHARD/TEXACO	NG	WTR	42
	BAKERSFIELD, CA (1)			
1988	CAIN CHEMICAL	NG	STM	42
	CORPUS CHRISTI, TX (1)	OIL		65
MS5001				
1985	CITY OF SANTA CLARA	NG	WTR	42PPM
	SANTA CLARA, CA (2)	OIL	WTR	42PPM
1985	TURLOCK IRRIGATION DIST.	NG	WTR	42PPM
	TURLOCK, CA (2)	OIL	WTR	65PPM
1987	MOBIL TORRANCE	NG	STM	42PPM
	TORRANCE, CA (1)	PROP	STM	42PPM
1988	MERCK, SHARP, DOHME	NG	WTR	45PPM
	WEST POINT, PA (1)	OIL	WTR	45PPM

NG = Natural Gas
RG = Refinery Gas
BUT = Butane
PROP = Propane
STM = Steam
WTR = Water
* = Utilize Multiple Nozzle Quiet Combustor
(1) = Data showing continuous compliance is included in Appendix D

APPENDIX D

FIELD DATA, AS REPORTED TO THE LOCAL AIR DISTRICT DEMONSTRATING CONTINUOUS COMPLIANCE WITH THE PERMIT NOx LIMIT

1. CARDINAL COGEN (MS6001B)

Attached here is the field data from Cardinal Cogen which has a MS6001B installed on the campus of the Stanford University. The emissions test was done in June 1988. This gas turbine is controlled to 42 PPMVD NOx @ 15% O_2 using the algorithm described here.

Cardinal Cogen is a special case. Their fuel contract with the supplier allows the fuel quality to vary at certain times. The customer also has a continuous exhaust monitor (CEM) installed in the stack as mandated by the BAAQMD. The customer is using the CEM to economize their plant operation by minimizing their steam injection. This is done manually..

It is important to recognize that the algorithm described here allows the customer to meet NOx compliance but not necessarily "economize" the steam flow. The Cardinal Cogen CEM provides a means to operate at the absolute minimum steam injection. If the fuel quality is significantly changing and the customer wants to optimize the steam flow manually, the constants in the algorithm have to be retuned. GE has designed an automatic system to do this which does not require retuning the constants. Such a system is in operation at several California sites.

The field data is a copy of the Emissions Report filed with the BAAQMD for the months of August and September, 1988. As is evident, the algorithm controls the gas turbine NOx below 42 PPMVD. In those few incidences (4 in 2 months) when the NOx exceeded 42 PPMVD (maximum variation is 3% or less), the cause was either the variation of the fuel gas composition or the excess occurred during start-up.

2. KERN RIVER COGENERATION COMPANY (4 X MS7001E)

This appendix also includes the field data from KRCC which has four MS7001E installed outside of Bakersfield, CA. NOx level is 140 lbs/hr (42 PPMVD @ 15% O_2) on natural gas and oil with steam injection. The data clearly shows that the NOx algorithm is controlling the gas turbines below the permit value.

Also included are the letters from Kern County Air Pollution Control District confirming that the units meet all applicable permits on the annual compliance tests for years 1987 and 1988.

Cardinal Cogen

a joint venture

Serra CoGen, Inc.
A Subsidiary of General Electric Company

Raymond Energy Inc.
A Subsidiary of Kaiser Engineers Inc.

October 13, 1988

BAAQMD
939 Ellis Street
San Francisco, CA 94109

Attn: Gale Karels

Subject: Emissions Report - August
Plant No. 1629

Dear Mr. Karels:

Attached is Cardinal Cogen's "Monthly Emissions Report" for August, 1988. This is the first monthly report submitted by Cardinal Cogen so we appreciate any comments your department may have concerning its content and format.

We realize this report is overdue and apologize for any inconvenience this may have caused BAAQMD. Our delay was caused by problems with extracting emissions data from our computer's archive storage system. We're confident this problem won't occur again.

Very Truly Yours,

Steven Mansperger
Instrument Technican

cc: A. Brush
O. Juvier
R. Paterson
F. Vilece
File 10.10

Principal Office:
Schenectady, N.Y.
Administrative Office:
Oakland, California

P.O. Box 2310
Stanford, California 94309
Tel: (415) 723-1760

CARDINAL COGEN

MONTHLY EMISSIONS REPORT

I. SOURCE GENERAL INFORMATION

1. Source — S-5 Duct Burner and S-6 Gas Turbine
2. Address — Cardinal Cogen
   Building 14-105, Stanford University
   Stanford, CA. 94305-4114
3. Phone Number — (415) 723-3890
4. Affected Facility
5. Person Completing Report:

Steven Mansperger

Signed: [signature]

Date: 10-13-88

This is to certify that, to the best of my knowledge, the information provided on these forms is correct and accurate.

6. Person Responsible for review and integrity of report:

Randall Peterson

Signed: [signature]

Title: Facility Engineer

Date: Oct 13, 1988

II. CONTINUOUS EMISSION MONITOR INFORMATION

1.	Manufacturer:	Horiba	Horiba	Horiba
2.	Model No. :	V1A-500F	PMA200F	V1A-500F
3.	Serial No. :	561749011	702008	561749012
4.	Basis for Gas Measurement:		Dry	
5.	Averaging Time :		6 minutes	
6.	Corrected to % Oxygen :		15 %	
7.	Zero/Span Values :			

	NOX	O2	CO
Zero	0 ppm	0 %	0 ppm
Span	98.55	20.9 %	94.4

8.	Date of last Performance Test :	7-27-88
9.	Performance Specification Test :	7-27-88
10.	Total Operating Time of Source During Reporting Period (minutes) :	20,133

BEST AVAILABLE COPY

CARDINAL COGEN

MONTHLY EMISSIONS REPORT

Operating Permit 304
Plant No. 16
Source S-5 Duct Burn
Source S-6 Gas Turbi

Date	NOx Daily Ave. Emissions (Corrected ppm)	NOx Max. Hrly Emissions (Corrected ppm)	NOx Daily Mass Emissions (Lbs per Day)	Gas Turb Fuel Use Daily Ave. (SCFM)	Duct Burn. Fuel Use Daily Ave. (SCFM)	Duct Burn. Operating Time (Min.)	Stm/Fuel Ratio Daily Ave
8-17-88	40	43	1,140	7,571	872	217	1.093
8-18-88	36	38	1,046	7,589	864	186	1.120
8-19-88	36	59	967	7,044	841	66	1.154
8-20-88	37	39	1,058	7,532	835	2	1.099
8-21-88	38	40	1,099	7,600	NA	0	1.109
8-22-88	37	39	1,075	7,519	860	183	1.137
8-23-88	38	39	1,094	7,544	863	199	1.100
8-24-88	38	40	1,102	7,516	875	218	1.093
8-25-88	36	41	1,063	7,474	877	227	1.085
8-26-88	33	40	948	7,464	838	6	1.077
8-27-88	37	39	1,063	7,516	NA	0	1.078
8-28-88	38	39	1,080	7,527	NA	0	1.077
8-29-88	38	41	1,089	7,454	845	109	1.081
8-30-88	39	41	1,104	7,412	843	65	1.069
8-31-88	39	40	1,116	7,477	844	105	1.076

NOTES:

1. NOx emission limit with duct burner and gas turbine operating together is 40 ppm corrected to 15% oxygen. When the gas turbine is operating without the duct burner, this limit is 42 ppm corrected to 15% oxygen.
2. Emissions reporting starts on 8-17-88, the day written notification of Cardinal Cogen's successful completion of the Performance Specification Test was received from BAAQMD.
3. The duct burner is generally used daily between 6AM - 11 AM to meet Campus heating steam demands.

CARDINAL COGEN

MONTHLY EMISSIONS REPORT

STATEMENT OF EXCESS EMISSIONS

Excess stack emissions occurred during the month of August, 1988, as listed below:

Date	Time	NOx Excess Emissions (PPM, 1 Hr. Average, Corrected to 15 % 02)	Fuel Firing Oil	Fuel Firing Gas	Corrective Action	Remarks
8-17-88	0100	42.5		x	Returned Steam	
	1300	43.3		x	Injection Control	
	1400	42.2		x	Constants	
8-18-88	2000	58.7		x	None	Occurred at low load during startup after a unit trip. Below load injection starts.

___ There were no exceedences during this reporting period.

CEMS CORRECTIVE ACTION REPORT

Parameter	Date & Time Inoperative Condition Began	Duration	Date & Time Inoperative Condition Ended	Corrective Action	District Dispatcher Notification Yes/No	Date	Time
NOx Analyser	8-25-88 @ 1700	.5 hr	8-25-88 @ 1730	Problems occurred during Zero calibration. Returned calibration circuitry.	No		

Significant changes in the monitoring system since the last Performance Test:

___ Yes X No

Signed : [signature] Date : 10-13-88

Title : INSTRUMENT TECH

CARDINAL COGEN

MONTHLY EMISSIONS REPORT

PLANT OPERATING RECORD

Date	Time Off Line	Time On Line	Reason for Shutdown
8-19-88	1757	2155	Control System Fault

Comments :

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Cardinal Cogen

a joint venture

Serra CoGen, Inc.
A Subsidiary of General Electric Company

Raymond Energy Inc.
A Subsidiary of Kaiser Engineers Inc.

October 25, 1988

BAAQMD
939 Ellis Street
San Francisco, CA 94109

Attn: Gale Karels

Subject: Emissions Report - September
Plant No. 1629

Dear Mr. Karels:

Attached is Cardinal Cogens's "Monthly Emissions Report" for September 1988.

Since we have not heard from you regarding the August Report, we are submitting this report in the same format.

Please notify us if you have any questions or comments.

Very Truly Yours,

Steven Mansperger

Steven Mansperger
Instrument Technican

cc: A. Brush
O. Juvier
R. Paterson
F. Vilece
R. Boericke
File 10.10

Principal Office:
Schenectady, N.Y.

P.O. Box 2310

C A R D I N A L C O G E N

M O N T H L Y E M I S S I O N S R E P O R T

I. SOURCE GENERAL INFORMATION

1. Source — S-5 Duct Burner and S-6 Gas Turbine
2. Address — Cardinal Cogen
   Building 14-105, Stanford University
   Stanford, CA. 94305-4114
3. Phone Number — (415) 723-3890
4. Affected Facility
5. Person Completing Report:

Steven Mansperger

Signed: Steven Mansperger

Date: Oct. 25, 1988

This is to certify that, to the best of my knowledge, the information provided on these forms is correct and accurate.

6. Person Responsible for review and integrity of report:

Randall Peterson

Signed: Randall C. Peterson

Title: Facility Engineer

Date: Oct 25 1988

II. CONTINUOUS EMISSION MONITOR INFORMATION

1.	Manufacturer:	Horiba	Horiba	Horiba
2.	Model No. :	V1A-500F	PMA200F	V1A-500F
3.	Serial No. :	561749011	702008	561749012
4.	Basis for Gas Measurement:		Dry	
5.	Averaging Time :		6 minutes	
6.	Corrected to % Oxygen :		15 %	
7.	Zero/Span Values :			

	NOX	O2	CO
Zero	0 ppm	0 %	0 ppm
Span	98.55	20.9 %	94.4

8.	Date of last Performance Test :	7-27-88
9.	Performance Specification Test :	7-27-88
10.	Total Operating Time of Source During Reporting Period (minutes) :	42,957

BEST AVAILABLE COPY

CARDINAL COGEN

MONTHLY EMISSIONS REPORT

Operating Permit 3(
Plant No. . . 1
Source S-5 Duct Bur
Source S-6 Gas Turt

Date	NOx Daily Ave. Emissions (Corrected ppm)	NOx Max. Hrly Emissions (Corrected ppm)	NOx Daily Mass Emissions (Lbs per Day)	Gas Turb Fuel Use Daily Ave. (SCFM)	Duct Burn. Fuel Use Daily Ave. (SCFM)	Duct Burn. Operating Time (Min.)	Stm/Fuel Ratio Daily Av
9-01-88	39	40	1,121	7,539	863	102	1.086
9-02-88	39	40	1,128	7,542	843	74	1.087
9-03-88	39	40	1,118	7,512	0	N/A	1.106
9-04-88	38	40	1,099	7,479	0	N/A	1.107
9-05-88	38	40	1,092	7,481	0	N/A	1.053
9-06-88	39	41	1,128	7,502	841	27	1.096
9-07-88	39	41	1,123	7,513	844	59	1.102
9-08-88	39	41	1,128	7,526	847	91	1.096
9-09-88	39	40	1,138	7,578	868	122	1.106
9-10-88	39	40	1,135	7,565	0	N/A	1.099
9-11-88	38	40	1,109	7,574	0	N/A	1.121
9-12-88	38	41	1,118	7,660	873	179	1.100
9-13-88	39	41	1,102	7,645	877	209	1.089
9-14-88	38	40	1,104	7,631	871	151	1.093
9-15-88	39	40	1,133	7,716	875	206	1.094
9-16-88	39	40	1,123	7,684	870	131	1.095
9-17-88	39	41	1,092	7,546	0	N/A	1.105
9-18-88	38	40	1,106	7,666	0	N/A	1.128
9-19-88	39	41	1,118	7,628	855	104	1.100
9-20-88	40	41	1,147	7,698	877	194	1.100
9-21-88	40	41	1,162	7,735	868	171	1.103
9-22-88	40	41	1,145	7,687	870	133	1.090
9-23-88	40	41	1,138	7,675	866	174	1.092
9-24-88	40	42	1,142	7,601	0	N/A	1.098
9-25-88	40	41	1,147	7,646	0	N/A	1.095
9-26-88	40	41	1,150	7,736	905	219	1.088
9-27-88	39	41	1,140	7,680	890	200	1.077
9-28-88	39	40	1,126	7,682	894	184	1.087
9-29-88	40	41	1,130	7,614	885	183	1.075
9-30-88	39	56	936	6,387	876	158	1.736

NOTES:

1. NOx emission limit with duct burner and gas turbine operating together is 40 ppm corrected to 15% oxygen. When the gas turbine is operating without the duct burner, this limit is 42 ppm corrected to 15% oxygen.
2. The duct burner is generally used daily between 6AM - 11AM to meet Campus heating steam demands.

CARDINAL COGEN

MONTHLY EMISSIONS REPORT

STATEMENT OF EXCESS EMISSIONS

Excess stack emissions occurred during the month of September, 1988, as listed below:

Date	Time	NOx Excess Emissions (PPM, 1 Hr. Average, Corrected to 15 % O2)	Fuel Firing Oil	Fuel Firing Gas	Corrective Action	Remarks
9-26-88	1338	43		x	Retuned Steam Injection Control Constants	
9-30-88	2100	73		x	None	Occurred at low load during startup after a unit trip. Below load injection starts.
	2106	55		x		

___ There were no excedences during this reporting period.

CEMS CORRECTIVE ACTION REPORT

Parameter	Date & Time Inoperative Condition Began	Duration	Date & Time Inoperative Condition Ended	Corrective Action	District Dispatcher Notification Yes/No	Date	Time

Significant changes in the monitoring system since the last Performance Test:

__ Yes X No

Signed : Steven Mangeger Date : Oct. 25, 1988

Title : Instrument Tech.

CARDINAL COGEN

MONTHLY EMISSIONS REPORT

PLANT OPERATING RECORD

Date	Time Off Line	Time On Line	Reason for Shutdown
9-30-88	1732	2135	Control Power System Fault

Comments : _____

BEST AVAILABLE COPY

Kern River Cogeneration Company | Box 80478, Bakersfield, CA 93388 • (805) 399-2861

Charles Myers, Executive Director

November 16, 1988

KR-2471

Mr. Edward J. Walsh
Turbine Technology Department
General Electric Company
Bldg. 53, Room 322
One River Road
Schenectady, NY 12345

Re: **Air Emission Data**

Dear Mr. Walsh:

Per your recent telephone conversation with Bill Hauhe of this office, attached are copies of two letters issued by the Kern County Air Pollution Control District (KCAPCD) to Kern River Cogeneration Company verifying compliance with all applicable permits for the years 1987 and 1988. Also, attached are copies of the "Monthly Stack Monitoring Report" (May, 1988 thru October, 1988) for the four (4) units located at the Kern River Cogeneration Company - Omar Hill site.

Though this is public information, we ask that you use discretion when it is disseminated. If you have any questions, contact Mr. W. E. Hauhe, Jr. at the letterhead address.

Sincerely,

C. O. MYERS
Executive Director

WEH:dmh

Attachment

cc: Messrs. F. A. Maggio (w/attachment)
M. A. Soares (w/attachment)
G. M. Thomson (w/attachment)

1601 "H" Street, Suite 150
Bakersfield, California 93301-5199
Telephone: (805) 861-3682

KERN COUNTY AIR POLLUTION CONTROL DISTRICT

LEON M HEBERTSON, M.D.
Director of Public Health Services
Air Pollution Control Officer

Kern River Cogeneration Co.	
CCM	WEH/
GUT	KSL
CCN	KWL
RWW	MS MS
CALL-UP	
COPY TO	MS
ROUTE	RTN
FILE	
JUN 22 '87	

June 18, 1987

Mervyn Soares
Kern River Cogeneration Company
P.O. Box 80478
Bakersfield, CA 93388

Subject: Omar Hill Annual Compliance Test
January - February, 1987

Dear Mr. Soares:

We have reviewed your annual compliance test re: Omar Hill and find the four units to be in compliance with all applicable permits.

Sincerely,

LEON M HEBERTSON, M.D.
AIR POLLUTION CONTROL OFFICER

Henry Mayrsohn
Manager Technical Services

HM/jb

KERN COUNTY AIR POLLUTION CONTROL DISTRICT

2700 "M" Street, Suite 275
Bakersfield, California 93301
Telephone: (805) 861-3682

Kern River Cogeneration Co.		
COM	AAC	
GMT	RC	
WEH	MAS	
KSL	REH	
RLL	RWW	
GLH	FAM	
COPY TO	MAS	
FILE		
OCT 17 '88		

October 14, 1988

Mr. Mervyn Soares
Kern River Cogeneration Company
P.O. Box 80478
Bakersfield, CA 93388

Subject: Kern River Cogeneration Company

Dear Mr. Soares:

Pursuant to completion and approval of your most recent source test, we find the subject facility to be in full compliance with emissison requirements.

Very truly yours,

CITRON TOY, INTERIM
AIR POLLUTION CONTROL DISTRICT

Henry Mayrsohn, P.E., Manager
Technical Services Section

HM:cm

cc: files

MONTHLY STACK MONITORING REPORT

KERN RIVER COGENERATION FACILITY - KERN COUNTY, CA - UNIT 1

DAY	AVERAGE GAS	OIL	MMBTU COMBINED	TOTAL MMBTU GAS	OIL	COMBINED	TOTAL CO LBS	TOTAL WATER GALLONS	AVERAGES CO2 PERCENT	CO LBS/HR	CO LBS/MMBTU	NOx LBS/HR	NOx LBS/MMBTU	WATER GALLONS/HR	WATER INJECTION RATIO
1	1014.40	0.00	1014.40	24,345.60	0.00	24,345.60	141.70	69,304.10	3.90	5.86	0.01	119.45	0.12	2,734.40	0.70
2	969.20	0.00	969.20	23,754.10	0.00	23,754.10	136.90	77,958.20	3.80	5.96	0.01	130.23	0.13	3,368.60	0.00
3	978.60	0.00	978.60	23,481.70	0.00	23,481.70	136.10	76,905.00	3.80	5.87	0.01	127.33	0.13	3,190.20	0.00
4	964.10	0.00	964.10	17,713.40	0.00	17,713.40	142.27	59,267.40	3.90	7.80	0.01	126.70	0.13	2,990.20	0.00
5	966.10	0.00	966.10	23,861.50	0.00	23,861.50	206.30	83,904.20	3.90	8.59	0.01	126.00	0.13	3,456.60	0.00
6	1008.40	0.00	1008.40	24,008.70	0.00	24,008.70	160.61	66,600.40	3.90	7.53	0.01	121.90	0.12	2,611.70	0.70
7	961.10	0.00	961.10	23,546.40	0.00	23,546.40	166.20	77,517.20	3.90	8.00	0.01	130.63	0.13	3,230.60	0.00
8	968.70	0.00	968.70	23,685.50	0.00	23,685.50	160.11	76,430.40	3.90	8.07	0.01	127.27	0.13	3,186.20	0.00
9	972.80	0.00	972.80	23,346.50	0.00	23,346.50	158.66	76,200.60	3.90	8.07	0.01	134.54	0.13	3,550.70	0.00
10	961.30	0.00	961.30	23,551.60	0.00	23,551.60	170.37	76,163.30	3.90	7.47	0.01	133.00	0.13	3,174.70	0.00
11	968.70	0.00	968.70	23,680.70	0.00	23,680.70	206.63	76,307.00	3.90	8.61	0.01	117.11	0.12	3,179.50	0.00
12	967.20	0.00	967.20	23,972.20	0.00	23,972.20	210.51	76,863.20	3.90	8.76	0.01	115.96	0.12	3,202.60	0.00
13	978.50	0.00	978.50	14,676.50	0.00	14,676.50	133.50	48,853.40	3.90	9.00	0.01	120.90	0.12	3,242.30	0.00
14	970.40	0.00	970.40	23,289.70	0.00	23,289.70	214.90	77,708.40	3.90	8.96	0.01	121.31	0.13	3,237.90	0.00
15	964.00	0.00	964.00	23,049.40	0.00	23,049.40	200.30	76,306.10	3.90	8.36	0.01	117.01	0.12	3,176.30	0.00
16	970.70	0.00	970.70	23,296.10	0.00	23,296.10	166.15	73,992.00	3.90	7.53	0.01	120.53	0.12	3,266.90	0.00
17	961.30	0.00	961.30	23,551.40	0.00	23,551.40	156.63	77,088.00	3.90	8.33	0.01	123.00	0.13	3,334.50	0.00
18	976.30	0.00	976.30	20,478.50	0.00	20,478.50	131.50	67,067.00	3.90	8.27	0.01	123.93	0.13	3,251.90	0.00
19	961.80	0.00	961.80	23,083.20	0.00	23,083.20	148.80	76,073.20	3.90	8.20	0.01	121.42	0.13	3,194.70	0.00
20	966.54	0.00	966.54	23,067.20	0.00	23,067.20	151.34	76,963.80	3.90	8.30	0.01	120.54	0.13	3,266.60	0.00
21	963.60	0.00	963.60	23,067.50	0.00	23,067.50	162.30	77,354.20	3.90	8.76	0.01	120.00	0.13	3,210.00	0.00
22	967.00	0.00	967.00	23,208.70	0.00	23,208.70	156.63	76,532.10	3.90	8.10	0.01	119.96	0.13	3,201.30	0.00
23	967.20	0.00	967.20	23,970.80	0.00	23,970.80	154.51	76,806.20	3.90	8.44	0.01	119.43	0.12	3,191.10	0.00
24	963.60	0.00	963.60	23,112.60	0.00	23,112.60	153.40	77,361.00	3.90	8.36	0.01	120.20	0.13	3,230.90	0.00
25	969.13	0.00	969.13	23,260.70	0.00	23,260.70	150.90	77,906.00	3.90	8.20	0.01	121.17	0.13	3,244.40	0.00
26	971.10	0.00	971.10	23,306.50	0.00	23,306.50	160.51	77,776.00	3.90	8.07	0.01	121.53	0.13	3,244.90	0.00
27	970.30	0.00	970.30	23,569.20	0.00	23,569.20	154.56	76,048.10	3.90	8.72	0.01	122.54	0.13	3,263.00	0.00
28	976.00	21.00	996.00	14,700.00	882.00	15,570.00	150.48	64,576.00	3.90	8.00	0.01	113.56	0.13	3,007.00	0.00
29	964.50	0.00	964.50	23,067.10	0.00	23,067.10	154.00	76,097.00	3.90	8.44	0.01	120.56	0.13	3,230.70	0.00
30	968.00	0.00	968.00	23,646.70	0.00	23,646.70	150.64	76,000.10	3.90	8.61	0.01	126.96	0.13	3,333.30	0.00
31	964.20	0.00	964.20	23,619.70	0.00	23,619.70	130.14	76,631.30	3.90	8.00	0.01	122.67	0.13	3,218.00	0.00
MTD	971.16	0.68	971.84	696,738.70	882.90	697,343.00	5,005.06	2,347,268.30							

MONTHLY STACK MONITORING REPORT

KERN RIVER COGENERATION FACILITY - KERN COUNTY, CA - UNIT 2

DAY	AVERAGE GAS	OIL	MMBTU COMBINED	TOTAL MMBTU GAS	TOTAL MMBTU OIL	TOTAL MMBTU COMBINED	TOTAL CO LBS	TOTAL WATER GALLONS	AVERAGES CO2 PERCENT	AVERAGES CO LBS/HR	AVERAGES CO LBS/MMBTU	AVERAGES NOx LBS/HR	AVERAGES NOx LBS/MMBTU	AVERAGES WATER GALLONS/HR	WATER INJECTION RATIO
1	973.10	0.00	973.10	23,353.20	0.00	23,353.20	136.53	66,353.40	3.00	5.37	0.01	131.54	0.13	2,977.20	0.70
2	944.70	0.00	944.70	21,720.90	0.00	21,720.90	133.71	70,723.20	3.00	5.51	0.01	134.90	0.13	2,466.70	0.70
3	966.90	0.00	966.90	23,486.70	0.00	23,486.70	137.90	61,803.90	3.00	5.33	0.01	133.90	0.13	2,466.80	0.70
4	940.70	0.00	940.70	16,992.90	0.00	16,992.90	130.50	61,726.80	3.00	7.76	0.01	119.80	0.13	2,466.90	0.70
5	965.70	0.00	965.70	23,896.40	0.00	23,896.40	134.90	63,531.70	3.00	5.13	0.01	135.61	0.13	2,466.80	0.70
6	954.90	0.00	954.90	22,918.70	0.00	22,918.70	157.72	61,537.90	3.00	6.87	0.01	136.27	0.13	2,466.90	0.00
7	969.90	0.00	969.90	23,595.50	0.00	23,595.50	136.50	63,532.20	3.00	6.84	0.01	119.50	0.13	2,466.10	0.70
8	965.90	0.00	965.90	23,469.20	0.00	23,469.20	156.93	62,506.50	3.00	6.54	0.01	118.53	0.13	2,457.90	0.70
9	969.20	0.00	969.20	23,261.50	0.00	23,261.50	134.71	63,413.20	3.00	7.76	0.01	116.76	0.13	2,453.90	0.70
10	966.60	156.80	1123.40	16,978.20	2,818.30	19,796.50	240.47	70,896.20	3.00	10.68	0.01	133.76	0.14	2,320.90	0.70
11	967.10	0.00	967.10	21,530.50	0.00	21,530.50	177.61	72,692.80	3.00	7.40	0.01	121.63	0.14	2,000.80	0.00
12	961.50	0.00	961.50	21,535.80	0.00	21,535.80	179.41	72,896.80	3.00	7.46	0.01	120.54	0.13	2,000.80	0.00
13	967.30	0.00	967.30	13,906.10	0.00	13,906.10	118.26	46,250.80	3.00	7.50	0.01	126.30	0.14	2,004.00	0.00
14	915.30	0.00	915.30	21,964.10	0.00	21,964.10	163.90	73,160.80	3.00	7.30	0.01	126.32	0.14	2,006.30	0.00
15	969.90	0.00	969.90	21,966.10	0.00	21,966.10	172.60	73,176.10	3.00	7.30	0.01	121.96	0.14	2,007.40	0.00
16	966.30	0.00	966.30	21,167.50	0.00	21,167.50	142.21	69,894.80	3.00	6.19	0.01	126.53	0.14	2,043.30	0.00
17	965.20	0.00	965.20	23,444.50	0.00	23,444.50	136.10	74,256.50	3.00	5.83	0.01	126.44	0.14	2,004.00	0.00
18	965.90	0.00	965.90	18,443.80	0.00	18,443.80	116.26	64,863.50	3.00	6.40	0.01	126.93	0.14	2,074.40	0.00
19	911.30	0.00	911.30	21,868.80	0.00	21,868.80	127.60	72,853.40	3.00	5.82	0.01	126.70	0.14	2,008.50	0.00
20	961.80	0.00	961.80	21,843.80	0.00	21,843.80	126.70	72,893.80	3.00	5.27	0.01	126.67	0.14	2,003.90	0.00
21	967.70	0.00	967.70	21,544.30	0.00	21,544.30	126.76	71,806.80	3.00	5.76	0.01	127.10	0.14	2,006.00	0.00
22	968.30	0.00	968.30	21,670.70	0.00	21,670.70	131.80	72,106.70	3.00	5.50	0.01	126.80	0.14	2,004.50	0.00
23	966.10	0.00	966.10	21,747.80	0.00	21,747.80	131.85	72,375.80	3.00	5.40	0.01	123.66	0.14	2,018.00	0.00
24	911.10	0.00	911.10	21,866.80	0.00	21,866.80	130.80	72,866.80	3.00	5.43	0.01	126.53	0.14	2,046.90	0.00
25	961.90	0.00	961.90	23,109.90	0.00	23,109.90	130.80	74,103.90	3.00	5.40	0.01	126.54	0.14	2,091.40	0.00
26	961.30	0.00	961.30	23,106.30	0.00	23,106.30	136.66	74,043.70	3.00	5.83	0.01	130.15	0.14	2,068.10	0.00
27	968.30	0.00	968.30	21,307.30	0.00	21,307.30	122.80	71,830.80	3.00	5.70	0.01	126.14	0.14	2,122.80	0.00
28	967.00	16.80	983.80	21,857.20	464.80	22,321.00	164.60	74,208.40	3.00	6.53	0.01	134.46	0.14	2,097.40	0.00
29	948.80	0.00	948.80	22,762.10	0.00	22,762.10	131.17	77,171.00	3.00	5.47	0.01	130.36	0.14	2,215.50	0.00
30	944.50	0.00	944.50	22,668.50	0.00	22,668.50	150.07	69,866.20	3.00	6.26	0.01	132.97	0.13	2,326.90	0.00
31	968.80	0.00	968.80	23,267.50	0.00	23,267.50	130.72	61,140.00	3.00	5.46	0.01	117.71	0.13	2,326.90	0.70
MTD	964.36	5.72	969.90	668,830.10	4,264.90	667,864.90	4,007.77	2,313,663.10							

MONTHLY STACK MONITORING REPORT

KERN RIVER COGENERATION FACILITY - KERN COUNTY, CA - UNIT 2

DAY	AVERAGE GAS	OIL	MMBTU COMBINED	TOTAL MMBTU GAS	TOTAL MMBTU OIL	TOTAL MMBTU COMBINED	TOTAL CO LBS	TOTAL WATER GALLONS	AVERAGES CO2 PERCENT	AVERAGES CO LBS/HR	AVERAGES CO LBS/MMBTU	AVERAGES NOx LBS/HR	AVERAGES NOx LBS/MMBTU	AVERAGES WATER GALLONS/HR	WATER INJECTION RATIO
1	1046.10	0.00	1046.10	25,066.70	0.00	25,066.70	134.04	91,053.00	3.00	5.19	0.00	123.04	0.12	3,626.40	0.70
2	1018.50	0.00	1018.50	23,436.00	0.00	23,436.00	131.71	85,761.30	3.00	5.72	0.01	126.02	0.12	3,641.00	0.00
3	1007.70	0.00	1007.70	24,185.10	0.00	24,185.10	141.00	83,056.40	3.00	5.00	0.01	127.73	0.13	3,466.70	0.00
4	1012.00	0.00	1012.00	18,208.70	0.00	18,208.70	134.35	69,007.00	3.00	7.07	0.01	126.10	0.13	3,464.00	0.00
5	1035.50	0.00	1035.50	24,811.30	0.00	24,811.30	137.53	96,113.70	3.00	7.01	0.01	131.05	0.13	3,546.40	0.00
6	1021.00	0.00	1021.00	24,708.10	0.00	24,708.10	130.53	91,106.00	3.00	7.00	0.01	122.07	0.13	3,704.30	0.70
7	1015.00	0.00	1015.00	24,374.30	0.00	24,374.30	172.06	89,976.00	3.00	7.31	0.01	119.54	0.12	3,748.00	0.70
8	1000.00	0.00	1000.00	24,208.10	0.00	24,208.10	146.01	81,566.10	3.00	6.09	0.01	122.10	0.13	3,306.50	0.00
9	1000.30	0.00	1000.30	24,008.00	0.00	24,008.00	177.23	81,183.00	3.00	7.38	0.01	127.02	0.13	3,383.70	0.00
10	900.00	0.00	900.00	23,770.40	0.00	23,770.40	166.10	80,070.50	3.00	6.94	0.01	123.76	0.13	3,300.30	0.00
11	900.30	0.00	900.30	23,538.00	0.00	23,538.00	166.04	80,530.30	3.00	7.76	0.01	118.43	0.13	3,356.40	0.00
12	903.40	0.00	903.40	23,000.70	0.00	23,000.70	164.00	80,307.10	3.00	7.71	0.01	118.44	0.13	3,347.00	0.00
13	1002.00	0.00	1002.00	15,044.00	0.00	15,044.00	116.17	49,067.10	3.00	7.74	0.01	125.02	0.13	3,330.50	0.00
14	997.00	0.00	997.00	23,941.50	0.00	23,941.50	190.03	81,206.10	3.00	7.04	0.01	124.12	0.13	3,307.40	0.00
15	994.30	0.00	994.30	23,000.50	0.00	23,000.50	153.33	81,000.70	3.00	7.00	0.01	118.57	0.13	3,411.30	0.00
16	997.30	0.00	997.30	23,007.70	0.00	23,007.70	145.23	77,340.70	3.00	6.31	0.01	123.63	0.13	3,353.00	0.00
17	1005.30	0.00	1005.30	24,142.10	0.00	24,142.10	150.33	83,004.70	3.00	6.36	0.01	120.03	0.13	3,406.30	0.00
18	1002.40	0.00	1002.40	21,040.50	0.00	21,040.50	122.77	73,130.00	3.00	5.85	0.01	121.36	0.13	3,401.00	0.00
19	900.30	0.00	900.30	23,742.10	0.00	23,742.10	153.04	83,300.70	3.00	5.50	0.01	118.10	0.13	3,470.40	0.00
20	903.00	0.00	903.00	23,514.30	0.00	23,514.30	130.47	84,304.10	3.00	5.51	0.01	117.37	0.13	3,513.30	0.00
21	903.00	0.00	903.00	23,547.40	0.00	23,547.40	145.02	86,040.40	3.00	6.07	0.01	115.30	0.12	3,500.70	0.70
22	900.10	0.00	900.10	23,000.30	0.00	23,000.30	141.55	86,436.00	3.00	5.00	0.01	114.04	0.12	3,460.50	0.70
23	900.70	0.00	900.70	23,001.30	0.00	23,001.30	144.55	86,406.00	3.00	6.00	0.01	113.10	0.11	3,560.00	0.70
24	903.00	0.00	903.00	23,000.00	0.00	23,000.00	142.07	86,706.00	3.00	5.04	0.01	115.01	0.13	3,574.00	0.70
25	900.00	0.00	900.00	23,000.50	0.00	23,000.50	141.16	86,127.70	3.00	0.00	0.01	116.00	0.13	3,560.70	0.00
26	897.10	0.00	897.10	23,000.70	0.00	23,000.70	139.21	86,767.10	3.00	5.00	0.01	126.00	0.13	3,304.00	0.00
27	1000.10	0.00	1000.10	23,072.30	0.00	23,072.30	127.10	73,404.00	3.00	5.00	0.01	124.53	0.13	3,400.50	0.00
28	972.10	10.00	982.60	23,362.00	402.30	23,767.30	176.72	84,006.70	3.00	7.26	0.01	110.02	0.13	3,530.00	0.00
29	1024.00	0.00	1024.00	24,500.00	0.00	24,500.00	150.11	87,142.00	3.00	5.76	0.01	123.06	0.13	3,631.00	0.00
30	1024.50	0.00	1024.50	24,588.10	0.00	24,588.10	150.00	86,140.30	3.00	6.00	0.01	120.74	0.13	3,672.50	0.00
31	1013.70	0.00	1013.70	24,328.80	0.00	24,328.80	136.42	87,706.50	3.00	5.00	0.01	117.04	0.13	3,654.40	0.70
MTD	1002.10	0.54	1002.70	724,474.00	402.30	724,877.30	4,704.34	2,543,300.00							

MONTHLY STACK MONITORING REPORT

KERN RIVER COGENERATION FACILITY - KERN COUNTY, CA - UNIT 4

DAY	AVERAGE GAS	OIL	MMBTU COMBINED	TOTAL MMBTU GAS	TOTAL MMBTU OIL	TOTAL MMBTU COMBINED	TOTAL CO LBS	TOTAL WATER GALLONS	AVERAGES CO2 PERCENT	AVERAGES CO LBS/HR	AVERAGES CO LBS/MMBTU	AVERAGES NOx LBS/HR	AVERAGES NOx LBS/MMBTU	AVERAGES WATER GALLONS/HR	WATER INJECTION RATIO
1	906.10	0.00	906.10	22,066.80	0.00	22,066.80	136.26	96,270.10	2.80	5.64	0.01	130.56	0.13	3,662.80	0.00
2	971.80	0.00	971.80	23,261.80	0.00	23,261.80	153.33	81,553.20	2.80	6.66	0.01	136.76	0.13	3,546.20	0.70
3	968.80	0.00	968.80	23,020.20	0.00	23,020.20	146.42	81,206.80	2.80	6.16	0.01	127.76	0.13	3,263.70	0.66
4	965.70	0.00	965.70	17,368.70	0.00	17,368.70	161.58	61,277.80	2.80	8.42	0.01	126.02	0.13	3,464.20	0.00
5	962.80	0.00	962.80	23,011.20	0.00	23,011.20	220.02	86,814.20	2.80	9.17	0.01	126.06	0.13	3,678.60	0.70
6	966.86	0.00	966.86	23,077.46	0.00	23,077.46	190.26	84,266.46	2.80	7.80	0.01	123.81	0.13	3,677.80	0.70
7	726.80	0.00	726.80	8,888.56	0.00	8,888.56	204.86	13,187.56	2.80	81.22	0.09	83.84	0.10	2,437.60	0.56
8	974.00	0.00	974.00	23,380.80	0.00	23,380.80	181.23	83,274.00	2.80	7.56	0.01	126.36	0.13	3,473.80	0.66
9	961.80	0.00	961.80	23,068.80	0.00	23,068.80	200.14	83,441.10	2.80	8.67	0.01	126.41	0.13	3,436.00	0.80
10	964.80	0.00	964.80	23,015.10	0.00	23,015.10	202.20	83,081.80	2.80	8.42	0.01	122.44	0.13	3,410.20	0.70
11	934.40	0.00	934.40	22,426.46	0.00	22,426.46	217.26	80,441.20	2.80	9.05	0.01	126.07	0.13	3,351.70	0.60
12	909.10	0.00	909.10	21,819.20	0.00	21,819.20	223.31	77,650.60	2.70	9.20	0.01	116.60	0.13	3,236.66	0.00
13	968.36	0.00	968.36	14,522.36	0.00	14,522.36	164.26	62,121.80	2.80	16.02	0.01	111.60	0.11	3,476.40	0.86
14	361.80	0.00	361.80	1,083.10	0.00	1,083.10	186.53	8,200.60	1.80	86.18	0.01	66.60	0.00	722.60	0.20
15	961.80	0.00	961.80	5,954.80	0.00	5,954.80	536.23	19,662.10	2.80	68.38	0.16	86.13	0.11	2,116.80	0.40
16	963.70	24.80	988.50	23,104.70	700.80	23,804.20	196.80	77,363.20	2.80	8.56	0.01	127.16	0.13	3,263.80	0.66
17	978.80	0.00	978.80	23,483.80	0.00	23,483.80	179.03	86,396.80	2.80	7.66	0.01	119.96	0.13	3,668.20	0.70
18	966.80	0.00	966.80	20,206.80	0.00	20,206.80	153.66	72,727.80	2.80	7.54	0.01	122.43	0.13	3,463.70	0.66
19	946.80	0.00	946.80	22,710.80	0.00	22,710.80	170.20	79,326.80	2.80	7.66	0.01	126.46	0.13	3,313.60	0.66
20	926.46	0.00	926.46	22,473.06	0.00	22,473.06	177.16	81,696.76	2.80	7.96	0.01	121.96	0.13	3,461.80	0.70
21	296.76	0.00	296.76	888.80	0.00	888.80	186.84	1,817.20	1.56	64.46	0.86	64.13	0.00	606.80	0.36
22	646.70	118.80	767.20	5,820.20	226.80	6,076.20	70.13	20,771.70	2.70	7.01	0.01	82.46	0.13	2,302.20	0.40
23	946.36	0.00	946.36	22,708.16	0.00	22,708.16	176.56	84,886.80	2.80	7.36	0.01	116.43	0.12	3,536.80	0.70
24	946.70	0.00	946.70	22,720.46	0.00	22,720.46	171.16	83,486.46	2.80	7.13	0.01	120.67	0.13	3,479.10	0.70
25	966.80	0.00	966.80	23,203.20	0.00	23,203.20	162.72	84,326.80	2.80	6.76	0.01	120.72	0.13	3,614.00	0.70
26	967.30	0.00	967.30	23,223.70	0.00	23,223.70	151.80	83,727.80	2.80	7.56	0.01	123.84	0.13	3,486.10	0.70
27	968.80	0.00	968.80	23,264.20	0.00	23,264.20	176.13	81,696.20	2.80	7.46	0.01	120.92	0.13	3,664.60	0.70
28	920.20	22.80	968.20	22,270.60	572.20	22,861.80	204.66	84,696.80	2.80	9.24	0.01	119.60	0.13	3,636.80	0.70
29	966.80	0.00	966.80	23,776.16	0.00	23,776.16	181.71	86,800.20	2.80	7.57	0.01	127.86	0.13	3,606.20	0.70
30	968.60	0.00	968.60	23,646.20	0.00	23,646.20	180.78	86,206.16	2.80	7.81	0.01	126.16	0.13	3,606.10	0.70
31	969.10	0.00	969.10	23,257.46	0.00	23,257.46	162.81	86,432.80	2.80	7.00	0.01	122.74	0.13	3,660.70	0.70
MTD	906.63	5.72	909.35	647,284.60	1,668.70	656,804.20	5,669.53	2,166,467.40							

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

4APT-AEB

AUG 0 6 1991

RECEIVED

AUG 0 9 1991

Division of Air
Resources Management

Mr. Clair H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: City of Lakeland (PSD-FL-166)

Dear Mr. Fancy:

This is to acknowledge receipt of the Prevention of Significant Deterioration (PSD) final determination and permit for the modification to the above referenced source, by letter dated July 26, 1991.

The proposed project consists of the addition of one GE "quiet combustor" combined cycle gas turbine with NO_x emissions limits of 25 ppm when firing natural gas and 42 ppm when firing fuel oil. In addition, the fuel oil use is limited to 33%. We have reviewed the package as requested and have no adverse comments.

Thank you for the opportunity to review and comment on this package. If you have any questions or comments on this package, please contact Mr. Gregg Worley of my staff at (404) 347-5014.

Sincerely yours,

Sally L. Shaver, for

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics
Management Division

cc: P. Lewis
B. Andrews
C. Holladay
A. Dodd, City of Lakeland
B. Thomas SW Dist.
S. Day, B&D
C. Shaver, NPS

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Florida Department of Environmental Regulatic
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-24
Lawton Chiles, Governor
Carol M. Browner, Secr

FAX TRANSMITTAL LETTER

DATE: 1-26-91

TO:

NAME: Bill Rodriquez
AGENCY: City of Tallahassee
TELEPHONE: 813/499-6344
OF PAGES (INCLUDE COVER SHEET): 2

FROM:

NAME: Patty Adams
AGENCY: Bur. of Air Regulation
IF ANY PAGES ARE NOT CLEARLY RECEIVED, PLEASE CALL IMMEDIATELY. PHONE NO: 904/488-1344
SENDER'S NAME:
COMMENTS: Permit will be mailed today

BEST AVAILABLE COPY

Florida Department of Environmental Regulatic
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-24
Lawton Chiles, Governor
Carol M. Browner, Secre

FAX TRANSMITTAL LETTER

DATE: 7-26-91

TO:

NAME: Stanley Rasmussen
AGENCY: Black & Veatch

TELEPHONE: 913/339-2434

OF PAGES (INCLUDE COVER SHEET): 2

FROM:

NAME: Patty Adams
AGENCY: DER - Bureau of Air Regulation

IF ANY PAGES ARE NOT CLEARLY RECEIVED, PLEASE CALL IMMEDIATELY. PHONE NO: 904/488-1344

SENDER'S NAME:

COMMENTS: Permit will be mailed today

Final Determination

City of Lakeland-Charles Larsen Power Plant
Lakeland, Florida

120 MW Combined Cycle Gas Turbine System

Permit Number: AC 53-190437
PSD-FL-166

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

July 19, 1991

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

In the matter of an
Application for Permit by:

City of Lakeland
501 East Lemon Street
Lakeland, Florida 33801-5050

DER File No. AC 53-190437
PSD-FL-166
Polk County

Enclosed is Permit Number AC 53-190437/PSD-FL-166 to install a combined cycle gas turbine plant at the existing Charles Larsen power plant in Lakeland, Polk County, Florida, issued pursuant to Section(s) 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; 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 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 7-26-91 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.

Kyra Tober (Clerk) 7-26-91 (Date)

Copies furnished to:
J. Harper, EPA
S. Day, B&V
H. Kerns, SW District
D. Schultz, B&V
C. Shaver, NPS

Final Determination

The Technical Evaluation and Preliminary Determination for the permit to install a combined cycle gas turbine at the City of Lakeland-Charles Larsen power plant in Lakeland, Polk County, Florida, was distributed on March 15, 1990. The Notice of Intent to Issue was published in the Lakeland Ledger on April 3, 1991. Copies of the evaluation were available for public inspection at the Department's Tampa and Tallahassee offices.

The City of Lakeland's (City) permit application has been reviewed and the Final Determination made by the Division of Air Resources Management. EPA Region IV indicated in their April 4 letter (attachment 2) that they had no adverse comments on the Technical Evaluation and Preliminary Determination (TE & PD). Comments were received from the City of Lakeland dated April 3 and May 15, 1991 (see attachments 1 and 4) and from the National Park Service (NPS) dated May 3, 1991 (attachment 3). The Division concurs with the City's comments concerning the narrative portion of the TE & PD and the comments will become part of the permit file. The NPS and the City's comments which pertain to BACT and Air Quality Analysis are addressed as follows:

BACT

The City would like a 33 percent instead of the proposed 25 percent capacity limit when using oil. In their May 15 letter they provided several supporting reasons as follows:

a. Limiting the oil to a maximum sulfur content of 0.2 percent is lower than recent permit applications of 0.3 to 0.5 percent sulfur.

b. The planned improvements will retire an existing 2.5 percent sulfur unit at the same facility.

c. The higher capacity limit is consistent with permit conditions being revised for the City of Vero Beach, should low NOx burners be installed.

d. Most 25 percent capacity limitations on other Florida projects have 65 ppmvd instead of the 42 ppmvd limit on the City's proposed facility.

e. Increased concern for natural gas capacity given existing uses and proposals to build new facility with generation exceeding 3500MW over the next 8-10 years.

Considering the use of low NOx burners (emission rate of 42 ppmvd) and the use of 0.2 percent maximum sulfur No. 2 fuel oil to limit the SO_2 emissions, DER is willing to allow up to 33% capacity limit for oil firing or 2925 hours per year.

Air Quality Analysis

NPS found the City's dispersion modeling analysis to be deficient since it lacked cumulative Class I increment analysis including all increment consuming sources impacting Chassahowitzka Wilderness Area. The NPS is becoming increasingly concerned about the cumulative impact of emissions on resources, such as lichens and bryophytes, that are known to be particularly sensitive to SO_2. They are also concerned about the acidification of surface water in the Wilderness Area due to increased sulfur and nitrogen deposition. They state that, "Acidification can have serious implications not only to invertebrates and fish but... species higher on the food chain... such as alligator, pelican, and bald eagle."

The Department agrees on the necessity to evaluate the total ambient pollution levels in the Wilderness Area. The Department agrees that future applicants will be required to perform a cumulative analysis for all increment consuming sources impacting the Chassahowitzka Wilderness Area.

The final action of the Department will be to issue construction permit AC 53-190437/PSD-FL-166 as proposed in the Technical Evaluation and Preliminary Determination.

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.

Recycled Paper

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.

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.

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.

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:

SPECIFIC CONDITIONS:

Pollutant	Acceptable Ambient Concentrations ug/m^3 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.

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 SO_2 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.

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:

$$NO_x = (NO_{x\ obs}) \left(\frac{P_{ref}}{P_{obs}}\right)^{0.5} e^{19(H_{obs} - 0.00633)} \left(\frac{288°K}{T_{AMB}}\right)^{1.53}$$

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 NOx 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.

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

Carol M. Browner, Secretary

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TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standards: Gas Firing	Standards: No. 2 Fuel Oil Firing	Gas Turbine and HRSG[a] Tons Per Year: Gas	Gas Turbine and HRSG[a] Tons Per Year: Oil	Basis
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)	-	3.0×10^{-6} lbs/MMBtu	—	.003	Est. by Appl.
Lead (Pb)	-	2.8×10^{-5} lbs/MMBtu	—	0.03	" "
Beryllium (be)	-	2.5×10^{-6} lbs/MMBtu	—	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	—	3.2×10^{-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_2SO_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

Pollutant	Determination
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_2SO_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:

- Combustion Products (Particulates and Heavy Metals). Controlled generally by good combustion of clean fuels.
- Products of Incomplete Combustion (CO, VOC, Toxic Organic Compounds). Control is largely achieved by proper combustion techniques.
- Acid Gases (SOx, NOx, HCl, Fl). 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, PM_{10}, 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/PM_{10} 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 PM_{10} 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 NOx 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 NOx emissions. The SCR process combines vaporized ammonia with NOx 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 NOx with a new catalyst. As the catalyst ages, the maximum NOx 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.

SO_2 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 PM_{10}, 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:

Pollutant	Emission Limit Natural Gas Firing	 No. 2 Fuel Oil Firing
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:

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

July 19, 1991
Date

Approved by:

Carol M. Browner, Secretary
Dept. of Environmental Regulation

July 26 1991
Date

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Mr. Alfred M. Dodd, P.E.
E & W Engineering Manager
City of Lakeland
Dept. of Electric & Water Util.
501 E. Lemon Street
Lakeland, FL 33801-5050

4a. Article Number
P 832 539 827

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DEPARTMENT OF ENVIRONMENTAL REGULATION

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Interoffice Memorandum

TO: Carol M. Browner

FROM: Steve Smallwood

DATE: July 19, 1991

SUBJ: Approval of Construction Permit AC 53-190437/PSD-FL-166
City of Lakeland - Charles Larsen Power Plant

Attached for your approval and signature is a permit and corresponding Best Available Control Technology (BACT) determination prepared by the Bureau of Air Regulation for the above mentioned company to install a combined cycle gas turbine plant at the existing Charles Larsen power plant in Lakeland, Polk County, Florida.

Comments were received from the National Park Service and the City of Lakeland.

I recommend your approval and signature.

CF/PL/plm

Attachments

LAKELAND ELECTRIC & WATER

(813) 499-6589

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G. A. Rodriguez
MANAGER OF
ENVIRONMENTAL AFFAIRS

RECEIVED
MAY 17 1991
Division of Air
Resources Management

May 15, 1991

Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Attention Mr. Barry Andrews

Ladies and Gentlemen:

On April 23, 1991, Mr. Steven M. Day, of Black & Veatch, and Mr. G. A. "Bill" Rodriguez, of the City of Lakeland, met with your staff to discuss the draft PSD permit conditions for the Larsen combustion turbine addition. During that meeting, the FDER requested additional justification from the City of Lakeland for increasing the annual oil firing capacity. FDER's proposed permit conditions limited the annual capacity for fuel oil firing to only 25%. The City of Lakeland desired to raise the capability slightly to allow firing fuel oil for 4 months per year. The City of Lakeland has prepared the enclosed justification to support the City's position.

If you have any further questions concerning this matter, please call me at (813) 499-6589 or Mr. Day at (913) 339-2880.

Sincerely,

G. A. "Bill" Rodriguez

/bls
Enclosure

xc: S. Day, Black & Veatch (w/Encl.)
A. Dodd, Lakeland (w/Encl.)
C. Fancy, FDER (w/Encl.)
P. Lewis, FDER (w/Encl.)
C. Holladay
B. Thomas, SwDist
J. Harper, EPA
C. Hall, NPS

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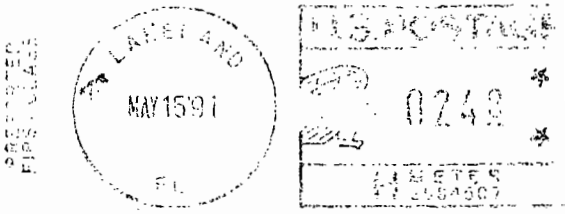

MR CLAIR H FANCY
FLORIDA DEPARTMENT OF ENVIRONMENTAL
REGULATION
TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32399-2400

City of Lakeland
Combustion Turbine Addition

Justification for Increasing Annual Fuel Oil Firing Capacity

The City of Lakeland recently submitted a Prevention of Significant Deterioration (PSD) application for a combined cycle combustion turbine addition at their Larsen Plant. The proposed turbine will utilize a low NO_x burner design to limit NO_x emissions to 25 ppmvd during natural gas firing and 42 ppmvd for No. 2 fuel oil use. With this permit application, the City of Lakeland has also limited the maximum sulfur content of the fuel oil to 0.2 percent for the proposed unit. This limitation is significantly lower than recent permit applications of 0.3 to 0.5 percent sulfur oil. It should be also noted that the City of Lakeland will be retiring an existing unit which is permitted at 2.5 percent fuel oil as part of the planned Larsen Facility improvements.

The FDER approved the permit application for the proposed combustion turbine and issued a set of draft permit conditions for the City of Lakeland's review. These conditions include a 25 percent annual capacity limit for No. 2 fuel oil firing and no capacity restrictions for natural gas firing.

Representatives from the City of Lakeland and Black & Veatch met with the FDER in Tallahassee on April 23, 1991 to propose some changes to the draft permit conditions. The main change was to increase the oil firing annual capacity from 25 percent to one-third capacity (four months per year). At that meeting, FDER requested additional information to support the capacity change. The remainder of this document provides the justification for this request.

The change in capacity would be consistent with the permit conditions currently being revised for the City of Vero Beach's proposed combustion turbine application. That permit will include a provision for raising the capacity to 33 percent if low NO_x burners are installed and compliance testing establishes a NO_x emission rate of 42 ppmvd or less. The City of Lakeland Project already has this lower NO_x emission limit and therefore, one-third capacity would also be appropriate.

Other Florida combustion turbine projects have recently received PSD permits that included annual capacity restrictions for No. 2 oil firing. For example, Hardee County combustion turbine project has an annual lifetime capacity of 25 percent. That project has associated NO_x emission limits of 42 ppmvd (natural gas) and 65 ppmvd (No. 2 fuel oil). Another example is Florida Power & Light's Lauderdale Repowering project. This project also has a 25 percent capacity for oil firing with an emission rate of 65 ppmvd. Considering the 25 percent capacity limit and the higher NO_x emission rate, these example projects have the potential to emit more annual NO_x emissions (65 ppmvd at 25 percent capacity) compared to the City of Lakeland's project (42 ppmvd at one-third capacity). Therefore, increasing the annual capacity slightly would not impose significant environmental concerns.

The importance of the City of Lakeland's concern regarding interruptible gas supply has become more evident recently. As of May 1, 1991, Florida Gas Transmission (FGT) interrupted the gas supply to several Florida utilities. These utilities are now required to utilize an alternative fuel for an unspecified period. Similar situations have occurred during extreme weather periods.

In addition, there is over 3,500 MW of new gas fired generation planned in the State of Florida during the next 8 to 10 years. This firing will exceed the present and projected capacity of the FGT system, thereby ensuring limited available of natural gas in the future. Gas interruption cannot be predicted and this makes it nearly impossible for utilities to anticipate the backup fuel requirements. Since this type of interruption has occurred throughout the year, the City of Lakeland wants to allow for a little more operating flexibility in providing electric customers with reliable service.

The City of Lakeland feels that this request is consistent with FDER's concept of limiting potential emissions. Also, the City of Lakeland's Larsen combustion turbine represents a "state-of-the-art" facility with low NO_x burner design and low sulfur fuel oil (0.2 percent maximum). It can be shown that this Project will generate less potential emissions during oil firing than similar projects that have been recently permitted. Also, the City of Lakeland has a concern with their obligation to provide reliability electrical service during unpredicted periods of interruptible gas supply.

I N T E R O F F I C E M E M O R A N D U M

Date: 16-May-1991 01:12pm GMT
From: Iris Littleton
LITTLETON_I
Dept: Office General Counsel
Tel No: 904/488-9730

TO: DUANE REVELL (REVELL,DUANE)

CC: Dottie Diltz (DILTZ_D)
CC: Pat Manning (MANNING_P)

Subject: New OGC Case Assignments

TO: Duane Revell

FROM: Iris - OGC - Tallahassee

Received 5/16/91 request for an Administrative Hearing from Eagle Point Homeowners, Inc. concerning permit IO08-177592.

Received 5/16/91 request for an Extension of Time from the City of Lakeland concerning permit AC53-190437.

Received 5/15/91 request for an Extension of Time from Lake Gibson Estates WWTP concerning permit DO53-188985.

Received 5/15/91 request for an Extension of Time from Coca Cola Foods concerning permit IO53-190551.

cc: P. Lewis

United States Department of the Interior
FISH AND WILDLIFE SERVICE

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Post Office Box 25486
Denver Federal Center
Denver, Colorado 80225

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Lakewood, Colorado 80228

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IN REPLY REFER TO:
RW Air Quality
Mail Stop 60130

MAY 03 1991

Mr. C.H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RECEIVED
MAY 7 1991
Division of Air Resources Management

Dear Mr. Fancy:

We have completed our review of the City of Lakeland's PSD permit application and the Florida Department of Environmental Regulation's (FDER) Technical Evaluation and Preliminary Determination Document for the proposed construction of a combined cycle combustion turbine generator at the existing Charles Larsen Power Plant. The facility is located approximately 90 km SE of the Chassahowitzka Wilderness Area, a class I area administered by the U.S. Fish and Wildlife Service. Our comments on the best available control technology (BACT), air quality modeling, and air quality related values analyses are discussed below.

We agree that combustion controls and firing of low sulfur fuels (natural gas as the primary fuel and 0.20 percent sulfur fuel oil as the backup fuel) represent BACT to minimize particulate matter and sulfur dioxide (SO_2) emissions from the proposed turbine. The City of Lakeland proposes to control nitrogen oxide (NO_X) emissions by using a "low NO_X combustor" turbine design, in combination with wet (water or steam injection) controls. The resulting NO_X rate proposed for the turbine is 25 parts per million (ppm) for gas firing, and 42 ppm for oil firing.

The City of Lakeland and the FDER also considered Selective Catalytic Reduction (SCR) as an alternative NO_X control system. The SCR technology could reduce NO_X emissions from the proposed turbine to less than 9 ppm, but at a substantial cost. The FDER calculated a cost effectiveness of $6,441 per ton of NO_X removed to reduce the turbine NO_X emissions from the proposed 25 ppm level to 9 ppm. Based on this cost effectiveness value, the FDER determined that the use of SCR technology is not justified at this time.

If the proposed "low NO_X combustor" design, rather than a standard combustor design (42 ppm NO_X for gas firing), is used as the base case in the BACT determination, we agree that SCR technology is not cost effective on a dollars per ton basis. However, although SCR will not be required for the City of Lakeland's turbine project, we believe that this technology

should be given serious consideration for future permit applications for combined-cycle gas turbine projects.

It is interesting to note that if the cost effectiveness calculation for SCR is made assuming a standard combustor turbine design, the use of SCR could be considered reasonable. For example, using the SCR costs provided by the City of Lakeland, the cost effectiveness to reduce NO_x emissions from 42 ppm to 9 ppm with SCR would only be $3,883 per ton. In essence, by choosing an "intermediate" NO_x control strategy, and using this strategy as the base case, the City of Lakeland is not being required to use SCR. However, it is also evident that the BACT process is driving emissions downward, and that applicants are looking for ways to inherently lower emissions, rather than opting for add-on flue gas cleaning technologies. Assuming this process continues, and inherently lower emitting systems are developed, such an approach may be preferred from a total environmental standpoint.

Visibility impairment was calculated using the VISCREEN model. The proposed project passed the Level 1 analysis, which indicates that plume impacts at the Chassahowitzka Wilderness Area are unlikely. The VISCREEN analysis calculated a delta E of 0.70 which is under the screening criteria of 2.0, and a plume contrast of 0.001 which is under the screening criteria of 0.50.

The EPA dispersion model Industrial Source Complex Short Term, (ISCST) was applied to calculate impacts of SO_2 and NO_x to the Chassahowitzka Wilderness Area. Five years of National Weather Service surface and upper air data from Tampa, Florida were used in the modeling analysis. Worst case emissions assuming 100 percent fuel oil firing were used in the modeling, and the regulatory default option in ISCST was employed. The results of the modeling indicate that the City of Lakeland project will not consume a large portion of the PSD Class I increments at the wilderness area. The Class I SO_2 increment impacts are 0.93 ug/m^3 for the 3-hour average, 0.2 ug/m^3 for the 24-hour average, and 0.015 ug/m^3 for the annual average. The Class I NO_x increment impact is 0.011 ug/m^3 for the annual average. The Class I particulate matter increment impacts are 0.012 ug/m^3 for the 24-hour average, and 0.001 ug/m^3 for the annual average. Ozone impacts from the volatile organic compound emissions were not modeled because the emissions are below the PSD de minimis level.

We found the dispersion modeling analysis to be deficient in that there was no cumulative class I increment analysis performed that included all increment consuming sources in the airshed impacting the Chassahowitzka Wilderness Area. Therefore, we cannot be certain that the class I increments would not be exceeded. Also, there was no cumulative ambient air quality analysis performed. A cumulative ambient analysis should include an assessment of the impacts from all increment-consuming plus background sources. The cumulative ambient concentrations are necessary to evaluate potential air quality related impacts on sensitive resources in the wilderness area.

Chassahowitzka National Wildlife Refuge was established in 1943 for the purpose of migratory bird conservation. The refuge provides habitat for a number of federally threatened and endangered species including the American alligator, bald eagle, eastern brown pelican, eastern indigo snake, Florida manatee, and three species of sea turtle. We are becoming increasingly concerned about the cumulative impact of emissions on resources, such as lichens and bryophytes, that are known to be particularly sensitive to SO_2. We are also concerned about the potential acidification of surface water in the wilderness area due to increased sulfur and nitrogen deposition. Acidification could have serious implications not only for the invertebrates and fish that would be directly affected, but also for species higher up the food chain that depend on them for food, species such as the alligator, pelican, and bald eagle.

In conclusion, we ask that the FDER require future applicants to perform a cumulative analysis that includes all increment consuming sources having the potential of impacting the Chassahowitzka Wilderness Area. In addition, to assess potential impacts on sensitive air quality related values, it is important for us to know the total ambient concentrations (increment plus background) at the class I area. Recent analyses have revealed that large portions of the 3-hour, 24-hour, and annual SO_2 class I increments in the wilderness area have been consumed. Therefore, FDER permitting decisions are likely to become more difficult and complex in the near future. Early coordination and consultation between our agencies will be critical to carrying out our mutual responsibility of protecting the Chassahowitzka Wilderness Area from adverse air quality impacts.

If you have any questions regarding this matter, please contact Tonnie Maniero of our Air Quality Branch in Denver at (303) 969-2071.

Sincerely,

Wilbur N. Ladd, Jr.
Assistant Regional Director
Refuges and Wildlife, Region 6

cc: A. Lewis
B. Andrews
C. Holladay
B. Thomas, SW Dist
J. Harper, EPA

LAKELAND ELECTRIC & WATER

PRODUCTION ENGINEERING

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APR 8 1991
DER-BAQM

April 3, 1991

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. Barry Andrews

We have reviewed FDER's Technical Evaluation and Preliminary Determination and proposed permit conditions dated March 15, 1991 for the 120 MW combined cycle gas turbine.

Our comments have been incorporated into the enclosed version of these documents. These comments are intended to clarify areas and propose minor changes in specific permit conditions. The main comments can be summarized as:

- Raising the annual capacity factor for fuel oil firing to one third. This will allow the potential capability of firing oil for four months of the year. Four months of oil firing would be sufficient to cover foreseeable interruptions to Lakeland's natural gas supply.

  The potential annual emission rates and fuel consumption have been adjusted to reflect the one third capacity factor.

- An initial compliance test shall be performed using both fuels. Annual NO_x compliance tests would be for those fuels that were used more than 170 hours during the preceding 12 month period. Orlando Utilities Commission (OUC) has a similar condition (11) in their PSD permit (PSD-FL-130) for the Indian River Generating Station.

- It is also proposed that CO, particulate, VOC, sulfuric acid mist, and beryllium emissions only be tabulated for PSD and inventory purposes. This proposal is also consistent with OUC Indian River PSD permit (Condition 7). Therefore, Method 5 has been deleted as a test method for particulate emissions.

- Daily testing of fuel characteristics is proposed to be changed to one test for each fuel oil shipment.

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City: LELAND State: FL ZIP Required: 3 3 8 0 1

2 To (Recipient's Name) Please Print: BARRY ANDREWS

Recipient's Phone Number (Very Important): (904) 488-13[illegible]

Company: FL DEPT ENVIRONMENTAL REGULATION TWIN TOWERS OFFICE BLDG

Department/Floor No.:

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14 [ ] FEDEX TUBE	54 [ ] FEDEX TUBE
Economy Two-Day Service (formerly Standard Air) (Delivery by second business day†)	**Heavyweight Service** (for Extra Large or any package over 150 lbs.)
30 [ ] ECONOMY TWO-DAY SVC.	70 [ ] HEAVYWEIGHT **
	80 [ ] DEFERRED HEAVYWEIGHT **

†Delivery commitment may be later in some areas.

*Declared Value Limit $100.

**Call for delivery schedule.

DELIVERY AND SPECIAL HANDLING (Check services required)

1 [ ] HOLD FOR PICK-UP (Fill in Box H)

2 [X] DELIVER WEEKDAY

3 DELIVER SATURDAY (Extra charge) [ ] (Not available to all locations)

4 [ ] DANGEROUS GOODS (Extra charge)

5 [ ]

6 [ ] DRY ICE ____ Lbs

7 [ ] OTHER SPECIAL SERVICE

8 [ ]

9 [ ] SATURDAY PICK-UP (Extra charge)

10 [ ]

11 [ ] DESCRIPTION

12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE
1	1	
Total 1	Total 1	Total

DIM SHIPMENT (Chargeable Weight) [ ] _____ lbs.

Received At: 1 [ ] Regular Stop 2 [ ] On-Call Stop 3 [X] Drop Box 4 [ ] B.S.C. 5 [ ] Station

FedEx Emp. No.

5 Release Signature: X

Date/Time 4/5 1615

Emp. No. Date

[ ] Cash Received

[ ] Return Shipment

[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold

Street Address

City State Zip

Received By: X

Date/Time Received FedEx Employee Number

Federal Express Use

Base Charges

Declared Value Charge

Other 1

Other 2

Total Charges

REVISION DATE 8/90
PART #119501 FXEM12/90
FORMAT #041

041

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- Potential annual CO emissions will exceed 100 tpy and therefore requires a BACT determination. The applicant's proposed BACT determination for CO was included in the application.

We will be scheduling a meeting soon to discuss these comments with you.

LEGAL NOTICE REQUIREMENT:

In accordance with DER Rule 17-103.150, we have published a legal notice in the local Lakeland Ledger newspaper and have included a copy of the notice herewith.

If you have any questions please call me at (813) 499-6461, Bill Rodriguez at (813) 499-6589, or Steve Day - B & V - (913) 339-2880.

Sincerely,

Al Dodd

ALfred M. Dodd, P.E.
E & W Engineer Manager

Enclosures

cc: Steve Day - Black & Veatch
G. A. "Bill" Rodriguez
P. Lewis
B. Andrews
C. Halladay
B. Thomas, SW Dist.
C. Maier, WPS

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Jazzie Shelton, Ch. E.
City of Lakeland
501 E. Orton St.
Lakeland, FL
33801-5050

4a. Article Number
Z 127 632 502

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

5. Signature (Addressee)

6. Signature (Agent)

7. Date of Delivery
9/08

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

PS Form 3811, December 1991 *U.S. GPO: 1993—352-714 DOMESTIC RETURN RECEIPT

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

Z 127 632 502

UNITED STATES POSTAL SERVICE

Receipt for Certified Mail

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

Sent to Jazzie Shelton	
Street and No. City of Lakeland	
P.O., State and ZIP Code Lakeland, FL	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, March 1993

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

APR - 4 1991

RECEIVED
APR 8 1991
DER-BAQM

4APT-AEB

Mr. Clair H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: City of Lakeland (PSD-FL-166)

Dear Mr. Fancy:

This is to acknowledge receipt of the Prevention of Significant Deterioration (PSD) preliminary determination and draft permit for the modification to the above referenced source, by letter dated March 15, 1991.

The proposed project consists of the addition of one GE "quiet combustor" combined cycle gas turbine with NO_x emissions limits of 25 ppm when firing natural gas and 42 ppm when firing fuel oil. In addition, the fuel oil use is limited to 25%. We have reviewed the package as requested and have no adverse comments.

Thank you for the opportunity to review and comment on this package. If you have any questions or comments on this package, please contact Mr. Gregg Worley of my staff at (404) 347-2904.

Sincerely yours,

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics
Management Division

cc: P. Lewis
B. Andrews
C. Holladay
B. Thomas, SW Dist.
C. Shaver, NPS

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FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 0137717565

0137717565

RECIPIENT'S COPY

Date 4/5/91

1 From (Your Name) Please Print: A M Dodd

Your Phone Number (Very Important): (813) 499-6461

Company: CITY OF LAKELAND ELEC & WATER

Department/Floor No.:

Street Address: EAST LEMON ST

City: LAKELAND State: FL ZIP Required: 3 3 8 0 1

2 To (Recipient's Name) Please Print: BARRY ANDREWS

Recipient's Phone Number (Very Important): (904) 488-1344

Company: FL DEPT ENVIRONMENTAL REGULATION TWIN TOWERS OFFICE BLDG

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip + 4 Codes.): 2600 BLAIR STONE RD

City: TALLAHASSEE State: FL ZIP Required: 32399-2400

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)

H IF HOLD FOR PICK-UP, Print FEDEX Address Here

Street Address:

City: State: ZIP Required:

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight Service (Delivery by next business morning†)	Standard Overnight Service (Delivery by next business afternoon†)
11 [ ] YOUR PACKAGING	51 [ ]
16 [X] FEDEX LETTER *	56 [ ] FEDEX LETTER *
12 [ ] FEDEX PAK *	52 [ ] FEDEX PAK *
13 [ ] FEDEX BOX	53 [ ] FEDEX BOX
14 [ ] FEDEX TUBE	54 [ ] FEDEX TUBE

Economy Two-Day Service (formerly Standard Air) (Delivery by second business day†)	Heavyweight Service (for Extra Large or any package over 150 lbs.)
30 [ ] ECONOMY TWO-DAY SVC.	70 [ ] HEAVYWEIGHT **
	80 [ ] DEFERRED HEAVYWEIGHT **

†Delivery commitment may be later in some areas. *Declared Value Limit $100. **Call for delivery schedule.

DELIVERY AND SPECIAL HANDLING (Check services required)

1 [ ] HOLD FOR PICK-UP (Fill in Box H)
2 [X] DELIVER WEEKDAY
3 [ ] DELIVER SATURDAY (Extra charge) (Not available to all locations) [ ]
4 [ ] DANGEROUS GOODS (Extra charge)
5 [ ]
6 [ ] DRY ICE _____ Lbs.
7 [ ] OTHER SPECIAL SERVICE _____
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
10 [ ]
11 [ ] DESCRIPTION
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE
1	1	
Total 1	Total 1	Total

DIM SHIPMENT (Chargeable Weight) [ ] _____ lbs.

Received At: 1 [ ] Regular Stop 2 [ ] On-Call Stop 3 [ ] Drop Box 4 [ ] B.S.C. 5 [ ] Station

FedEx Emp. No.:

5 Release Signature:

Date/Time: 4/5 1615

Emp. No.: Date:

[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold

Street Address:

City: State: Zip:

Received By: X

Date/Time Received: FedEx Employee Number:

Federal Express Use

Base Charges:
Declared Value Charge:
Other 1:
Other 2:
Total Charges:

REVISION DATE 8/90
PART #11950 EXEM 12/90
FORMAT #0

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U.S.A.

advantage over other regional banking centers like the Cayman Islands and the Bahamas.

Your
dget In
ages!!

687-7088
67

5346345. Sheriff Lawrence W. Crow, Jr. reserves the right to accept or reject any or all bids, to waive any informalities in any bid, and to accept the bid that in his judgement will be a responsible bid in the best interest of Polk County.
/S/ Sheriff Lawrence W. Crow, Jr.
C-66 — 4-1 thru 4-7; 1991

5346345. Sheriff Lawrence W. Crow, Jr., reserves the right to accept or reject any or all bids.
/s/ Lowrence W. Crow, Jr.
Sheriff
C-67 — 4-1 thru 4-7; 1991

BEST AVAILABLE COPY

Building Official - City of Auburndale, FL Salary $24,498 - $34,996. Responsible for the enforcement of building, electrical, plumbing, mechanical, zoning codes and other related ordinances; conducts inspections; supervises the Code Enforcement Division. Require H.S. grad or GED with course work in building, construction or engineering. Ten (10) years experience as an inspector, contractor, superintendent of construction, architect, engineer, or any combination, five (5) years at a supervisory level. Certification by CABO, BOAF, or the State of FL as a Building Official, or the ability to obtain within one year.
C-122 — 4-3; 1991

NOTICE OF VACANCY ON BOARD OF LAKELAND REGIONAL HEALTH SYSTEMS, INC.

Pursuant to the Bylaws of Lakeland Regional Health Systems, Inc., notice is hereby given of expiration of the terms of office for five (5) of the directors of Lakeland Regional Medical Center, Inc. Their terms of office will expire September 30, 1991. Any individual wishing to be considered for service on the Board of Directors should notify, in writing, the Office of President of Lakeland Regional Medical Center, Inc., Jack T. Stephens, P.O. Box 448, Lakeland, Florida 33804, within thirty (30) days of the publication of this notice. The term of office will be for three (3) years, expiring on September 30, 1994.
C-115 — 4-3; 1991

PUBLIC AUCTION NOTICE
MAY 9, 1991
9:00 AM.
WEBB'S TOWING AND RECOVERY
2005 GARY ROAD, U.S. 92 EAST
LAKELAND, FLORIDA 33801-2444
(813) 687-0304
FAX: 688-0926

1. 70 OLDSMOBILE, 4 DOOR, VIN 386690M227400
2. 80 DODGE, 4 DOOR, VIN ZL44AAD232941
3. 78 PONTIAC, FIREBIRD, 2T87A8N139480
4. 81 PLYMOUTH HORIZON, VIN 1P3BL14AXBD225952
5. 75 CHEVY IMPALA, VIN 1L57H51192084
6. 78 BUICK REGAL, VIN 4M47A8H246445
7. 75 CHEVY, 4 DOOR, VIN 1L69H5J247961

C-121 — 4-3; 1991

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
Gives Notice of Intended Agency Action

The District gives notice of its intent to issue a permit to the following applicant(s) on April 9, 1991:

CARL BOOZER, P O BOX 711, WINTER HAVEN, FL 33882-0711, application #2-105-0118AUVM. The applicant proposes to withdraw 0.15 MGD of GROUND WATER FROM THE FLORIDAN AQUIFER via ONE EXISTING WELL TWO PROPOSED WELLS for CITRUS to serve 110.0 acres in Polk County located in the
NE ¼ OF NE ¼ OF SW ¼ OF SW ¼ of Section 19, Township 27 SOUTH, Range 27 East;
NE ¼ OF SE ¼ OF SW ¼ OF NW ¼ of Section 19, Township 27 SOUTH, Range 27 East;
NW ¼ OF SE ¼ OF SW ¼ OF SW ¼ of Section 19, Township 27 SOUTH, Range 27 East;

The file(s) containing each of the above-listed application(s) are available for inspection Monday through Friday except for legal holidays, 8:00 a.m. to 5:00 p.m. at the St. Johns River Water Management District, Highway 100 West, Palatka, Florida.

The District will take action on each permit application listed above unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of section 120.57, F.S., and section 40C-1.511, F.A.C. A person whose substantial interests are affected by any of the Districts proposed permitting decisions identified above may petition for an administrative hearing in accordance with section 120.57, F.S. Petitions must comply with the requirements of Florida Administrative Code Rules 40C-1.111 and 40C-1.521 and be filed with (received by) the District Clerk, P.O. Box 1429, Palatka, Florida 32078-1429. Petitions for administrative hearing on the above application(s) must be filed within fourteen (14) days of publications of this notice or within fourteen (14) days of actual receipt of this intent, whichever first occurs. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under section 120.57, F.S., concerning the subject permit application. Petitions which are not filed in accordance with the above provisions are subject to dismissal.
C-123 — 4-3; 1991

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to City of Lakeland - Charles Larsen Plant, 2002 E. Rood 92, Lakeland, Polk County, Florida 33801, to construct and operate a 120 MW combined cycle gas turbine system. A determination of Best Available Control Technology (BACT) was required. The Class I particulate matter PSD increment consumed is 0.012 vs. 10 allowable 24-hour average and 0.001 vs. 5 allowable annual average, in micrograms per cubic meter. The Class I sulfur dioxide PSD increment consumed is 0.93 vs. 25 allowable 3-hour average, 0.20 vs. 5 allowable 24-hour average, and 0.015 vs. 2 allowable annual average, in micrograms per cubic meter. The Class I nitrogen dioxide increment consumed is 0.011 vs. 2.5 allowable annual average, in micrograms per cubic meter. The maximum predicted increases in ambient concentrations for the above three pollutants for all averaging times are less than significant in the Class II area surrounding the plant, thus no increment consumption was calculated. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:
Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Department of Environmental Regulation
Southwest District
4520 Oak Fair Blvd.
Tampa, Florida 33601-7347

Any person may send written comments on the proposed action to Mr. Barry Andrews at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination.

Further, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.
C-120 — 4-3; 1991

LEDGER APRIL 3, 1991

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

March 15, 1991

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Alfred M. Dodd, P.E.
E & W Engineering Manager
City of Lakeland
Department of Electric & Water Utilities
501 East Lemon Street
Lakeland, Florida 33801-5050

Dear Mr. Dodd:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit to construct and operate a 120 MW combined cycle gas turbine system.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Barry Andrews of the Bureau of Air Regulation.

Sincerely,

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

CHF/PL/plm

Attachments

c: Harry Kerns, SWD
Jewell Harper, EPA

Recycled Paper

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

City of Lakeland Department of
Electric and Water Utilities
501 E. Lemon Street
Lakeland, Florida 33801-5050

DER File No. AC 53-190437
PSD-FL-166

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue an air construction permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, City of Lakeland-Charles Larson Power Plant, applied on December 17, 1990, to the Department of Environmental Regulation for a permit to construct and operate a 120 MW combined cycle gas turbine generator.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit is required for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department, at the address specified within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application(s) have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office in General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a

hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

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

Copies furnished to:

Harry Kerns, SWD
Jewell Harper, EPA

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 3-15-91.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statuts, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk

3-15-91
Date

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to City of Lakeland-Charles Larsen Plant, 501 E. Lemon Street, Lakeland, Polk County, Florida 33801-5050, to construct and operate a 120 MW combined cycle gas turbine system. A determination of Best Available Control Technology (BACT) was required. The Class I particulate matter PSD increment consumed is 0.012 vs. 10 allowable 24-hour average and 0.001 vs. 5 allowable annual average, in micrograms per cubic meter. The Class I sulfur dioxide PSD increment consumed is 0.93 vs. 25 allowable 3-hour average, 0.20 vs. 5 allowable 24-hour average, and 0.015 vs. 2 allowable annual average, in micrograms per cubic meter. The Class I nitrogen dioxide increment consumed is 0.011 vs. 2.5 allowable annual average, in micrograms per cubic meter. The maximum predicted increases in ambient concentrations for the above three pollutants for all averaging times are less than significant in the Class II area surrounding the plant, thus no increment consumption was calculated. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

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(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by Petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

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The application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Southwest District
4520 Oak Fair Blvd.
Tampa, Florida 33601-7347

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Further, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Technical Evaluation
and
Preliminary Determination

City of Lakeland-Charles Larsen Power Plant
Lakeland, Florida

120 MW Combined Cycle Gas Turbine System

Permit Number: AC 53-190437
PSD-FL-166

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

March 15, 1991

SYNOPSIS OF APPLICATION

I. NAME AND ADDRESS OF APPLICANT

City of Lakeland
Department of Electric and Water Utilities
501 East Lemon Street
Lakeland, Florida 33801-5050

II. REVIEWING AND PROCESS SCHEDULE

Date of Receipt of Application: December 17, 1990.

III. FACILITY INFORMATION

III.1 **Facility Location**

This facility is located at S.R. 92 and East Lake Parker Drive in the city of Lakeland, Polk County, Florida. The UTM coordinates are 409.185 km East and 3102.754 km North.

III.2 **Facility Identification Code (SIC)**

Major Group No. 49 - Electric, Gas and Sanitary Services.

Industry Group No. 493 - Combination Electric, Gas and Other Utility Services.

Industry Group No. 4931 - Electric and Other Services Combined.

III.3 **Facility Category**

The City of Lakeland-Charles Larsen Power Plant is classified as a major emitting facility. The proposed project will emit approximately 425 (gas) and 732 (oil) tons per year (TPY) of nitrogen oxides (NO_X), 2.6 (gas) and 920 (oil) TPY of sulfur dioxide (SO_2), 22 (gas) and 66 (oil) TPY of particulate matter (PM), and 20 (oil) TPY of volatile organic compounds (VOC), 0.01 (oil) TPY of beryllium, 0.12 (oil) TPY of lead, 0.01 (oil) TPY of mercury, and 27.6 (oil) TPY of sulfuric acid mist.

IV. PROJECT DESCRIPTION

The City of Lakeland-Charles Larsen Power Plant proposes to construct and operate a 120 MW combined cycle gas turbine system. The unit will be located at the Charles Larsen Power Plant. The combustion turbine (CT) will be capable of generating approximately 80 MW while operating in simple cycle and 120 MW when in combined cycle operation. While in the combined cycle the heat recovery steam generator (HRSG) will power the existing Larsen Unit 5 steam turbine-generator. The primary fuel will be natural gas and No. 2 fuel oil with a sulfur content of 0.2 percent.

V. RULE APPLICABILITY

The proposed project is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code (F.A.C.).

The plant is located in an area designated attainment for all criteria pollutants in accordance with F.A.C. Rule 17-2.420.

The proposed project will be reviewed under F.A.C. Rule 17-2.500, Prevention of Significant Deterioration (PSD), because it will be a major modification to a major facility. This review consists of a determination of Best Available Control Technology (BACT) and unless otherwise exempted, an analysis of the air quality impact of the increased emissions. No air quality impact analysis is required for ozone, even though there will be a significant increase in VOC emissions, because this increase is less than 100 TPY. The review also includes an analysis of the project's impacts on soils, vegetation and visibility; along with air quality impacts resulting from associated commercial, residential and industrial growth.

This source shall comply with the New Source Performance Standards for Gas Turbines, Subpart GG, Appendix A, which is contained in 40 CFR 60, and is adopted by reference in F.A.C. Rule 17-2.660. The proposed source shall also comply with applicable provisions of F.A.C Rule 17-2.700, Stack Test Procedures, and F.A.C. Rule 17-2.630, Best Available Control Technology.

VI. SOURCE IMPACT ANALYSIS

VI.1 **Emission Limitations**

The operation of the combined cycle plant will produce emissions of NO_x, SO_2, CO, HC, sulfuric acid mist, PM, PM_{10}, Be, Pb and Hg. The impact of these pollutant emissions are below the Florida ambient air quality standards (AAQS) and/or the acceptable ambient concentration levels (AAC). Table 1 lists each contaminant and its maximum expected emission rate, along with the proposed increase of emissions.

VI.2 **Air Toxics Evaluation**

The operation of this source will produce emissions of chemical compounds that may be toxic in high concentrations. The emission rates of these chemicals shall not create ambient concentrations greater than the acceptable ambient concentrations (AAC) as shown below. Determination of the AAC for these organic compounds shall be determined by Department approved dispersion modeling or ambient monitoring.

$$AAC = \frac{OEL}{\text{Safety Factor}}$$

Where,

AAC = acceptable ambient concentration

Safety Factor = 50 for category B substances and 8 hrs/day
100 for category A substances and 8 hrs/day
210 for category B substances and 24 hrs/day
420 for category A substances and 24 hrs/day

OEL = Occupational exposure level such as ACGIH, ASHA and NIOSH published standards for toxic materials.

MSDS = Material Safety Data Sheets

VI.3 Air Quality Analysis

a. Introduction

The operation of the proposed 120 MW combined cycle gas turbine system will result in emissions increases which are projected to be greater than the PSD significant emission rates for the following pollutants: CO, NO_X, SO_2, PM, PM_{10}, Be, and H_2SO_4 mist. Therefore, the project is subject to the PSD review requirements contained in F.A.C. Rule 17-2.500 for these pollutants. Part of these requirements is an air quality impact analysis for these pollutants, which includes:

- An analysis of existing air quality;
- A PSD increment analysis (for SO_2, PM, PM_{10}, and NO_X);
- An ambient Air Quality Standards analysis (AAQS);
- An analysis of impacts on soils, vegetation, visibility and growth-related air quality impacts; and
- A Good Engineering Practice (GEP) stack height determination.

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analyses are based on air quality dispersion modeling completed in accordance with EPA guidelines.

Based on these required analyses, the Department has reasonable assurance that the combined cycle gas turbine system, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard. A brief description of the modeling methods used and results of the required analyses follow. A more complete description is contained in the permit application on file.

b. Analysis of the Existing Air Quality

Preconstruction ambient air quality monitoring may be required for pollutants subject to PSD review. However, an exemption to the monitoring requirement can be obtained if the maximum air quality impact resulting from the projected emissions increase, as determined through air quality modeling, is less than a pollutant-specific de minimus concentration. The predicted maximum concentration increase for each pollutant subject to PSD review is given below:

	CO	SO_2	TSP & PM_{10}	NO_x	Be
PSD de minimus Concentration (ug/m^3)	575	13	10	14	.001
Averaging Time	8-hr	24-hr	24-hr	Annual	24-hr
Maximum Predicted Impact (ug/m^3)	2.7	4.7	0.3	0.2	.000005

There are no monitoring de minumus concentrations for H_2SO_4 mist. As shown above, the predicted impacts are all less than the corresponding de minimus concentrations; therefore, no preconstruction monitoring is required for any pollutant.

c. Modeling Method

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used by the applicant to predict the impact of the proposed project on the surrounding ambient air. All recommended EPA default options were used. Direction-specific downwash parameters were used because the stacks were less than the good engineering practice (GEP) stack height. Five years of sequential hourly surface and mixing depth data from the Tampa, Florida National Weather Service (NWS) station collected during 1982 through 1986 were used in the model. Since five years for data were used, the highest-second-high short-term predicted concentrations are compared with the appropriate ambient air quality standards or PSD increments. For the annual averages, the highest predicted yearly average was compared with the standards.

For this project emissions from fuel oil burning are significantly higher than those from natural gas combustion, while the gas flow characteristics are fairly similar thus resulting in higher predicted ground level-pollutant impacts from fuel oil combustion. All modeling impacts were, therefore, based on fuel oil consumption. Dispersion modeling for emissions from the HRSG (height of 155 feet) and bypass stacks (height of 100 feet) were performed.

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pollutants with Class I increments. The maximum predicted SO_2 increases are 0.015 ug/m^3 for the annual averaging time, 0.20 ug/m^3 for the 24-hr averaging time and 0.93 for the 3-hr averaging time. The maximum predicted PM increases are 0.001 ug/m^3 for the annual averaging time and 0.012 for the 24-hr averaging time. The maximum predicted NO_2 increase is 0.011 ug/m^3 for the annual averaging time. These predicted values are all much less than the corresponding Class I increments.

e. Additional Impacts Analysis

The increased emissions at the City of Lakeland Power Plant are not expected to affect the visibility in the Chassahowitzka National Wilderness area located 94 km away because of the very small maximum predicted impacts. Because the impacts from the proposed pollutants are predicted to be less than PSD significance levels, no harmful effects on soils and vegetation is expected. In addition, the proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

VII. CONCLUSION

Based on the information provided by the City of Lakeland Power Plant, the Department has reasonable assurance that the proposed installation of the 120 MW combined cycle gas turbine system, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

Barry D. Andrews
#36024
3-15-91

d. Modeling Results

The applicant first evaluated the potential increase in ambient ground-level concentrations associated with the project to determine if these predicted ambient concentration increases would be greater than specified PSD significant impact levels for CO, SO_2, NO_x, PM and PM_{10}. Dispersion modeling was performed with receptors placed along the 36 standard radial directions (10 degrees apart) surrounding the proposed source at the following downwind distances: 100 meter intervals from 100 to 1000 meters, 250 meter intervals from 1,250 to 3,000 meters, and 1,000 meter intervals from 4,000 to 10,000 meters. The results of this modeling presented below show that the increases in ambient ground-level concentrations for all averaging times are less than the PSD significant impact levels for CO, SO_2, NO_x, PM and PM_{10}.

Pollutant	Averaging Time	PSD Significance Level (ug/m3)	Ambient Concentration Increase (ug/m3)
CO	8-hour	500	2.7
	1-hour	2000	9.4
SO_2	Annual	1.0	0.2
	3-hour	25.0	19.7
	24-hour	5.0	4.7
NO_2	Annual	1.0	0.2
PM/PM_{10}	Annual	1.0	0.01
	24-hour	5.0	0.3

Therefore, further dispersion modeling for comparison with AAQS and PSD increment consumption were not required in this case.

The applicant did not model emissions from the noncriteria regulated pollutants Be and H_2SO_4 for which no ambient air quality standards have been defined under PSD rules. However, based on modeling results provided by the applicant for SO_2 and pertinent information supplied by the applicant for Be and H_2SO_4 mist emissions, the Department calculated predicted ambient air quality impacts, for informational purposes, for comparison with Department-derived de minimus concentration levels (AAC). The calculated value for Be is .000002 ug/m^3, annual average, which is less than the de minimus level of .0004 ug/m^3, annual average, while the calculated value for H_2SO_4 mist is 0.14 ug/m^3, 24-hr average, which is less than the de minimus level of 2.4 ug/m^3, 24-hr average.

The Department performed dispersion modeling to determine the predicted ambient concentration increases in the Class I Chassahowitzka National Wilderness Area located 94 km away for the

pollutants with Class I increments. The maximum predicted SO_2 increases are 0.015 ug/m^3 for the annual averaging time, 0.20 ug/m^3 for the 24-hr averaging time and 0.93 for the 3-hr averaging time. The maximum predicted PM increases are 0.001 ug/m^3 for the annual averaging time and 0.012 for the 24-hr averaging time. The maximum predicted NO_2 increase is 0.011 ug/m^3 for the annual averaging time. These predicted values are all much less than the corresponding Class I increments.

e. Additional Impacts Analysis

The increased emissions at the City of Lakeland Power Plant are not expected to affect the visibility in the Chassahowitzka National Wilderness area located 94 km away because of the very small maximum predicted impacts. Because the impacts from the proposed pollutants are predicted to be less than PSD significance levels, no harmful effects on soils and vegetation is expected. In addition, the proposed modification will not significantly change employment, population, housing or commercial/industrial development in the area to the extent that a significant air quality impact will result.

VII. CONCLUSION

Based on the information provided by the City of Lakeland Power Plant, the Department has reasonable assurance that the proposed installation of the 120 MW combined cycle gas turbine system, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standards: Gas Firing	Standards: No. 2 Fuel Oil Firing	Gas Turbine and HRSG[a] Tons Per Year: Gas	Gas Turbine and HRSG[a] Tons Per Year: Oil	Basis
NO_x	25 ppm at 15% oxygen on a dry basis	42 ppmv at 15 percent oxygen on a dry basis	425	181	BACT
SO_2	Natural gas as fuel	0.2 percent S by weight	2.6	230	BACT
PM/PM_{10}	0.006 lb/MMBtu	0.025 lb/MMBtu	22	16.5	BACT
VOC	-	-	9	5.0	BACT
CO	-	-	232	59.3	BACT
Mercury (Hg)	-	-	3.0×10^{-6} lbs/MMBtu	.003	Est. by Appl.
Lead (Pb)	-	-	2.8×10^{-6} lbs/MMBtu	0.03	" "
Beryllium (be)	-	-	2.5×10^{-6} lbs/MMBtu	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	1.9×10^{-5} lbs/MMBtu	1.7×10^{-3}	BACT

(a) Emissions rates based on 100 percent capacity factor for natural gas and 25 percent capacity factor for oil firing.

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 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 application dated December 17, 1990.

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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.

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.

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.

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:

SPECIFIC CONDITIONS:

Pollutant	Acceptable Ambient Concentrations ug/m^3 8-hrs	24-hrs	Annual
Beryllium	0.02	0.005	0.0004
Lead	1.5	0.36	0.09
Mercury: allyl compounds	0.1	0.024	- RAC = 2
• all forms of vapor except allyl	0.5	0.12	-
• allyl & organic compounds	1	0.24	-

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; 17,936,100 gals/yr.
- Maximum annual firing using No. 2 fuel oil shall not exceed 25% of the annual capacity factor.
- Maximum sulfur (S) content in the oil shall not exceed 0.20 percent by weight.
- Maximum heat input shall not exceed 1055 MMBtu/hr (gas) or 1040 MMBtu/hr (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.

SPECIFIC CONDITIONS:

Compliance Determination

9. Compliance with the NO_x, SO_2, CO, PM, and VOC standards shall be determined by the following reference methods as described in 40 CFR 60, Appendix A (July 1, 1990) and adopted by reference in F.A.C. Rule 17-2.700.

- Method 1. Sample and Velocity Traverses
- Method 2. Volumetric Flow Rate
- Method 3. Gas Analysis
- Method 5. Determination of Particulate Matter Emissions from Stationary Sources
- Method 9. Determination of the Opacity of the Emissions from Stationary Sources
- Method 10. Determination of the Carbon Monoxide Emission from Stationary Sources
- Method 20. Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines

10. Method 5 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 SO_2 emission limit can also be determined by calculations based on fuel analysis using ASTM D2880-71 for the sulfur content of liquid fuels and ASTM D1072-80, D3031-81, D4084-82 or D3246-81 for sulfur content of gaseous fuels.

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.

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:

$$NO_x = (NO_{x\ obs}) \left(\frac{P_{ref}}{P_{obs}}\right)^{0.5} e^{19\,(H_{obs} - 0.00633)} \left(\frac{288°K}{T_{AMB}}\right)^{1.53}$$

where:

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

SPECIFIC 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 NOx 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.

17. Sulfur, nitrogen content and lower heating value of the fuel being fired in the gas turbine shall also be recorded daily. 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.

SPECIFIC CONDITIONS:

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).

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).

PERMITTEE:
City of Lakeland

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

Issued this _____ day
of _____, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

_____
Carol M. Browner, Secretary

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_2SO_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

Pollutant	Determination
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_2SO_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:

- Combustion Products (Particulates and Heavy Metals). Controlled generally by good combustion of clean fuels.
- Products of Incomplete Combustion (CO, VOC, Toxic Organic Compounds). Control is largely achieved by proper combustion techniques.
- Acid Gases (SOx, NOx, HCl, Fl). 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, PM_{10}, 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/PM_{10} emissions limitation of 0.014 lb/MMBtu for No. 2 fuel oil firing is reasonable as BACT for the Lakeland facility.

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The emissions of carbon monoxide and volatile organic compounds are each below the significant level and therefore do not require a BACT analysis.

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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.

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Selective catalytic reduction is a post-combustion method for control of NOx emissions. The SCR process combines vaporized ammonia with NOx 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 NOx with a new catalyst. As the catalyst ages, the maximum NOx 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 476 tons (65% of 732 tons/yr) of NOx annually for oil firing. When this reduction is taken into consideration with the total annual cost of $2,190,000, the cost per ton of controlling NOx is $4,600. This cost is lower than that determined for natural gas firing and is more consistent with what has been 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 25% 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.

SO_2 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 PM_{10}, 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:

Pollutant	Emission Limit Natural Gas Firing	 No. 2 Fuel Oil Firing
NOx	25 ppmvd @ 15% O_2	42 ppmvd @ 15% O_2*
SO_2	Natural gas as fuel	Sulfur content not to exceed 0.20%
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 25% 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:

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

_____1991
Date

Approved by:

Carol M. Browner, Secretary
Dept. of Environmental Regulation

_____1991
Date

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standards		Gas Turbine and HRSG[a] Tons Per Year		Basis
	Gas Firing	No. 2 Fuel Oil Firing	Gas	Oil	
NO_x	25 ppm at 15% oxygen on a dry basis	42 ppmv at 15 percent oxygen on a dry basis	425	181	BACT
SO_2	Natural gas as fuel	0.2 percent S by weight	2.6	230	BACT
PM/PM_{10}	0.006 lb/MMBtu	0.025 lb/MMBtu	22	16.5	BACT
VOC	-	-	9	5.0	BACT
CO	-	-	232	59.3	BACT
Mercury (Hg)	-	-	3.0×10^{-6} lbs/MMBtu	.003	Est. by Appl.
Lead (Pb)	-	-	2.8×10^{-6} lbs/MMBtu	0.03	" "
Beryllium (be)	-	-	2.5×10^{-6} lbs/MMBtu	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	1.9×10^{-5} lbs/MMBtu	1.7×10^{-3}	BACT

(a) Emissions rates based on 100 percent capacity factor for natural gas and 25 percent capacity factor for oil firing.

SYNOPSIS OF APPLICATION

I. NAME AND ADDRESS OF APPLICANT

City of Lakeland
Department of Electric and Water Utilities
501 East Lemon Street
Lakeland, Florida 33801-5050

II. REVIEWING AND PROCESS SCHEDULE

Date of Receipt of Application: December 17, 1990.

III. FACILITY INFORMATION

III.1 Facility Location

This facility is located at S.R. 92 and East Lake Parker Drive in the city of Lakeland, Polk County, Florida. The UTM coordinates are 409.185 km East and 3102.754 km North.

III.2 Facility Identification Code (SIC)

Major Group No. 49 - Electric, Gas and Sanitary Services.

Industry Group No. 493 - Combination Electric, Gas and Other Utility Services.

Industry Group No. 4931 - Electric and Other Services Combined.

III.3 Facility Category

The City of Lakeland-Charles Larsen Power Plant is classified as a major emitting facility. The proposed project will emit approximately 425 (gas) and 732 (oil) tons per year (TPY) of nitrogen oxides (NO_x), 2.6 (gas) and 920 (oil) TPY of sulfur dioxide (SO_2), 22 (gas) and 66 (oil) TPY of particulate matter (PM), and 20 (oil) TPY of volatile organic compounds (VOC), 0.01 (oil) TPY of beryllium, 0.12 (oil) TPY of lead, 0.01 (oil) TPY of mercury, and 27.6 (oil) TPY of sulfuric acid mist.

IV. PROJECT DESCRIPTION

The City of Lakeland-Charles Larsen Power Plant proposes to construct and operate a 120 MW combined cycle gas turbine system. The unit will be located at the Charles Larsen Power Plant. The combustion turbine (CT) will be capable of generating approximately 80 MW while operating in simple cycle and 120 MW when in combined cycle operation. While in the combined cycle the heat recovery steam generator (HRSG) will power the existing Larsen Unit 5 steam turbine-generator. The primary fuel will be natural gas and No. 2 fuel oil with a sulfur content of 0.2 percent.

TABLE 1
ALLOWABLE EMISSION LIMITS
Combined Cycle Combustion Turbine

Pollutant	Standards: Gas Firing	Standards: No. 2 Fuel Oil Firing	Gas Turbine and HRSG[a] Tons Per Year: Gas	Gas Turbine and HRSG[a] Tons Per Year: Oil	Basis
NO_x	25 ppm at 15% oxygen on a dry basis	42 ppmv at 15 percent oxygen on a dry basis	425	~~191~~ 244	BACT
SO_2	Natural gas as fuel	0.2 percent S by weight	2.6	~~230~~ 307	BACT
PM/PM_{10}	0.006 lb/MMBtu	0.025 lb/MMBtu	22	~~16.5~~ 22	BACT
VOC	-	-	9	~~5.0~~ 6.7	BACT
CO	-	-	232	~~59.3~~ 79	BACT
Mercury (Hg)	-	-	3.0×10^{-6} lbs/MMBtu	.003	Est. by Appl.
Lead (Pb)	-	-	2.8×10^{-6} lbs/MMBtu	0.03	" "
Beryllium (be)	-	-	2.5×10^{-6} lbs/MMBtu	.003	BACT
Sulfuric Acid Mist	Natural gas as fuel	Low sulfur content oil	1.9×10^{-5} lbs/MMBtu	1.7×10^{-3}	BACT

(a) Emissions rates based on 100 percent capacity factor for natural gas and ~~95 percent~~ one third capacity factor for oil firing.

-5

-6

Not consistent with application

SPECIFIC CONDITIONS:

Compliance Determination

9. Compliance with the NO_x, SO_2, CO, (oil) and visible emission ~~PM, and VOC~~ standards shall be determined by the following reference methods as described in 40 CFR 60, Appendix A (July 1, 1990) and adopted by reference in F.A.C. Rule 17-2.700.

- Method 1. Sample and Velocity Traverses
- Method 2. Volumetric Flow Rate
- Method 3. Gas Analysis
- Method 5. Determination of Particulate Matter Emissions from Stationary Sources
- Method 9. Determination of the Opacity of the Emissions from Stationary Sources
- Method 10. Determination of the Carbon Monoxide Emission from Stationary Sources
- Method 20. Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines

10. Method 5 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 SO_2 emission limit can also be determined by calculations based on fuel analysis using ASTM D2880-71 for the sulfur content of liquid fuels~~, and ASTM D1072-80, D3031-81, D4084-82 or D3246-81 for sulfur content of gaseous fuels.~~

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.

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:

$$NO_x = (NO_x\ obs)\left[\frac{P_{ref}}{P_{obs}}\right]^{0.5} e^{19(H_{obs} - 0.00633)}\left[\frac{288°K}{T_{AMB}}\right]^{1.53}$$

(include as exponent)

where:

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

10. An initial compliance test shall be performed using both fuels. Annual NO_x compliance tests shall be performed with the fuel(s) used for more than ~~170~~ 400 hours in the preceding 12 month period.

SPECIFIC 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 NOx 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.

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. ~~daily~~. 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.

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.

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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

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:

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

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.025

Products of Incomplete Combustion

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Carbon monoxide emissions exceed PSD Significant emission rate of 100 tpy. (3) Refer to application for BACT determination.

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.

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BACT Determination by DER

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Beryllium	Emissions limited by natural gas and No. 2 fuel oil firing	

* No. 2 fuel oil usage limited to ~~25%~~ one third 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:

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

_____ 1991
Date

Approved by:

Carol M. Browner, Secretary
Dept. of Environmental Regulation

_____ 1991
Date

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2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. Alfred M. Dodd
Engineering Manager
Lakeland Dept. of Electric
and Water Utilities
501 E. Lemon Street
Lakeland, FL 33801-5050

4. Article Number
P 407 852 627

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- ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED

5. Signature — Addressee
X

6. Signature — Agent
X Mary Joseph

7. Date of Delivery
3/18/91

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr. 1989 *U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

P 407 852 627

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to Mr. Alfred M. Dodd, City of Lakeland	
Street and No. 501 E. Lemon St.	
P.O., State and ZIP Code Lakeland, FL 33801-5050	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 3-15-91 Permit: AC 53-190437 PSD-FL-166	

PS Form 3800, June 1985 *U.S.G.P.O. 1989-234-555

BLACK & VEATCH

8400 Ward Parkway, P.O. Box No. 8405, Kansas City, Missouri 64114, (913) 339-2000

RECEIVED

FEB 7 1991

DER-BAQM

City of Lakeland, Florida
Combustion Turbine Project

B&V Project 16587
B&V File 32.0402
February 6, 1991

FEDERAL EXPRESS

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Additional Information to Support PSD Application

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

Gentlemen:

Mr. Preston Lewis recently requested some general information regarding the existing units at the City of Lakeland's Larsen Power Plant. This information is being sent directly to Mr. Lewis. He requested this information to assist him with the review of the City of Lakeland's recent combustion turbine PSD application.

The provided information includes a larger site arrangement drawing, a summary table of existing unit parameters, and the current DER permits for Units 4 through 7. If there are questions based on this information, please contact Dan Nelson (B&V) at 913-339-2149.

Very truly yours,

BLACK & VEATCH

Steven M. Day

Steven M. Day

dwn
Enclosures

cc: Mr. Preston Lewis, FDER
Mr. G. A. Rodriguez, COL
C. Holladay
B. Andrews
B. Thomer, SWDist
J. Harper, EPA
C. Shaver, NPS

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

January 10, 1991

Mrs. Chris Shaver, Chief
Policy, Planning and Permit Review Branch
Dept. of Interior, National Park Service
Post Office Box 25287
Denver, Colorado 80225

Dear Mrs. Shaver:

RE: City of Lakeland
Polk County
PSD-FL-166

Enclosed for your review and comment is the above referenced PSD permit application. If you have any comments or questions, please contact Preston Lewis, Barry Andrews, or Cleve Holladay at the above address or at (904)488-1344.

Sincerely,

Patricia G. Adams

Patricia G. Adams
Planner
Bureau of Air Regulation

/pa

Enclosure

Recycled Paper

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner,
Secretary

January 10, 1991

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
U.S. EPA - Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Ms. Harper:

RE: Completeness Review

The enclosed applications are being forwarded to you for your review and comments

1. City of Lakeland, Polk County, combustion turbine project, PSD-FL-166.

2. Florida Power Corporation, Volusia County, combustion turbine units at DeBary, PSD-FL-167.

If you have any questions, please call Preston Lewis, Cleve Holladay, or Barry Andrews at (904)488-1344. If it is convenient to FAX a response to us, the FAX number to use is (904)922-6979.

Sincerely,

Patricia G. Adams

Patricia G. Adams
Planner
Bureau of Air Regulation

/pa

Enclosures

Recycled Paper

LAKELAND ELECTRIC & WATER

PRODUCTION ENGINEERING

Excellence Is Our Goal, Service Is Our Job

December 13, 1990

Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. C. H. Fancy, Chief, Bureau of Air Regulation

Gentlemen:

Enclosed is an original and two copies of the City of Lakeland Combustion Turbine Project application for construction permit.

Each bound application prepared by our consultant - Black and Veatch, contains a copy of FDER Form 17-1.202 (1), the Ambient Air Quality Impact Assessment and the BACT Analysis. In addition, computer printouts and a diskette of all the air modeling computer runs supporting the application are enclosed.

Attached you will find a letter of authorization for the undersigned and the required $5,000 application fee.

If you have any questions please call our Manager of Environmental Affairs, Mr. G. A. "Bill" Rodriguez at (813)/499-6589) or Mr. Steve Day at Black & Veatch (913/339-2820).

Very truly yours,

Alfred M. Dodd

Alfred M. Dodd, P.E.
E & W Engineering Manager
City of Lakeland
Department of Electric and Water Utilities
501 East Lemon Street
Lakeland, Florida 33801-5050
(813) 499-6461

Enclosure

cc: G. A. Rodriguez
Steve Day
File LPE-01-89
P. Lewis
B. Andrews
C. Holladay
J. Harper, EPA
C. Shaver, UPS
B. Thomas, SW Dist.

RECEIVED
DER - MAIL ROOM
1990 DEC 17 AM 8 56

BEST AVAILABLE COPY

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL
PACKAGE
TRACKING NUMBER

838431 2823

838431 2823

RECIPIENT'S COPY

Date 12/14/90

1 From (Your Name) Please Print | Your Phone Number (Very Important)

Company: CITY OF LAKELAND ELEC & WATER | Department/Floor No.

Street Address: 01 EAST LEMON ST

City: LAKELAND | State: FL | ZIP Required: 33801

2 To (Recipient's Name) Please Print | Recipient's Phone Number (Very Important)

Company | Department/Floor No.

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip + Codes.)

City | State | ZIP Required

YOUR INTERNAL BILLING REFERENCE INFORMATION (First 24 characters will appear on invoice.)

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City | State | ZIP Required

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card
5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight Service (Delivery by next business morning†)		Standard Overnight Service (Delivery by next business afternoon†)	
11	[X] YOUR PACKAGING	51	[ ]
16	[ ] FEDEX LETTER *	56	[ ] FEDEX LETTER *
12	[ ] FEDEX PAK *	52	[ ] FEDEX PAK *
13	[ ] FEDEX BOX	53	[ ] FEDEX BOX
14	[ ] FEDEX TUBE	54	[ ] FEDEX TUBE

Economy Two-Day Service (formerly Standard Air) (Delivery by second business day†)		Heavyweight Service (for Extra Large or any package over 150 lbs.)	
30	[ ] ECONOMY TWO-DAY SVC.	70	[ ] HEAVYWEIGHT **
		80	[ ] DEFERRED HEAVYWEIGHT **

† Delivery commitment may be later in some areas.
* Declared Value Limit $100.
** Call for delivery schedule.

DELIVERY AND SPECIAL HANDLING (Check services required)

1	[ ]	HOLD FOR PICK-UP (Fill in Box H)
2	[ ]	DELIVER WEEKDAY
3	[X]	DELIVER SATURDAY (Extra charge) (Not available to all locations)
4	[ ]	DANGEROUS GOODS (Extra charge)
5	[ ]	
6	[ ]	DRY ICE ____ Lbs
7	[ ]	OTHER SPECIAL SERVICE ____
8	[ ]	
9	[ ]	SATURDAY PICK-UP (Extra charge)
10	[ ]	
11	[ ]	DESCRIPTION
12	[ ]	HOLIDAY DELIVERY (If offered) (Extra charge)

	PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE
	1	11	
Total	Total	Total	Total

DIM SHIPMENT (Chargeable Weight)
[ ] ____ lbs

Received At
1 [ ] Regular Stop 3 [ ] Drop Box
2 [ ] On-Call Stop 4 [ ] B.S.C. 5 [ ] Station

FedEx Emp. No. 7446

Emp. No. | Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [X] Chg. To Hold
Street Address
City | State | Zip
Received By
X
Date/Time Received | FedEx Employee Number

5 Release Signature:
Date/Time 12/14/90 1619

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 8/90
PART #1,19501 FXEM 8/90
FORMAT #041
041

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engineer registered in the State of Florida except when the application is for renewal of an air pollution operation permit at a non-Title V source as defined in Rule 62-210.200, F.A.C., or where professional engineering is not required by Chapter 471, F.S. Where required by Chapter 471 or 492, F.S., applicable portions of permit applications and supporting documents which are submitted to the Department for public record shall be signed and sealed by the professional(s) who prepared or approved them.

(4) Processing fees are as follows:

(a) Air Pollution Permits.

1. Construction Permits Fee for an Emissions Unit Requiring Prevention of Significant Deterioration or Nonattainment Area Preconstruction Review.

The processing fee for a construction permit for an emissions unit requiring Prevention of Significant Deterioration (PSD) or Nonattainment Area (NAA) preconstruction review pursuant to Rule 62-212.400 or 62-212.500, F.A.C., respectively, shall be $7500.

2. Construction Permit Fee for an Emissions Unit Not Requiring Prevention of Significant Deterioration or Nonattainment Area Preconstruction Review. No processing fee shall be required for a construction permit for an emissions unit not requiring Prevention of Significant Deterioration (PSD) or Nonattainment Area (NAA) preconstruction review, if the facility containing the emissions unit holds an air operation permit issued pursuant to Chapter 62-213, F.A.C. For any such emissions unit at a facility not holding a Chapter 62-213, F.A.C., air operation permit, the processing fee shall be as follows:

a. Construction permit for an emissions unit having potential emissions of 100 or more tons per year of any single pollutant $ 5000

b. Construction permit for an emissions unit having potential emissions of 50 or more tons per year, but less than 100 tons per year, of any single pollutant $ 4500

c. Construction permit for an emissions unit having potential emissions of 25 or more tons per year, but less than 50 tons per year, of any single pollutant $ 2000

d. Construction permit for an emissions unit having potential emissions of 5 or more tons per year, but less than 25 tons per year, of any single pollutant $ 1000

e. Construction permit for an emissions unit having potential emissions of less than 5 tons per year of each pollutant $ 250

3. Operation Permit Fee for an Emissions Unit at a Non-Title V Source.

a. Operation permit for an emissions unit required to measure actual emissions by stack sampling $ 1500

b. Operation permit for an emissions unit required to measure actual emissions by any method other than stack sampling (such as visible emissions observation or continuous emissions monitoring) $ 1000

c. Operation permit for an emissions unit not required to measure actual emissions $ 750

4. Similar Emissions Unit Fee. - Where new or existing multiple emissions units located at the same facility are substantially similar in nature, the applicant may submit a single application and permit fee for construction or operation of the emissions units at the facility. To be considered substantially similar each of the emissions units must be substantially similar in regard to each of the following: nominal description or type of emissions unit; type of fuel burned; type of material processed, stored, or handled; type of air pollution control equipment; regulated pollutants emitted; applicable emissions standards; and applicable regulatory control criteria. For a construction permit, the single application fee shall be the fee that would apply for a single emissions unit with emissions that equal the total of the potential emissions of all of the substantially similar emissions units at the facility. The fee for an operation permit for a group of similar emissions units at the same facility, submitted under the same application and with the same emissions testing or monitoring requirements, shall be the fee that would apply to any emissions unit in the group if each emissions unit were being permitted singly.

5. Multiple Emissions Unit Fee. If the Department issues a single construction or operation permit covering multiple emissions units or groups of similar emissions units at a facility, the permit processing fee shall be the sum of the fees applicable to each emissions unit and group of similar emissions units covered by the permit.

(b) Domestic Wastewater Facility Permits.

1. Preliminary Design Report reviews for Types I, II, and III domestic wastewater facilities as defined in Rule 62-600.200, F.A.C. For new domestic wastewater facilities, the fee for review of a preliminary design report shall be in addition to the application processing fee.

	Type I	Type II	Type III
a. Treatment plant with or without reuse/disposal system	$5000	$3750	$1200
b. Reuse/land application system and associated transmission/distribution facilities, when applied for separately from the treatment facility	$5000	$3750	$1200

Best Available Copy

Is your RETURN ADDRESS completed on the reverse side?

SEND

- Comp...
- Compl...
- Print your ... address on the re... that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

...xtra fee):

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

Consult postmaster for fee.

Service.

3. Article Addressed to:
Farzie Shelton, Env. Coord
Dept. of Electric/Water Utilities
501 E. Lemon St.
Lakeland, Fl 33801-5050

4a. Article Number
Z 127 632 521

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt f Merchandise

7. Date of Delivery
008 BC. 09/25/

5. Signature (Addressee)

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

6. Signature (Agent)

PS

Z 127 632 521

Receipt for Certified Mail

UNITED STATES POSTAL SERVICE

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

PSD-F1-166A

Sent to Farzie Shelton	
Street and No. City of Lakeland	
P.O., State and ZIP Code Dept of E & W Util	
Postage Lakeland, Fl	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 9-21-95 AC 53190437 PSD-F1-166 Unit 8	

PS Form 3800, March 1993

Is your RETURN ADDRESS completed on the reverse side?

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Jarzie Shelton, Ch. E.
City of Lakeland
501 E. Lemon St.
Lakeland, Fl
33801-5050

4a. Article Number
Z 127-632-502

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

7. Date of Delivery
0108 [illegible] 09/4/95

5. Signature (Addressee)

6. Signature (Agent)

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

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Z 127 632 502

PSD-FL-166A

UNITED STATES POSTAL SERVICE

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to Jarzie Shelton	
Street and No. City of Lakeland	
P.O., State and ZIP Code Lakeland, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, March 1993

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

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

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

Consult postmaster for fee.

3. Article Addressed to:

Mr. Alfred M. Dodd, P.E.
E & W Engineering Manager
City of Lakeland
Dept. of Electric & Water Util.
501 E. Lemon Street
Lakeland, FL 33801-5050

4a. Article Number

P 832 539 827

4b. Service Type

☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

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

6. Signature (Agent)

PS Form **3811**, October 1990 *U.S. GPO: 1990—273-861 **DOMESTIC RETURN RECEIPT**

APIS
UPDATED
FOR AC53-190437
BY MIRZA.
2-13-92

P 832 539 827

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to: Mr. Alfred M. Dodd, City of Lakeland	
Street & No.: 501 E. Lemon St.	
P.O., State & ZIP Code: Lakeland, FL 33801-5050	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date: Mailed: 7-26-91 Permit: AC 53-190437	

PS Form **3800**, June 1990

RETURN ADDRESS completed on the reverse

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

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

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

Consult postmaster for fee.

3. Article Addressed to:

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

4a. Article Number
Z 127 633 230

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

7. Date of Delivery
0108 12-26-95

5. S...

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

Thank you for using Return Receipt Service.

PSD-F1-166A

Z 127 633 230

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Farzie Shelton	
Street and No. City & Lakeland	
P.O., State and ZIP Code Lakeland, FL	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 12-22-95	

PSD-F1-166
A053-190437

PS Form 3800, March 1993

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)* 2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:
Mr. Alfred M. Dodd
Engineering Manager
Lakeland Dept. of Electric
and Water Utilities
501 E. Lemon Street
Lakeland, FL 33801-5050

4. Article Number
P 407 852 627

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X Mary Joseph

7. Date of Delivery
3-18-91

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form **3811**, Apr. 1989 ★U.S.G.P.O. 1989-238-815 **DOMESTIC RETURN RECEIPT**

P 407 852 627

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to Mr. Alfred M. Dodd, City of Lakeland	
Street and No. 501. E. Lemon St.	
P.O., State and ZIP Code Lakeland, FL 33801-5050	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 3-15-91 Permit: AC 53-190437 PSD-FL-166	

PS Form 3800, June 1985 ☆U.S.G.P.O. 1989-234-555

PSD-FL-166 PERMITTING HISTORY

Lakeland Electric & Water Utilities **Facility ID No.: 1050003**
Charles Larsen Memorial Power Plant Unit 8

PSD Permit History (for tracking purposes):

	Issue	PERMITTING ACTION DESCRIPTION
Permit No.	Date	
PSD-FL-166 AC53-190437	7/26/91	To construct/install one 120 MW combined cycle unit PG7111EA. Primary fuel: NG. Back- up 0.20 % fuel oil.
PSD-FL-166A 1050003-001AC	12/22/95	Amendment to incorporate the custom fuel monitoring schedule, to revise Table 1 limits for SO2 and SAM, and to remove correction of NOx ISO conditions.
PSD-FL-166B 1050003-005-AC	4/17/98	Permit re-issued to delete requirements for Hg, Pb,Be; replacement of the fuel oil usage limit with a curve of fuel oil usage vs compressor inlet temperature; clarification of the type of changes at the facility that would require the company to notify the Department and apply for a permit modification, and removal of the tpy limits for CO and H2SO4. Amendment also adds the short term limit for CO (25ppm) that was established in the BACT but inadvertently left out of the original PSD permit.
PSD-FL-166C 1050003-007-AC	5/30/00	Permit modification to install direct water spray fogging system to combined cycle combustion turbine (Unit 8).

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in one of the file drawers labeled Supplementary Documents Drawer. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: Lakeland, City of

Permit(s) Numbered:

AC	53	-	190437
PSD	FL	-	166

Period during which document was received:		Detailed Description
APPLICATION 4 NOV 1988	1.	18"x24" BLUEPRINT: SITE ARRANGEMENT (DRAWING NUMBER: 16587-CSTU-S1001)

Lakeland Concerns Per Steve Day 3/27/91

- What will be tested and when
- 25% annual capacity factor increase to $\frac{8760}{3}$
- CO exceeds significance and yet we say it does not and do not do a BACT
- Inconsistencies in Particulates would prefer A, B, C, D Orlando Utilities way of handling

Met 4/22/99

Barry 3/27/91 11:10 Am

Steve Day would like to me with you and I monday 2:00 pm to discuss the Lakeland PSD/BACT attached one some of the Client's concerns.

Preston