



Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

November 3, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Allan Wade Smith, General Manager
Orange Cogeneration L.P., Inc.
1125 US Hwy. 98 South, Suite 100
Lakeland, Florida 33801

Re: DEP File Nos. 1050231-003-AC and 1050231-004-AV, PSD-FL-206C
Bartow Facility Combined Cycle Combustion Turbine
Extension of Nitrogen Oxides Emissions Compliance Date

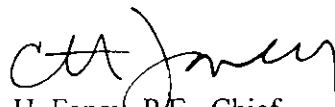
Dear Mr. Smith:

Enclosed is one copy of the Draft Air Construction and Title V Permit Modifications for the combined cycle combustion turbine located in Bartow, Polk County. The Department's Intent to Issue Air Construction and Title V Permit Modifications and the "Public Notice of Intent to Issue Air Construction and Title V Permit Modifications" are also included.

The "Public Notice of Intent To Issue Air Construction and Title V Permit Modifications" must be published in the legal section of a newspaper of general circulation in Polk County. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (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 modifications.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please contact Mr. Linero at 850/921-9523.

Sincerely,


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

CHF/aal

Enclosures

In the Matter of an
Application for Permit Modifications by:

Orange Cogeneration L.P., Inc.
1125 US Highway 98 South, Suite 100
Lakeland, Florida 33801

DEP File Nos. 1050231-003-AC
1050231-004-AV
PSD-FL-206C
Orange Cogeneration Facility
Polk County

INTENT TO ISSUE AIR CONSTRUCTION AND TITLE V PERMIT MODIFICATIONS

The Department of Environmental Protection (Department) gives notice of its intent to issue air construction and Title V permit modifications (copy of draft air construction and Title V permit modifications attached) for the proposed action, as detailed in the application specified above, for the reasons stated below. This permitting action will also ultimately modify Title V permit number 1050231-001-AV.

The applicant, Orange Cogeneration L.P., Inc. applied on September 29, 1998, to the Department for air construction and Title V permit modifications to extend the final nitrogen oxides emissions compliance date for its combined cycle combustion turbine located in Bartow, Polk County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above action is not exempt from permitting procedures. The Department has determined that air construction and Title V permit modifications are required to extend the final date until January 1, 2000 to comply with the lower nitrogen oxides emission standard (15 ppm).

The Department intends to issue these air construction and Title V permit modifications based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed "Public Notice of Intent to Issue Air Construction and Title V Permit Modifications." The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. Rule 62-110.106(7)(b), F.A.C., requires that the applicant cause the notice to be published as soon as possible after notification by the Department of its intended action. For the purpose of these rules, "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. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/922-6979). You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed permit issuance action for a period of thirty days from the date of publication of "Public Notice of Intent to Issue Air Permit." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of

the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.



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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Intent to Issue Air Construction and Title V Permit Modifications (including the Public Notice, and Draft permit modifications) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 11-5-98 to the person(s) listed:

- Allan Wade Smith, Orange Cogeneration L.P., Inc. *
- Doug Neeley, EPA
- Gracy Danois, EPA
- John Bunyak, NPS
- Bill Thomas, SWD

Clerk Stamp

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

Keri Jaber
(Clerk)

11-5-98
(Date)

**PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION AND TITLE V PERMIT
MODIFICATIONS**

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File Nos. 1050231-003-AC and 1050231-004-AV, PSD-FL-206C
Orange Cogeneration Facility
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue air construction and Title V permit modifications to Orange Cogeneration for its facility located in Bartow, Polk County. This permitting action will also ultimately revise Title V permit number 1050231-001-AV. A Best Available Control Technology (BACT) determination was not required for this modification pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Orange Cogeneration GP, Inc., 1125 US Highway 98 South, Suite 100, Lakeland, Florida 33801.

This existing facility consists of two 41 megawatt General Electric LM6000PB gas-fired combustion turbines with heat recovery steam generators and an auxiliary boiler. The applicable nitrogen oxides (NOx) emission limit is 25 parts per million (ppm). By January 1999 the combustion turbines must comply with a limit of 15 ppm. The applicant has requested an extension until January 1, 2000 to meet the lower limit using Dry Low NOx technology (DLN). This will allow General Electric additional time to incorporate design changes based on recent testing conducted in Ohio and Florida. A similar developmental program by General Electric resulted in emissions well below 15 ppm by DLN from its larger 7EA gas combustion turbines at Cane Island, Mulberry and Gainesville.

The Department will issue the final permit modifications with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue Air Construction and Title V Permit Modifications." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit modifications and require, if applicable, another Public Notice.

The Department will issue these permit modifications with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties

listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project 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:

Dept. of Environmental Protection Bureau of Air Regulation 111 S. Magnolia Drive, Suite 4 Tallahassee, Florida 32301 Telephone: 850/488-0114 Fax: 850/922-6979	Dept. of Environmental Protection Southwest District Office 3804 Coconut Palm Drive Tampa, Florida 33619-8218 Telephone: 813/744-6100 Fax: 813/744-6084	Polk County Public Works Dept. Natural Resources & Drainage Div. 4189 Ben Durrance Road Bartow, Florida 33830 Telephone: 941/534-7377 Fax: 941/534-7374
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The complete project file includes the Draft Permit modifications, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

December xx, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Allan Wade Smith
General Manager
Orange Cogeneration L.P., Inc.
1125 US Highway 98 South, Suite 100
Lakeland, Florida 33801
Re: Permit Modification No. 1050231-003-AC (PSD-FL-206C)
Orange Cogeneration Facility, Extension of NOx Compliance Date

Dear Mr. Smith:

The Department has reviewed the modification requested in your letter dated September 25, 1998. The referenced permit is hereby modified as follows:

SPECIFIC CONDITION 10

Prior to January 1, ~~1999~~ 2000, the maximum NOx concentration, 1-hour average, from each CT/HRSG unit, shall not exceed 25 parts per million by volume dry corrected to 15 percent oxygen (25 ppmvd @ 15% O₂), as determined by the procedures in Specific Conditions Nos. 16, 17 and 18.

SPECIFIC CONDITION 11

After December 31, ~~1998~~ 1999, the maximum NOx concentration, 1-hour average, from each CT/HRSG unit, shall not exceed 15 ppmvd @ 15% O₂, as determined by the procedures in Specific Conditions Nos. 16, 17 and 18. The permittee shall obtain prior approval from the Department for any air pollution control equipment not addressed in this permit that is needed to meet the NOx emission standard.

SPECIFIC CONDITION 15

Manufacturer's curves for the emission rate correction to other temperatures at different loads shall be provided to DEP for review by January 1, ~~1999~~ 2000. Until new curves are approved by the Department or the combustion turbines meet the NOx emission standard of 15 ppmvd @ 15% (whichever occurs first), the stack, operator, and emission data for the proposed combustion turbines in Table 2-4 (October 28, 1993) will be used. The data will be used to determine compliance with the maximum allowable emission rates of the regulated air pollutants at different air inlet temperatures for these turbines.

TABLE 1

The compliance date is hereby changed to 1/1/00 as is the date in Note (d).

A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit modification is issued pursuant to Chapter 403, Florida Statutes. Any party to this order (permit modification) has the right to seek judicial review of it under Section 120.68, F.S., by the filing of a Notice of Appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, 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 (thirty) days after this Notice is filed with the Clerk of the Department.

Sincerely,

Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/aal

December xx, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Allan Wade Smith
General Manager
Orange Cogeneration L.P., Inc.
1125 US Highway 98 South, Suite 100
Lakeland, Florida 33801
Re: Permit Modification No. 1050231-001-AV and 1050231-004-AV
Orange Cogeneration Facility, Extension of NO_x Compliance Date

Dear Mr. Smith:

The Department has reviewed the modification requested in your letter dated September 25, 1998. The referenced permit is hereby modified as follows:

SPECIFIC CONDITION A.6

The compliance date is hereby changed to January 1, 2000 in the table for NO_x for this specific condition.

APPENDIX S, TABLE 1-1

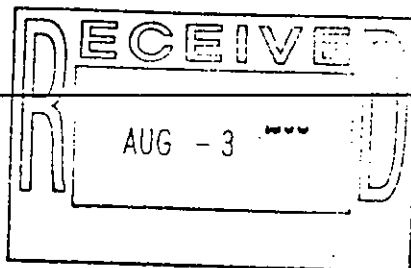
The compliance date is hereby changed to January 1, 2000 in the table for NO_x.

A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit revision is issued pursuant to Chapter 403, Florida Statutes. Any party to this order (permit revision) has the right to seek judicial review of it under Section 120.68, F.S., by the filing of a Notice of Appeal under Rule 9A10 of the Florida Rules of Appellate Procedure with the Clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, 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 (thirty) days after this Notice is filed with the Clerk of the Department.

Sincerely,

Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/aal



**GE Industrial AeroDerivative
Gas Turbines**

GE Power Systems
One Neumann Way, S156
Cincinnati, OH 45215-1988
Phone: (513) 552-2295
Fax: (513) 552-5722

July 27, 1998

Mr. Wade Smith
General Manager
Orange Cogeneration GP, Inc.
1125 US Highway 98 South, Suite 100
Lakeland, Florida 33801

Dear Mr. Smith,

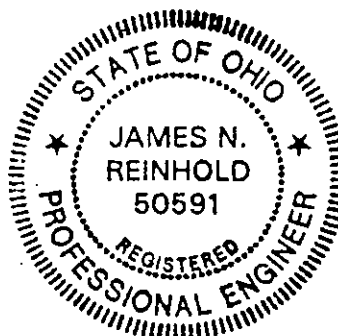
GE is committed to reducing the NOx emissions of our LM6000 Dry Low Emissions (DLE) gas turbines. We have an aggressive, active program to reduce NOx emissions to levels less than 15ppm when running on gas fuel.

The main focus of this program has been to achieve 15ppm levels at the Orange Cogen site by 12/31/98. During the past year we have conducted several tests on the gas turbines at your site and on gas turbines at our factory in Evendale, Ohio. While these tests yielded emissions improvements, these improvements have been offset by increasing emissions caused by gas turbine deterioration. As a result, this program needs approximately one more year to define additional changes and testing to achieve the 15ppm goal.

We believe the technology to reduce NOx emissions on this product to a 15ppm level is available. Unfortunately, maintaining a 15ppm level has proven challenging since emissions levels increase as the gas turbine deteriorates and firing temperatures increase with operating time. GE IAD recommends Orange Cogen request a one year extension of the current 25ppm NOx permit. This will give us the time to develop and test changes to reduce NOx emissions to consistent, sustainable levels of less than 15ppm.

Sincerely,

James N. Reinhold, P.E.
Technical Programs Manager
GE Industrial AeroDerivative Gas Turbines



Florida Department of
Environmental Protection

Memorandum

TO: Clair Fancy

THRU: Al Linero *AL*

FROM: Susan DeVore-Fillmore *JK*
MSF

DATE: November 3, 1998

SUBJECT: Orange Cogeneration GP Inc.
PSD-FL-206C
Extension of Compliance Date for 15 ppm NOx Limit

Attached is the intent to issue for two letters modifying the construction and Title V permits for the Orange Cogen combined cycle combustion turbine to allow an additional year for their General Electric LM6000PB with dry low NOx technology to maintain a consistent level of NOx at 15 ppmvd @ 15% O₂.

This existing facility consists of two 41 megawatt General Electric LM6000PB gas-fired combustion turbines with heat recovery steam generators and an auxiliary boiler. The applicable nitrogen oxides (NOx) emission limit is 25 parts per million (ppm). By January 1999 the combustion turbines must comply with a limit of 15 ppm. The applicant has requested an extension until January 1, 2000 to meet the lower limit using Dry Low NOx technology (DLN). This will allow General Electric additional time to incorporate design changes based on recent testing conducted in Ohio and Florida. A similar developmental program by General Electric resulted in emissions well below 15 ppm by DLN from its larger 7EA gas combustion turbines at Cane Island, Mulberry and Gainesville.

I recommend your approval and signature.

Is your RETURN ADDRESS completed on the reverse side?

SENDER

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
 Mr. Allan Smith
 Orange Cogen
 1125 US Hwy. 98 South
 Suite 100
 Lakeland, FL 33801

4a. Article Number
 2333 612 521

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

7. Date of Delivery
 10-2-98

5. Received By: (Print Name)
 [Signature]

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

6. Signature: (Addressee or Agent)
 X [Signature]

PS Form 3811, December 1994

102595-97-B-0179

Domestic Return Receipt

Thank you for using Return Receipt Service.

125 521 612 333 Z

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

Sent to	
Allan Smith	
Street & Number	
Orange Cogen	
Post Office, State, & 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, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	
1050231-001-AU 9-30-98	
11 002-AC	

PS Form 3800, April 1995



Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

September 30, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Allan Wade Smith
General Manager
Orange Cogeneration
1125 U.S. Highway 98 South - Suite 100
Lakeland, Florida 33801

Re: Orange Cogeneration Facility
Permit No.: 1050231-001-AV

Dear Mr. Smith:

We received your letter of September 25 requesting a modification for the above mentioned permit. Since the facility currently holds a Title V permit issued by the Department, and this is a non-PSD permit, no permit fee is required pursuant to FDEP Rule 62-4.050(4)(a)2. Therefore, enclosed herewith is the check, (No. 1255 for \$250) you submitted with your request.

If you have any questions regarding this matter, please call me at (850)921-9523.

Sincerely,

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

AAL/kt



original TV is 1050231-001-4v

new TV Proj # is 1050231-004-4v

PSD - FL - 206 C

RECEIVED

SEP 29 1998

BUREAU OF
AIR REGULATION

September 25, 1998

Mr. Al Linero, P.E.
Administrator, New Source Review Section
Division of Air Resources Management
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32339-2400

Re: Orange Cogeneration Facility
Permit No.: 1050231-001-AV

1050231-003-AC

Dear Mr. Linero:

This correspondence is submitted on behalf of Orange Cogeneration Limited Partnership ("OCLP") to request that specific condition A.6. and Appendix S, Table 1-1 be modified to require compliance with a maximum NO_x emissions level, 1-hour average, of 15 ppmvd @ 15% O₂ by January 1, 2000 instead of January 1, 1999. OCLP also request that common condition C.2. be modified from "...in no case exceed two hours in any 24 hour period..." to "...in no case exceed four hours in any 24 hour period..."

The Orange Cogeneration Facility utilizes a dry low-NO_x technology developed by General Electric Company ("GE") to control NO_x and CO emissions. During the development of the Orange Cogeneration Facility, GE advised OCLP to seek an air permit NO_x limit of 15 ppm effective December 31, 1997. GE believed that their DLE combustion system would be able to sustain NO_x levels below 15 ppm by that time. However, technical difficulties delayed their program and a request to extend the compliance date to January 1, 1999 was granted to OCLP by the FDEP.

GE has continued to work toward their goal of reaching a sustainable NO_x emission of 15 ppm. During the past year they have conducted several test at the Orange Cogeneration Facility and at their facility in Evendale, Ohio. The results of these tests have been encouraging, but they need an additional year to reach their goal of sustained operation at 15 ppm NO_x

GE has recommended that OCLP request a one-year extension of the current 25 ppm NO_x emissions level so that they can continue to improve their DLE combustion system. They believe that they will be able to reach that goal by the end of 1999.

I have enclosed a letter from GE Industrial AeroDerivative Gas Turbines to OCLP and a copy of the presentation given to the FDEP during the meeting on July 9, 1998. These enclosures address the DLE program status and explain GE's plans and commitment for achieving a 15 ppm NO_x emissions level by the end of 1999. The letter was prepared by the GE team responsible for the development of the DLE combustion system and it was signed by two Professional Engineers, one of which is registered in Florida.

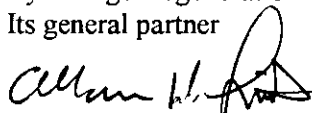
The request to modify the common condition is at the request of the FDEP southwest district office. As you are aware, the Orange Cogeneration Facility starts-up and shuts-down daily. The

highly efficient, DLE equipped combustion turbines at the facility operate with unstable flames at low loads. This characteristic is inherent in the DLE technology. During the transition through the low load conditions during start-up and shutdown, the facility could emit CO levels in excess of the permitted amount. Changing the allowable time for start-ups and shutdowns gives the facility the flexibility it needs to operate. Following discussion with the FDEP in Tampa and Mr. Martin Costello of your office, OCLP decided to make this request.

I have also enclosed a check for \$250.00 for the permit modification fee.

If you have any questions please call me at 941-682-6338.

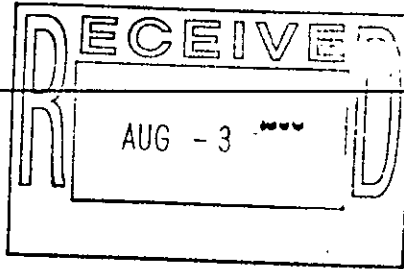
Sincerely,
Orange Cogeneration Limited Partnership
By Orange Cogeneration GP, Inc.
Its general partner


Allan Wade Smith
General Manager

Enclosures

Cc: Mr. Dennis Oehring - CSWE Operations

941-533-9073 -
941-534-1191 -



**GE Industrial AeroDerivative
Gas Turbines**

GE Power Systems
One Neumann Way, S156
Cincinnati, OH 45215-1988
Phone: (513) 552-2295
Fax: (513) 552-5722

July 27, 1998

Mr. Wade Smith
General Manager
Orange Cogeneration GP, Inc.
1125 US Highway 98 South, Suite 100
Lakeland, Florida 33801

Dear Mr. Smith,

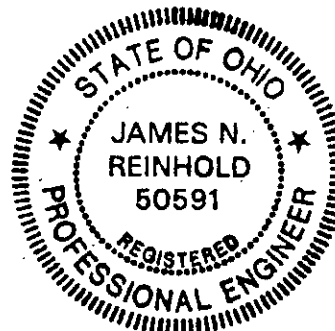
GE is committed to reducing the NOx emissions of our LM6000 Dry Low Emissions (DLE) gas turbines. We have an aggressive, active program to reduce NOx emissions to levels less than 15ppm when running on gas fuel.

The main focus of this program has been to achieve 15ppm levels at the Orange Cogen site by 12/31/98. During the past year we have conducted several tests on the gas turbines at your site and on gas turbines at our factory in Evendale, Ohio. While these tests yielded emissions improvements, these improvements have been offset by increasing emissions caused by gas turbine deterioration. As a result, this program needs approximately one more year to define additional changes and testing to achieve the 15ppm goal.

We believe the technology to reduce NOx emissions on this product to a 15ppm level is available. Unfortunately, maintaining a 15ppm level has proven challenging since emissions levels increase as the gas turbine deteriorates and firing temperatures increase with operating time. GE IAD recommends Orange Cogen request a one year extension of the current 25ppm NOx permit. This will give us the time to develop and test changes to reduce NOx emissions to consistent, sustainable levels of less than 15ppm.

Sincerely,

James N. Reinhold, P.E.
Technical Programs Manager
GE Industrial AeroDerivative Gas Turbines





LM6000 DLE Program Status

Presented To The
Florida Department Of
Environmental Protection
July 9, 1998

By
Jim Reinhold
Technical Programs Manager





Agenda

- Engine Cross Section
- Fleet status
- Current product capabilities
- Factory emissions trend
- Program history
- Recent progress
- Future plans
- Summary

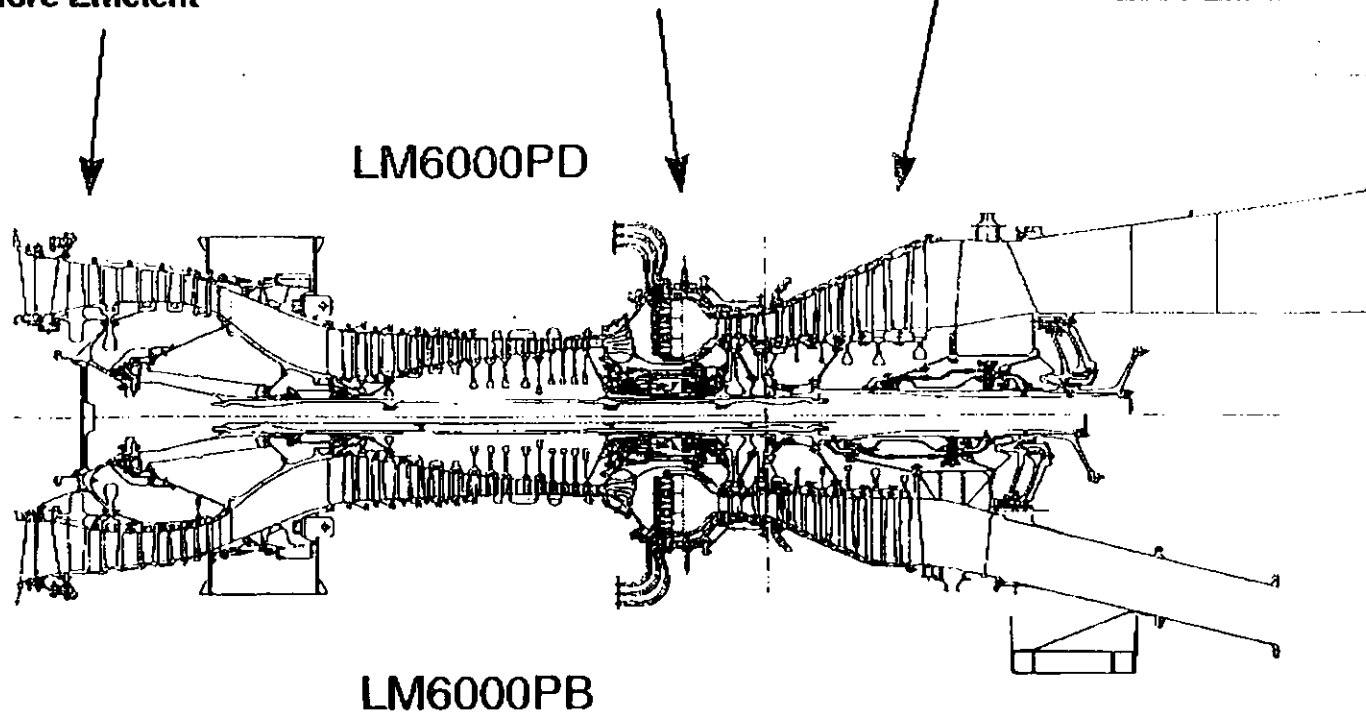


LM6000 Cross Section Comparison

New Booster Vanes (0-3)
- More Efficient

Dual Fuel DLE
Combustor

Improved LPT Components
- More Efficient
- Mechanical Drive Capable
- Less Exhaust Noise





LM6000 DLE Fleet Status

- 33 PB/PD model gas turbines shipped to date
- 16 operating
 - 11 PB models
 - 5 PD models
 - First dual fuel PD model - start up 7/98
- 120,000 hours of experience



Current GE LM6000 DLE NOx Capability

(75-100% Power - except where noted)

Fuel System	Engine Delivery	Gas*	Liquid*
Gas Only	3Q94	25 ppm	N/A
Dual Fuel	1Q98	25 ppm	?

* Assumes fuel has no fuel bound nitrogen



Current GE LM6000 DLE CO, THC, NMHC And Particulate Capability (75-100% Power)

CO	25 ppm
THC	15
NMHC	6
Particulates*	3 lbs/hr

* Particulate capability has been established at the field proven limit of detectability, the DLE system itself is not expected to produce measureable quantities of particulates



Program History

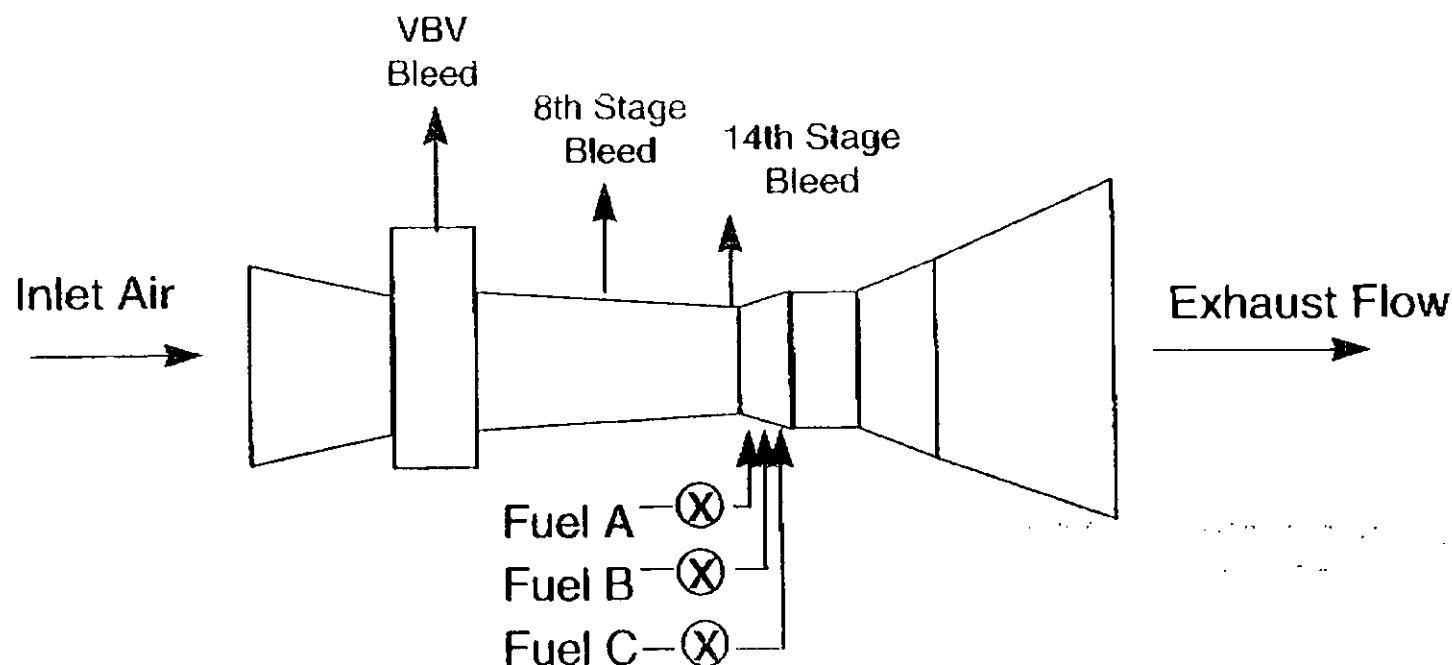
- Basic DLE (premixed) technology developed during 1970s and 1980s
- GE M&I program launched in 1990
- First Commercial Availability - Gas Only Systems

Product	Date	NOx	CO
LM6000	1994	<25 ppm	<25 ppm
LM2500	1995	<25 ppm	<25 ppm
LM1600	1996	<25 ppm	<25 ppm



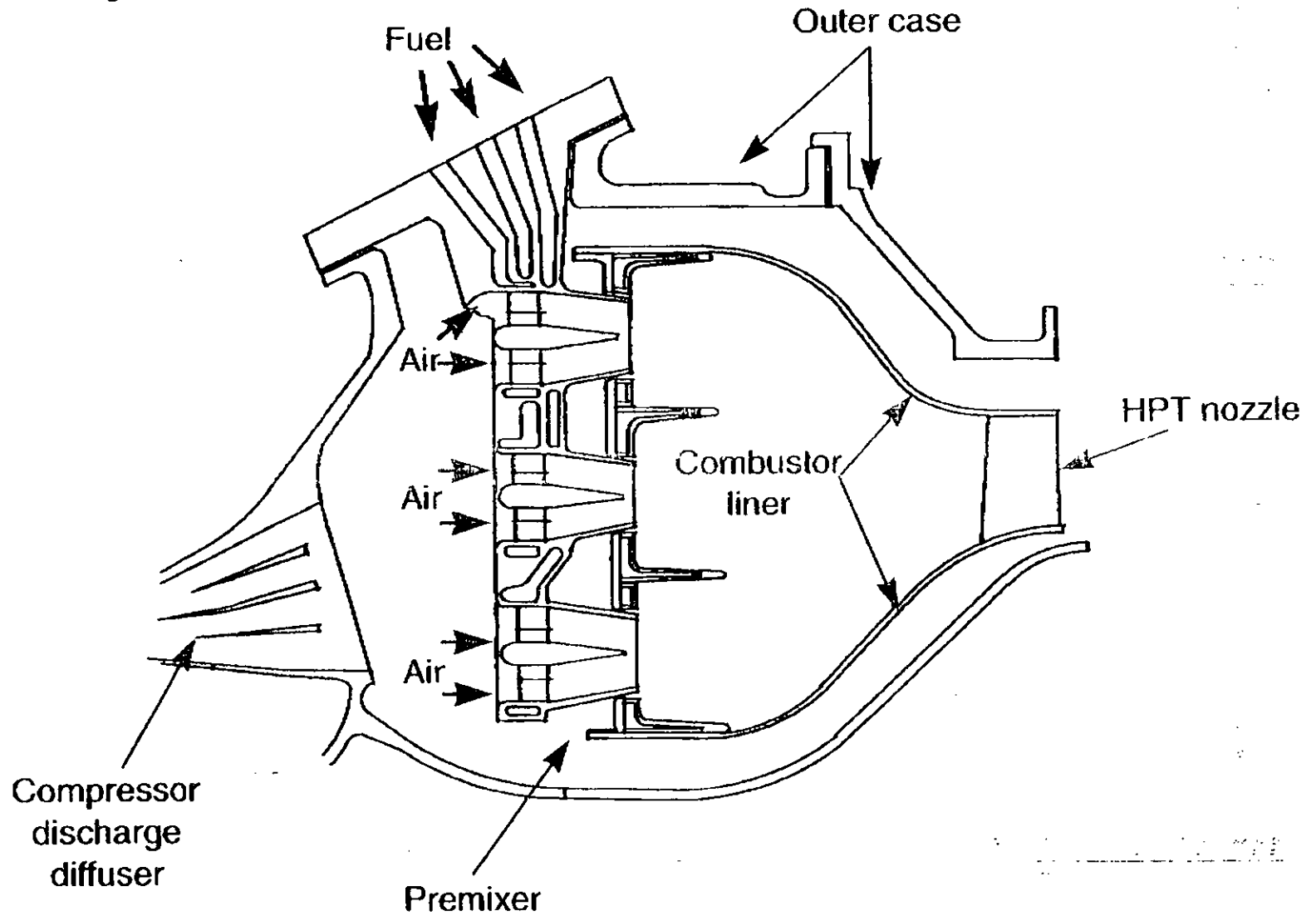
GE M&I Approach to DLE

- Combination of fuel and air staging: Required for premix operation from start to full power
- Triple annular combustor: Compact, minimal cooling air required, and facilitates fuel staging





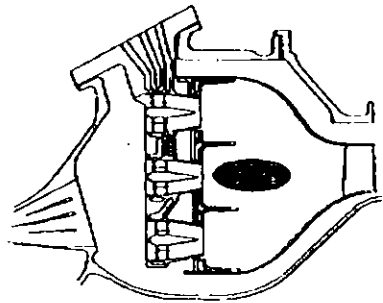
Primary Air and Fuel Flow



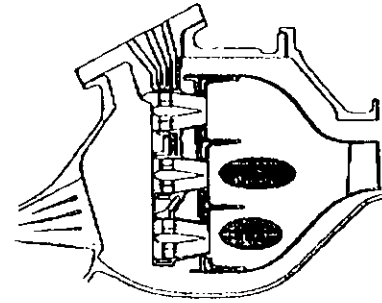


LM6000 DLE Burner Modes

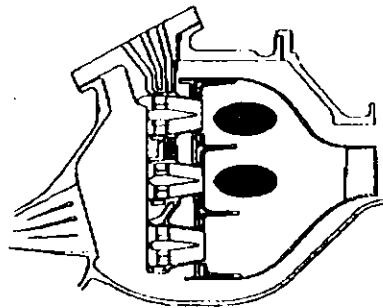
Starting configuration
B reaction zone



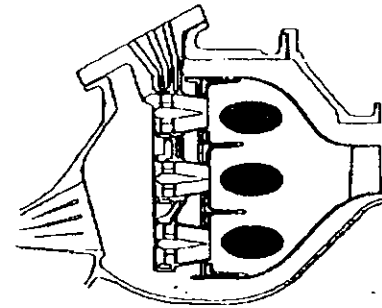
5 - 25% load
BC reaction zone



25 - 50% load
AB reaction zone



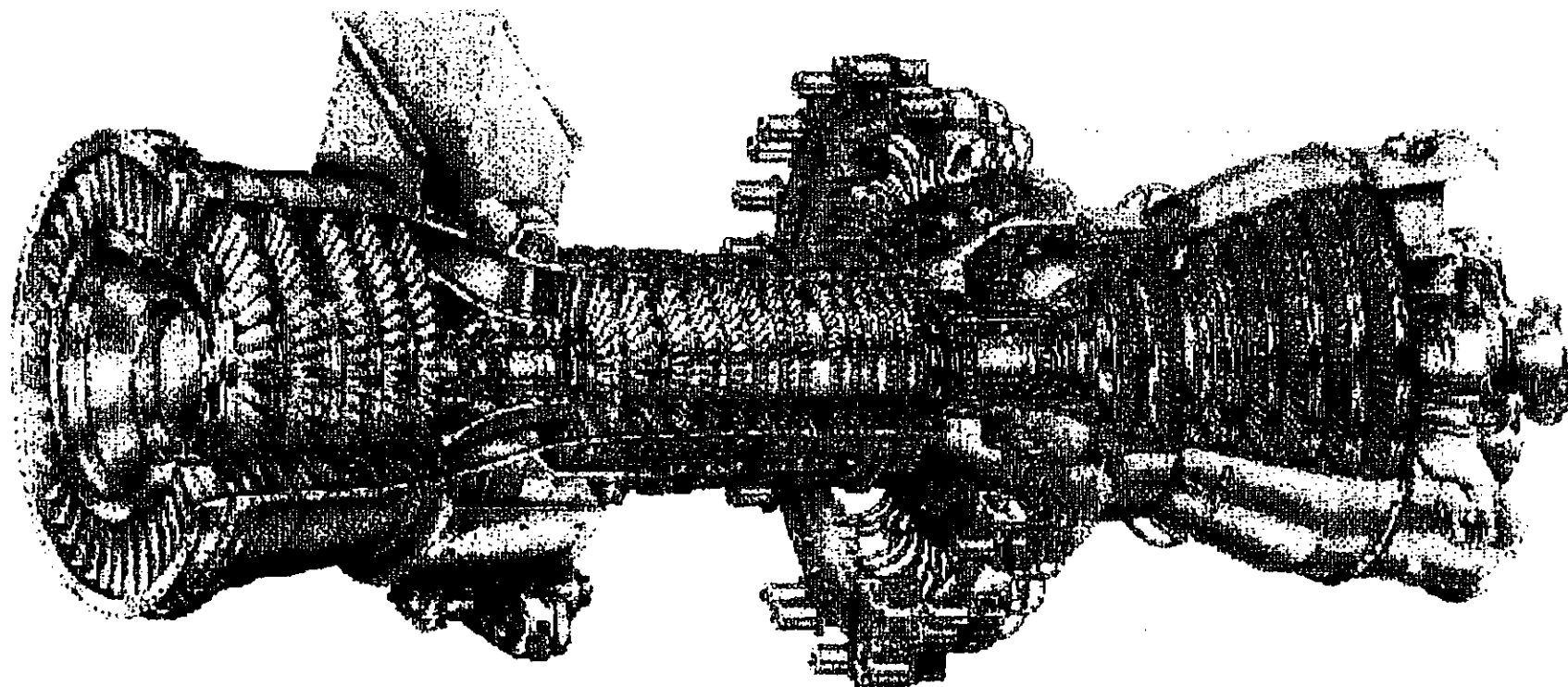
50% to full load
ABC reaction zone





GE Industrial AeroDerivative
Gas Turbines

LM6000 DLE Gas Turbine

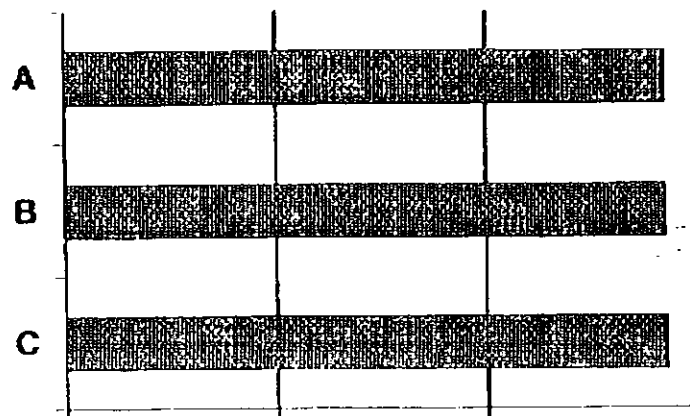
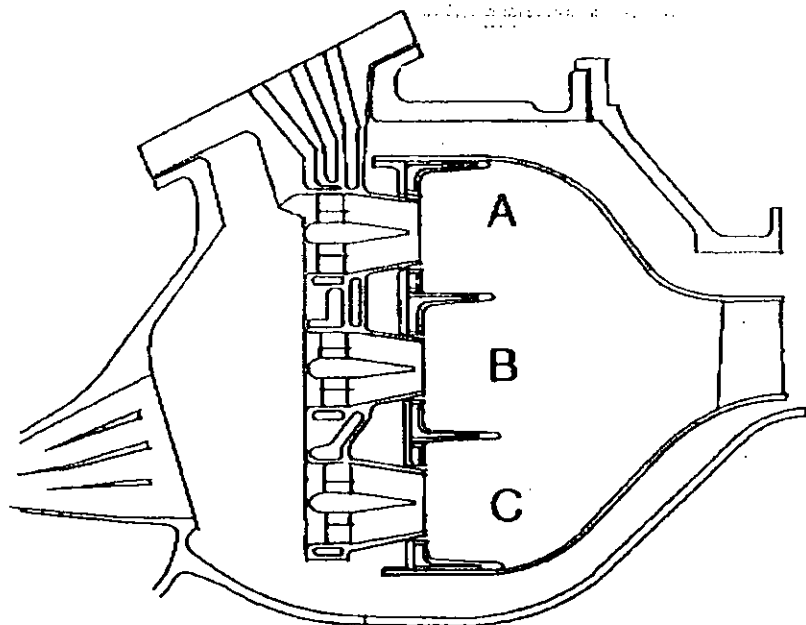


SEP 28 '98 11:44AM R FELINI

P.11



DLE Background - 1993

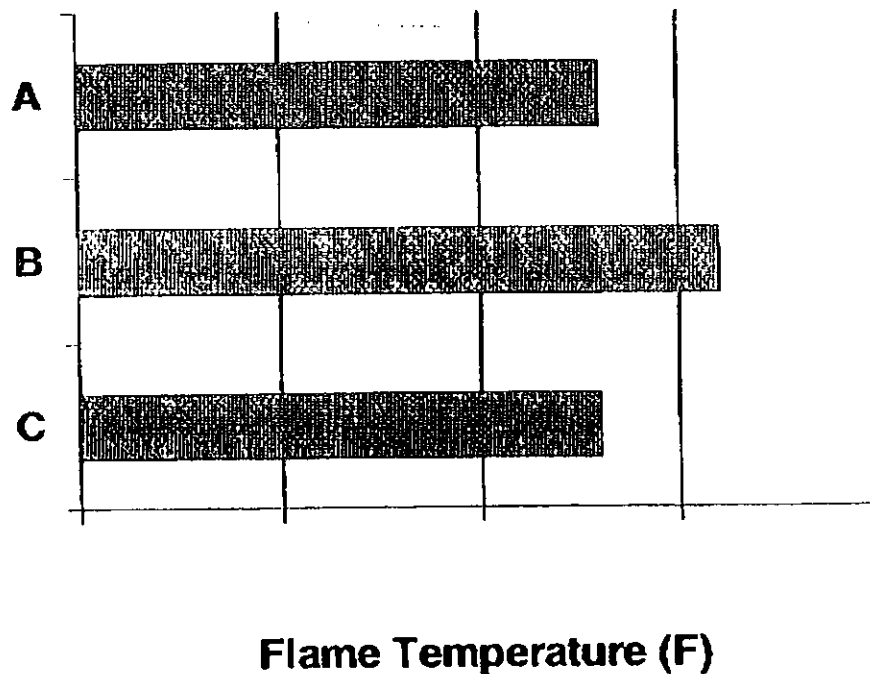


Flame Temperature (F)

- With equal ring temperatures we were confident 12 +/- 2 ppm Nox was achievable
- First (only) 15 ppm NOx guarantee was made for Orange Cogen / Dec 1997 effectivity



DLE Background - 1994



- First engine test demonstrated that equal ring flame temperature operation was not possible
- Discovered upper limit on A & C ring temperatures
- Higher B dome temperature
- Higher NO_x resulted, 16 +/- 2 ppm
- Reduced B dome combustor life
- 1994 focus on adding independent ring temperature control, reducing combustion dynamics and improving B ring dome life

SEP 28 '98 11:47AM R FELINI

P.13



DLE Background - 1994/5

- Increased B ring cooling flow to achieve acceptable cyclic combustor life
- Added "B ELBO" circuit to reduce combustion dynamics to acceptable levels at high power
- Average NOx was about 17 ppm
- Dual fuel DLE program officially launched in 1995
 - NOx goal of: 15ppm gas, 42ppm liquid
 - gas to liquid, liquid to gas fuel transfer capability

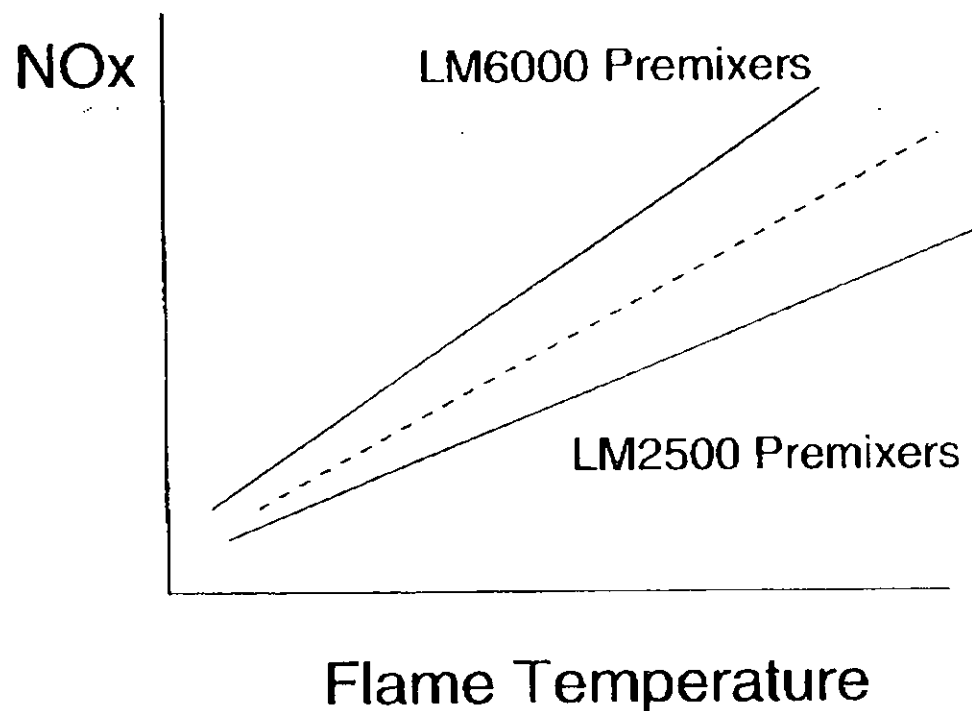


DLE Background - 1996

- Increased A & C ring cooling flow to achieve acceptable combustor oxidation life
- Added "A ELBO" circuit to reduce combustion dynamics at low power to acceptable levels
- Average NOx (on natural gas) now about 18 ppm
- Dual fuel DLE premixer development continued with component testing
 - Early testing with existing premixer swirler showed flashback (on liquid)
 - Swirler package redesigned - flashback eliminated
 - Liquid emissions promising (< 42 ppm) - gas emissions unchanged
 - Engine testing planned to evaluate operability
- Launched program to develop NOx optimizer system
 - Joint program with GE Corporate Research & Development
 - Automated adjustments to maintain emissions within compliance limits
 - Uses optimizing techniques and measured emissions data to find minimum NOx emissions



DLE Background - 1996 (continued)



- LM6000 gas premixers were redesigned to approach LM2500 premixer performance
 - Expected a 3 ppm NOx reduction
 - Reduced dome temperatures
- First unit tested at Orange Cogen - results were disappointing - no apparent reduction in NOx



1997 Activities

- Second redesign of gas premixers tested at Orange Cogen in March
 - New premixer design incorporates increased air flow
 - Anticipate a reduction in NOx of 4 ppm
- 4 ppm reduction in NOx measured, but baseline level had increased to 21 ppm
 - Impact of engine degradation investigated
 - Testing proposed to investigate further increases in airflow
- Demonstrated prototype NOx optimizer system @ Orange Cogen
 - Manual inputs - Algorithm found settings to minimize NOx
- First dual fuel DLE engine test conducted in June/July
 - Liquid NOx levels less than 42 ppm
 - Acoustics/operability problems on gas - Gas NOx greater than 25 ppm
- Dual fuel premixer swirler changed back to gas only configuration
 - Liquid injector modified to prevent flashback
 - Engine testing conducted in October/November

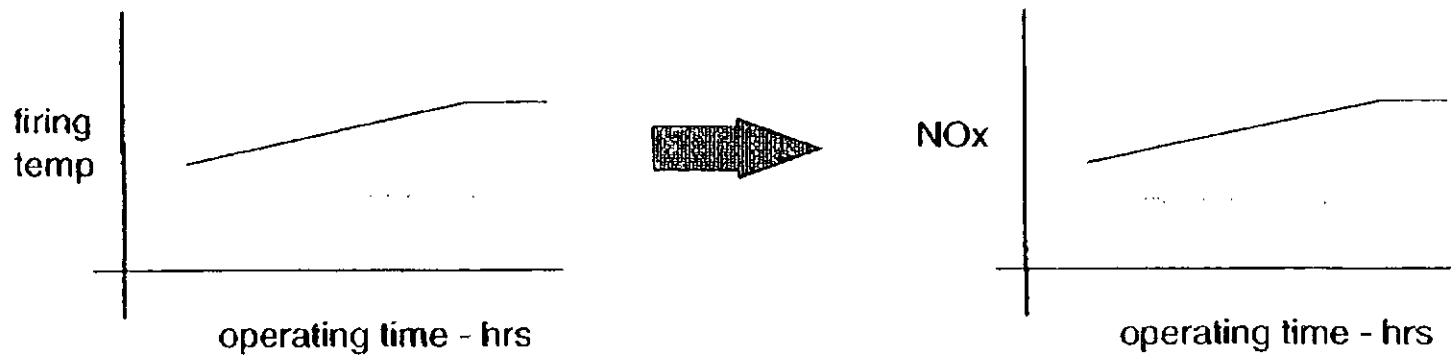


Late 97/Early 98 Activities

- Impact of engine degradation on NOx emissions evaluated
 - As engine degrades, firing temperature at constant power increases causing increased NOx
 - Level of degradation at Orange Cogen consistent with expected levels
- Testing performed at Orange Cogen to explore whether further increases in airflow would reduce NOx
 - Increasing airflow can reduce NOx, but rapid increases in CO are possible
- Testing performed on LM6000PD engines to evaluate emissions levels at various power levels
- Engine testing of redesigned dual fuel premixer conducted
 - Gas emissions levels same as gas only premixer
 - Liquid emissions levels disappointing



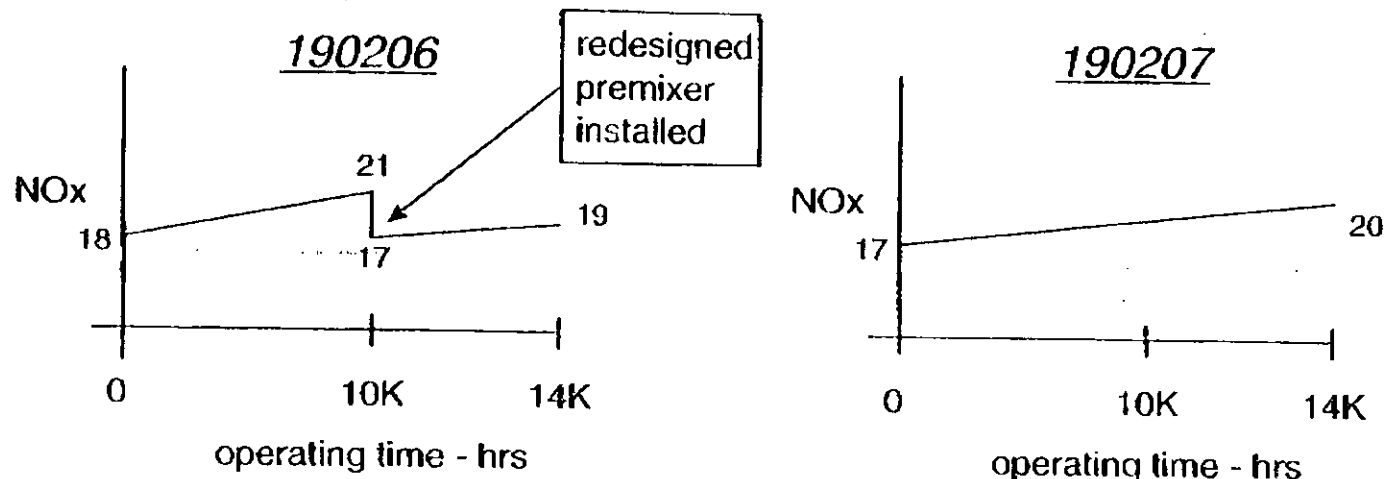
Impact of Engine Degradation (@ Constant Power)



- As engine degrades, firing temperature (fuel flow) increases to maintain same power output
 - Increased firing temperatures drive increased NOx
- Restoring performance (hot section refurbishment) should reduce NOx to initial levels



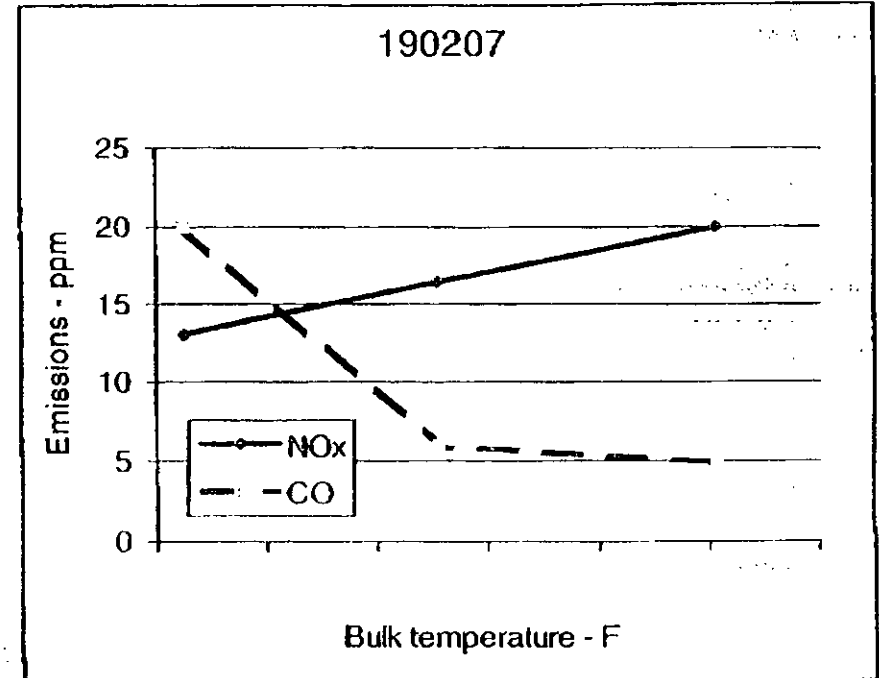
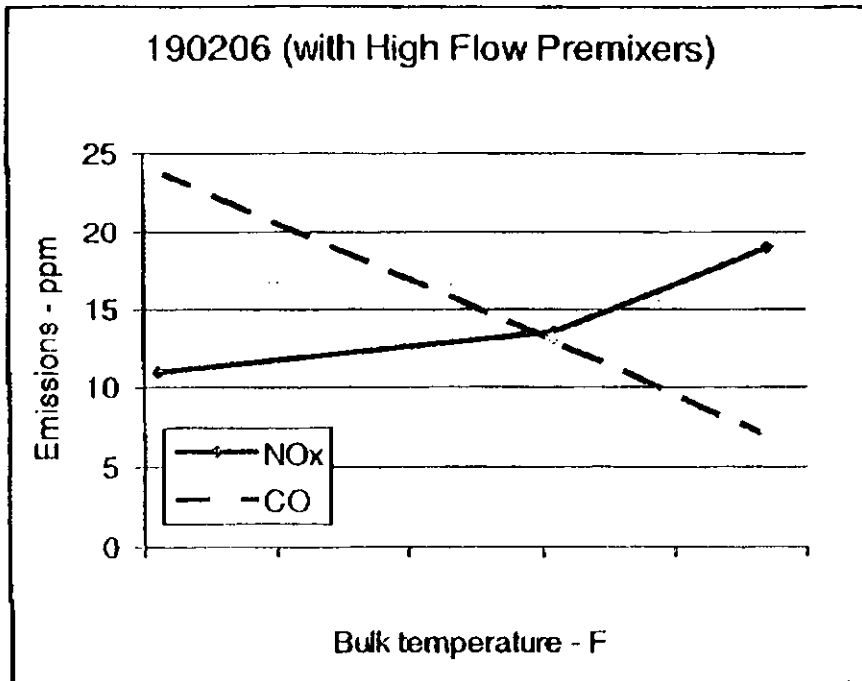
NOx Degradation at Orange Cogen



- Nox levels increasing with engine operating time
 - level of increase consistent with degradation studies
- Redesigned premixer reduced NOx by expected amount
- Additional testing performed to determine if further increases in airflow would reduce NOx



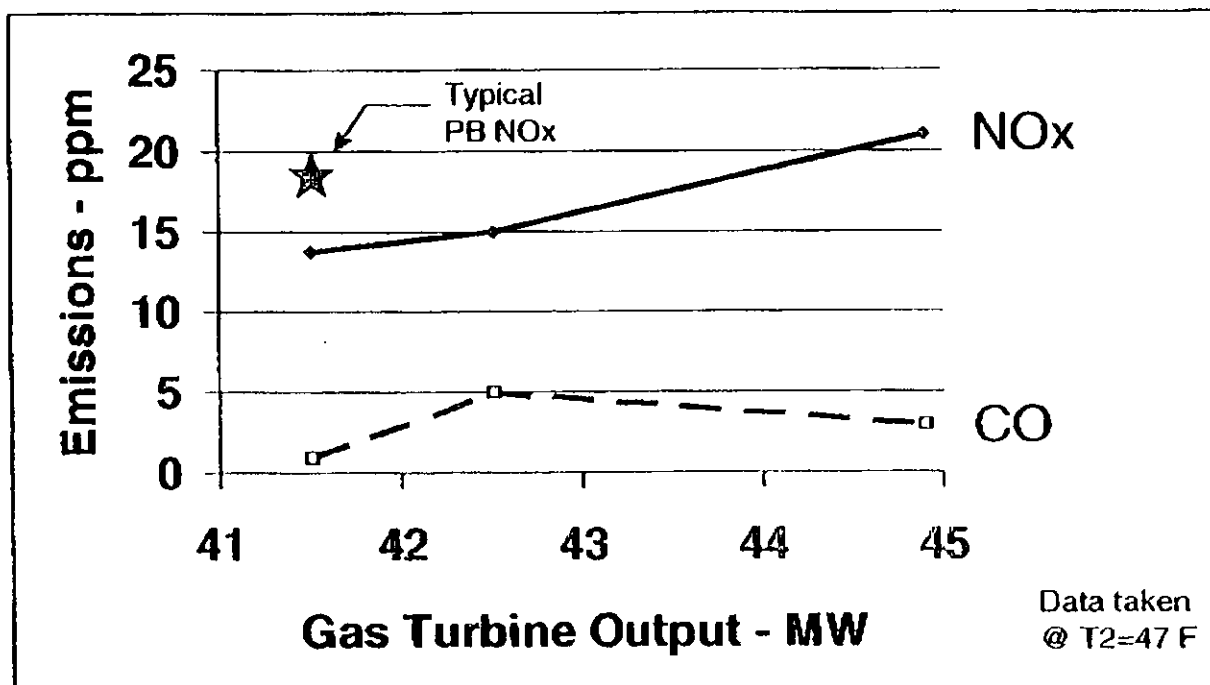
Increased Premixer Airflow Testing



- Testing conducted to simulate increasing premixer airflow
- Some increase in airflow will further reduce NOx, but rapid CO increases possible
 - rapidly changing CO indicates potential operability problems



LM6000PD Emissions Levels



- Testing conducted on production engine using existing premixer design
- NOx emissions levels on PD lower than PB for comparable power
 - Differences are booster stator vanes and low pressure turbine module
- Testing to determine impact of increased flow premixers on PD scheduled for Fall '98



Summary

- The LM6000 achieves its high level of efficiency by a combination of aerodynamically efficient components, high cycle pressure ratio (30) and high firing temperature (2300 F)
- Within the class of high efficiency medium sized gas turbines the LM6000 has the lowest available emission when operating on gas, 25 ppm today : working to 15 ppm
- The LM6000 engine should be the first gas turbine with an all dry dual fuel system to achieve 25/65 ppm NOx levels - 12/98
- The LM6000 engine should be the first gas turbine with an all dry dual fuel system to achieve 15/42 ppm NOx levels
- GE is committed to the development of DLE systems and will continue to improve these systems to achieve:
 - reduced emissions
 - increased durability & reliability
 - lower life cycle costs



Meeting the Emissions Objectives at Orange Cogeneration

Meeting with FL-DEP
5-11-99

RB Hook
Mgr - LM6000 Technical Programs

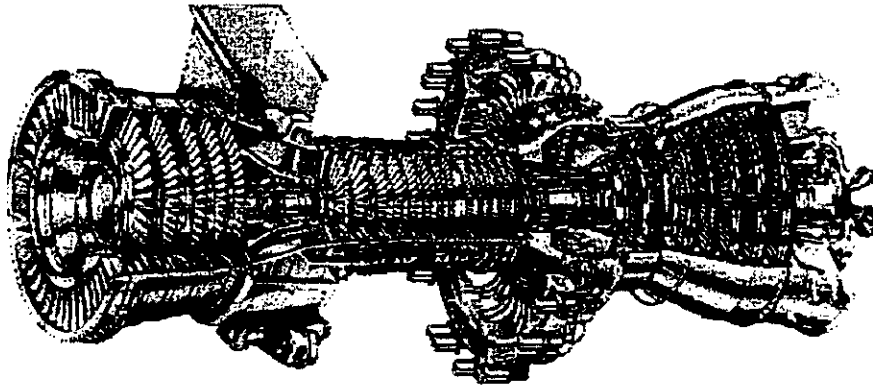


Agenda

- Review LM6000 DLE and July 9, 1998 meeting actions
- GE efforts to improve LM6000 Dry Low Emissions
- Current Status of LM6000 Emissions Capability
- Mass Emissions: Efficiency and Duty Cycle Considerations
- Evaluation of Alternatives
- Conclusion



LM6000 Dry Low Emissions Systems

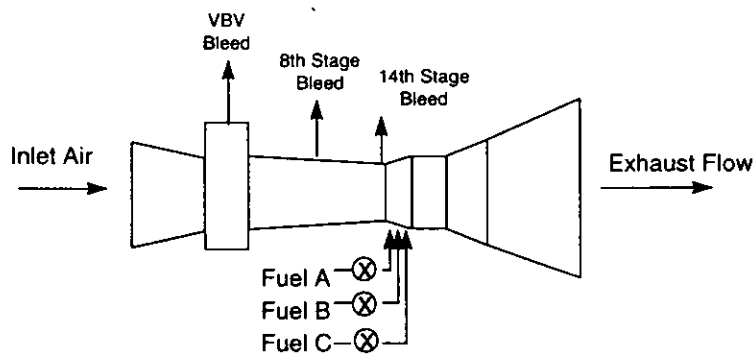


3



GE - IAD Approach to Dry Low Emissions

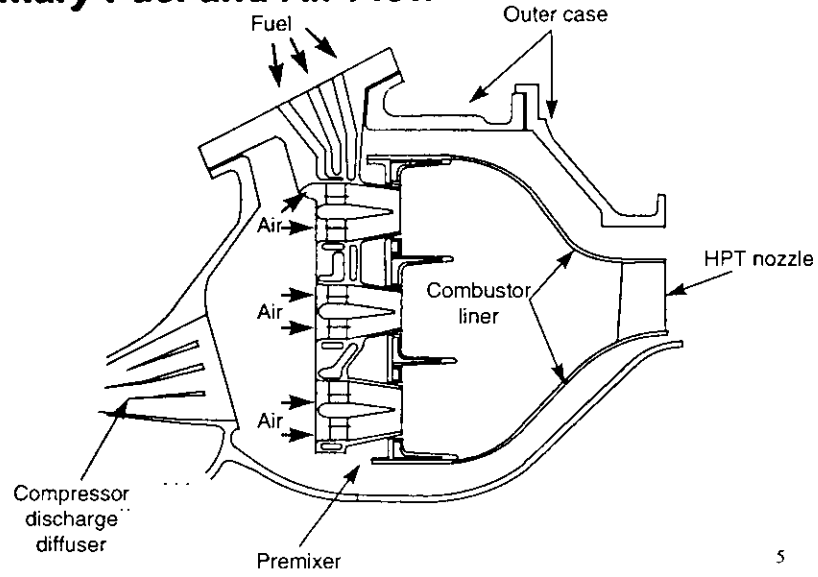
- Combination of fuel and air staging: Required for premix operation from start to full power
- Triple annular combustor: Compact, minimal cooling air required, and facilitates fuel staging



4



Primary Fuel and Air Flow

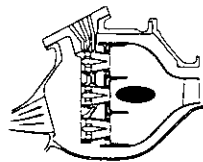


5

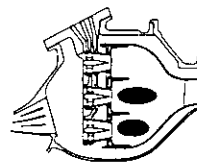


Burner Modes

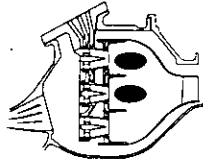
Starting configuration
B reaction zone



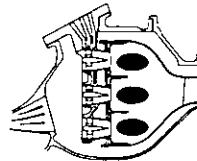
5 - 25% load
BC reaction zone



25 - 50% load
AB reaction zone



50% to full load
ABC reaction zone



6



LM6000 Fleet Experience

Model

	PA	PB	PC*	PD	Totals
Engines Produced	140**	20	49	24	233
Engines in Operation ***	103	15	12	7	137
Hours of Operation ***	1,696,495	230,790	31,011	21,926	1,980,222
High Time Engine (hours) ***	48,984	32,572	8,666	7,580	

LM6000 DLE: 44 engines shipped to date with 250000 hrs operating experience

7



LM6000 DLE Product Emissions Ratings

Fuel System	Engine Delivery	Gas*	Liquid*
Gas Only	3Q94	25 ppm	N/A
Dual Fuel	1Q98	25 ppm	75+ppm

* Assumes fuel has no fuel bound nitrogen

8



Action Items from 7-9-98 Meeting with DEP

- LM6000 PD testing to evaluate impact of high flow premixers on LM6000 DLE emissions
- Continue NOx optimizer program
- Evaluate alternate technologies
- Evaluate "Lbs NOx per MW-hr energy produced"

9



Progress Summary

LM6000 PD Testing

- High flow premixers provided 1-4 points benefit
- At 44.5 MW ; NOx ~ 23 ppm, 19 ppm with hi-flo
- At 41.4 MW ; NOx ~ 13 ppm, 12 ppm with hi-flo

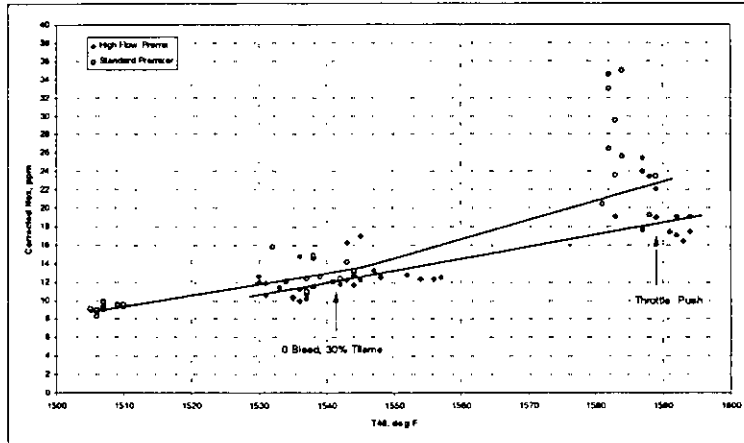
NOx optimizer demonstrator

- Reduces variability, not fundamental performance
- Finds boundaries
- Finds lowest NOx
- Demonstrated technology in Evendale Test Cell 8/98

10



High Flow Premixer Testing 12-98



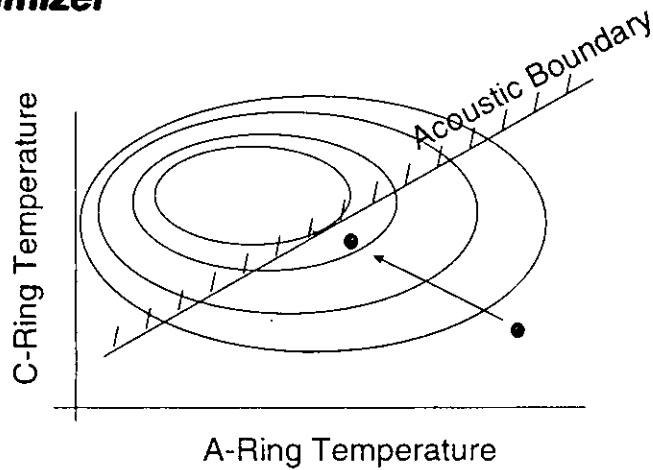
High-Flow Premixers provided 1-4 ppm improvement depending on operating power level

GE COMPANY PROPRIETARY

11



Optimizer

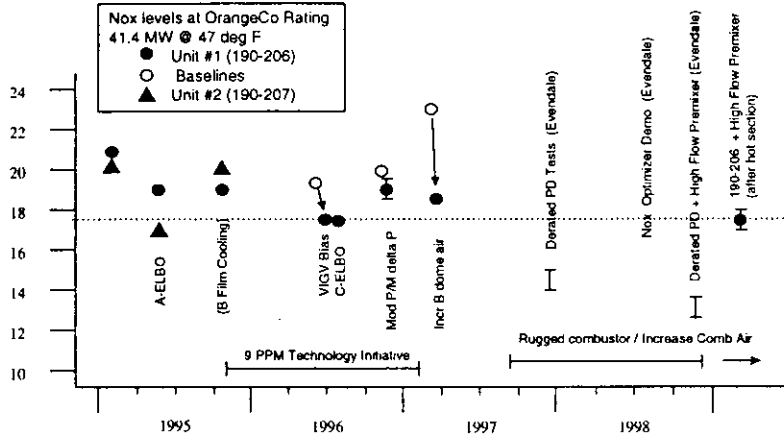


Optimizer seeks minimum NOx subject to constraints on acoustic

12



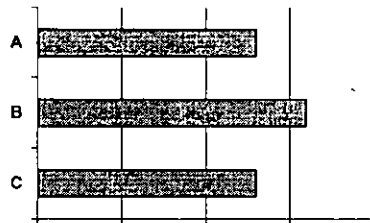
Overview of GE Efforts on 15 ppm



Approx 4 ppm reductions achieved ; Lowest new and clean levels ~18ppm



Technology Barrier - Acoustics



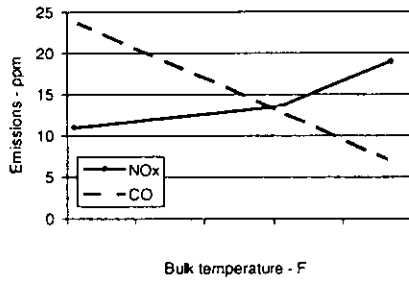
Flame Temperature (F)

- First engine test demonstrated that equal ring flame temperature operation was not possible
- Discovered upper limit on A & C ring temperatures
- Higher B dome temperature
- Higher NOx resulted, 16 +- 2 ppm
- Reduced B dome combustor life
- 1994 focus on adding independent ring temperature control, reducing combustion dynamics and improving B ring dome life

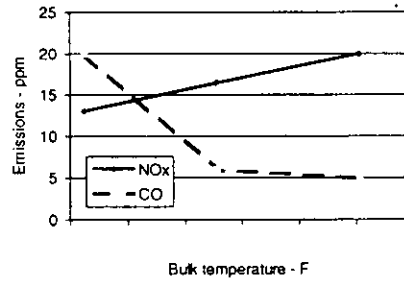


Technology Barrier - CO

190206 (with High Flow Premixers)



190207

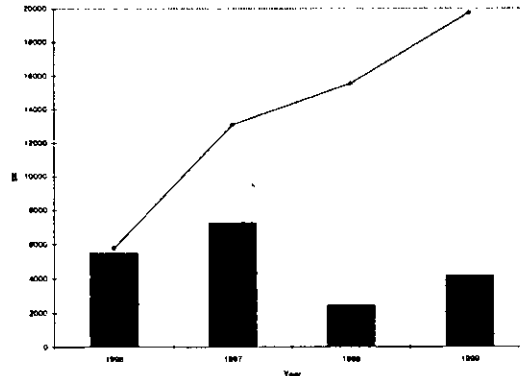


- Testing conducted to simulate increasing pre-mixer airflow
- Some increase in airflow will further reduce NOx, but rapid CO increases possible
 - rapidly changing CO indicates potential operability problems

15



GE - IAD Investment in DLE Technology



GE-IAD's continued investment in dry low emissions technology totals nearly \$20MM in period 1996-1999 (i.e. after OrangeCo's startup)

16

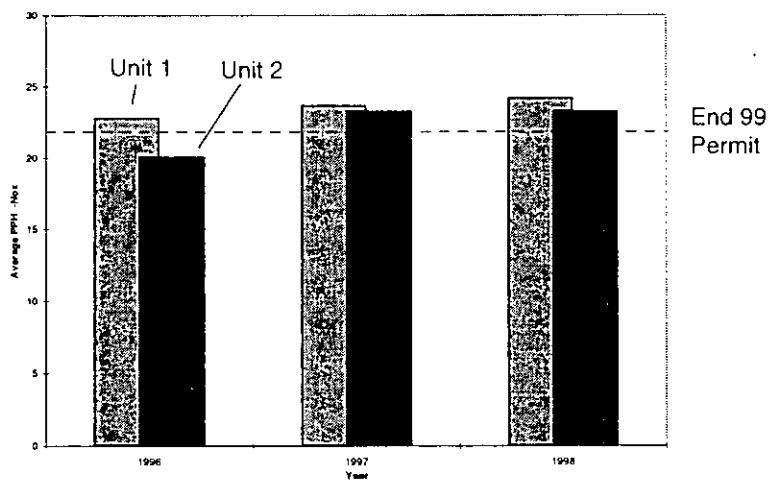


Review of historical plant emissions data

17



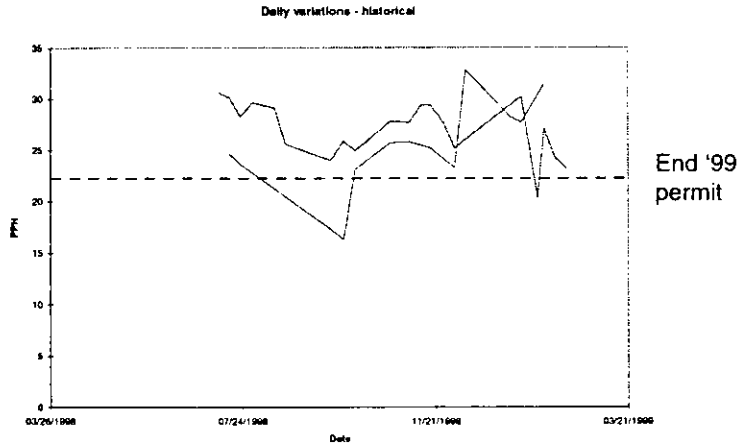
History of Emissions - Annual average pph



Annual Average PPH has been historically < 10% above end 99 permit 18



History of Emissions - Daily variations in PPH

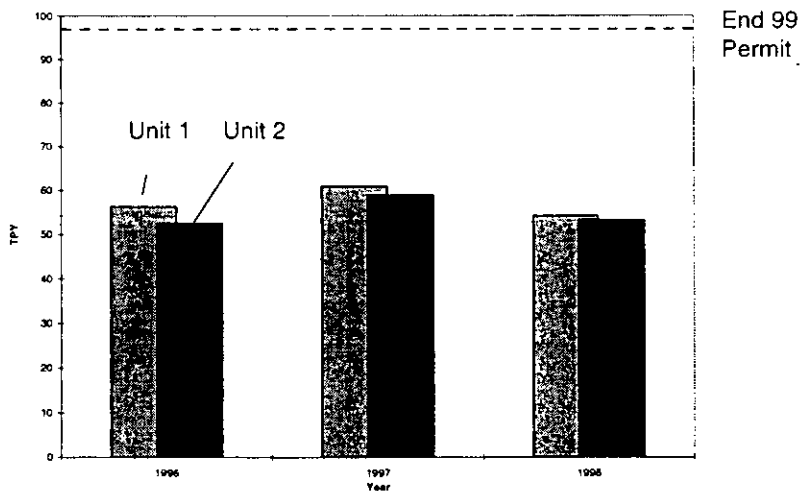


Daily variations in pph during peak hours are higher than average and end '99 permit levels

19



Site History of Emissions - TPY



Historical operation is well below end 99 - tons per year limits

20



**Comparison of LM6000 Emissions with
End 1999 Permit Levels**

	Permit	1998 Actual	1998 Projected for 8760 hrs
PPM	15	19-25	19-25
lb/hr per engine	22	Averaged 23.7	Average 23.7
Total Ton/yr	194	108	208

Scaled to 8760 hours OrangeCo would have exceeded new limit by 14 T (7.2%)



Summary - Current Situation

- GE-IAD has invested \$20MM in dry low emissions technology since OrangeCogen's commissioning
- Investment continues
- Lowest NOx levels achieved new and clean are
 - 17-18 ppm on LM6000PB
 - No clear path to meet 15 ppm on these engines
- Operational experience at OrangeCo site during 1998
 - Hourly average ppm ranged from 19 -25 ppm
 - Mass emissions (pph) averaged < 10% higher than end 1999 limits
 - Mass emissions (TPY) less than end 1999 limits
 - Using 1998 data, continuous operation would result in 7.2% above new annual ton/year limits



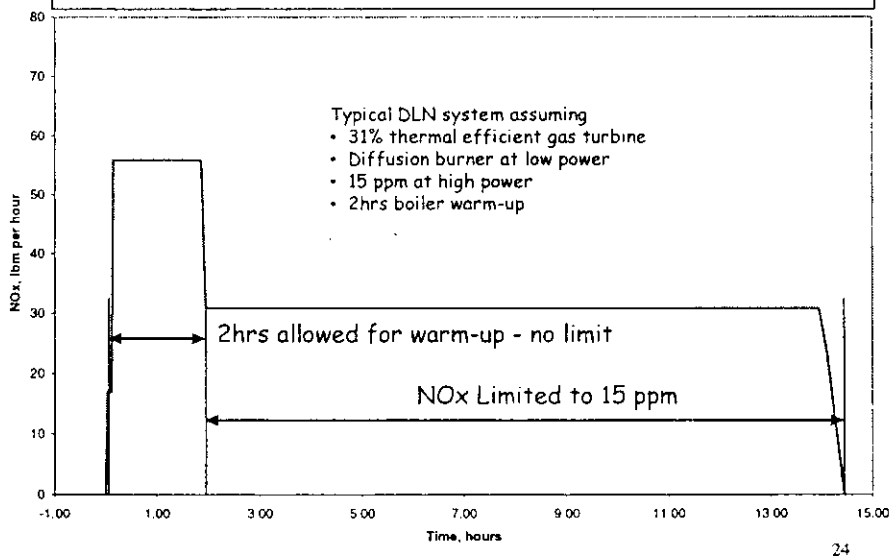
Mass Emissions of LM6000

- Comparison with lower pressure ratio cycle
- Advantage of "premix" across operating range

23

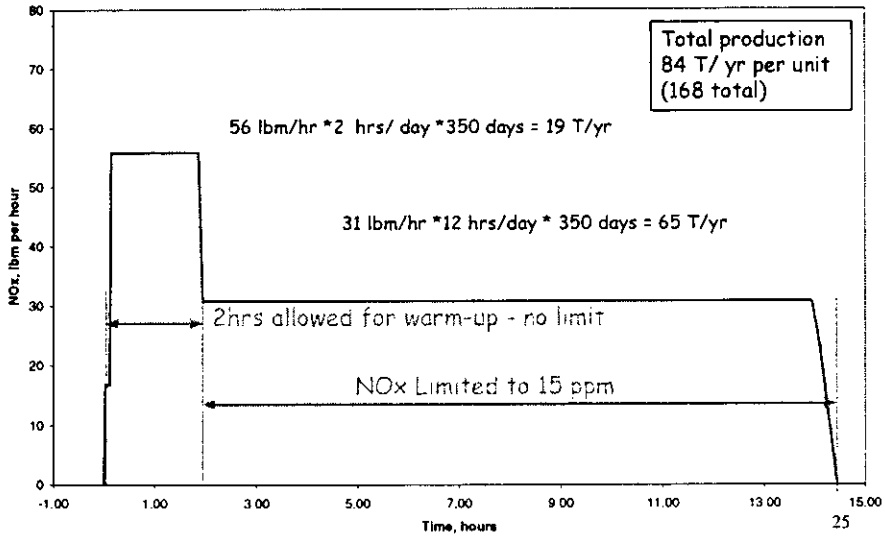


NO_x - Typical Diffusion / Premix System

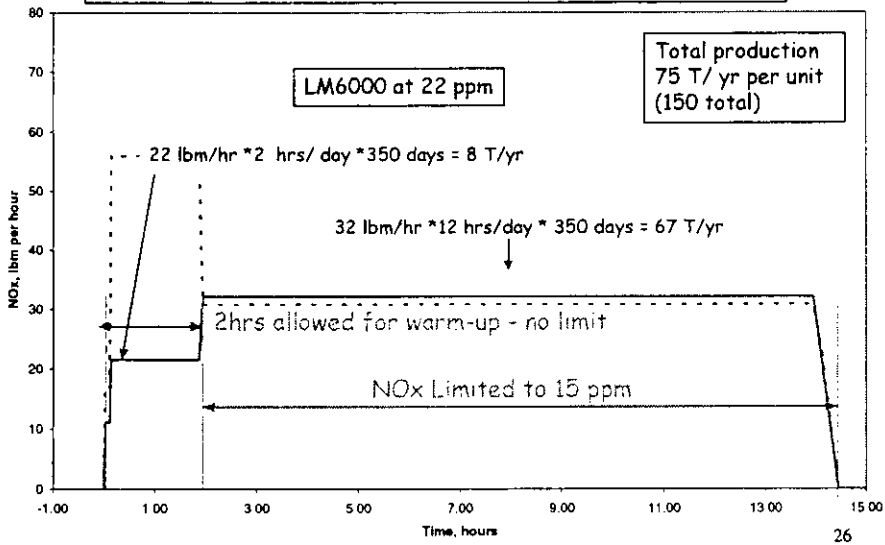




NOx - Typical Diffusion / Premix System



NOx - LM6000 Lean Premix System





Comparison of LM6000 Emissions with Typical Industrial

	Typical Industrial @ 15 ppm	LM6000 @ 22 ppm
During Warmup	38	16
At Baseload	130	134
Total TPY	168	150
lb/MW-hr	0.72	0.65

For Orange Cogeneration's duty cycle, LM6000 @ 22ppm has
lower emissions than Typical Industrial @ 15ppm

27



Evaluation of Alternatives

- SCR
- Derated LM6000 PD
- ~~SCONOX~~ ← Not mature
- ~~XONON~~ ← Not commercially available

28



Exhaust Treatments - SCR

- High installed cost
- Ongoing operating expenditures for ammonia, catalyst and upkeep
- Ammonia emissions to environment
- Fine particle emissions to environment
- Risks associated with handling hazardous materials (ammonia, catalyst)
- Creation of hazardous waste
- Lost revenue during retrofit

Net negative impact to environment at higher cost

29



Alternate Technology - Derated LM6000 PD

- Reduces NOx by reduced firing temperature/ higher efficiency
- Net plant power is reduced by approx 2 MW (loss of exhaust energy)
- Lost revenue (14400 MW-HRS)
- Installation / retrofit outage (1 month per engine including fuel system)
- High capital cost

High cost with net plant power reduction

30

Z 333 612 492

US Postal Service
Receipt for Certified Mail

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

Sent to <i>Allan Smith</i>	
Street & Number <i>Orange Cogen</i>	
Post Office, State, & ZIP Code <i>Lakeland, FL</i>	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date <i>1050231-003-AC 11-5-98</i> <i>PSD-FL-206C</i>	

PS Form 3800, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER: ■ Complete items 1 and/or 2 for additional services. ■ Complete items 3, 4a, and 4b. ■ Print your name and address on the reverse of this form so that we can return this card to you. ■ Attach this form to the front of the mailpiece, or on the back if space does not permit. ■ Write "Return Receipt Requested" on the mailpiece below the article number. ■ The Return Receipt will show to whom the article was delivered and the date delivered.		I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.	
3. Article Addressed to: <i>Allan W. Smith, Gen Mgr</i> <i>Orange Cogen</i> <i>1125 US Hwy 98 S.</i> <i>Lakeland, FL 33801</i>		4a. Article Number <i>Z 333 612 492</i>	
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