Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

November 24, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Wade Smith, General Manager
Orange Cogeneration Limited Partnership
1125 U.S. 98 South
Suite 100
Lakeland, Florida 338701

Re: DEP File No. (PSD-FL-206C)
Orange Cogeneration / Polk County

Dear Mr. Smith:

Enclosed is one copy of the Draft Air Construction Permit Modification for the installation of wet technologies on Orange Cogeneration Units 1 and 2, specifically the implementation of SPRINT™ and selective water injection. The Department's Intent to Issue Air Construction Permit Modification and the "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT MODIFICATION" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT MODIFICATION" must be published within 30 (thirty) days of receipt of this letter. 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 amendment.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A.A. Linero, P.E., New Source Review Section at the above letterhead address. If you have any other questions, please contact Mr. M. P. Halpin, P.E. at 850/921-9530.

Sincerely,

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

CHF/mph

Enclosures

In the Matter of an
Application for Permit Modification by:

Orange Cogeneration Limited Partnership
1125 U.S. 98 South, Suite 100
Lakeland, Florida 33801
_____/

DEP File No. 1050231-005-AC
Permit PSD-FL-206C
Orange Cogeneration
Polk County

INTENT TO ISSUE AIR CONSTRUCTION PERMIT MODIFICATION

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit modification (copy of DRAFT Permit modification attached) for the proposed action, as detailed in the application specified above, for the reasons stated below.

The applicant, Orange Cogeneration Limited Partnership (OCLP) applied on October 25, 1999, to the Department for an air construction permit modification to allow for the installation of NO_x control equipment, including SPRINT™ and selective water injection for its combined cycle combustion turbines located at the Orange Cogeneration facility, 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 an air construction permit modification is required to install the associated NO_x control equipment.

The Department intends to issue this air construction permit modification 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, 62-296, 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 Permit Modification." 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 modification 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 Modification." 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 modification 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 PERMIT MODIFICATION (including the PUBLIC NOTICE, and DRAFT permit modification) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 11-23-99 to the person(s) listed:

Wade Smith, Orange Cogeneration *
Gregg Worley, EPA
Doug Neeley, EPA
John Bunyak, NPS
Bill Proses, DEP-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.

Kini Jolen (Clerk) 11-23-99 (Date)

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT MODIFICATION

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Orange Cogeneration Limited Partnership, Orange Cogeneration Facility
DEP File No. PSD-FL-206C, 1050231-005-AC
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a modification of a Prevention of Significant Deterioration (PSD) Permit to Orange Cogeneration Limited Partnership (OCLP) for its Orange Cogeneration Facility located in Polk County. A Best Available Control Technology (BACT) determination was not required for this modification pursuant to Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD). The applicant's name and address are: Orange Cogeneration Limited Partnership, 1125 U.S. 98 South, Suite 100, Lakeland, Florida 33801.

This is an existing facility consisting of two nominal 40 Megawatt combined cycle combustion turbines (Units 1 and 2). Both units fire natural gas and biogas with heat inputs of 368.3 MMBtu/hr each (at an ambient temperature of 47°F). These units have a Title V permit (1050231-001-AV) issued by the State of Florida.

The permitted emission rate of nitrogen oxides (NO_X) for Units 1 and 2 while firing natural gas or biogas is 25 ppm. On an annual basis the permitted tons per year (TPY) of potential NO_X emissions are 168.6 each. Effective January 1, 2000 the permitted NO_X emission rate for each unit decreases to 15 ppm while firing natural gas or biogas firing, causing the potential TPY of NO_X to be equal to 101.2 (a reduction of 67.4 TPY for each unit).

OCLP requests that the aforementioned NO_X emission rates for each unit remain at 25 ppm, for a period of time adequate to allow for the installation and testing of wet technologies. OCLP has determined that an extension of 20 months (through August 2001) will allow adequate time for the units to be capable of achieving the lower (15 ppm) limits through the application of this technology. No other emission limit increases are requested.

It is noted that emissions from each unit have ranged from 52.5 to 61.1 tons per year of NO_X over a 3-year period. This reflects the intermediate loading duty of these units. It is expected that each unit will typically operate in a similar manner in the future.

The Department will issue the final permit modification 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 14 (fourteen) days from the date of publication of "Public Notice of Intent to Issue Air Construction Permit Modification." 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 modification 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:

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100
Fax: 813/744-6084

The complete project file includes the Draft Permit modification, 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.

TECHNICAL EVALUATION AND

PRELIMINARY DETERMINATION

Orange Cogeneration Limited Partnership

Orange Cogeneration Facility

Polk County

DEP File No. 1050231-005-AC

PSD-FL-206C

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

November 24, 1999

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

1. Applicant

Orange Cogeneration Limited Partnership
1125 U.S. Highway 98 South
Suite 100
Lakeland, Fl 33801

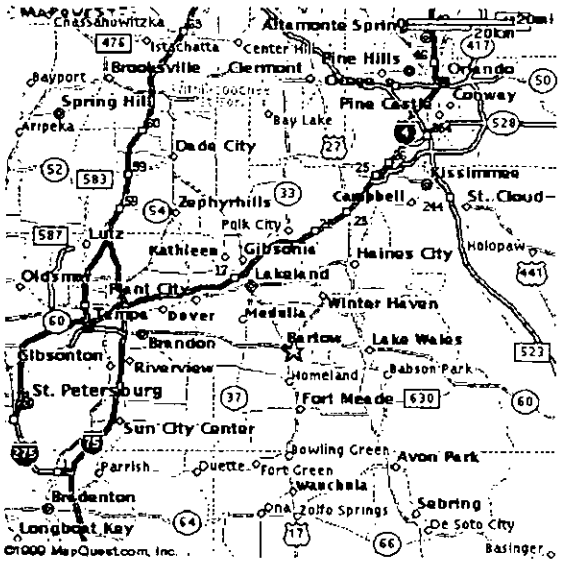
Authorized Representative: Mr. Wade Smith, General Manager

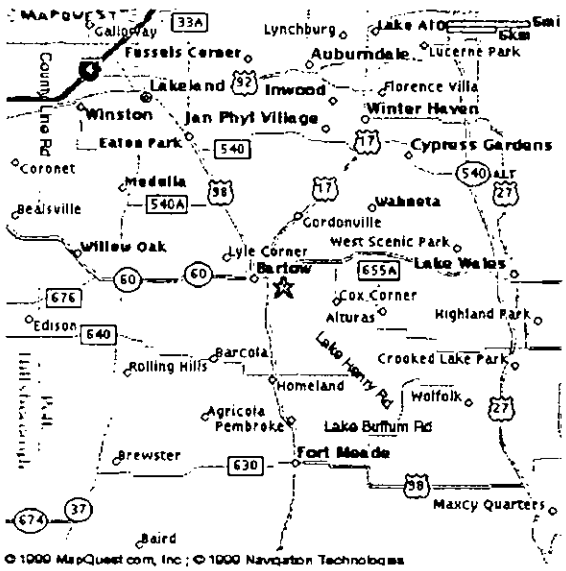
2. Source Name and Location

Orange Cogeneration Limited Partnership
Clear Springs Road
Bartow, Florida 33830

UTM Coordinates: Zone 17, 418.75 km East and 3083.0 km North

The location of the site is shown below:





3. Source Description

The Orange Cogeneration Limited Partnership (OCLP) facility consists of two combustion turbines, each with an associated heat recovery steam generator; an auxiliary boiler, and "unregulated or insignificant" emissions units.

Each combustion turbine is a GE LM6000 DLE unit nominally rated at 40 MW generating capacity, with a maximum heat input for natural gas or biogas of 368.3 MMBtu/hr. The auxiliary boiler has a maximum heat input for natural gas of 100 MMBtu/hr.

4. Current Permit and Major Regulatory Program Status

The HRSGs and the combustion turbines are regulated under Rule 62-210.300, F.A.C. Permits Required. Based on the BACT and permit information, the combustion turbines are required to operate at lower NO_X levels than authorized at this time. The original PSD permit authorized a NO_X emission limit of 25 ppmvd until 12/31/97, after which the emission limit was to be reduced to 15 ppmvd. The

applicant filed two requests for extensions, which were granted by the Department, allowing for the current compliance date of 12/31/99 in order for the lower NO_X limit to be achieved.

5. Permit Modification Request

On October 25, 1999 the Department received a request from OCLP for modification of its permit to install SPRINT™ and selective water injection on Emission Units 001 and 002. The applicant indicated that this request was required in order to meet the Department's BACT limit of 15 ppmvd on each combustion turbine. General Electric has "partnered" with OCLP and met with the Department on September 2 in order to present the subject proposal. GE and OCLP believe that pursuing this proposal will lead to a system solution which has environmental benefits over SCR, will yield lower on-going operating costs when compared to SCR and will advance the state of the art in emissions technology for the LM6000 AeroDerivative gas turbine.

Orange Cogeneration has further requested that the Department revise the PSD permit to reflect that the 25 ppmvd limit for NO_X is appropriate as BACT if the subject proposal should fail to achieve 15 ppmvd.

6. Emissions Increases Due to Modification/Method of Operation

The only emissions increase which this modification will cause relate to the differential NO_X emission levels of 15 ppmvd versus 25 ppmvd for the extension period requested. The Department estimates this as per the table below. This is based on 8760 hours of operation at maximum output for each CT, although this is unlikely based upon past operation (actual past emissions are also shown):

EMISSIONS INCREASES DUE TO PERMIT EXTENSION ON BOTH CT's THROUGH 8/2001

Unit	Emission Rate 15 ppm (lb/hr)	Emission Rate 25 ppm (lb/hr)	Emission Increase At 8760 hr (TPY)	Actual Emissions (96-98 avg. TPY)	Facility PTE Increase (TPY)	PSD Threshold tons/yr
1	23.1	38.5	67.4	57.3	Yr. 2000 - 134.8	40
2	23.1	38.5	67.4	55.0	Yr. 2001 - 89.9	40

7. Conclusions

Based upon information that the Department has reviewed, this project has the ability to reduce NO_X emissions to the required 15 ppmvd rate. Therefore, the Department concludes that the project is worth implementing and authorizes the appropriate extension of time in order to do so. However, the applicant demonstrates some "hedging" based upon the request to revise the permit limit to 25 ppmvd should the proposal fail. Accordingly, the Department concludes that there exists some possibility that the proposal will fail and is not inclined to revise the permit to the 25 ppmvd level in the event of failure. Additionally, since this action represents the third extension of time to achieve 15 ppmvd, no further extensions of time should be authorized to meet the targeted rate, short of the time required to implement an SCR.

For further details regarding this review, contact:

Michael P. Halpin, P.E., Review Engineer
New Source Review Section
Bureau of Air Regulation
850/488-0114

GE Industrial AeroDerivative
Gas Turbines

GE Power Systems
One Neumann Way, S158
Cincinnati, OH 45215-1988
Phone: (513) 552-5925
Fax: (513) 552-5059

October 18, 1999

Orange Cogeneration Limited Partnership
1125 US 98 South, Suite 100
Lakeland, FL 33801

Attn: Wade Smith

The purpose of this letter is to document two new technical alternatives that have the potential to achieve the desired emission levels of 15 ppm NOx without the use of exhaust treatment. The new alternatives are:

- Application of Sprint™ technology
- Use of selective H2O injection into the combustor

These alternatives were presented to the Florida Department of Environmental Protection (DEP) in a meeting held September 2, 1999. A copy of that presentation is attached for reference.

Background

During the last six months, GE evaluated various alternatives to meeting the contractual agreements with Orange Cogeneration Limited Partnership (OCLP) regarding gas turbine NOx emissions. These were documented in a 6-25-99 letter from OCLP to FL-DEP.

Technically viable alternatives evaluated included SCR and derated LM6000PD. Of these, SCR was the more cost effective.

About the same time (June 1999) GE conducted some additional measurements which suggested that the needed NOx improvements could likely be achieved via small amounts of H_2O injection using Sprint™ technology and/or by selectively injecting H_2O into certain areas of the combustor. GE disclosed this work to the FL-DEP in early July and made a technical presentation on Sept. 2 at Tallahassee.

The advantages of using "damp" technology over SCR are as follows:

- Provides lower total emissions to atmosphere (when ammonia slip is considered).
  - An SCR with 10 ppm ammonia slip will add an additional 48 ton per year of NH3. For the two gas turbines at the plant. Additional introduction of ammonia into the atmosphere is a concern since it could potentially lead to increased O2 consumption by algae in sensitive water areas causing fishkills or other degradation of the environmental ecosystems.
  - Therefore damp technology would avoid 48 ton per year of additional emissions.
- Avoids visible haze emissions associated with ammonia slip
- Avoids possible complaints of odor due to ammonia
- Reduces operating costs
  - Ammonia costs
  - Catalyst replacement costs
  - Catalyst disposal costs
  - Gas turbine performance losses due to SCR back pressure
- Avoids additional opportunity for "fugitive" ammonia release and impacts to nearby residential areas due to transportation, handling and storage

This memo provides the technical rationale and proposal to pursuing "damp" technology to capitalize on the aforementioned benefits.

SPRINT™ Technology

Tests were conducted at the OCLP facility at Bartow, Florida that included injecting a water mist into the engine inlet. The tests were conducted at high power operating conditions and the water injection rate was approximately 5 gallons per minute. Figures 1 and 2 show the results of these tests for the two different engines at the site. These figures show how NOx emissions vary as a function of power with and without water injection into the engine inlet. With water injection NOx emissions were lower by approximately three ppm at a given power level. The results were nearly identical on both of the engines at the site.

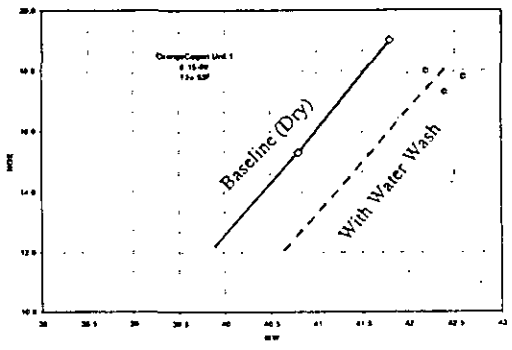


Figure 1
SPRINT Results on Unit #1

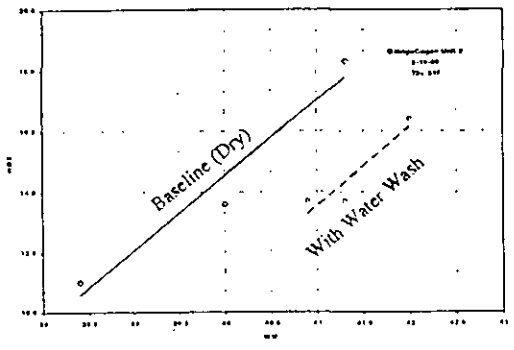


Figure 2
SPRINT Results on Unit #2

What is significant in these results is that data obtained during the tests indicate that the NOx permit level of 15 PPM was *nearly achieved* on both engines at rated power. In fact, NOx levels of 15.5 and 16.0 PPM were recorded on units one and two, respectively.

This demonstration was conducted using a crude water mist injection system that is normally used to clean the engine inlet, which is known to produce a circumferentially non-uniform water mist. This is significant in two respects. First, it can be expected that a system that provides more uniform injection will also provide lower emission levels. Second, the demonstrator system used for the tests is not suitable for long term operation. GE is currently developing a system for the LM6000 PC that should provide a uniform injection pattern. This system will be developed and demonstrated during fourth quarter 1999. This system would then have to be adapted for use on the LM6000PB models at OCLP.

Selective Water Injection

Major factors driving and NOx emissions on LM6000PB

The LM6000PB combustor is a triple annular design in which there are three concentric burning zones called domes. At high power operating conditions all three combustor domes are lit. Also, at these conditions all engine bleeds are closed and the control mode is called "throttle push ". In throttle push control mode the flame temperatures in the inner and outer domes ("C" and "A" domes) are regulated to a control schedule that is determined by combustor acoustic boundaries. As power is increased, inner and outer dome flame temperatures are regulated to preset temperatures and any additional fuel flow required to achieve power is fed to the center dome ("B" dome).

Therefore, during throttle push control mode, the B dome temperature increases as power is increased. The NOx also increases as power is increased.

Statistical evaluation of NOx emissions during these operating conditions has verified that the B-dome flame temperature is the main NOx production driver. *Therefore, control of the B dome flame temperature is the primary key to achieving low NOx on the LM6000.*

Previously, the strategy that was being pursued to lower NOx emissions was to add more air to this dome. While high flow premixers achieved some success in reducing NOx by adding air to the B dome, there were several factors which limited the amount of air which could be added to this dome. These included issues relative to idle operation and turbine cooling.

Method for controlling B dome temperature

The Sprint™ feasibility data was encouraging in that water could be added into the engine system without increasing combustor acoustic activity.

This suggests that low levels of water or steam could be introduced into the B dome region of the combustor thereby reducing temperatures and suppressing NOx generation. By so doing, it should be possible, at the OCLP facility rating condition, to duplicate flame temperatures at the minimum NOx point thereby achieving the lowest possible NOx emissions from these gas turbines. The current LM6000s at the OCLP plant have produced NOx emissions levels in the range of the 12-13 ppm at the minimum NOx point. GE believes that, with the use of water or steam injection, levels below 15 ppm may be achieved at the rated conditions for OCLP.

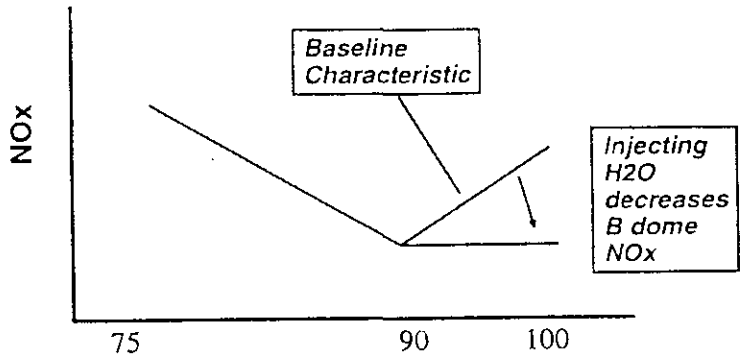


Figure 3 Impact of H2O Injection on NOx Emissions Characteristic

Figure three (above) shows how water or steam injection could potentially flatten out the NOx versus power characteristic and high power. This could also benefit the degradation characteristics of the engine. As fuel flow increases are required to maintain power as the units performance degrades between major maintenance repair cycles, resulting B dome temperature increases can conceivably be offset by water flow increases.

Technology demonstration plan

GE proposes to demonstrate this technology using an existing dual fuel dry low emissions premixer design. Water or steam will be introduced into the B-dome of the combustor using the liquid passages in the dual fuel premixer.

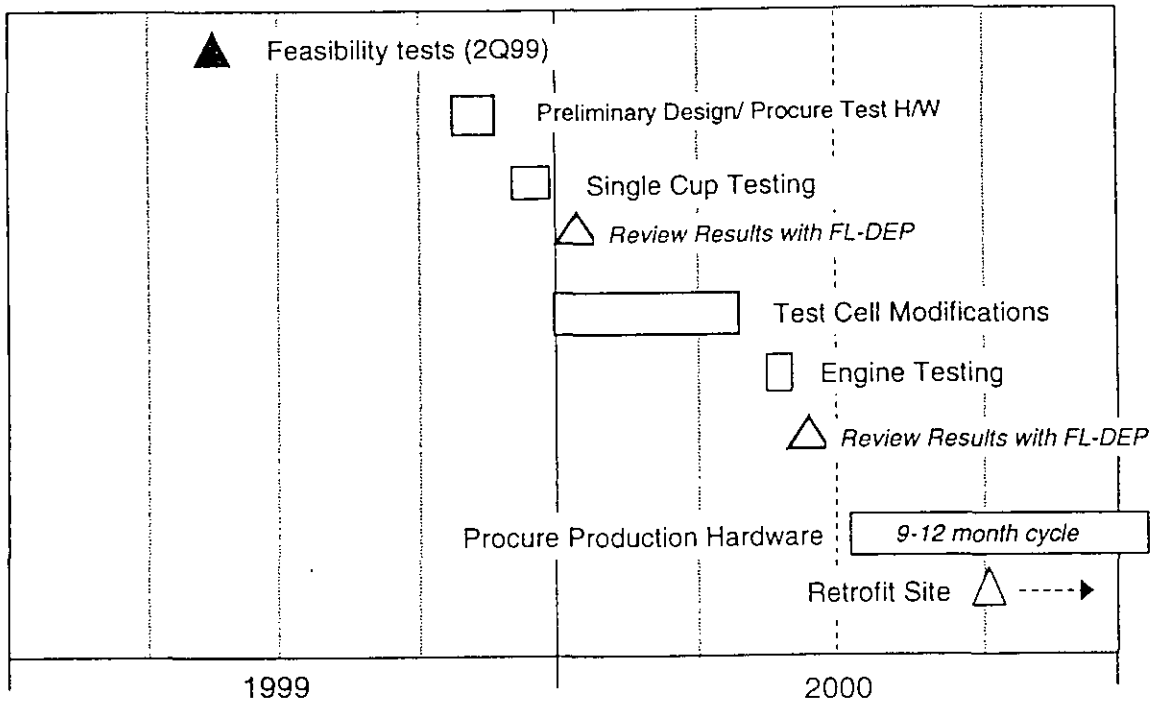
The first element of the program will be to conduct a single test in a combustor rig to determine lean blow out characteristics and flame stability with water and steam

injection. This test will determine whether water or steam is the best alternative for achieving the B dome NOx suppression.

After a determination is made whether water or steam is the best alternative, an engine demonstration test will be undertaken, in GE's engine test facility. The outcome of the engine test will determine if selective water injection, or SPRINT™, or if some combination of the two approaches provides the best solution. It should be noted that the selective water injection system, by itself, may satisfy contract requirements and, in that event, GE reserves the right to implement this system solely as a resolution to this contract. The test will also determine if there are any technology issues, such as acoustic boundaries or CO emissions, that will require further development.

The availability of hardware and the modification of the test cell for water injection and SPRINT™ operation will pace this test. The engine test will be complete no later than the end of June 2000. At that time, a technical review will be conducted with the FL-DEP and a determination made as to whether this approach is practical for commercialization. A preliminary milestone chart is provided below.

Water Injection Program Schedule



If the wet injection scheme is shown to be feasible, GE intends to proceed with design and procurement of a production quality system to be installed at the OCLP facility. The cycle time will depend on whether there are changes required to the

fuel nozzles, however it is expected that this could be accomplished by end June 2001.

If, on the other hand, it is determined that this technology is not capable of achieving the permit levels at the OCLP plant, installation of selective catalytic reduction systems can be pursued to address the emissions limit. GE is working very closely with an SCR supplier to make commercial arrangements for this scenario.

Summary

We believe that pursuing the proposed technology demonstration plan will lead to a system solution which has many environmental benefits over SCR, will be a favorable alternative in terms of net plant profitability for OCLP due to lower on-going operating costs when compared to SCR, and will also advance the state of the art in emissions technology for the LM6000 AeroDerivative gas turbine

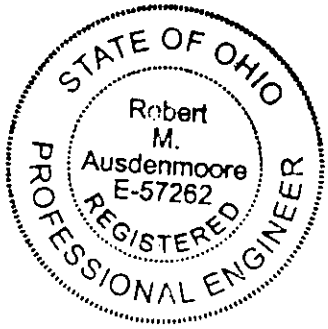
Based on our discussion in Tallahassee earlier this month, we are optimistic that the regulatory agencies and other concerned parties will find value in these advantages and provide a permit extension to mid-2001 to allow us to demonstrate this technology and implement it at the site.

Best regards,

RB Hook
LM6000 Technical Program Mgr.
GE Industrial Aeroderivative Gas Turbines

Concurred:

Bob Ausdenmoore
Systems Engineer
GE Industrial Aeroderivative Gas Turbines



November 24, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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

Re: DEP File No. 1050231-005-AC; Modification of Permit No. PSD-FL-206C
Orange Cogeneration / Polk County

The applicant, Orange Cogeneration Limited Partnership (OCLP), applied on October 25, 1999, to the Department for a modification to air construction permit number PSD-FL-206C for its Orange Cogeneration Facility located in PolkCounty. The request is to allow the facility to install NO_X control equipment on Emission Units 001 and 002, GE LM 6000 DLE units configured for combined cycle operation. The specific equipment requested will allow SPRINT™ and selective water injection to be installed in addition to the Dry Low Emissions equipment. The Department has reviewed the modification request. The referenced permit is hereby modified as follows:

Specific Condition 8 and Table 1 (note e): Each CT shall have a maximum heat input (LHV) of 368.3 MMBtu/hr, which is approximately 389,300 CFH of natural gas, when using dry low NO_X and/or wet injection technologies ~~technology~~ to control NO_X emissions.

Specific Condition 10: Prior to September ~~January~~ 1, ~~2000~~ 2001, the maximum NO_X concentration, 1 hour average, from each CT/HRSG unit shall not exceed 25 parts per million by volume dry corrected to 15 percent oxygen at ISO standard ambient conditions (ppmvd @ 15% O_2 at ISO conditions), as determined by the procedures in Specific Conditions No. 16, 17 and 18.

Specific Condition 11 and Table 1 (note d): After ~~December 31, 1999~~ August 31, 2001, the maximum NO_X concentration, ~~+~~ 24-hour block average, from each CT/HRSG unit shall not exceed 15 ppmvd @ 15% O_2 at ISO conditions as determined by the procedure in Specific Condition Nos. 16, 17 and 18. No further extensions of this permit shall be granted for the purpose of achieving the targeted 15 ppmvd NO_X emissions, with the exception of a reasonable time required to install SCR. 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 NO_X emission standard. The Department may revise the limit based upon the capabilities of alternative equipment installed.

Specific Condition 19: Prior to ~~January 1, 1998~~ September 1, 2000, the permittee shall provide a report showing how the allowable NO_X emissions of 15 ppmvd @ 15% O_2 ISO conditions is achieved by the CTs.

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 filing 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 must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this permit modification was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on _____ to the person(s) listed:

Wade Smith, Orange Cogeneration LP *
Doug Neely, EPA
John Bunyak, NPS
Bill Proses, DEP-SWD
Mr. Gregg Worley, EPA

Clerk Stamp

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

_____ _____
(Clerk) (Date)

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

July 19, 1999

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

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

Re: Orange Cogeneration Facility, ARMS ID No. 1050231
Re-Evaluation of Best Available Control Technology (BACT) for NOx

Dear Mr. Smith:

On June 28, 1999, the Department received your request for a determination on the economic feasibility of installing Selective Catalytic Reduction (SCR) on the existing General Electric LM6000PB gas-fired combined cycle combustion turbines. Based on the information available to the Department, including your letter, the Department has determined that Orange Cogen will need to install SCR on these units. The key factors in making this determination are:

- The units presently operate under and comply with an initial nitrogen oxides (NO_X) permit emission limit of 25 ppmvd @15 percent oxygen.
- The units were to have achieved a Best Available control Technology (BACT) limit of 15 ppmvd by January 1, 1998.
- After December 31, 1999, the maximum NO_X concentration, 1-hour average, from each CT/HSRG 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 NO_X emission standard. The Department may revise the limit based on the capabilities of alternative equipment installed.[1]
- GE had provided reasonable assurance that it would meet the compliance date through its research and development efforts. They now report that the technology barrier will not allow achievement of 15 ppmvd @ 15% oxygen by Dry Low-Emissions (DLE) technology alone.
- NO_X control by XONON™ technology was rejected by Orange Cogen as not commercially available. The Department confirmed that GE and Catalytica have no plans for applying the XONON™ controls to the line of aeroderivative gas turbines. However, plans are under way to evaluate this technology on the larger GE Frame 7EA and 7FA units.
- SCONOx™ technology was rejected by Orange Cogen as not demonstrated for this size gas turbine and having limited commercial availability.
- Replacement of the LM6000PB units with derated LM6000PD units was rejected by Orange Cogen as not economically feasible.

- Economic analyses were presented based on three different levels of NO_X control with SCR: 3.5, 6.0, and 15.0 ppmvd @ 15% oxygen. The estimates ranged from $5,500 to 12,000 per ton removed.

Based on the information provided, the Department does not believe the cost effectiveness for SCR to be prohibitive to the applicant considering that GE "is contractually obligated to correct the engines or implement alternate technology to meet air permit limits of 15 ppmvd.[2]" The Department is also aware that other companies have installed SCR on both simple and combined cycle LM6000 units[3,4,5].

We understand you are obtaining actual bids. We will be happy to discuss with you the minimum requirements for submitting a complete application. An extension of the compliance date can be considered to provide time to install and test a properly designed system.

We received a late E-Mail from GE regarding simulations incorporating Spray Intercooling (SPRINT) technology to accomplish power and emissions improvements. There will be a demonstration in the first half of 2000. The description does not (yet) provide reasonable assurance that SPRINT will actually result in achievement of 15 ppmvd and it would obviously cause at least a further year-long extension of the 25 ppmvd limit.

If you have any additional questions, please contact Al Linero at 850/921-9523 or Jeff Koerner at 850/414-7268.

Sincerely,

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

cc: Gregg Worley, EPA
Don Shepherd, NPS
C. St. Cin, Foster Wheeler Environmental Corporation
R.B. Hook, GE AeroDerivative
D. Oehring – CSWE Operations Orange Cogeneration

References

[1] Permit Condition 11. DEP File No. 1050231-003-AC (PSD-FL-206C). Permit Modification Orange Cogen. December, 1998.

[2] Letter. Hook, R.B., GE to Smith, W., Orange Cogen. GE's Position with respect to Contractual Agreement. June 25, 1999.

[3] Permit. Texas Air Resources Board Permit No. 37984 for Lubbock Power & Light. Two LM6000PC units with a NO_X limit of 9 ppmvd @ 15% oxygen controlled with SCR.

[4] Article. "LP&L Begins the LM6000 Sprint." Power Engineering. November 1998.

[5] Document. Guidance for Power Plant Siting and BACT. California Air Resources Board. June, 1999.

ORANGE COGENERATION

October 22, 1999

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

RE: Orange Cogeneration Limited Partnership
Permit No. PSD-FL-206/1050231-002-AC
Nitrogen Oxides Requirements
Request for Permit Modification

1050231-005-AC
PSD-FL-206(C)

Dear Mr. Fancy:

Thank you for meeting with representatives from Orange Cogeneration Limited Partnership (Orange Cogeneration) and General Electric Corporation (GE) in September regarding possible nitrogen oxides (NOx) controls for the Orange Cogeneration facility in Polk County. We appreciate your openness to consider GE's newest NOx control strategies for the LM6000 series of industrial aeroderivative gas turbines. As promised during our meeting, we have enclosed documentation from GE regarding its current schedule for development of these new inlet water injection technologies (Sprint™ and selective water injection).

As we discussed at our recent meeting, Orange Cogeneration would like to obtain Department approval of these new technologies with a further extension of the compliance deadline for the targeted NOx emission rate of 15 ppm. In addition, Orange Cogeneration respectfully requests that the Department revise the PSD permit to reflect that the 25 ppm limit for NOx is appropriate as Best Available Control Technology (BACT) if these new technologies should fail to achieve 15 ppm (with a margin for compliance and possible degradation over time).

Please accept this letter as Orange Cogeneration's formal request, pursuant to Rule 62-4.080(3) and Rule 62-212.400, FAC., to amend Orange Cogeneration's PSD permit (PSD-FL-206) (as amended on August 25, 1997 and December 18, 1998) to extend the date for compliance with the NOx emission limit of 15 ppm and to provide that the NOx emission limit will be established at 25 ppm in the event the new technology is unable to achieve the lower limit. Enclosed is a check in the amount of $250 made payable to the Department as the fee for this request. The requested permit modifications to the modified permit are as follows:

1125 US Highway 98 South • Suite 100 • Lakeland, Florida 33801
(941) 682-6338 • FAX (941) 683-8257

Under Modified Specific Condition

#8	Add to the list of control technologies to control NO_x emission: "using dry low NO_x or wet injection technologies ~~technology~~ to control NO_x emissions."
#10	Change the compliance date from "Prior to January 1, 1999," to "Prior to September 1, 2001".
#11	Change compliance date to "After August 31, 2001," instead of "After December 31, 1998". Insert a new sentence: "Should the NO_x standard of 15 ppm @ 15% O_2 not be achieved during the initial compliance tests (with a reasonable margin for compliance and degradation over time), the NO_x emission limit for this facility shall be 25 ppm @ 15% O_2."
#15	Change review date from "...review by January 1, 1998." to "...review by September 1, 1999."
Table 1	Change the compliance date in the body of the table and in note (d) to "9/1/01" instead of "1/1/99". Insert a new sentence in note (d) to read: "Should the NO_x standard of 15 ppm @ 15% O_2 not be achieved during the initial compliance tests (with a reasonable margin for compliance and degradation over time), the NO_x emission limit for this facility shall be 25 ppm @ 15% O_2." Also, add wet injection technology to note (e) and to the "Control" column in the table.

As explained in GE's letters to Orange Cogeneration dated October 7, 1999, copies of which are attached, these new water injection technologies being proposed for the Polk County facility offer lower NOx emissions with minimal environmental, energy and economic impacts, especially when compared to a selective catalytic reduction (SCR) system. While these water injection systems rely on a well-demonstrated approach to minimizing NOx emissions by reducing the combustor flame temperature, full-scale implementation is not expected to be available until the third quarter of 2001. Orange Cogeneration believes that it is reasonable to continue to pursue these technologies for its facility in an effort to meet the targeted rate of 15 ppm for NOx and requests that the Department authorize the use of these technologies. Because of the time needed by GE for further testing, development, and full-scale implementation, Orange Cogeneration also respectfully requests that the compliance deadline for achieving the 15 ppm NOx rate be extended from January 1, 2000 to September 1, 2001.

While GE and Orange Cogeneration have made every effort to achieve NOx rates of 15 ppm on the Polk County units using dry low NOx combustion technology (including an expenditure of over $20 million by GE in pursuit of lower NOx rates on LM6000 machines), it appears that

combustion technology alone will be insufficient to achieve rates this low on a long-term basis. We would therefore appreciate your consideration of these water injection technologies as a reasonable alternative to achieve the targeted rate. In support of its request, and in response to some of the issues raised in the Department's July 19, 1999 letter, Orange Cogeneration offers the following.

Implementation of BACT: When the BACT determination was originally made, the Department apparently relied on available information from existing combustion turbines that had demonstrated the achievability of NOx levels in the range of 25 ppm. Relying on vendor guarantees and advances made with other types of combustion turbines such as Frame 7EA's and 7F's (but not LM6000's), the Department's determination found that NOx levels of 15 ppm should be achievable in the future using dry low NOx combustion technology. The permit therefore reflected a NOx limit of 25 ppm that would be reduced to 15 ppm at a point in the future, with both limits to be achieved using dry low NOx combustion technology unless a different technology were approved by the Department. Even though significant advances were made in lowering NOx levels on other types of combustion turbines and despite its best efforts, GE has been unable to reach consistent NOx levels at or below 15 ppm with the LM6000 aeroderivative gas turbines due to a technology barrier. To implement the current BACT, Orange Cogeneration therefore proposes to utilize water injection technology, as described in the attached documentation from GE and as we discussed at our meeting in September. With the information provided, we trust that the Department will have sufficient reasonable assurance that GE's technology will achieve the targeted levels. If additional information is needed, please let us know.

The use of this alternative water injection technology should be considered as implementation of the original BACT determination, consistent with prior actions by the Department. For example, in a similar situation, the Department found low-NOx burner technology to be BACT and established a certain emission rate in the original determination; the Department later authorized an SCR system to be installed as an implementation of the BACT to meet the original limit. That facility's permit specifically stated that the Department's approval of the alternative technology was not subject to PSD review. (PSD-FL-195A, Florida Power Corporation, Condition B.1.i). Similarly, Orange Cogeneration's use of a water injection technology should be considered an implementation of the original BACT and should not trigger a reopening of the determination.

Target Rate of 15 PPM: The Department should revise the permit to reflect that the 25 ppm limit is appropriate as BACT if the water injection system fails to achieve the targeted rate, notwithstanding GE's concerted effort that has a reasonable potential for success. While the target rate of 15 ppm was placed in the permit as part of the BACT determination based on a vendor guarantee (limited to initial operation only), it was not a demonstrated technology at the time. While there have been significant attempts to reduce NOx emissions to achieve levels at or below 15 ppm using dry low NOx combustion technology in recent years, NOx rates at this low level have not been demonstrated on this type of unit using combustion controls alone.
The original BACT determination found that the use of an SCR system to achieve NOx levels of 15 ppm was not justified based on economic and environmental factors, and this holds true today. As indicated in our June 25, 1999 submittal, incremental costs to achieve levels of 15 to 3.5 ppm of NOx using SCR are currently in the range of $5,562 to $11,971 per ton removed, which are not reasonable or cost-effective based on previous Department determinations. While the Department stated in its July 19, 1999 letter that the costs *were* reasonable because GE was contractually liable for a portion of the SCR costs, the costs are nevertheless being incurred by someone and neither the Department's rules nor federal guidance provides that costs paid or assumed by a third party are to be disregarded in a BACT analysis. The contractual arrangement between GE and Orange Cogeneration is not relevant for consideration in the cost analysis--the incremental cost-benefit analysis appropriately considers the full costs of an SCR system regardless of who may pay for the system, its components, or its operation. Even considering GE's contractual obligations, however, a significant portion of the costs including ammonia supply, certain capital costs (e.g., related to catalyst sizing), catalyst maintenance and replacement, and other continuing operating and maintenance costs will be incurred by Orange Cogeneration for the life of the project. Orange Cogeneration therefore requests that the Department revise the permit to reflect that the BACT limit is appropriately 25 ppm if the water injection technologies fail to achieve the targeted rate of 15 ppm.

Reopening of BACT: There is no basis at this time for the Department to reopen the original BACT determination to lower the NOx emission rate below 15 ppm. While a 1985 draft EPA guidance document provides that BACT should be reconsidered when a facility requests an extension of the 18-month period within which to commence construction, the extensions requested by Orange Cogeneration have been compliance-related and not tied to construction. Once a unit has been constructed, as the Orange Cogeneration facility has, federal guidance provides that BACT should be reopened only where a modification is triggered or a significant revision causing an increase in emissions is being requested. Because Orange Cogeneration has

not triggered a modification and is not proposing a change in operations that would increase emissions, it is inappropriate to reopen the BACT determination or consider imposing a lower emission rate.

In summary, Orange Cogeneration formally requests that the Department amend PSD FL-206 to authorize the use of water injection technology to meet the targeted NOx level of 15 ppm (assuming an appropriate margin for compliance and degradation over time) by September 1, 2001, and that the Department also revise the permit to reflect that the appropriate BACT limit for NOx is 25 ppm if, despite best efforts, the facility is unable to achieve the targeted lower NOx

levels using water injection technology in conjunction with the existing dry low emissions controls. The requested revised language of the PSD permit is set forth above.

Orange Cogeneration appreciates your consideration of this request to revise the PSD permit. We also request a meeting at your earliest convenience to further discuss this matter in greater detail. If you have any questions in the meantime, please call me at (941) 682-6338.

Sincerely,

ORANGE COGENERATION LIMITED PARTNERSHIP
By: Orange Cogeneration GP, Inc., its General Partner

Wade Smith
General Manager

Enclosure

cc: Al Linero, DEP BAR
Bill Proses, DEP SWD
Gregg Worley, EPA
Ellen Porter, NPS
R. B. Hook, GE Aeroderivative
D. Oehring, CSWE Operations Orange Cogeneration

ORANGE COGENERATION, LP

1341

Database Report 1341

Vendor Acct:

FLORIDA DEP OL	Florida DEP		00000000000000880	10/22/99
Voucher Number	Invoice Number	Inv. Date	Outstanding Amt.	Net Paid Amount
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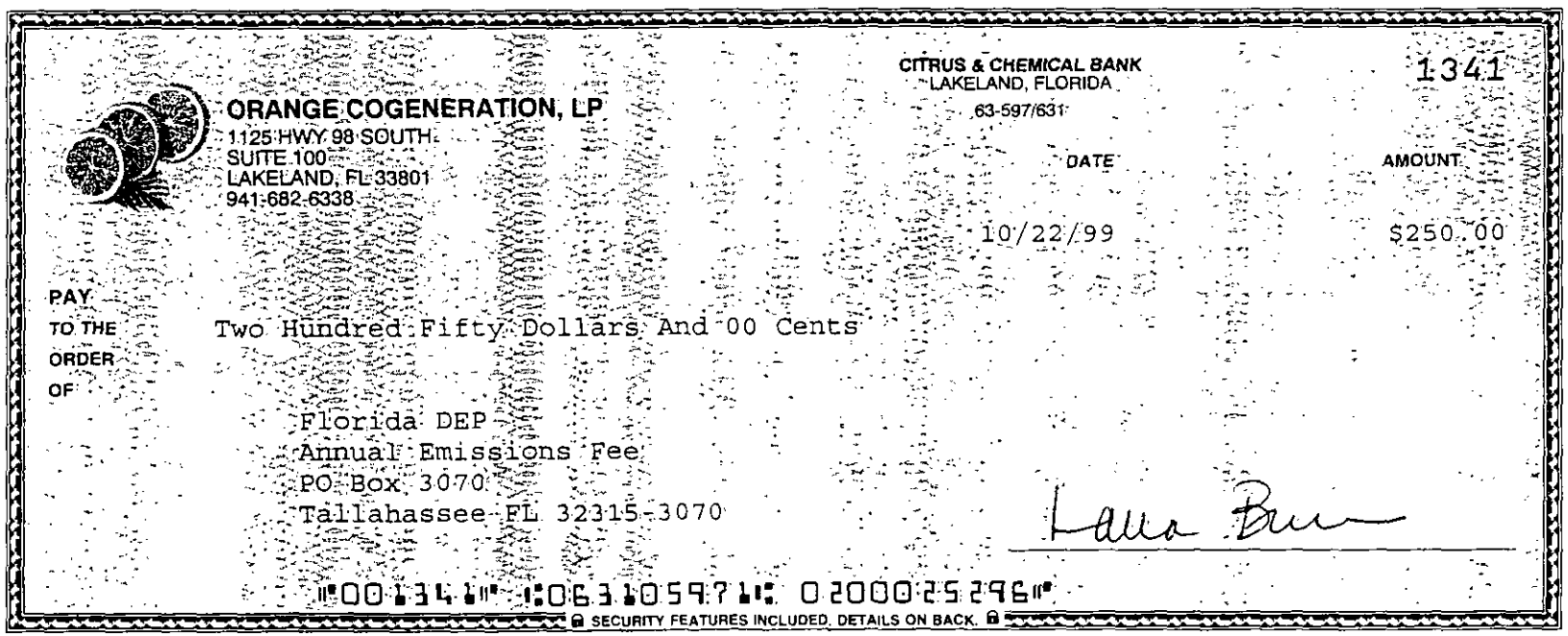
$250.00 $250.00



ORANGE COGENERATION, LP
1125 HWY 98 SOUTH
SUITE 100
LAKELAND, FL 33801
941-682-6338

CITRUS & CHEMICAL BANK
LAKELAND, FLORIDA
63-597/631

1341

DATE 10/22/99

AMOUNT $250.00

PAY TO THE ORDER OF Two Hundred Fifty Dollars And 00 Cents

Florida DEP
Annual Emissions Fee
PO Box 3070
Tallahassee FL 32315-3070

⑈001341⑈ ⑆063105971⑆ 02000252 96⑈

SECURITY FEATURES INCLUDED, DETAILS ON BACK.