Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

March 11, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

W. Jeffrey Pardue, Director
Environmental Services Department
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

Re: DEP File Nos. AC53-214903 and PSD-FL-190(D)
Tiger Bay Power Plant - 270 MW Cogen Unit
Increased Steam Electrical Power Generation

Dear Mr. Pardue:

Enclosed is one copy of the Draft Air Construction Permit Modification to increase steam electrical power generation at the cogeneration facility located near Ft. Meade, Polk County. 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 modification.

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 Mrs. Teresa Heron or Mr. Linero at 850/488-1344.

Sincerely,

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

CHF/aal/th

Enclosures

In the Matter of an
Application for Permit Modification by:

Mr. W. Jeffrey Pardue, CEP, Director
Environmental Services Department
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

Facility ID. No. 1050223
AC-53-214903/PSD-FL-190(D)
Tiger Bay Cogen Facility
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 project, as detailed in the application specified above, for the reasons stated below.

The applicant, Florida Power Corporation, applied on February 16, 1998 to the Department for an air construction permit modification for its Tiger Bay Cogen Combined Cycle Unit located five miles west of Ft. Meade, Polk County. The requested permit modification is to increase electrical power generation from the steam turbine from 74 to 86 megawatts (MW) and from the entire unit from 258 to 270 MW.

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 actions are not exempt from permitting procedures. The Department has determined that an air construction permit modification is required to operate the facility as described.

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 62-103.150, 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 within 30 (thirty) days in the legal advertisement section of a newspaper of general circulation in the area affected. 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. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. 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: 850/488-1344; Fax 850/ 922-6979) 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 modification pursuant to Rule 62-103.150 (6), F.A.C.

The Department will issue the FINAL Permit Modification, in accordance with the conditions of the enclosed DRAFT Permit Modification 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 DRAFT Permit Modification issuance action for a period of 30 (thirty) 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, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit Modification, the Department shall issue a Revised DRAFT Permit Modification 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. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9730, fax: 850/487-4938. Petitions 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. A petitioner must 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 28-5.207 of the Florida Administrative Code.

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

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 of intent. 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 3-16-98 to the person(s) listed:

Mr. W. Jeffrey Pardue, FPC*
Mr. Brian Beals, EPA Region 4
Mr. John Bunyak, NPS
Mr. Bill Thomas, SWD
Mr. Joe King, Polk County

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Kyni Faber (Clerk) 3-16-98 (Date)

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT MODIFICATION

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File Nos. AC 53-214903 and PSD-Fl-190(D)

Florida Power Corporation
Tiger Bay Power Plant - 270 MW Cogen Unit
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit modification to Florida Power Corporation (FPC) to increase steam electrical power generation from 74 to 86 megawatts (MW) and total electrical power generation from 258 to 270 MW at its cogeneration facility located five miles west of Fort Meade, Polk County. A Best Available Control Technology (BACT) determination was not required pursuant to Rules 62-212.400 and 410, F.A.C., or 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Power Corporation, 3201 34th Street South, St. Petersburg, Florida 33733.

Originally the combined cycle unit was permitted to produce 258 MW of electricity (184MW combustion turbine and 74 MW steam turbine). The steam turbine was operationally limited by the previous owner, DESTEC, to 74 MW so the construction and operation of the plant were not subject to the Power Plant Site Certification (PPSA) requirements. The new owner, FPC, has submitted the project for a separate review under the PPSA.

According to the FPC and DESTEC, the steam electrical generation portion of the unit can produce more steam than necessary to generate 74 MW. Excess steam, beyond the amount required to produce 74 MW, was either wasted or provided to sold to other users. Excess steam will, instead, be used to produce additional electricity.

According to the applicant, there will be no additional fuel or water consumption and no emissions increases resulting from the change. The unit will continue to comply with the previous PSD permit conditions and BACT determination. The unit burns natural gas, an inherently clean fuel. Nitrogen oxides are to be controlled by either Dry Low NOx combustion or selective catalytic reduction.

The Department will issue the FINAL Permit Modification, in accordance with the conditions of the DRAFT Permit Modification 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 DRAFT Permit Modification issuance action for a period of 30 (thirty) days from the date of publication of this Notice. Written comments should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit Modification, the Department shall issue a Revised DRAFT Permit Modification and require, if applicable, another Public Notice.

The Department will issue FINAL Permit Modification with the conditions of the DRAFT Permit Modification unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 850/487-4938. Petitions 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. A petitioner must 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 28-5.207 of the Florida Administrative Code.

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

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 of intent. 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
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 850/744-6100
Fax: 850/744-6084

Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida, 32301
Telephone: 850/488-1344
Fax: 850/922-6979

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 Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-1344, for additional information.

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April XX, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

W. Jeffrey Pardue, Director
Environmental Services Department
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

Re: DEP File No. AC53-214903/PSD-FL-190(D)
Tiger Bay Power Plant - 270 MW Cogen Unit

Dear Mr. Pardue:

The Department has reviewed your February 16, 1998 letter requesting modification of construction permit No. AC-53-214903 (PSD-FL-190) to increase power generation from the above mentioned combined cycle combustion unit from 258 to 270 MW. The original operator, DESTEC, limited electrical generation from the steam turbine to 74 MW, so the construction and operation of the plant were not subject to the Power Plant Certification (PPSA) requirements.

It is our understanding from FPC and DESTEC that the unit is capable of producing and has produced more steam than necessary to generate 74 MW and that the excess steam was either wasted or sold to other users. Therefore, the diversion of the excess steam to additional electrical production will not result in increased fuel or water consumption or increased emissions.

This request is acceptable. No changes to the permit are required except that all references to this permit, BACT determination and related permitting documents are hereby revised as follows:

FROM:

258 MW Combined Cycle System: 184 MW combustion turbine and 74 MW steam generator unit

TO:

270 MW Combined Cycle System: 184 MW combustion turbine and 86 MW steam generator unit

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 the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of

DRAFT

the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT MODIFICATION (including the FINAL 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:

Mr. W. Jeffrey Pardue, FPC*
Mr. Dario Zuloaga, P.E., FPC
Mr. Brian Beals, EPA Region 4
Mr. John Bunyak, NPS
Mr. Buck Oven, DEP
Mr. Bill Thomas, SWD
Mr. Joe King, Polk County

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)

Florida Power
CORPORATION

RECEIVED
FEB 18 1998
BUREAU OF
AIR REGULATION

February 16, 1998

Mr. Al Linero, P.E.
Administrator, New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

Dear Mr. Linero:

Re: Tiger Bay Cogen Facility

As you know, the Tiger Bay Cogeneration Facility was purchased by Florida Power Corporation (FPC) from DESTEC in 1997. FPC is in the process of obtaining a site certification for an additional 10.5 megawatts (MW) of steam electric capacity. This reflects the actual steam capacity of the unit, which is a nominal 85.5 MW.

This change necessitates a corresponding amendment language contained in the BACT determination in order to reflect the unit's actual capacity. References to the steam turbine capacity in the final BACT determination should be changed to reflect the nominal 85.5 MW capacity. The combustion turbine has a nominal capacity of 184 MW, which combined with the nominal 85.5 MW capacity of the steam turbine, results in a total plant capacity of 269.5 MW. Attachment 1 contains a P.E.-certified certification of the capacity of the steam turbine. A check in the amount of $250 is enclosed for the processing of this amendment.

Thank you for your processing of this request. Please contact Mr. Mike Kennedy at (813) 866-4344 if you have any questions or comments.

Sincerely,

cc: J. Heron, BAR

W. Jeffrey Pardue, C.E.P.
Director

Attachments

Florida Power
CORPORATION

INTEROFFICE CORRESPONDENCE

Performance Services	MAC	231-5292
OFFICE	MAC	TELEPHONE

SUBJECT: Tiger Bay Steam Turbine Capabilities

TO: Michael J. Kennedy

DATE: November 20, 1997

Performance Services has reviewed the design specifications for the steam turbine at Tiger Bay and concluded that the steam turbine is capable of operating continuously at 105 percent of initial pressure (1537.5 psia) with control valves wide open. We expect to generate 87.4 gross megawatts at the following steam inlet conditions:

- steam flow of 549,675 lbs/hr
- Throttle steam pressure of 1537.5 psia
- Throttle steam temperature of 1000 deg F
- Exhausting to 1.62 psia

If you have any further questions concerning Tiger Bay, please call me at Ext. 231-5292.

Dario Zuloaga

Dario B. Zuloaga, P.E.
License # 0032729 (FL)
Lead Principal Engineer
Performance Services

cc: Bob Anderson

Department of Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

December 15, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. W. Jeffrey Pardue, Director
Environmental Services Department
Florida Power Corporation
3201 34th Street South
St. Petersburg, FL 33733

Re: DEP File No. PSD-FL-190(D)
Tiger Bay Power Plant - 270 MW Combined Cycle Plant

Dear Mr. Pardue:

The Department has reviewed your February 16, 1998 letter requesting modification of construction permit No. PSD-FL-190 to increase power generation from the above mentioned combined cycle combustion unit from 258 to 270 MW. The original operator, DESTEC, limited electrical generation from the steam turbine to 74 MW, so the construction and operation of the plant were not subject to the Power Plant Certification (PPSA) requirements.

It is our understanding from FPC and DESTEC that the unit is capable of producing and has produced more steam than necessary to generate 74 MW and that the excess steam was either wasted or sold to other users. Therefore, the diversion of the excess steam to additional electrical production rather than cogeneration will not result in increased fuel or water consumption or increased emissions. Additionally, the site was certified by the Siting Board in June, 1998.

Your request is acceptable. No changes to the PSD permit are required except that all references to electrical generating capacity in the PSD permit, BACT determination, and related permitting documents are hereby revised as follows:

~~258~~ 270 MW Combined Cycle System: 184 MW combustion turbine and ~~74~~ 86 MW steam generator unit

A copy of this letter shall be filed with the referenced PSD permit and shall become part of the PSD 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 the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Sincerely,

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this FINAL PSD PERMIT MODIFICATION was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 12-17-98 to the person(s) listed:

W. Jeffrey Pardue, FPC*
Dario Zuloaga, P.E., FPC
Gregg Worley, EPA Region 4
John Bunyak, NPS
Bill Thomas, SWD
Joe King, Polk County
Buck Oven, DEP

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 12-17-98
Date

FINAL DETERMINATION

FLORIDA POWER CORPORATION
TIGER BAY FACILITY
PERMIT No. PSD-FL-190(D)
Polk County

An Intent to Issue an Air Construction Permit Modification to Florida Power Corporation (FPC) was distributed on March 16, 1998. This permit amendment was to increase steam electrical power generation from 74 to 86 megawatts (MW) at its 270 megawatt cogeneration facility located five miles west of Fort Meade, Polk County. The Public Notice of Intent to Issue Air Construction Permit was published in The Ledger, Lakeland, Polk County, Florida on March 26,1998.

No comments were submitted during the public notice period. The final action of the Department will be to issue the permit modification as noticed.

Florida Department of
Memorandum Environmental Protection

TO: Howard Rhodes

THRU: Clair Fancy

FROM: A. A. Linero 12/16

DATE: December 15, 1998

SUBJECT: FPC/ Tiger Bay Power Plant
Modification of Permit
AIRS No. AC53-214903/PSD-FL-190(D)

Attached is the final permit modification allowing an increase of the steam electrical power generating capacity of this plant from 74 to 86 MW and the total electrical power generating capacity from 258 MW to 270 MW at the FPC Tiger Bay Power Plant.

Originally the steam turbine portion of the unit was operationally limited by its previous owner (DESTEC) to 74 MW, so the construction and operation of the plant were not subject to the Power Plant Site Certification (PPSA) requirements. According to FPC (who bought the plant from DESTEC), the steam portion generates steam beyond the amount required to produce 74 MW of electricity. Excess steam was generated and wasted or sold to customers such as IMC Agrico. Now the excess steam will also make electricity.

A final certification order has been issued and we may proceed with issuance of the PSD permit modifications

I recommend your approval and signature

AAL/th

Attachments

Florida Power
CORPORATION

April 3, 1998

Mr. A. A. Linero, P.E.
Florida Department of
Environmental Protection
New Source Review Section
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Permit Nos. PSD-FL-190 (D) / AC53-214903
Tiger Bay Facility
Increased Steam Electrical Power Generation

Dear Mr. Linero:

Enclosed is the newspaper affidavit of publication for the permit amendment referenced above. The Public Notice of Intent was published in the Lakeland Ledger in Polk County on March 26, 1998.

If you have any questions, please feel free to give me a call at (813) 866-5022 or Mr. J. Michael Kennedy at (813) 866-4344.

Sincerely,

Jennifer L. Tillman

Jennifer L. Tillman, P.E.

Enclosure

cc: J. Heron

Florida Department of
Environmental Protection

Memorandum

TO: Clair Fancy, Mike Hickey, Geofrey Mansfield, David Bickner, Robert Elias, James Antista, Andrew Grayson, Earl Peterson, Brian Sodt, Mary Miller, George Perry, Pepe Menendez, Richard Tschantz, Mark Carpanini

FROM: Steve Palmer
Siting Coordination Office

DATE: October 6, 1997

SUBJECT: FPC Tiger Bay Electrical Power Plant Site Certification Application
PA 97-37; Module 8047

The Department and affected agencies have reviewed the Florida Power Corporation Site Certification Application for the Tiger Bay Electrical Power Plant and have found the application to be sufficient in accordance with 403.5067 F.S. A copy of the Staff Analysis report and Conditions of Certification are enclosed. Notice of the February 18, 1998 hearing date has been published.

If you have any questions, please call me at 850/487-0472.

Attachment --

Florida Power
CORPORATION

November 25, 1997

Mr. Steven L. Palmer, P.E.
Siting Coordination Office
Florida Department of Environmental Protection
2720 Blair Stone Rd.
Tallahassee, FL 32399

RE: Florida Power Corporation
Tiger Bay Facility Power Plant Site Certification Application
Response to Sufficiency Questions/Comments

Dear Mr. Palmer:

Florida Power Corporation (FPC) has received the sufficiency questions from Mr. Al Linero of the DEP's New Source Review Section regarding the application referenced above. In response the following comments are provided.

Questions 1 through 5.

All five comments/questions center on the issue of the proposed increase in permitted steam capacity. For purposes of the original construction permit and the Title V permit application, then-owner Destec imposed an operational limitation of 74 megawatts (MW) of steam capacity. Therefore, Destec represented 74 MW as the capacity of the steam generator. By accepting this limit, Destec avoided the site certification process.

As given in FPC's site certification application, the actual capacity of the steam generator is approximately 12 MW higher, or a nominal 85.5 MW (under certain conditions, the capacity of the unit is as high as 87.4 MW, as shown later in this letter). Since FPC proposes to operate the unit at that level, a site certification is required because the turbine will be operated at greater than the threshold level of 75 MW. As a result, the total capacity of the 184 MW combustion turbine and the 85.5 MW steam generator is actually a nominal 269.5 MW, or more conveniently, 270 MW. Mr. Linero is correct in that the PSD permit and Title V permit application should be revised to reflect this change. FPC will submit a request to make these changes in the near future.

Questions 6 and 7.

These questions regard the current fate of the excess steam and whether use of the excess steam in the future will result in greater air pollutant emissions. In order to maintain steam turbine operation below 75 MW, excess steam is currently sent to a steam host, which is U.S. Agri-Chemicals, or in the absence of need it is vented to the ambient air. The combustion turbine normally operates at its full load capacity, but not all of the steam produced by the heat recovery system is routed through the steam turbine.

Since the excess steam is already being generated, use of the steam to produce an additional 10 to 12 MW of electricity will not result in additional fuel consumption or air pollutant emissions. In fact, FPC's customers will receive the benefit of additional electricity at no additional cost and with no incremental impact to the environment.

Question 8.

Mr. Dario Zuloaga, P.E., of FPC's Performance Services department has completed a review of the design specifications for the Tiger Bay steam turbine. I have attached Mr. Zuloaga's conclusions regarding the capacity of this turbine. Mr. Zuloaga's evaluation resulted in an anticipated maximum capacity of 87.4 MW, which is approximately 12.5 MW higher than the current limitation. This is consistent with FPC's application for a nominal 10 to 12 MW of additional steam capacity.

Please contact Mr. Mike Kennedy at (813) 866-4344 or Ms. Jennifer Tillman at (813) 866-5022 if you have any further questions regarding the application.

Sincerely,

W. Jeffrey Pardue, C.E.P.
Director

Enclosure

cc: Mr. Al Linero, DEP

CC: T. Heron
S. Sheplak
B. Mitchell

Florida Power
CORPORATION

INTEROFFICE CORRESPONDENCE

Performance Services	MAC	231-5292
OFFICE	MAC	TELEPHONE

SUBJECT: **Tiger Bay Steam Turbine Capabilities**

TO: **Michael J. Kennedy** DATE: **November 20, 1997**

Performance Services has reviewed the design specifications for the steam turbine at Tiger Bay and concluded that the steam turbine is capable of operating continuously at 105 percent of initial pressure (1537.5 psia) with control valves wide open. We expect to generate 87.4 gross megawatts at the following steam inlet conditions:

- steam flow of 549,675 lbs/hr
- Throttle steam pressure of 1537.5 psia
- Throttle steam temperature of 1000 deg F
- Exhausting to 1.62 psia

If you have any further questions concerning Tiger Bay, please call me at Ext. 231-5292.

Dario Zuloaga

Dario B. Zuloaga, P.E.
License # 0032729 (FL)
Lead Principal Engineer
Performance Services

cc: Bob Anderson

Memorandum

Florida Department of
Environmental Protection

TO: Steve Palmer

FROM: A. A. Linero 10/27

DATE: October 27, 1997

SUBJECT: FPC Tiger Bay Sufficiency Review

The New Source Review Section has reviewed the FPC/Tiger Bay Site Certification Application and has the following comments and questions:

1. According to our files, previous information provided through Destec's professional engineer of record in pursuit of the PSD permit clearly indicates that the rating of the steam generator is 74 megawatts (MW).
2. The PSD permit refers to a 258 MW combined cycle unit. In the conditions, it refers to the 184 MW combustion turbine. This is consistent with a 74 MW steam generator.
3. According to the letter dated December 21, 1992 from the Department's Siting Office to Destec, information provided by Destec is "sufficient to demonstrate that the steam cycle portion of the proposed Tiger Bay cogeneration project is less than 75 MW and is therefore exempt from the provisions of the Florida Electrical Power Plant Siting Act."
4. The Title V application submitted by Destec describes a 184 MW (nominal) combustion turbine and a separate nominal 74 MW generator.
5. Will the electrical generating capacity of the combined cycle continue to be 258 MW? If it is increased, the PSD permit and Title V application should be revised.
6. Please explain more clearly how the "excess steam" was wasted. Was the steam sent to a steam host? At what MW rate does the combustion turbine presently operate when the heat recovery steam generator produces as much steam as required to generate 74 MW from the steam turbine/generator?
7. Will the change in operation result in actual emission increases and actual fuel consumption compared with the established historical emissions and fuel consumption? If not, how will such increases be avoided?
8. A sealed evaluation of the capacity of the unit should be submitted by a professional engineer experienced in mechanical and electrical aspects of these types of units or by the manufacturer.

Florida Department of
Environmental Protection

Memorandum

TO: Clair Fancy (4)
Mike Hickey (4)
Geofrey Mansfield (3)
David Bickner (1)

FROM: Steve Palmer
Siting Coordination Office

DATE: October 6, 1997

SUBJECT: FPC Tiger Bay Electrical Power Plant Site Certification Application
PA 97-37; Module 8047

Attached is a copy of the FPC Tiger Bay SCA. This is an existing combustion turbine facility with heat recovery steam generation capability that has recently been purchased by FPC. The previous owners only produced 74.9 MW of steam electric power to avoid having to engage the siting process. Excess steam was wasted to maintain this level of production. FPC proposes to use all the available steam to produce electricity.

Because this facility is already permitted and no addition fuel consumption or site modifications are proposed, we are setting an accelerated review schedule. Please review this application for sufficiency and return your comments to me by November 5, 1997. If sufficiency questions can be timely resolved, reports will be due to the Siting Office on November 19,1997.

Attachment --

Florida Power
CORPORATION

September 15, 1997

Mr. Hamilton S. Oven
Siting Coordination Administrator
Florida Department of Environmental Protection
2720 Blair Stone Rd.
Tallahassee, FL 32399

RE: Florida Power Corporation
Tiger Bay Facility Power Plant Site Certification Application

Dear Mr. Oven:

Florida Power Corporation (FPC) is applying for a site certification under the Florida Power Plant Siting Act (PPSA) for its Tiger Bay facility. Although Tiger Bay is an existing facility, the application is necessary in order for FPC to use the approximately 10 to 15 MW of additional steam capacity available. Because of the very minor increase in capacity, and the fact that no additional impacts to the environment will occur from the use of this capacity, FPC requests an expedited review as previously discussed.

Enclosed are fourteen copies of the application and a check in the amount of $75,000. Please contact Mr. Mike Kennedy at (813) 866-4344 or Ms. Jennifer Tillman at (813) 866-5022 if you have any questions regarding this submittal.

Sincerely,

W. Jeffrey Pardue, C.E.P.
Director

Enclosure

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

March 11, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

W. Jeffrey Pardue, Director
Environmental Services Department
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

Re: DEP File Nos. AC53-214903 and PSD-FL-190(D)
Tiger Bay Power Plant - 270 MW Cogen Unit
Increased Steam Electrical Power Generation

Dear Mr. Pardue:

Enclosed is one copy of the Draft Air Construction Permit Modification to increase steam electrical power generation at the cogeneration facility located near Ft. Meade, Polk County. 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 modification.

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 Mrs. Teresa Heron or Mr. Linero at 850/488-1344.

Sincerely,

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

CHF/aal/th

Enclosures

In the Matter of an
Application for Permit Modification by:

Mr. W. Jeffrey Pardue, CEP, Director
Environmental Services Department
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

Facility ID. No. 1050223
AC-53-214903/PSD-FL-190(D)
Tiger Bay Cogen Facility
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 project, as detailed in the application specified above, for the reasons stated below.

The applicant, Florida Power Corporation, applied on February 16, 1998 to the Department for an air construction permit modification for its Tiger Bay Cogen Combined Cycle Unit located five miles west of Ft. Meade, Polk County. The requested permit modification is to increase electrical power generation from the steam turbine from 74 to 86 megawatts (MW) and from the entire unit from 258 to 270 MW.

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 actions are not exempt from permitting procedures. The Department has determined that an air construction permit modification is required to operate the facility as described.

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 62-103.150, 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 within 30 (thirty) days in the legal advertisement section of a newspaper of general circulation in the area affected. 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. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. 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: 850/488-1344; Fax 850/ 922-6979) 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 modification pursuant to Rule 62-103.150 (6), F.A.C.

The Department will issue the FINAL Permit Modification, in accordance with the conditions of the enclosed DRAFT Permit Modification 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 DRAFT Permit Modification issuance action for a period of 30 (thirty) 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, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit Modification, the Department shall issue a Revised DRAFT Permit Modification 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. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9730, fax: 850/487-4938. Petitions 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. A petitioner must 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 28-5.207 of the Florida Administrative Code.

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

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 of intent. 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 3-16-98 to the person(s) listed:

Mr. W. Jeffrey Pardue, FPC*
Mr. Brian Beals, EPA Region 4
Mr. John Bunyak, NPS
Mr. Bill Thomas, SWD
Mr. Joe King, Polk County

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Kyri Jaber 3-16-98
(Clerk) (Date)

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT MODIFICATION

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File Nos. AC 53-214903 and PSD-Fl-190(D)

Florida Power Corporation
Tiger Bay Power Plant - 270 MW Cogen Unit
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit modification to Florida Power Corporation (FPC) to increase steam electrical power generation from 74 to 86 megawatts (MW) and total electrical power generation from 258 to 270 MW at its cogeneration facility located five miles west of Fort Meade, Polk County. A Best Available Control Technology (BACT) determination was not required pursuant to Rules 62-212.400 and 410, F.A.C., or 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Power Corporation, 3201 34th Street South, St. Petersburg, Florida 33733.

Originally the combined cycle unit was permitted to produce 258 MW of electricity (184MW combustion turbine and 74 MW steam turbine). The steam turbine was operationally limited by the previous owner, DESTEC, to 74 MW so the construction and operation of the plant were not subject to the Power Plant Site Certification (PPSA) requirements. The new owner, FPC, has submitted the project for a separate review under the PPSA.

According to the FPC and DESTEC, the steam electrical generation portion of the unit can produce more steam than necessary to generate 74 MW. Excess steam, beyond the amount required to produce 74 MW, was either wasted or provided to sold to other users. Excess steam will, instead, be used to produce additional electricity.

According to the applicant, there will be no additional fuel or water consumption and no emissions increases resulting from the change. The unit will continue to comply with the previous PSD permit conditions and BACT determination. The unit burns natural gas, an inherently clean fuel. Nitrogen oxides are to be controlled by either Dry Low NOx combustion or selective catalytic reduction.

The Department will issue the FINAL Permit Modification, in accordance with the conditions of the DRAFT Permit Modification 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 DRAFT Permit Modification issuance action for a period of 30 (thirty) days from the date of publication of this Notice. Written comments should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit Modification, the Department shall issue a Revised DRAFT Permit Modification and require, if applicable, another Public Notice.

The Department will issue FINAL Permit Modification with the conditions of the DRAFT Permit Modification unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and 120.57 F.S. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 850/487-4938. Petitions 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. A petitioner must 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 28-5.207 of the Florida Administrative Code.

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

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 of intent. 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
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 850/744-6100
Fax: 850/744-6084

Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida, 32301
Telephone: 850/488-1344
Fax: 850/922-6979

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 Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-1344, for additional information.

DRAFT

April XX, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

W. Jeffrey Pardue, Director
Environmental Services Department
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

Re: DEP File No. AC53-214903/PSD-FL-190(D)
Tiger Bay Power Plant - 270 MW Cogen Unit

Dear Mr. Pardue:

The Department has reviewed your February 16, 1998 letter requesting modification of construction permit No. AC-53-214903 (PSD-FL-190) to increase power generation from the above mentioned combined cycle combustion unit from 258 to 270 MW. The original operator, DESTEC, limited electrical generation from the steam turbine to 74 MW, so the construction and operation of the plant were not subject to the Power Plant Certification (PPSA) requirements.

It is our understanding from FPC and DESTEC that the unit is capable of producing and has produced more steam than necessary to generate 74 MW and that the excess steam was either wasted or sold to other users. Therefore, the diversion of the excess steam to additional electrical production will not result in increased fuel or water consumption or increased emissions.

This request is acceptable. No changes to the permit are required except that all references to this permit, BACT determination and related permitting documents are hereby revised as follows:

FROM:

258 MW Combined Cycle System: 184 MW combustion turbine and 74 MW steam generator unit

TO:

270 MW Combined Cycle System: 184 MW combustion turbine and 86 MW steam generator unit

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 the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of

DRAFT

the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT MODIFICATION (including the FINAL 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:

Mr. W. Jeffrey Pardue, FPC*
Mr. Dario Zuloaga, P.E., FPC
Mr. Brian Beals, EPA Region 4
Mr. John Bunyak, NPS
Mr. Buck Oven, DEP
Mr. Bill Thomas, SWD
Mr. Joe King, Polk County

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)

Florida Power
CORPORATION

RECEIVED
FEB 18 1998
BUREAU OF
AIR REGULATION

February 16, 1998

Mr. Al Linero, P.E.
Administrator, New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

Dear Mr. Linero:

Re: Tiger Bay Cogen Facility

As you know, the Tiger Bay Cogeneration Facility was purchased by Florida Power Corporation (FPC) from DESTEC in 1997. FPC is in the process of obtaining a site certification for an additional 10.5 megawatts (MW) of steam electric capacity. This reflects the actual steam capacity of the unit, which is a nominal 85.5 MW.

This change necessitates a corresponding amendment language contained in the BACT determination in order to reflect the unit's actual capacity. References to the steam turbine capacity in the final BACT determination should be changed to reflect the nominal 85.5 MW capacity. The combustion turbine has a nominal capacity of 184 MW, which combined with the nominal 85.5 MW capacity of the steam turbine, results in a total plant capacity of 269.5 MW. Attachment 1 contains a P.E.-certified certification of the capacity of the steam turbine. A check in the amount of $250 is enclosed for the processing of this amendment.

Thank you for your processing of this request. Please contact Mr. Mike Kennedy at (813) 866-4344 if you have any questions or comments.

Sincerely,

cc: J. Heron, BAR

W. Jeffrey Pardue, C.E.P.
Director

Attachments

Florida Power
CORPORATION

INTEROFFICE CORRESPONDENCE

Performance Services	MAC	231-5292
OFFICE	MAC	TELEPHONE

SUBJECT: Tiger Bay Steam Turbine Capabilities

TO: Michael J. Kennedy

DATE: November 20, 1997

Performance Services has reviewed the design specifications for the steam turbine at Tiger Bay and concluded that the steam turbine is capable of operating continuously at 105 percent of initial pressure (1537.5 psia) with control valves wide open. We expect to generate 87.4 gross megawatts at the following steam inlet conditions:

- steam flow of 549,675 lbs/hr
- Throttle steam pressure of 1537.5 psia
- Throttle steam temperature of 1000 deg F
- Exhausting to 1.62 psia

If you have any further questions concerning Tiger Bay, please call me at Ext. 231-5292.

Dario Zuloaga

Dario B. Zuloaga, P.E.
License # 0032729 (FL)
Lead Principal Engineer
Performance Services

cc: Bob Anderson

Memorandum

Florida Department of
Environmental Protection

TO: Clair Fancy

THRU: Al Linero 3/11

FROM: Teresa Heron

DATE: March 11, 1998

SUBJECT: FPC/Tiger Bay Combined Cycle Power Plant
Modification of Permit AC 53-214903/PSD-FL-190(D)

Attached is a draft permit amendment increasing the steam electrical power generating capacity of this plant from 74 to 86 MW and the total electrical power generating capacity from 258 MW to 270 MW.

Originally the steam turbine portion of the unit was operationally limited by its previous owner (DESTEC) to 74 MW, so the construction and operation of the plant were not subject to the Power Plant Site Certification (PPSA) requirements. According to the company, the steam portion generates steam beyond the amount required to produce 74 MW of electricity. Excess steam was generated and wasted or sold to customers such as IMC Agrico. Now the excess steam will also make electricity.

FPC claims that there will not be emissions due to making additional electricity from the excess steam. FPC provided an engineer's assessment of the physical capability of the unit. It is consistent with the requested permit change.

I recommend your approval and signature

AAL/th

Attachment

3/13 AL, TERESA —
BUCK SAYS NOT TO ISSUE FINAL
UNTIL AFTER CERTIFICATION IS FINAL
NEED TO SEND BUCK A COPY OF THIS
Clair

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:
W. Jeffrey Pardue, Director
Florida Power Corp.
3201 34th St. South
St. Petersburg, Fl
33733

4a. Article Number
P 265 659 313

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

7. Date of Delivery
MAR 18 1998

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 Domestic Return Receipt

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

P 265 659 313

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

Sent to Jeffrey Pardue	
Street & Number PO Box	
Post Office, State, & ZIP Code St. Pete, 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 POO-Fl-190(o) 3-16-98	

PS Form **3800**, April 1995

BEST AVAILABLE COPY

AFFIDAVIT OF PUBLICATION

THE LEDGER

Lakeland, Polk County, Florida

RECEIVED
APR 25 1996
BUREAU OF AIR REGULATION

Case No ....

STATE OF FLORIDA)
COUNTY OF POLK)

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

Notice of Intent

in the matter of

Issue Permit Amendment Airs ID 1050223-001-AC

in the ....

Court, was published in said newspaper in the issues of

February 23;

1996

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

Signed [signature]
Nelson Kirkland
Classified Advertising Manager

by Nelson Kirkland who is personally known to me

Sworn to and subscribed before me this 23rd

day of February A.D. 19 96

(Seal) [signature: Barbara L. Dunlap]
Notary Public

My Commission Expires ....

Order #
552237

BARBARA L. DUNLAP
MY COMMISSION # CC 505559
EXPIRES: October 26, 1999
Bonded Thru Notary Public Underwriters

F 827

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF INTENT TO ISSUE PERMIT AMENDMENT
AIRS ID 1050223-001-AC

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit amendment to Tiger Bay Limited Partnership, 3219 State Road 630 West, Fort Meade, Polk County, Florida 33841. This amendment is to increase the allowable heat input from 1615 million BTU per hour lower heating value at 27F to 1710 million BTU per hour to its combustion turbine located at the Tiger Bay Cogeneration facility in Fort Meade. The change will allow the company to continue to generate 184 megawatts of electric power under very low temperature conditions. There will be no increase in allowable air pollution emission limits. Any increase in actual emissions resulting from operating at very low temperature conditions will be minimal and of short duration.

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

The Petition shall contain the following information:

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

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

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

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

Z 127 633 201

Receipt for Certified Mail

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

Mr. Jeffrey J. Fassett
Senior Plant Engineer
Tiger Bay Cogen
3219 State Road 630 West
Fort Meade, Florida 33841

Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, March 1993

Is your RETURN ADDRESS completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Jeffrey J. Fassett
Senior Plant Engineer
Tiger Bay Cogen
3219 State Road 630 West
Fort Meade, Florida 33841

4a. Article Number
Z 127 633 201

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

7. Date of Delivery
5-1-96

5. Signature (Addressee)

6. Signature (Agent)
[signature]

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

Thank you for using Return Receipt Service.

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

Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

April 23, 1996

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Mr. Jeffrey J. Fassett
Senior Plant Engineer
Tiger Bay Cogen
3219 State Road, 630 West
Fort Meade, Florida 33841

Dear Mr. Fassett:

Re: Amendment of Permits AC53-214903, PSD-FL-190A AIRS ID# 1050223-001-AC
Tiger Bay Cogen, Combined Cycle Unit

The Department has reviewed your letters dated January 18 and January 24 requesting an increase in the allowable heat input rate to produce 184 MW of electrical power from the combustion turbine. The Department has also received your letter dated February 9 requesting the deletion of the requirement to adjust source test results to ISO conditions for the purpose of BACT compliance. The above referenced permit is hereby amended as follows:

From:
Specific Condition:

5. The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operation parameters include, but are not limited to:

184 MW Combustion Turbine

a) The maximum heat input of 1849.9 MMBtu/hr (LHV) at 27°F and at base load for distillate fuel oil.

b) The maximum heat input of 1614.8 MMBtu/hr (LHV) at 27°F and at base load for natural gas.

Duct Burner

c) The maximum heat input of 100 MMBtu/hr (HHV) of natural gas.

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

$NO_X = (NO_{X\,obs})(P_{ref}/P_{obs})^{0.5} e^{19(Hobs - 0.00633)} (288°K/T_{AMB})^{1.53}$

where:

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

$NO_{x\ obs}$ = Measured NO_x emission at 15 percent oxygen, ppmv.
P_{ref} = reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.
P_{obs} = Measured combustor inlet absolute pressure at test ambient pressure.
H_{obs} = Specific humidity of ambient air at test.
e = Transcendental constant (2.718).
T_{AMB} = Temperature of ambient air at test.

To:
Specific Condition:

5. The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operation parameters include, but are not limited to:

184 MW Combustion Turbine

a) The maximum heat input of 1849.9 MMBtu/hr (LHV) at 27°F and at base load for distillate fuel oil.

b) The maximum heat input of **1710 MMBtu/hr** and at base load for natural gas.

Duct Burner

c) The maximum heat input of 100 MMBtu/hr (HHV) of natural gas.

13. This condition is deleted. Tests conducted to establish compliance with NO_x limits which are more stringent than the NSPS standard shall not require an ISO correction (Guidance on Rate of Operation During Compliance Testing for Combustion Turbines dated November 22, 1995).

A copy of this amendment letter shall be attached to and shall become a part of Air Construction Permit AC53-214903.

Sincerely,

Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/al/w

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this PERMIT AMENDMENT and all copies were mailed by certified mail before the close of business on 4/29/96 to the listed persons.

Clerk Stamp

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

Charlotte J Hayes 4/29/96
Clerk Date

Copies to be furnished to:

T. Ellison, SWD
J. Harper, EPA
J. Bunyak, NPS
J. Benedetti, DESTEC

Florida Department of

Memorandum **Environmental Protection**

TO: Howard Rhodes

THROUGH: Clair Fancy

FROM: Al Linero 4/22

DATE: April 22, 1996

SUBJ: Tiger Bay Limited Partnership - Amendment of Permit
AC53-214903, PSD-FL-190 AIRS ID# 1050223-001-AC

Attached for your review and approval is a permit amendment for Tiger Bay Limited Partnership which, upon approval, will amend one permit condition to increase the allowable heat input rate to a 184 MW combustion turbine. The change reflects the actual "capacity versus ambient temperature" curves and will allow the unit to continue to produce 184 MW at low temperatures such as have been recently experienced. There will be no increase in the hourly or annual emissions limitations or in electrical production throughtout the rest of the operating ranges.

At the request of Tiger Bay, we also deleted a condition which required correction of NOx emissions for ISO conditions. This is consistent with our guidance on compliance testing of combustion turbines.

If you have any questions, Teresa Heron and I will be glad to discuss the details. We recommend your approval and signature.

AAL/th/w

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

February 26, 1996

Mr. Al Linero
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Tiger Bay Limited Partnership
Amendment of Permit AC53-214903, PSD-Fl-190(A)

Dear Mr. Linero:

I would like to thank you and your staff for processing Tiger Bay Limited Partnership's ("Tiger Bay") request for amendment to the above referenced permits in such an expeditious manner. And for the opportunity to provide written comment as part of the public review process on this permitting action.

I have reviewed your draft language for amending Condition No.5 relating to fuel usage at the gas turbine (Attachment 1) and find the language acceptable.

However, I understand from Ms. Teresa Heron that Tiger Bay's request dated February 9, 1996 (Attachment 2) concerning Condition No.13 and the requirement to adjust source testing results to ISO conditions may not have been received in a timely manner to be included in your draft language. Therefore, Tiger Bay respectfully requests that the amendment to Condition No.13 also be included in this permitting action. Tiger Bay understands that the amendment may consist of the total deletion of the condition.

Again, thank you for your time and consideration into this matter. Your efforts are greatly appreciated. If you have any questions or require any further information please do not hesitate to contact me at (713) 735-4568.

Very truly yours,

Jeanne Benedetti
Senior Environmental Engineer

Attachments

CC Jeff Fassett

CC: T. Ellison, SWD
EPA
NPS
T. Heron, BAR

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

February xx, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DRAFT

Jeffrey J. Fassett
Senior Plant Engineer
Tiger Bay Cogen
3219 State Road 630 West
Fort Meade, Florida 33841

Dear Mr. Fassett:

Re: Amendment of Permits AC53-214903, PSD-FL-190(A) - AIRS ID NO. 1050223-001-AC
Tiger Bay Cogen, Combined Cycle Unit

The Department has reviewed your letters dated January 18 and January 24 requesting an increase in the allowable heat input rate to produce 184 MW of electrical power from the combustion turbine. The above referenced permit is hereby amended as follows:

From:
Specific Condition:

5. The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operation parameters include, but are not limited to:

184MW Combustion Turbine

a) The maximum heat input of 1849.9 MMBtu/hr (LHV) at 27°F and at base load for distillate fuel oil.

b) The maximum heat input of 1614.8 MMBtu/hr (LHV) at 27°F and at base load for natural gas.

Duct Burner

c) The maximum heat input of 100 MMBtu/hr (HHV) of natural gas.

To:
Specific Condition:

5. The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operation parameters include, but are not limited to:

184MW Combustion Turbine

a) The maximum heat input of 1849.9 MMBtu/hr (LHV) at 27°F and at base load for distillate fuel oil.

b) The maximum heat input of 1710 MMBtu/hr and at base load for natural gas.

Duct Burner

c) The maximum heat input of 100 MMBtu/hr (HHV) of natural gas.

A copy of this amendment letter shall be attached to and shall become a part of Air Construction Permit.

Sincerely, DRAFT

Howard Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

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

Clerk Stamp

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

_____
Clerk Date

Copies to be furnished to:
T. Ellison, SWD
J. Harper, EPA
J. Bunyak, NPS
J. Benedetti, DESTEC

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

February 9, 1996 (By Facsimile)

Mr. Al Linero
Florida Department of Environmental Protection
Air Resource Management
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Re:' Tiger Bay Limited Partnership
Permit Number: AC53-214903
Facility ID: AIRS-1050223

Dear Mr. Linero:

As discussed today with Mr. Martin Costello, Tiger Bay Limited Partnership ("Tiger Bay") would like to request an amendment to Special Condition No.13 of the above referenced permit. The amendment would remove the requirement to adjust source test results to ISO conditions for the purpose of BACT compliance demonstration.

I thank you and your staff for their assistance. If you should have any questions or require any further information please do not hesitate to contact me at (713) 735-4568.

Very truly yours,

Jeanne Benedetti
Senior Environmental Engineer

CC: Jeff Fassett

G:\1253\CORRESPO\LINERO.WPD

Z 127 633 167

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

Sent to	Jeffrey Fassett
Street and No.	New Bay Cogen
P.O., State, and ZIP Code	Ft. Meade, FL
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	2-19-96

AC53-214903
PSD-FL-190(A)

PS Form 3800, March 1993

Is your RETURN ADDRESS completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery
Consult postmaster for fee.

3. Article Addressed to:
Jeffrey Fassett, Sr. Plant Mgr
New Bay Cogen
3219 State Rd 630 W
Ft. Meade, FL 33841

4a. Article Number
Z 127 633 167

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

7. Date of Delivery
2-23-96

5. Signature (Addressee)

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

6. Signature (Agent)
Dina M. Alvarado

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

Thank you for using Return Receipt Service.

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

February 19, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Jeffrey J. Fassett
Senior Plant Engineer
Tiger Bay Cogen
3219 State Road 630 West
Fort Meade, Florida 33841

Dear Mr. Fassett:

Re: Amendment of Permits AC53-214903, PSD-FL-190(A). AIRS ID NO. 1050223-001-AC

Attached is one copy of the Proposed Permit Amendment, Intent to Issue and Notice of Intent to Issue Permit Amendment for publication by Tiger Bay for the above referenced emissions unit.

Please submit any comments you may have concerning the Department's proposed action to Mr. A. A. Linero, P.E., Administrator at the above address. If you have any questions, please call Teresa Heron or Kanani K. Winans at (904) 488-1344.

Sincerely,

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

CHF/th/t

cc: T. Ellison, SWD
J. Harper, EPA
J. Bunyak, NPS
J. Benedetti, DESTEC

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

February xx, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DRAFT

Jeffrey J. Fassett
Senior Plant Engineer
Tiger Bay Cogen
3219 State Road 630 West
Fort Meade, Florida 33841

Dear Mr. Fassett:

Re: Amendment of Permits AC53-214903, PSD-FL-190(A) - AIRS ID NO. 1050223-001-AC
Tiger Bay Cogen, Combined Cycle Unit

The Department has reviewed your letters dated January 18 and January 24 requesting an increase in the allowable heat input rate to produce 184 MW of electrical power from the combustion turbine. The above referenced permit is hereby amended as follows:

From:
Specific Condition:

5. The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operation parameters include, but are not limited to:

184MW Combustion Turbine

a) The maximum heat input of 1849.9 MMBtu/hr (LHV) at 27°F and at base load for distillate fuel oil.

b) The maximum heat input of 1614.8 MMBtu/hr (LHV) at 27°F and at base load for natural gas.

Duct Burner

c) The maximum heat input of 100 MMBtu/hr (HHV) of natural gas.

To:
Specific Condition:

5. The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operation parameters include, but are not limited to:

184MW Combustion Turbine

a) The maximum heat input of 1849.9 MMBtu/hr (LHV) at 27°F and at base load for distillate fuel oil.

b) The maximum heat input of 1710 MMBtu/hr and at base load for natural gas.

DRAFT

Duct Burner

c) The maximum heat input of 100 MMBtu/hr (HHV) of natural gas.

A copy of this amendment letter shall be attached to and shall become a part of Air Construction Permit.

Sincerely,

Howard Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

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

Clerk Stamp

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

_____

Clerk Date

Copies to be furnished to:
T. Ellison, SWD
J. Harper, EPA
J. Bunyak, NPS
J. Benedetti, DESTEC

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CERTIFIED MAIL

In the matter of an
Application for Permit by:

DEP AIRS ID NO. 1050223-001-AC
Polk County

Jeffrey J. Fassett
Senior Plant Engineer
Tiger Bay Cogen
3219 State Road 630 West
Fort Meade, Florida 33841

_____/

INTENT TO ISSUE PERMIT AMENDMENT

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit amendment (copy attached) to the applicant as detailed in the application/request specified above for the reasons stated below.

The applicant, Tiger Bay Limited Partnership (Tiger Bay), requested that the Department modify Specific Condition No. 5.b. for the facility referenced above located at 3219 State Road 630 West in Fort Meade, Florida.

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

Pursuant to Section 403.815, F.S., and Rule 62-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit Amendment. The notice shall be published one time only within 30 days in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit amendment.

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

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

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

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

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

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed by certified mail before the close of business on 2-19-96 to the listed persons.

Clerk Stamp

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

Clerk Date

Copies to be furnished to:
T. Ellison, SWD
J. Harper, EPA
J. Bunyak, NPS
J. Benedetti, DESTEC

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF INTENT TO ISSUE PERMIT AMENDMENT

AIRS ID 1050223-001-AC

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

The Petition shall contain the following information;

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

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

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

Department of Environmental Protection
Southwest District
3809 Coconut Palm Drive
Tampa, Florida 33619-8218

Any person may send written comments on the proposed action to Administrator, New Source Review Section at the Department's Tallahassee address. All comments received within 14 days of the publication of this notice will be considered in the Department's final determination.

Florida Department of
Environmental Protection

Memorandum

TO: Clair Fancy

THROUGH: A. A. Linero 2/16

FROM: Teresa Heron TH

DATE: February 16, 1996

SUBJECT: Tiger Bay Limited Partnership - Amendment of Permit AC53-214903, PSD-FL-190(A), AIRS ID NO. 1050223-001-AC

Attached for your review and approval is a permit amendment for Tiger Bay Limited Partnership which, upon approval, will amend one permit condition to increase the allowable heat input rate to a 184 MW combustion turbine. The change reflects the actual "capacity versus ambient temperature" curves and will allow the unit to continue to produce 184 MW at low temperatures such as have been recently experienced. There will be no increase in the hourly or annual emissions limitations or in electrical production throughout the rest of the operating ranges.

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

AAL/th/w

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

February 9, 1996 (By Facsimile)

Mr. Al Linero
Florida Department of Environmental Protection
Air Resource Management
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Re: Tiger Bay Limited Partnership
Permit Number: AC53-214903
Facility ID: AIRS-1050223

Dear Mr. Linero:

As discussed today with Mr. Martin Costello, Tiger Bay Limited Partnership ("Tiger Bay") would like to request an amendment to Special Condition No.13 of the above referenced permit. The amendment would remove the requirement to adjust source test results to ISO conditions for the purpose of BACT compliance demonstration.

I thank you and your staff for their assistance. If you should have any questions or require any further information please do not hesitate to contact me at (713) 735-4568.

Very truly yours,

Jeanne Benedetti
Senior Environmental Engineer

CC: Jeff Fassett

G:\1253\CORRESPO\LINERO.WPD

DESTEC ENERGY

DESTEC ENERGY, INC
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

FACSIMILE TRANSMITTAL

DATE: 2-9, 1996

TOTAL NO. OF PAGES: 2 including this page

SENT BY: Jeanne Benedetti

DESTEC ENVIRONMENTAL AFFAIRS FAX NO.: (713) 735-4571

PLEASE DELIVER THE FOLLOWING PAGES TO:

PERSON	COMPANY	FAX NUMBER
Martin Costello	FDEP	(904) 922 - 6979
		( ) -
		( ) -
		( ) -

PROJECT: Tiger Bay Limited

PROJ. NO.:

cc:

FILE NO.:

SUBJECT:

MESSAGE: Martin,
Thank you!
Jeanne

CONFIDENTIALITY NOTICE:

THE INFORMATION CONTAINED IN THIS FACSIMILE MESSAGE IS LEGALLY PRIVILEGED AND CONFIDENTIAL INFORMATION INTENDED ONLY FOR THE USE OF THE ADDRESSEE NAMED ABOVE. IF THE READER OF THIS MESSAGE IS NOT THE INTENDED RECIPIENT, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION, DISTRIBUTION OR COPYING OF THIS TELECOPY IS STRICTLY PROHIBITED. IF YOU HAVE RECEIVED THIS TELECOPY IN ERROR, PLEASE IMMEDIATELY NOTIFY US BY TELEPHONE AND RETURN THE ORIGINAL MESSAGE TO US AT THE ADDRESS ABOVE VIA UNITED STATES POSTAL SERVICE. WE WILL REIMBURSE ANY COSTS YOU INCUR IN NOTIFYING US AND RETURNING THE MESSAGE TO US.

IF THIS TRANSMISSION IS INCOMPLETE, PLEASE CALL (713) 735-4442.

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

February 9, 1996 (By Facsimile)

Mr. Al Linero
Florida Department of Environmental Protection
Air Resource Management
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Re: Tiger Bay Limited Partnership
Permit Number: AC53-214903
Facility ID: AIRS-1050223

Dear Mr. Linero:

As discussed today with Mr. Martin Costello, Tiger Bay Limited Partnership ("Tiger Bay") would like to request an amendment to Special Condition No.13 of the above referenced permit. The amendment would remove the requirement to adjust source test results to ISO conditions for the purpose of BACT compliance demonstration.

I thank you and your staff for their assistance. If you should have any questions or require any further information please do not hesitate to contact me at (713) 735-4568.

Very truly yours,

Jeanne Benedetti
Senior Environmental Engineer

CC: Jeff Fassett

G:\1253\CORRESPO\LINERO.WPD

DESTEC
OPERATING COMPANY

TIGER BAY COGEN
3219 STATE RD., 630 WEST
FORT MEADE, FL 33841
(813) 285-1200 FAX (813) 285-1206

January 24, 1996

RECEIVED
JAN 29 1996
BUREAU OF
AIR REGULATION

Mr. Al Linero
Florida Department of Environmental Protection
Air Resource Management
2600 Blairstone Road
Tallahassee, Florida 32399-2400

RE: Tiger Bay Limited Partnership
Permit Number: AC53-214903
Facility ID: AIRS-1050223

Dear Mr. Linero,

It was a pleasure meeting with you and your staff on January 23, 1996 to discuss Specific Condition No.5.b of Tiger Bay Limited Partnership's ("Tiger Bay") air quality permit.

Based on our discussion and a review of potential operating conditions, Tiger Bay would like to propose the following amendment to Specific Condition No.5.b:

> "The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operating parameters include, but are not limited to: b) The maximum heat input of ~~1,614.8 MMBtu/hr (LHV) at 27°F~~ 1,710 MMBtu/hr and at base load for natural gas."

Again, thank you very much for your time. It was a pleasure meeting you. If you should have any questions or require further information please do not hesitate to contact me at (941) 285-1200 or Ms. Jeanne Benedetti, Senior Environmental Engineer at (713) 735-4568.

Very truly yours,

Jeffrey J. Fassett
Senior Plant Engineer

cc: Teresa Heron
Kanani Wirans

cc: Jeanne Bennedette / Destec

bcc: Pete Carrizales / Destec
Robert Chatham / Destec
Chuck Cook / Destec
Bob Pope / GE
J.D. Sellers / Destec
Vern Staub / Destec

DESTEC
OPERATING COMPANY

January 18, 1996

TIGER BAY COGEN
3219 STATE RD., 630 WEST
FORT MEADE, FL 33841
(813) 285-1200 FAX (813) 285-1206

Mr. Al Linero
Florida Department of Environmental Protection
Air Resource Management
2600 Blairstone Road
Tallahassee, Florida 32399-2400

RE: ***Tiger Bay Limited Partnership***
Permit Number: AC53-214903
Facility ID: AIRS-1050223

Dear Mr. Linero,

As we discussed on January 17, 1996, I submit on behalf of Tiger Bay Limited Partnership ("Tiger Bay") , the following proposed amendment to Specific Condition No. 5.b. of the permit referenced above (Attachment 1). Attached you will find the required $250.00 filing fee and documentation supporting the request.

Specific Condition No. 5.b. states:

> "The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operating parameters include, but are not limited to: b) The maximum heat input of 1,614.8 MMBtu/hr (LHV) at 27°F and at base load for natural gas."

On January 16, 1996, Tiger Bay discovered that while operating at base load and in compliance with permitted emissions limitations, we were consuming fuel at a rate that was within 0.5% of the rate allowed by our permit. We feel that this was in the accuracy of our installed plant instrumentation but allows no room for any deviation without reducing plant load.

Tiger Bay requests the deletion Specific Condition No. 5.b. in its entirety. This proposed modification does not include any change in the emission limits contained in Table 1of the permit.

The following is offered in support of this amendment:

1) The configuration, plant operating history (continuous emission monitoring data), quarterly reports, and annual source test data has demonstrated that the turbine continuously operates well below the permitted emission limitations.

2) In accordance with the Specific Conditions, No.14, Tiger Bay provided your office with the manufacturer's capacity versus temperature (ambient) curve with the compliance test results (Attachment 3). Please note that this curve, dated April 18, 1991, was developed by the manufacturer three and a half (3 1/2) years prior to Tiger Bay reaching achieved operation. The curve was based on theoretical data, since there were no similar units operating at the time Tiger Bay was permitted. Consequently, this curve does not reflect the actual operating parameters of Tiger Bay's gas turbine.

3) There is no apparent correlation between turbine emissions and ambient temperatures, i.e., a change in ambient conditions does not necessarily result in a corresponding change in NOX emissions, measured in ppmvd, (see attached graph showing ambient temperature, MW and corrected NOX emissions).

4) The turbine manufacturer used a lower heating value (LHV) of 923 / scf in developing the curve referenced above. The fuel gas currently being consumed at the plant has a LHV of 942 / scf which is approximately 2% above design. The control scheme utilized by the manufacturer calculates a reference firing temperature based upon compressor inlet temperature (ambient), fuel gas flow (not energy) and exhaust temperature. Since the exhaust temperature is only one of the three (3) variable which would be directly affected by a higher LHV of the fuel, despite higher energy inputs the control system does not back down the combustion turbine heat consumption in, a direct, linear fashion.

5) The data from the CEMS is fed to the Distribution Control System (DCS) for data acquisition and reporting. Tiger Bay will implement changes at the DCS such that emissions are recorded on lbs / hr basis in addition to ppmvd (@ 15% O_2).

6) Permit levels tied to theoretical design data does not allow any room for unit efficiency degradation or normal fluctuation in pipeline quality gas.

Thank you very much for your time and expeditious consideration into this matter. If you should have any questions or require any further information please do not hesitate to contact me at (941) 285-1200 or Ms. Jeanne Benedetti, Senior Environmental Engineer at (713) 735-4568.

Very truly yours,

Jeffrey J. Fassett
Senior Plant Engineer

CC: SWD
EPA
NPS

cc: Jeanne Bennedette / Destec
Tom Ellison / FDEP

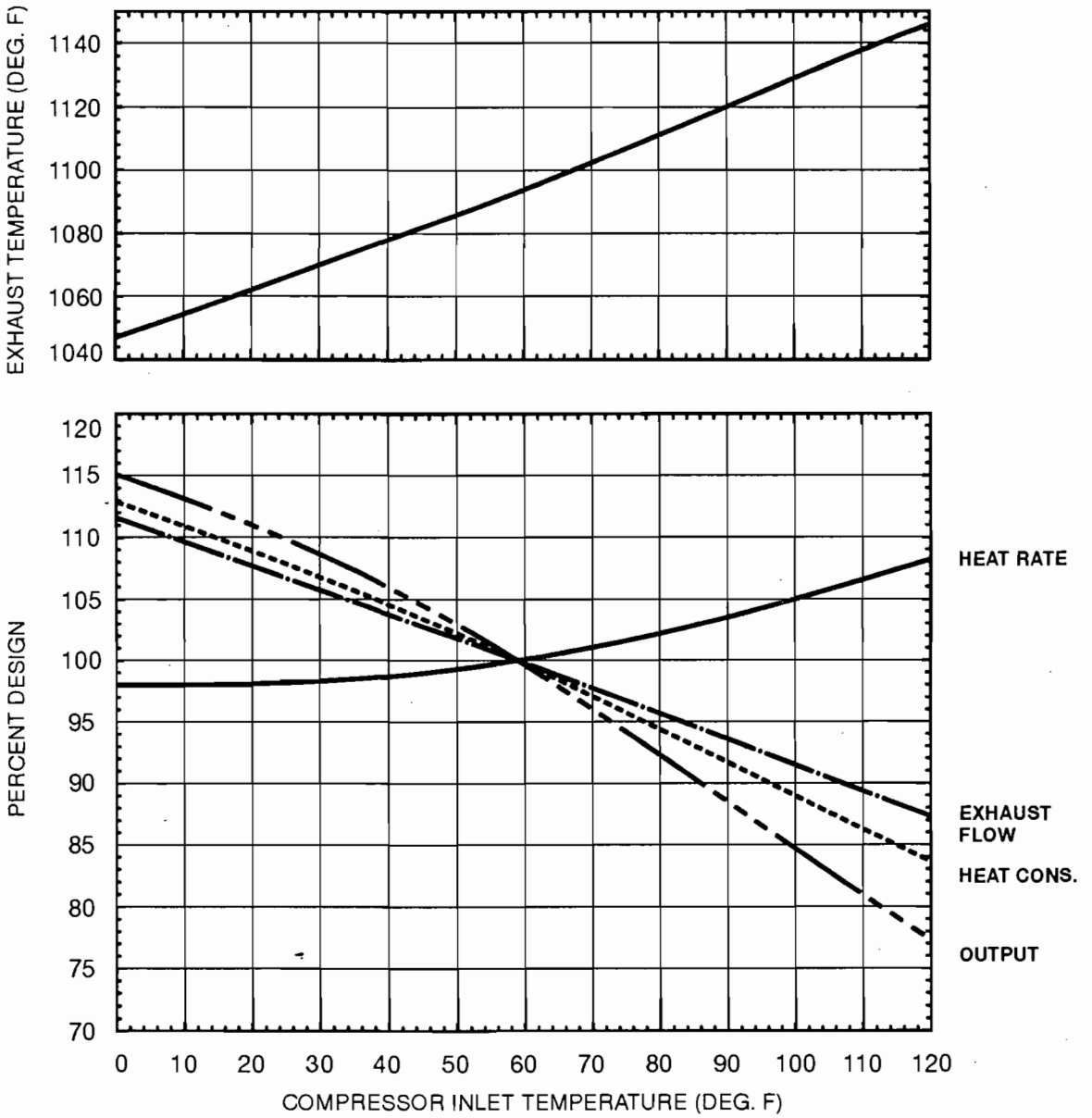
Table 3-2. Emissions Test Results - Tiger Bay Cogeneration Facility
Gas Firing - Base Load Condition
Date: 24 October, 1995

Parameter	Units	Run #1	Run #2	Run #3	Average	Permit Emissions Limit
Operating Parameters:						
Load:	MW	143.80	143.80	143.80	143.80	
Fuel Flow:	MSCFH	1513.83	1513.83	1513.83	1513.83	
Volumetric Flow Rate	dscfm	664953	721375	719299	701876	
Ambient Data:						
Ambient Temperature	degrees F	83.6	84.8	83.9	84.1	
Wet Bulb Temperature:	degrees F	75.8	74.3	68.3	72.8	
Barometric Pressure:	"Hg	30.03	30.05	30.02	30.03	
Specific Humidity (Hobs):	# H2O/# DA	0.01630	0.01530	0.01090	0.01417	
Emissions Data:						
Oxygen:	%V, dry	13.9	13.8	13.8	13.8	
Nitrogen Oxides:	ppmV, dry	21.6	22.3	22.4	22.1	
	lb/MMBtu	0.06707	0.06827	0.06857	0.06797	
	ppmV@15% O2	18.2	18.5	18.6	18.5	
	ppmV@15% O2 & ISO Conditions	20.5	20.4	18.9	19.9	25 ppmV
	lb/hr (c)	102.9	115.2	115.4	111.2	161.9 lb/hr
Carbon Monoxide:	ppmV, dry	0.9	0.8	0.8	0.8	15 ppmvd
	lb/MMBtu	0.00170	0.00149	0.00149	0.00156	
	ppmV@15% O2	0.8	0.7	0.7	0.7	
	lb/hr (c)	2.6	2.5	2.5	2.5	48.8 lb/hr
VOCs	ppmV as Propane	0.0	0.0	0.0	0.0	
	lb/hr	0.0	0.0	0.0	0.0	2.8 lb/hr
Visible Emissions (Average)	% Opacity	0	NA	NA	0	
(Highest 6-min. avg.	% Opacity	0	NA	NA	0	

General Electric Model PG7221(FA) Gas Turbine

Effect of Compressor Inlet Temperature on
Output, Heat Rate, Heat Consumption, Exhaust Flow
And Exhaust Temperature at 100% Speed

FUEL: NATURAL GAS & DISTILLATE OIL
DESIGN VALUES ON CURVE 517HA303



DATE 4/18/91
FJ BROOKS

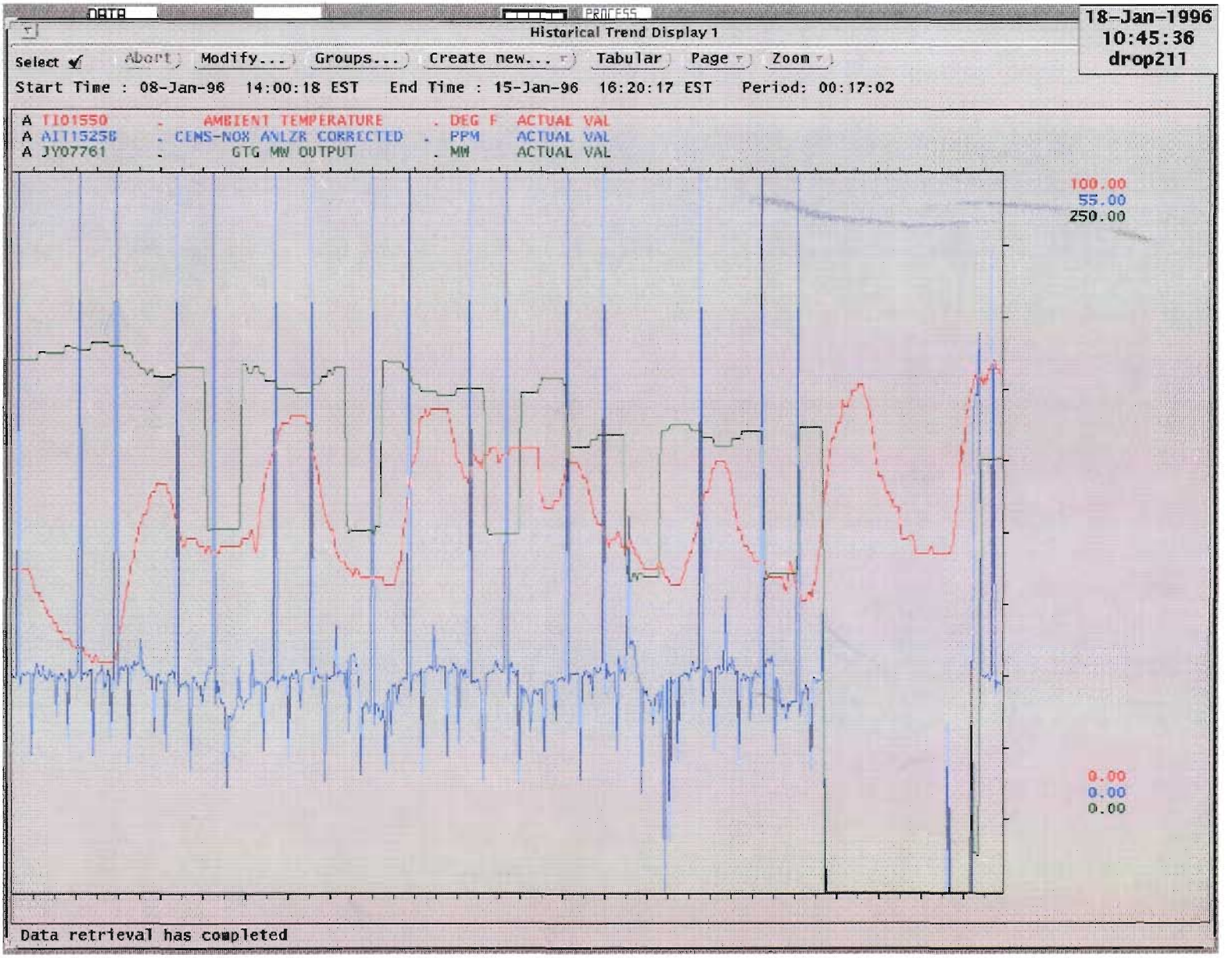
517HA304

Environmental Science & Engineering, Inc.
Continuous Emissions Monitoring Data
Performed for: Destec Engineering, Inc.
Tiger Bay Cogen; Ft. Meade, FL

Table 3-5. EMISSIONS TEST RESULTS AT 150 MW LOAD POINT

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	AVERAGE
Turbine conditions					
Load	MW	151.0	150.0	146.0	149.0
Fuel flow rate	lb/sec	18.92	18.92	18.92	18.92
Gross Calorific Value	Btu/lb	23221	23221	23221	23221.0
Heat input rate (Gross)	MMBtu/hr	1581.4	1581.4	1581.4	1581.4
Pobs (Compressor Discharge)	psig	201.3	199.8	197.1	199.4
Pref (Compressor Discharge)	psig	195.3	195.3	193.3	194.6
Ambient conditions					
Barometric Pressure	in Hg	29.96	29.96	29.84	29.92
Ambient temperature	deg F	70.2	74.5	81.0	75.2
Wet bulb temperature	deg F	68.0	69.1	70.9	69.3
Specific humidity	lb H2O/lb. dry air	0.01382	0.01363	0.01358	0.01367
Test results					
Stack flow rate (1)	ACFM	1030300	1030300	1030300	1030300
Stack flow rate (1)	DSCFM	718633	718633	718633	718633
Oxygen	%V	13.85	13.80	13.85	13.83
NOx	ppmV	18.6	19.1	19.7	19.1
	ppmV @ 15% O2	15.6	15.9	16.4	16.0
	ppmV @ ISO	17.2	17.2	17.6	17.3
	lb / hr	95.9	98.3	101.3	98.5
CO	ppmV	1.1	1.0	0.8	1.0
	ppmV@ 15% O2	1.0	0.8	0.7	0.8
	lb / hr	3.6	3.0	2.4	3.0
VOC	ppmV as C3H8	0.0	0.0	0.0	0.0
	lb/hr as C3H8	0.0	0.0	0.0	0.0
Particulate Matter	gr/dscf	0.00321	0.00021	0.00058	0.00133
	lb/hr	19.99	1.26	3.63	8.29

Notes: (1) Average of three measurements made during particulate matter tests


DATA
PROCESS
Historical Trend Display 1
18-Jan-1996
10:45:36
drop211
Select
Abort
Modify...
Groups...
Create new...
Tabular
Page
Zoom
Start Time : 08-Jan-96 14:00:18 EST End Time : 15-Jan-96 16:20:17 EST Period: 00:17:02
A TI01550 . AMBIENT TEMPERATURE . DEG F ACTUAL VAL
A AIT15258 . CEMS-NOX ANLZR CORRECTED . PPM ACTUAL VAL
A JY07761 . GTG MW OUTPUT . MW ACTUAL VAL
100.00
55.00
250.00
0.00
0.00
0.00
Data retrieval has completed

FAX TRANSMISSION

DESTEC OPERATING COMPANY
TIGER BAY COGEN
3219 State Road 630 West
Fort Meade, Florida 33841
941-285-1200
Fax: 941-285-1206

To: Teresa Heron **Date:** 01-25-96

Fax #: 904-922-6979 **Pages:** 2 , including this cover sheet.

From: Jeff Sassett

Subject: Tiger Bay Quality Air Permit

COMMENTS:

DESTEC
OPERATING COMPANY

TIGER BAY COGEN
3219 STATE RD., 630 WEST
FORT MEADE, FL 33841
(813) 285-1200 FAX (813) 285-1206

January 24, 1996

Mr. Al Linero
Florida Department of Environmental Protection
Air Resource Management
2600 Blairstone Road
Tallahassee, Florida 32399-2400

RE: Tiger Bay Limited Partnership
Permit Number: AC53-214903
Facility ID: AIRS-1050223

Dear Mr. Linero,

It was a pleasure meeting with you and your staff on January 23, 1996 to discuss Specific Condition No.5.b of Tiger Bay Limited Partnership's ("Tiger Bay") air quality permit.

Based on our discussion and a review of potential operating conditions, Tiger Bay would like to propose the following amendment to Specific Condition No.5.b:

> "The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operating parameters include, but are not limited to: b) The maximum heat input of ~~1,614.8 MMBtu/hr (LHV) at 27°F~~ 1,710 MMBtu/hr and at base load for natural gas."

Again, thank you very much for your time. It was a pleasure meeting you. If you should have any questions or require further information please do not hesitate to contact me at (941) 285-1200 or Ms. Jeanne Benedetti, Senior Environmental Engineer at (713) 735-4568.

Very truly yours,

Jeffrey J. Fassett
Senior Plant Engineer

JJF:tma

cc: Jeanne Benedetti / Destec
F39.2.6

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
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- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Ms. Jeanne L. Benedetti
Senior Environmental Engineer
Destec Energy, Inc.
Post Office Box 4411
2500 Citywest Boulevar, Suite 150
Houston, Texas 77210-4411

4a. Article Number
Z 127 632 571

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

7. Date of Delivery
NOV 20 1995

5. Signature (Addressee)

6. Signature (Agent)
C. Mack

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

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Thank you for using Return Receipt Service.

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

UNITED STATES POSTAL SERVICE

Sent to Ms. Jeanne L. Benedetti
Senior Environmental Engineer
Street and No. Destec Energy, Inc.
P.O. State and ZIP Code Post Office Box 4411
2500 Citywest Boulevard, Ste 15
Houston Texas 77210-4411

Certified Fee	$
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	11-15-95 Return Check kkw

PS Form **3800**, March 1993

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

November 15, 1995

CERTIFIED MAIL -- RETURN RECEIPT REQUESTED

Ms. Jeanne L. Benedetti
Senior Environmental Engineer
Destec Energy, Inc.
Post Office Box 4411
2500 Citywest Boulevard, Suite 150
Houston, Texas 77210-4411

Dear Ms. Benedetti:

Re: Extension of Permit No AC53-214903, PSD-FL-190

In accordance with the amendment, which was approved by the Department in October, 1995, the permit referenced above is automatically extended through the later of November 1, 1996 or 240 days after commencing operation. Further details of the conditions of this extension are contained in the amendment, which was sent to your office recently.

Also enclosed is your check for $50 is hereby refunded since no action was required of the Department.

If you should require further information in response to your request, please call me at (904)488-1344.

Sincerely,

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

AAL/kw

enclosure

DESTEC ENERGY

RECEIVED
OCT 16 1995
BUREAU OF
AIR REGULATION

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

October 11, 1995

Mr. A. A. Linero
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Tiger Bay Limited Partnership
Request for Extension of Construction Permit No. AC53-214903 & PSD-FL-190

Dear Mr. Linero:

Tiger Bay Limited Partnership respectfully requests an extension of the Construction Permit referenced above for an additional one year period from the current expiration date of January 1, 1996. Tiger Bay Limited Partnership requests such extension because of the delays in Florida's current Title V permit application program. This request is being provided prior to 60 days before the expiration date of the permit in accordance with F.A.C. Rule 17-4.090.

Pursuant to your letter dated September 6, 1995 to Mr. Robert Chatham, enclosed you will find the $50.00 processing fee for the extension of said Permit to December 31, 1996.

In addition, the financial institutions have requested confirmation that Tiger Bay Limited Partnership will continue to have the ability to reinstall the duct burner unit upon issuance of an extension. If you could provide confirmation of this, it would be greatly appreciated.

I thank you for your time in reviewing this matter. If upon review you have any questions or require any further information, please do not hesitate to contact me at (713) 735-4568 or Mr. Robert Chatham at (713) 735-4087.

Very truly yours,

Jeanne L. Benedetti
Senior Environmental Engineer

Enclosure
JLB:mjf
cc: Robert Chatham
Teresa Heron, FDEP - Tallahassee
Robert Soich, FDEP - Tampa

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

October 11, 1995

Mr. A. A. Linero
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Tiger Bay Limited Partnership
Request for Extension of Construction Permit No. AC53-214903 & PSD-FL-190

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I thank you for your time in reviewing this matter. If upon review you have any questions or require any further information, please do not hesitate to contact me at (713) 735-4568 or Mr. Robert Chatham at (713) 735-4087.

Very truly yours,

Jeanne L. Benedetti
Senior Environmental Engineer

Enclosure
JLB:mjf
cc: Robert Chatham
Teresa Heron, FDEP - Tallahassee
Robert Soich, FDEP - Tampa

Destec Energy Inc.
P.O. Box 4411
Houston, Texas 77210

DATE 10/10/95

CHECK NUMBER 144682

PAYMENT ADVICE

INVOICE NUMBER	INVOICE DATE	COMMENT	GROSS	DEDUCTIONS	AMOUNT PAID
100395FE	100395	TIGER BAY - AIR PERMIT EXT	50.00	.00	50.00

DETACH BEFORE DEPOSITING

DESTEC ENERGY

CITIBANK Delaware
One Penn's Way
New Castle, DE 19720

62-20
311

CHECK NUMBER 00144682

DATE	AMOUNT
10/10/95	$*********50.00

PAY
FIFTY AND 00/100 **********

Destec Energy Inc.

TO THE ORDER OF:

163150 FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FL 32399-2400

Craig E. Hess

[redacted] [redacted] [redacted]

Is your RETURN ADDRESS completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert S Chatham, PE
Sr. Envio. Engineer
Destec Energy, Inc
PO Box 4471
Houston, TX 77210-4411

4a. Article Number
Z 127 632 503

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

7. Date of Delivery
SEP 11 1995

5. Signature (Addressee)

6. Signature (Agent) P. Mott

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

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

Thank you for using Return Receipt Service.

Z 127 632 503

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

UNITED STATES POSTAL SERVICE

Sent to	Robert Chatham
Street and No.	Destec Energy
P.O., State and ZIP Code	(Tiger Bay) Houston TX
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	9-7-95

PS Form **3800**, March 1993

Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

September 6, 1995

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Robert S. Chatham, P.E.
Senior Environmental Engineer
Destec Energy, Inc.
P. O. Box 4411
Houston, Texas 77210-4411

Dear Mr. Chatham:

The Bureau of Air Regulation received your August 2, 1995 request to extend a permit issued to Tiger Bay Limited Partnership. Before we can begin processing your request, we will need a $50 processing fee for each permit extension. If you have any questions, please call Patty Adams at (904)488-1344.

Sincerely,

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

AAL/pa

cc: John Reynolds

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

August 25, 1995

Mr. Robert Soich
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: Outage Update for Duct Burner Unit
Permit No. AC53-214903 and PSD-FL-190
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Soich:

The purpose of this letter is to update the FDEP on the status of our efforts to have the duct burner unit reinstalled. As you know, the original duct burner had to be removed because of a structural failure. Presently, the unit has not been reinstalled. However, we are working with the vendor and the plant to have the unit reinstalled. Our plan is to complete the reinstallation during the December 1995 or March 1996 outages. The compliance testing should commence within sixty days after the initial firing of the unit.

Respectively, the Partnership request FDEP's written concurrence that Tiger Bay is allowed to proceed with the duct burner reinstallation during the December or March outages. Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:mf

cc: Ms. Teresa Heron, FDEP - Tallahassee
Mr. William Proses, FDEP - Tampa

G:\1253\CORRESPO\soich3

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

August 10, 1995

Mr. Robert S. Chatham
Senior Environmental Engineer
Destec Energy, Incorporated
2500 Citywest Boulevard, Suite 150
Post Office Box 4411
Houston, Texas 77210-4411

Dear Mr. Chatham:

This letter is in response to your request for an extension of permits AC-53-214903 and PSD-F1-190. Please note the attached proposed rule language which will, if adopted, extend the air construction permits by law if the rule is approved. It is anticipated that the rule will be adopted in early September.

Therefore, I propose that you check with Larry George at 904/488-0114 around September to determine the status of the rule.

If the proposed rule, for any reason, is not adopted you will need to request an extension from the Tallahassee office and provide an appropriate fee pursuant to Chapter 62-4, F.A.C., at least sixty days before the permits expire (by the end of October).

Please contact me at 904/488-1344 if you have any questions.

Sincerely,

John C. Brown, Jr., P.E.
Administrator
Air Permitting and Standards

JCB/sk

cc: Al Linero
Bill Thomas, SWD
Ken Kosky, KBN

DESTEC ENERGY

August 2, 1995

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

Mr. Al Linero
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Tiger Bay Limited Partnership
(Previously Central Florida Power Limited Partnership)
DEP Permit Number AC53-214903 & PSD-FL-190
Construction Permit Extension to Accommodate Title V

Dear Mr. Linero:

Due to the recent extension of time for submitting Title V applications, the above referenced construction permit will expire before the Title V application due date. The Title V permit application for this source will be due in February 1995 while the permit expires on January 1, 1996. This issue was discussed between Ken Kosky of KBN Engineering and Jerry Kissel of the Southwest District. Mr. Kissel indicated that the FDEP policy is to extend the construction permit in these cases. In addition, he indicated that the office issuing the permit needed to extend the permit. As a consequence, since the construction permit was issued in Tallahassee, an extension of the construction permit till July 31, 1996 is requested. An extension till July 31, 1996 will allow for any future delays in the Title V application due dates.

Please call me at (713) 735-4087 if you have any questions.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC/sem

cc: FDEP, Mr. Clair Fancy, P.E., Chief
FDEP, Mr. Bill Thomas, Southwest District Office
Ken Kosky, KBN

g:\linero

al
Copy TSRS

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

September 22, 1995

IMPORTANT NOTICE

To ~~Whom It May Concern~~: Robert Chatham

Because of the delay in the U.S. Environmental Protection Agency's (EPA) approval of Florida's request for delegation of the Title V air permitting program, the Division of Air Resources Management began rule making in July to defer the permit application deadlines for all Title V sources. As a matter of non-rule policy, the current Title V permit application deadlines (August 1, 1995, November 15, 1995, and April 2, 1996, depending on source type) have been postponed pending completion of this rule making.

Proposed new application deadlines were published in the Florida Administrative Weekly July 28, 1995; however, alternative new deadlines were recommended by several industry groups. In response, the Division of Air Resources Management has made changes to its July 28 proposal. The new deadlines, which will be formally adopted within the next two weeks, are as follows:

January 1, 1996, for the acid rain part of the applications (where required).

July 1, 1996, if the facility is a Title V source solely by Rule 62-213.200(19)(f)

June 15, 1996, otherwise.

If you have questions, please contact the Division's Title V permitting staff at (904) 488-1344.

Sincerely,

Al Linero
Administrator
New Source Review

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

additional documentation or information needed to process the application. An applicant making timely and complete application for permit, or timely application for permit renewal as described by Rule 62-4.090(1), F.A.C., shall continue to operate the source under the authority and provisions of any existing valid permit or Florida Electrical Power Plant Siting Certification, provided the applicant complies with all the provisions of Rule 62-213.420(1)(b)3. and 4. F.A.C. Failure of the Department to request additional information within sixty days of receipt of a properly signed application shall not impair the Department's ability to request additional information pursuant to Rule 62-213.420(1)(b)3. and 4., F.A.C.

This means Construction Permits too!

3. For those permit applications submitted pursuant to the provisions of Rule 62-213.420(1)(a)1., F.A.C., the Department shall notify the applicant if the Department becomes aware at any time during processing of the application that the application contains incorrect or incomplete information. The applicant shall submit the corrected or supplementary information to the Department within ninety days unless the applicant has requested and been granted additional time to submit the information. Failure of an applicant to submit corrected or supplementary information requested by the Department within ninety days or such additional time as requested and granted shall render the application incomplete.

4. For all applications other than those addressed at Rule 62-213.420(1)(b)3., F.A.C., should the Department become aware, during processing of any application that the application contains incorrect information, or should the Department become aware, as a result of comment from an affected State, an approved local air program, EPA, or the public that additional information is needed to evaluate the application, the Department shall notify the applicant within 30 days. When an applicant becomes aware that an application contains incorrect or incomplete information, the applicant shall submit the corrected or supplementary information to the Department. If the Department notifies an applicant that corrected or supplementary information is necessary to process the permit, and requests a response, the applicant shall provide the information to the Department within ninety days of the Department request unless the applicant has requested and been granted additional time to submit the information or, the applicant shall, within ninety days, submit a written request that the Department process the application without the information. Failure of an applicant to submit corrected or supplementary information requested by the Department within ninety days, or such additional time as requested and granted, or to

62-213.420(1)(a)2

This says if you make timely application for Title V permit, you can operate on existing valid Construct or Operate Permit.

(c) Emissions of all regulated pollutants which the applicant knows or has reason to believe are being emitted from a source even if no emission limitation would apply to the source unless otherwise provided in this subsection. The applicant shall report pollutants for each emissions unit and for source wide emissions such as fugitive emissions. For those pollutants for which no standard test method or published emissions factor is available to the applicant, the applicant shall estimate the emissions and shall include the basis for the estimate with the emissions information. For purposes of this subsection, regulated pollutant means, in addition to the regulated air pollutants specified in Rule 62-213.200, F.A.C., any hazardous air pollutant and any pollutant to which an emissions limitation applies in accordance with Rule 62-213.420(3)(c)1., F.A.C. Except as provided in Chapter 62-297, F.A.C., for submittal of compliance test data, nothing in this section shall be construed to require testing of actual emissions for determining estimated or potential emissions for a permit application. All applicants shall report regulated pollutants as follows:

1. Those Title V sources for which an emission limitation is included in the source's most recent operation permit or in the construction permit shall report and quantify, for each emissions unit subject to the emissions limitation, all emissions of any pollutant to which the limitation applies;

2. Title V sources emitting or with the potential to emit any pollutant described in paragraphs (a) and (c) of the definition of regulated air pollutant in Rule 62-213.200, F.A.C., shall report each such pollutant as follows:

a. Each Title V source emitting or with the potential to emit fifty tons or more per year of carbon monoxide shall report all emissions of carbon monoxide for each emissions unit with the potential to emit ten tons or more per year of the pollutant. Fugitive carbon monoxide emissions and emissions from units with the potential to emit less than ten tons per year shall be considered as source-wide emissions and shall be reported as source-wide emissions if, in the aggregate, the source-wide emissions equal or exceed ten tons per year;

b. Each Title V source emitting or with the potential to emit five hundred pounds or more per year of lead and lead compounds, expressed as lead, shall report all emissions of lead and lead compounds, expressed as lead, for each emissions unit with the potential to emit one hundred pounds or more per year of lead and lead compounds, expressed as lead. Fugitive emissions of lead and lead compounds, expressed as lead, and emissions from units with

PROPOSED LANGUAGE - In mean time we will process extension requests. al

62-213.420 Permit Applications

(1)(a)1. For sources that have commenced operation by January 1, 1996 ~~January 2, 1995~~, a timely application under this chapter is one that is submitted as follows:

2. Except for sources that are subject to the Florida Electrical Power Plant Siting Act (FEPPSA), a source that commences operation after January 1, 1996 ~~January 2, 1995~~, must file an application for an operation permit under this chapter ninety days before expiration of the source's construction permit, but no later than 180 days after commencing operation. A source that has applied for an Electrical Power Plant Siting Certification prior to January 1, 1996 ~~January 2, 1995~~, but has not commenced operation by that date, shall file an application for an operation permit under this Chapter no later than 180 days after commencing operation. Sources subject to the FEPPSA that apply for Electrical Power Plant Siting Certification subsequent to January 1, 1996 ~~January 2, 1995~~, shall apply for a permit under the provisions of this chapter at the same time the Florida Power Plant Siting Certification application is submitted.

4. The expiration dates of all air construction permits for Title V sources that expire between September 1, 1995, and September 1, 1996, are hereby extended to September 1, 1996.

Specific Authority: 403.061, 403.087, F.S.

Law Implemented: 403.061, 403.0872, F.S.

History: New 11-28-93; Amended 4-62-94; Formerly 17-213.420; Amended 11-23-94, 4-2-95, _____.

DESTEC ENERGY

TO: J. REYNOLDS

August 2, 1995

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

(clean copy attached)
Per telecon J. Reynolds/J Kissel 8/14/95, Talle will process. I told R. Chatham* that DEP would contact him if fee required.
- JK 8/14/95

Mr. Al Linero
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Tiger Bay Limited Partnership
(Previously Central Florida Power Limited Partnership)
DEP Permit Number AC53-214903 & PSD-FL-190
Construction Permit Extension to Accommodate Title V

Dear Mr. Linero:

*he mentioned that they have another permit, for a spray dryer, in the same situation

Due to the recent extension of time for submitting Title V applications, the above referenced construction permit will expire before the Title V application due date. The Title V permit application for this source will be due in February 1995 while the permit expires on January 1, 1996. This issue was discussed between Ken Kosky of KBN Engineering and Jerry Kissel of the Southwest District. Mr. Kissel indicated that the FDEP policy is to extend the construction permit in these cases. In addition, he indicated that the office issuing the permit needed to extend the permit. As a consequence, since the construction permit was issued in Tallahassee, an extension of the construction permit till July 31, 1996 is requested. An extension till July 31, 1996 will allow for any future delays in the Title V application due dates.

Please call me at (713) 735-4087 if you have any questions.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RECEIVED
AUG 04 1995
Department of Environmental Protection
SOUTHWEST DISTRICT
BY _____

RSC/sem

cc: FDEP, Mr. Clair Fancy, P.E., Chief
FDEP, Mr. Bill Thomas, Southwest District Office
Ken Kosky, KBN

g:\linero

DESTEC ENERGY

RECEIVED

JAN 27 1995

Bureau of
Air Regulation

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

January 23, 1994

[CORRECTED]

State of Florida
Department of Environmental Regulation
Division of Air Resources Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

RE: Start of Commercial Operations
Permit Nos. PSD-F1-190, AC53-214903 and AC53-230744
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

To Whom It May Concern:

On behalf of Tiger Bay Limited Partnership (TBLP), we are pleased to announce that on January 1, 1995, TBLP commenced commercial operations.

Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:gmc

cc: M. M. Davenport
J. Heron
B. Thomas, SW Dist.
G. Harper, EPA

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DESTEC ENERGY

File

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

January 18, 1995

Mr. Robert Soich
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: Outage Update for Duct Burner Unit
Permit No. AC53-214903 and PSD-FL-190
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Soich:

Presently, the Tiger Bay cogeneration facility has planned the following outages:

First Outage:	March 4 to March 17, 1995
Second Outage:	April 8 to April 21, 1995

The plant expects to perform the engineering tests for the duct burner unit between March 17 and April 8, 1995. The compliance testing is expected to commence after the April outage.

Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:gmc

cc: M. M. Davenport
Ms. Teresa Heron, FDEP - Tallahassee
Mr. William Proses, FDEP - Tampa

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DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
PO BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

December 20, 1994

Mr. Robert Soich
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: 90 Day Extension for Duct Burner Unit
Permit No. AC53-214903 and PSD-FL-190
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Soich:

On behalf of Tiger Bay Limited Partnership (TBLP), we are requesting a 90 day extension for the duct burner unit's initial source test. Presently, TBLP is experiencing duct burner problems which will require an outage to make the necessary modifications or repairs. At this time, the outage schedule has not been finalized but the repairs are expected to be completed during the month of March 1995. During the time between now and the March outage, TBLP plans to not fire the duct burner unit until the modifications or repairs have been completed. The maximum firing date for the duct burner unit was October 31, 1994.

Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:gmc

cc: M. M. Davenport
Ms. Teresa Heron, FDEP - Tallahassee
Mr. William Proses, FDEP - Tampa

G:\1253\CORRESPO\soich1.rsc

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

December 14, 1994

Mr. Robert Soich
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33616

Dear Mr. Soich:

Enclosed is a copy of the source test report submitted on behalf of Tiger Bay Cogeneration Facility, Permit No: AC53-214903/PSD-FL-190. The report was prepared by Environmental Science and Engineering, Inc. for testing conducted on the gas turbine between October 19 and 23, 1994. Source testing for the duct burner has not been completed at this time.

If you have any questions, please contact Robert Chatham at 713/735-4087.

Sincerely,

Scott A. Kicker
Environmental Engineer

Enclosure

cc: Ms. Teresa Heron (FDER Tallahassee)
Mr. William Proses (FDEP Tampa)

File: 1253.2.3.3.5.2

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert S. Chatham
Senior Environmental Manager
Destec Energy, Inc.
Post Office Box 4411
Houston, Texas 77210-4411

4a. Article Number
Z 751 860 005

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

7. Date of Delivery
DEC - 8 1994

5. Signature (Addressee)

6. Signature (Agent)
CURTIS NICKERSON

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

PS Form **3811**, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Z 751 860 005

Receipt for Certified Mail

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

UNITED STATES POSTAL SERVICE

Sent to: Mr. Robert S. Chatham	
Street and No.: Post Office Box 4411	
P.O., State and ZIP Code: Houston, Texas 77210-4411	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: Mailed: 12/06/94 AC 53-214903 [PSD-FL-190(A)]	

PS Form **3800**, March 1993

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

December 2, 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert S. Chatham
Senior Environmental Engineer
Destec Energy, Inc.
Post Office Box 4411
Houston, Texas 77210-4411

RE: Amendment to Construction Permit
NSPS Custom Fuel Monitoring Schedule
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility
AC 53-214903 [PSD-FL-190(A)]

Dear Mr. Chatham:

The Department has reviewed your August 3, 1994 request, with supporting data and additional data submitted on September 9 and 22, 1994, for an NSPS Custom Fuel Monitoring Schedule. The schedule would only apply to a monitoring schedule for sulfur dioxide (SO_2) and nitrogen oxide (NO_x) when natural gas is being fired at the subject facility (refer to Attachment No. 1). The facility is required by the permit to comply with Subpart GG of the New Source Performance Standards (NSPS), 40 CFR 60. For sources utilizing pipeline quality natural gas, 40 CFR 60.334(b) and 40 CFR 60.334(b)(2) state that a custom fuel monitoring schedule, if supported by data which demonstrates compliance with NSPS emission limits, may be approved by the Administrator of EPA. This authority has been delegated to EPA's regional offices and a copy of the subject request was jointly submitted to EPA Region IV for a determination. The Department received a letter from EPA on October 12, 1994, stating that a custom fuel monitoring schedule for this facility was acceptable, if it complied with all items of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987 (Refer to Attachment No. 2). The results from a minimum of three sampling events for six consecutive months were provided by the permittee, which demonstrated consistent compliance with the allowable sulfur dioxide emissions limits specified under 40 CFR 60.333 and this permit. Therefore, upon issuance of the amended permit, the permittee shall begin monitoring the sulfur content of natural gas as specified in 2.b. of the Custom Fuel Monitoring Schedule for Natural Gas. In accordance with the EPA determination, the permit Specific Conditions will be amended as follows:

I. Specific Condition Number;

18. From

Sulfur and nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be determined as specified in 40 CFR 60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Southwest District office. Any custom schedule approved by DEP pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance. The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

To

This source shall be in compliance with all requirements of 40 CFR 60, Subpart GG (Standards of Performance for Stationary Gas Turbines), 40 CFR 60, Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units), and Rule 62-296.800(2)(a), F.A.C. (Standards of Performance for New Stationary Sources (NSPS)).

A. Natural Gas

Pursuant to 40 CFR 60.334(b)(2), a custom fuel monitoring schedule shall be followed for the natural gas fired at this facility and shall be as follows:

Custom Fuel Monitoring Schedule for Natural Gas (NG)

1. Monitoring of fuel nitrogen content shall not be required when NG is the only fuel being fired in the turbines.

2. Sulfur Monitoring

a. Analysis for fuel sulfur content of the NG fired at this facility shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are ASTM D1072-80, ASTM D3031-81, ASTM D3246-81, and ASTM D4084-82, as referenced in 40 CFR 60.335(b)(2).

b. This custom fuel monitoring schedule shall become effective on the date this permit is amended. Effective the date of this custom schedule, sulfur monitoring of NG fired at the facility shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.

c. If, after the monitoring required in item 2(b) above, or herein, the sulfur content of the NG fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333 and in this permit, sample analysis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

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

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

B. <u>Distillate Fuel Oil</u>

The records of distillate fuel oil usage shall be kept by the company for a five-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the distillate fuel oil being fired in the gas turbine exceeds 0.05 percent sulfur content, by weight.

II. **Attachments to be Incorporated;**

- **Destec letter received September 12, 1994.**
- **FDEP letter dated August 18, 1994.**
- **U.S. EPA letter received October 12, 1994.**

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

The Petition shall contain the following information:

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

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this amendment. Persons whose substantial interests will be affected by any decision of the Department with regard to the amendment request/application have the right to petition to become a party to the proceeding. The petition must conform to the

requirements specified above and be filed (received) within 14 days of receipt of this amendment in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, Florida Administrative Code.

This letter amendment must be attached to Construction Permit, No. AC 53-214903 [PSD-FL-190(A)], and shall become part of the permit.

Sincerely,

Howard L. Rhodes

Howard L. Rhodes
Director
Division of Air Resources
Management

HLR/cl/b

Attachments

cc: G. Kissel, SWD
J. Harper, EPA
J. Bunyak, NPS
K. Kosky, KBN

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this AMENDMENT and all copies were mailed by certified mail before the close of business on 12/6/94 to the listed persons.

Clerk Stamp

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

Barbara J. Boutwell 12/6/94
Clerk Date

Florida Department of
Memorandum — Environmental Protection

TO: Howard Rhodes

FROM: Clair Fancy

DATE: December 2, 1994

SUBJECT: Approval of Construction Permit Amendment
NSPS Custom Fuel Monitoring Schedule
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility
AC 53-214903 [PSD-FL-190(A)]

Attached for your approval and signature is an amendment to a construction permit prepared by the Bureau of Air Regulation for the Tiger Bay Cogeneration Facility. The purpose of this amendment is to specify a custom fuel monitoring schedule for sulfur dioxide and nitrogen oxides in natural gas used as fuel at this facility. Pursuant to 40 CFR 60.334(b)(2), the request for a custom fuel monitoring schedule, with data which demonstrated consistent compliance with all the conditions of this permit and 40 CFR 60, Subpart GG, was approved by the Administrator of the U.S. EPA. This amendment will not cause an increase in annual permit allowable emission limits, annual actual emission limits, or result in any equipment change. There is no controversy associated with this action.

This amendment is recommended for your approval and signature.

CF/CSL

Attachment

DESTEC ENERGY

D.E.R.

OCT 14 1994

SOUTHWEST DISTRICT
TAMPA

DESTEC ENERGY, INC.
34759 LENCIONI AVENUE
SUITE A
BAKERSFIELD, CA 93308
(805) 392-7301 • FAX (805) 393-5143

October 12, 1994

William A. Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, FL 33619

RE: CEMS Certification and Source Testing
Permit No: AC53-214903 and PSD-FL-190
AC53-230744
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Proses:

Enclosed is a copy of the preliminary results of the spray dryer visible emissions test conducted on September 27, 1994, Permit No: AC53-230744. The test was conducted with the spray dryer unit operating at a maximum spray dryer heat input of 2,311 SCFH for ambient operating conditions. A final report of the visible emissions test with a Certificate of Completion will be submitted to your office on or before November 11, 1994.

If you have any questions regarding these issues, please call me at 805/392-7347.

Sincerely,

Scott A. Kicker
Environmental Engineer

cc: Teresa Heron, FDEP-Tallahassee
Bob Soich, FDEP-Tampa

F:\WORK\KICKER\PROJECTS\1253\VETEST

bcc: Vern Staub
J.D. Sellers
Robert Chatham
File: (Tiger Bay) 1253

Environmental
Science &
Engineering, Inc.

A CILCORP Company

Sept. 29, 1994

Mr. Scott Kicker
DESTEC Energy
34759 Lencioni Avenue
Bakersfield, CA 93308

Dear Mr. Kicker:

On Sept. 27, 1994 ESE performed a visual emissions test at your Tiger Bay Cogen Facility at Ft. Meade, FL. The visual test measured the opacity of your spray dryer baghouse. The emissions for the one hour period was all zero opacity.

If we can be of further service, or if you desire further information please feel free to call.

Sincerely,

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Norman R. Czarniak

Norman R. Czarniak

dsg\jeffer2.nrc

P.O. Box 1703 Gainesville, FL 32602-1703 Phone (904) 332-3318 (800) 874-7872 Fax (904) 333-6622

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Form Number: DC001 Page 1 of 2

Continued on VEO Form Number: DC002

Method Used (Circle One): Method 9 | 203A | 203B | Other: _____

Company Name: DESTEC Energy

Facility Name: TIGER BAY COGEN

Street Address:

City: FT. MEADE | State: FL | Zip:

Process: SPRAY DRYER | Unit #: | Operating Mode: 100%

Control Equipment: BAG HOUSE | Operating Mode: 100%

Describe Emission Point: CIRCULAR STEEL STACK GRAY 1.4' dia

Height of Emiss. Pt.: Start 73.5' End ✓ | Height of Emiss. Pt. Rel. to Observer: Start 4' End 4'

Distance to Emiss. Pt.: Start 25' End ✓ | Direction to Emiss. Pt. (Degrees): Start 348 End 348

Vertical Angle to Obs. Pt.: Start ~12° End ✓ | Direction to Obs. Pt. (Degrees): Start ~~348~~ 168 End 168

Distance and Direction to Observation Point from Emission Point: Start 25' SSE End ✓

Describe Emissions: Start Non Visible End ✓

Emission Color: Start Clear End ✓ | Water Droplet Plume: Attached ☐ Detached ☐ None ☒

Describe Plume Background: Start Gray Cloud End ✓

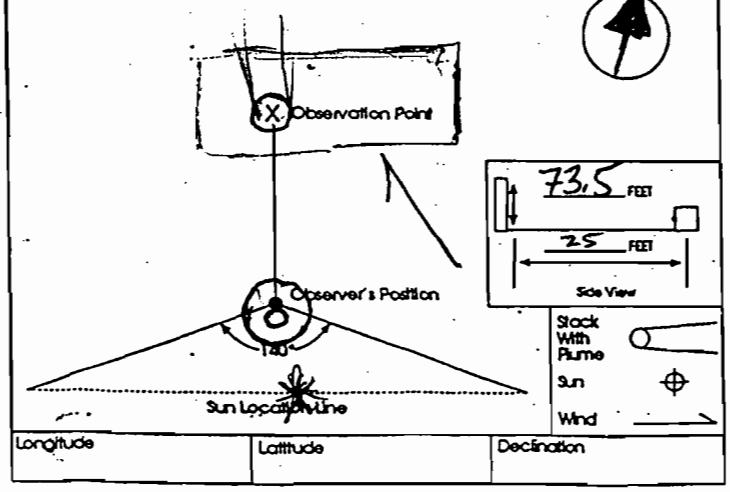
Background Color: Start Gray End ✓ | Sky Conditions: Start ● End

Wind Speed: Start 6-8 End 10-12 | Wind Direction: Start SE End ✓

Ambient Temp.: Start 78 End 78 | Wet Bulb Temp.: 75 | Rel Percent: 86%

Source Layout Sketch

Draw North Arrow: ☐TN ☐MN



Longitude | Latitude | Declination

Additional Information

Observation Date	Time Zone	Start Time	End Time
9/27/94	E	1124	1224

Min \ Sec	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
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12	0	0	0	0	
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15	0	0	0	0	
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26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): NORMAN R. CZARNIAK

Observer's Signature: Norman R. Czarniak Date: 9/27/94

Organization: E.S.E

Certified By: EASTERN TECH. ASSOC. Date: 8/24/94

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Form Number	DC002	Page	2	of	2
Continued on VEO Form Number					

Method Used (Circle One)
Method 9 203A 203B Other: _____

Company Name		
Facility Name		
Street Address		
City	State	Zip

Process	Unit #	Operating Mode
Control Equipment		Operating Mode

Describe Emission Point			
1.5' dia			
Height of Emiss. Pt. Start 73.5	End	Height of Emiss. Pt. Rel. to Observer Start	End
Distance to Emiss. Pt. Start	End	Direction to Emiss. Pt. (Degrees) Start	End

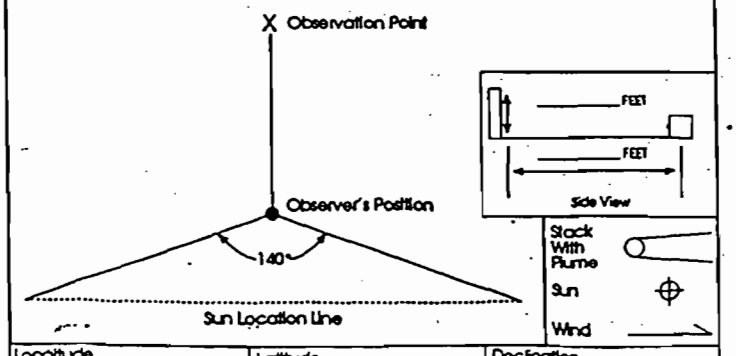
Vertical Angle to Obs. Pt. Start	End	Direction to Obs. Pt. (Degrees) Start	End
Distance and Direction to Observation Point from Emission Point Start		End	

Describe Emissions Start		End	
Emission Color Start	End	Water Droplet Plume Attached ☐	Detached ☐ None ☐

Describe Plume Background Start		End	
Background Color Start	End	Sky Conditions Start	End
Wind Speed Start	End	Wind Direction Start	End
Ambient Temp. Start	End	Wet Bulb Temp.	RH Percent

Source Layout Sketch

Draw North Arrow ☐TN ☐MN



Longitude	Latitude	Declination

Additional Information

Observation Date	Time Zone	Start Time	End Time

Sec / Min	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
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23	0	0	0	0	
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26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print)	
Observer's Signature	Date
Organization	
Certified By	Date

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Form Number: DC 001 | Page 1 of 2

Continued on VEO Form Number: DC 002

Method Used (Circle One): Method 9 | 203A | 203B | Other: _____

Company Name: DESTEC Energy

Facility Name: TIGER BAY COGEN

Street Address:

City: Ft. MEADE | State: FL | Zip:

Process: SPRAY DRYER | Unit #: | Operating Mode: 100%

Control Equipment: BAG HOUSE | Operating Mode: 100%

Describe Emission Point: CIRCULAR STEEL STACK GRAY 1.4' dia

Height of Emiss. Pt.: Start 73.5 ✓ End ✓

Height of Emiss. Pt. Rel. to Observer: Start 4' End 4'

Distance to Emiss. Pt.: Start 25' End ✓

Direction to Emiss. Pt. (Degrees): Start 348 End 348

Vertical Angle to Obs. Pt.: Start ~12° End ✓

Direction to Obs. Pt. (Degrees): Start NE 348/168 End 168

Distance and Direction to Observation Point from Emission Point: Start 25' SSE End ✓

Describe Emissions: Start Non Visible End ✓

Emission Color: Start Clear End ✓

Water Droplet Plume: Attached ☐ Detached ☐ None ☒

Describe Plume Background: Start Gray Cloud End ✓

Background Color: Start Gray End ✓

Sky Conditions: Start ● End

Wind Speed: Start 6-8 End 10-12

Wind Direction: Start SE End ✓

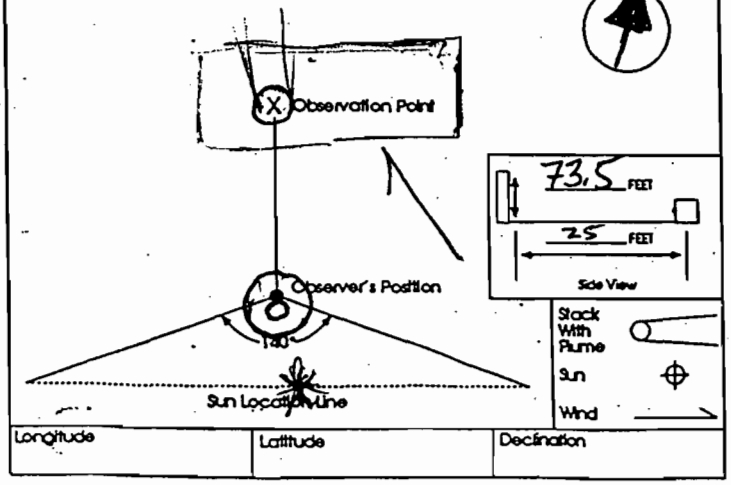
Ambient Temp.: Start 78 End 78

Wet Bulb Temp.: 75

RH Percent: 86%

Source Layout Sketch

Draw North Arrow: ☐TN ☐MN



Longitude | Latitude | Declination

Additional Information

Observation Date	Time Zone	Start Time	End Time
9/27/94	E	1124	1224

Min \ Sec	0	15	30	45	Comments
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3	0	0	0	0	
4	0	0	0	0	
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11	0	0	0	0	
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13	0	0	0	0	
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25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print): NORMAN R. CZARNIAK

Observer's Signature: Norman R. Czarniak | Date: 9/27/94

Organization: E.S.E

Certified By: EASTERN TECH. ASSOC. | Date: 8/24/94

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Form Number	DC002	Page 2 of 2
Continued on VEO Form Number		

Method Used (Circle One)
Method 9 203A 203B Other: _____

Company Name

Facility Name

Street Address

City | State | Zip

Process | Unit # | Operating Mode

Control Equipment | Operating Mode

Describe Emission Point

1.5' dia

Height of Emiss. Pt. Start 73.5 End | Height of Emiss. Pt. Rel. to Observer Start End

Distance to Emiss. Pt. Start End | Direction to Emiss. Pt. (Degrees) Start End

Vertical Angle to Obs. Pt. Start End | Direction to Obs. Pt. (Degrees) Start End

Distance and Direction to Observation Point from Emission Point
Start End

Describe Emissions
Start End

Emission Color Start End | Water Droplet Plume Attached ☐ Detached ☐ None ☐

Describe Plume Background
Start End

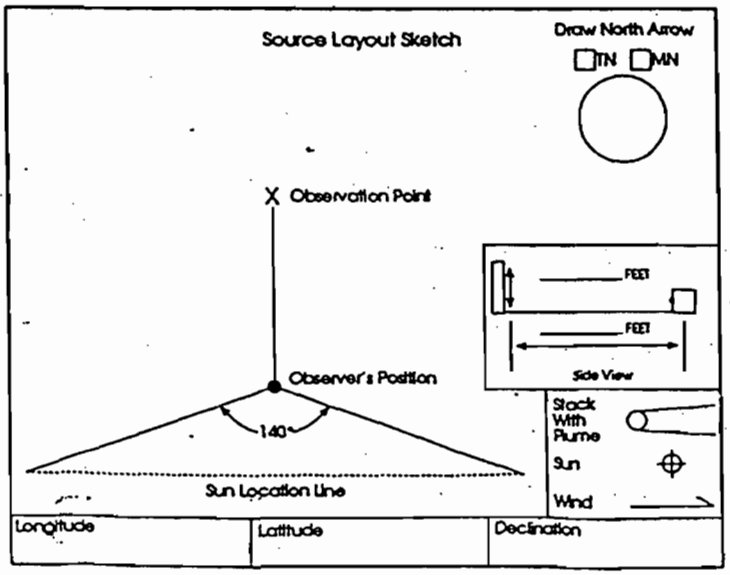
Background Color Start End | Sky Conditions Start End

Wind Speed Start End | Wind Direction Start End

Ambient Temp. Start End | Wet Bulb Temp. | RH Percent

Source Layout Sketch

Draw North Arrow ☐TN ☐MN



Longitude | Latitude | Declination

Additional Information

Observation Date	Time Zone	Start Time	End Time

Sec / Min	0	15	30	45	Comments
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26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observer's Name (Print)

Observer's Signature | Date

Organization

Certified By | Date

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

OCT 06 1994

4APT-AEB

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

SUBJ: Approval of NSPS Custom Fuel Monitoring Schedule for Tiger Bay Limited Partnership, Gas Turbine Cogeneration Facility, Permit Nos. AC53-214903 and PSD-FL-190

Dear Mr. Fancy:

This is to acknowledge a letter from Mr. Robert S. Chatham of Destec Energy (DE) dated August 3, 1994, requesting approval of a customized fuel monitoring schedule for the above referenced project. This letter was jointly transmitted to the U.S. Environmental Protection Agency (EPA), and to you.

Since the authority for approving a custom fuel monitoring plan under 40 CFR Part 60, Subpart GG has not been delegated to the State of Florida, we have reviewed DE's custom fuel monitoring schedule including the additional information submitted on September 22, 1994. Based on our review, we have determined that the proposed schedule is acceptable, as long as this source complies with all items of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987. A copy of this memo was included with DE's request as an enclosure.

If you have any questions regarding this letter, please contact Mr. Mirza P. Baig of my staff at (404) 347-3555, voice mail extension 4147.

Sincerely yours,

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

DESTEC ENGINEERING

DESTEC ENGINEERING, INC.
2500 CITYWEST BLVD., SUITE 150
HOUSTON, TEXAS 77042

POST OFFICE BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

September 26, 1994

William A. Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: CEMS Certification and Source Testing
Permit No: AC53-214903 and PSD-FL-190
AC53-230744
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Proses:

CEMS Certification and Source Testing was originally scheduled at Tiger Bay Limited (Permit No: AC53-2414903 and PSD-FL-190) for September 19 through September 25. Since the duct burner for the facility is not currently in service, CEMS Certification and Source Testing has tentatively been scheduled to begin either October 10 or 17. As soon as the duct burner is in service, a firm date will be selected for CEMS Certification and Source Testing.

As we discussed on September 26, the spray dryer unit for Permit No: AC53-230744 is currently in operation. Tiger Bay Limited has scheduled a visible emissions opacity test to be conducted on September 27.

If you have any questions regarding this issue, please call me at 805/392-7347 or 813/285-7137.

Sincerely,

Scott A. Kicker
Environmental Engineer

cc: Teresa Heron, FDEP-Tallahassee

DEP ROUTING AND TRANSMITTAL SLIP

TO: (NAME, OFFICE, LOCATION)

1. Teresa Heron

2. DARM

3. Karen [illegible]

4.

5.

PLEASE PREPARE REPLY FOR:

____ SECRETARY'S SIGNATURE

____ DIV/DIST DIR SIGNATURE

____ MY SIGNATURE

____ YOUR SIGNATURE

____ DUE DATE ________

ACTION/DISPOSITION

____ DISCUSS WITH ME

____ COMMENTS/ADVISE

____ REVIEW AND RETURN

____ SET UP MEETING

____ FOR YOUR INFORMATION

____ HANDLE APPROPRIATELY

____ INITIAL AND FORWARD

____ SHARE WITH STAFF

__✓__ FOR YOUR FILES

COMMENTS:

RECEIVED
OCT 05 1994
Bureau of
Air Regulation

FROM: SWD/TPA/AP DATE: 9/29/94 PHONE: 813 542-6100

DEP 15-026 (12/93)

CLM

DESTEC ENGINEERING

DESTEC ENGINEERING, INC
2500 CITYWEST BLVD., SUITE 150
HOUSTON, TEXAS 77042

POST OFFICE BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

September 26, 1994

William A. Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: CEMS Certification and Source Testing
Permit No: AC53-214903 and PSD-FL-190
AC53-230744
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Proses:

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If you have any questions regarding this issue, please call me at 805/392-7347 or 813/285-7137.

Sincerely,

Scott A. Kicker
Environmental Engineer

cc: Teresa Heron, FDEP-Tallahassee

Z 751 859 984

Receipt for Certified Mail

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

Sent to Mr. Robert S. Crafham	
Street and No. Destec Energy, Inc.	
P.O., State and ZIP Code P.O Box 4411 Houston TX	
Postage	$
Certified Fee 9	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Mailed 9/23/94 AC 53-214903 PSD-FL-190(A)	

PS Form **3800**, March 1993

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

September 22, 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert S. Chatham, P.E.
Senior Environmental Engineer
Destec Energy, Inc.
P.O. Box 4411
Houston, Texas 77210-4411

RE: NSPS Custom Fuel Monitoring Schedule
Tiger Bay Cogeneration Facility
Permit Amendment Request
AC 53-214903 [PSD-FL-190(A)]

Dear Mr. Chatham:

To complete our review of your request, received on September 12, 1994, to amend the construction permit by incorporating a custom fuel monitoring schedule, it was necessary to request additional information. This information was received today and is adequate to complete the amendment request. Your amendment request, which includes the initial submittal and the additional information, is being mailed to the U.S. EPA for their review and determination. When a response from EPA is received, you will be notified. If your request is approved by EPA, the amendment will be processed.

Your consideration in this issue has been appreciated and if you have any questions please call Charles Logan at (904)488-1344.

Sincerely,

Bruce Mitchell

Bruce Mitchell
Environmental Administrator
Bureau of Air Regulation

BM/CSL/bjb
cc: J. Brown, DEP
B. Thomas, SWD

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

September 22, 1994

RECEIVED
SEP 23 1994
Bureau of
Air Regulation

Mr. Charles Logan
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: NSPS Custom Fuel Monitoring Schedule
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility
AC 53-214903 (PSD-FL-190)

Dear Mr. Logan:

This correspondence is submitted on behalf of Tiger Bay Limited Partnership (TBLP) to request approval of a natural gas custom fuel monitoring schedule and to supplement our September 9, 1994 correspondence. This request is made necessary by TBLP's Specific Permit Condition No. 18 of AC 53-214903 and 40 CFR Part 60.334(b)(2). It is our understanding that this schedule should address sulfur content of the natural gas; the nitrogen content in natural gas is not required. Please amend TBLP's Specific Condition No. 18 as per the attached custom fuel monitoring schedule.

Should you or your department have questions or comments about this letter, please contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:kro
Attachment

cc: Mr. Bill Thomas - FDEP, SW District

G:\1253\CORRESPO\logan3.rsc

CUSTOM FUEL MONITORING SCHEDULE

Specific Condition No. 18

From

Sulfur and nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be determined as specified in 40 CFR 60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Southwest District office. Any custom schedule approved by DER pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance. The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

To

This source shall comply with all requirements of 40 CFR 60, Subparts GG and Dc and F.A.C. Rule 17-296.800(2)(a), Standard of Performance for Stationary Gas Turbines and Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. 40 CFR 60.334(b)(2) requires that a custom fuel monitoring schedule shall be followed for natural gas fired at this facility, as follows:

Custom Fuel Monitoring Schedule for Natural Gas

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

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are ASTM D1072-80, ASTM D3031-81, ASTM D3246-81, and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. This custom fuel monitoring schedule shall become effective on the date this permit becomes valid. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters. If monitoring data is provided by the applicant which demonstrates consistent compliance with the requirements herein, the applicant may begin monitoring as per the requirements of 2(c).

c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

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

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

The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the distillate fuel oil being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

September 22, 1994

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 4

To Charles Logan	From Robert Chatham
Co. FDEP	Co.
Dept. Air	Phone # 713 735 4087
Fax # 904 922-6979	Fax #

Mr. Charles Logan
Bureau of Air Regulation
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: NSPS Custom Fuel Monitoring Schedule
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility
AC 53-214903 (PSD-FL-190)

Dear Mr. Logan:

This correspondence is submitted on behalf of Tiger Bay Limited Partnership (TBLP) to request approval of a natural gas custom fuel monitoring schedule and to supplement our September 9, 1994 correspondence. This request is made necessary by TBLP's Specific Permit Condition No. 18 of AC 53-214903 and 40 CFR Part 60.334(b)(2). It is our understanding that this schedule should address sulfur content of the natural gas; the nitrogen content in natural gas is not required. Please amend TBLP's Specific Condition No. 18 as per the attached custom fuel monitoring schedule.

Should you or your department have questions or comments about this letter, please contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:kro
Attachment

cc: Mr. Bill Thomas - FDEP, SW District

CUSTOM FUEL MONITORING SCHEDULE

Specific Condition No. 18

From

Sulfur and nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be determined as specified in 40 CFR 60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Southwest District office. Any custom schedule approved by DER pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance. The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

To

This source shall comply with all requirements of 40 CFR 60, Subparts GG and Dc and F.A.C. Rule 17-296.800(2)(a), Standard of Performance for Stationary Gas Turbines and Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. 40 CFR 60.334(b)(2) requires that a custom fuel monitoring schedule shall be followed for natural gas fired at this facility, as follows:

Custom Fuel Monitoring Schedule for Natural Gas

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

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are ASTM D1072-80, ASTM D3031-81, ASTM D3246-81, and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. This custom fuel monitoring schedule shall become effective on the date this permit becomes valid. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters. If monitoring data is provided by the applicant which demonstrates consistent compliance with the requirements herein, the applicant may begin monitoring as per the requirements of 2(c).

c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

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

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

The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the distillate fuel oil being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

Mr. Charles Logan
Bureau of Air Regulation
Florida Department of Environmental Protection
September 22, 1994

bcc: S. A. Kicker
J. D. Sellers
S. E. Stevens
File 1253

G:\1253\CORRESPO\logan3.ltr

File Copy

Department of Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

September 21, 1994

Ms. Jewell Harper, Chief
Air Enforcement Branch
U.S. EPA., Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

RE: NSPS Custom Fuel Monitoring Schedule
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility
AC 53-214903 [PSD-FL-190]

Dear Ms. Harper:

This letter serves to follow up a telephone conversation with Mr. Mirza Baig regarding a request by Tiger Bay Limited Partnership Corporation (JSC) to amend the Tiger Bay Cogeneration Facility construction permit. The amendment is requested pursuant to 40 CFR 60.334(b)(2), which would allow the applicant to use a custom fuel monitoring schedule for determining the sulfur and nitrogen content of natural gas being fired in combustion turbines at the facility.

Pursuant to 40 CFR 60.334(b)(2), the U.S. EPA Administrator must approve the custom fuel monitoring schedule. The supporting data needed for approval of the request has been enclosed for your review. We would appreciate a response as soon as possible. If you have any questions please call Charles Logan at (904)488-1344.

Sincerely,

John Brown

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

Attachment
CHF/csl

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

September 9, 1994

Mr. Charles Logan
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility
AC 53-214903 (PSD-FL-190)

Dear Mr. Logan:

The Florida Gas Transmission Company (FGT) is routing the natural gas to the facility's combustion turbine via a recently installed pipe line. The facility has no natural gas bulk storage capability.

On behalf of Tiger Bay Limited Partnership, I have attached the following documents in response to the Florida Department of Environmental Regulation letter dated August 18, 1994.

Item 1: Enclosed is the $250 processing fee.

Item 2: Enclosed are several FGT natural gas analysis reports dated December 1993 to August 1994. According to FGT, the analysis method used to determine total sulfur is ASTM 4468. The natural gas that is fired by the combustion turbine will be sampled on the six-acre Tiger Bay site.

Please note that this is being submitted only to the Florida Department of Environmental Regulation. Should you or your department have questions or comments about this letter, please contact me at (713) 735-4087.

Sincerely,

for Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:kro
Attachments (2) cc: Mr. Bill Thomas - FDEP, SW District (w/o att.)

G:\1253\CORRESPO\logan.rsc

TIGER BAY LIMITED PARTNERSHIP
September 8, 1994

Total Sulfur (GR/CCF) ASTM 4468	Date
0.10	08/17/94
0.08	08/08/94
0.09	08/01/94
0.09	07/26/94
0.06	07/19/94
0.07	07/12/94
0.07	07/06/94
0.08	06/29/94
0.07	06/22/94
0.09	06/14/94
0.05	06/07/94
0.07	05/31/94
0.08	05/24/94
0.08	05/24/94
0.14	05/17/94
0.05	05/11/94
0.03	05/03/94
0.07	04/26/94
0.10	04/19/94
0.05	04/12/94
0.06	04/06/94
0.05	03/29/94
0.08	03/23/94
0.05	03/15/94
0.05	03/08/94

0.07	03/02/94
0.07	02/21/94
0.09	02/15/94
0.04	02/09/94
0.18	01/31/94
0.22	01/26/94
0.28	01/18/94
0.18	01/11/94
0.30	01/05/94
0.18	12/21/93
0.42	12/14/93
0.31	12/07/93
0.48	12/01/93

Source: Florida Gas Transmission Company, Maitland, Florida

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

AUG 14 1987

OFFICE OF
AIR AND RADIATION

MEMORANDUM

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

FROM: John B. Rasnic, Chief
Compliance Monitoring Branch

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

Air Programs Branch Chiefs
Regions I-X

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

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

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

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

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

Attachment

cc: John Crenshaw
George Walsh
Robert Ajax
Earl Salo

Enclosure

Conditions for Custom Fuel Sampling Schedule for Stationary Gas Turbines

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

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measuremant of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.

   c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample anaylsis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

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

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

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

September 7, 1994

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: Zero Liquid Discharge System - Initial Firing
Permit No. AC53-230744 and IC53-221795
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Proses,

On September 1, 1994, the initial natural gas firing of the zero liquid discharge system occurred.

Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:kro

cc: Teresa Heron, FDEP - Tallahassee
George Sharrock, FDEP - Tampa

DEP ROUTING AND TRANSMITTAL SLIP

TO: (NAME, OFFICE, LOCATION)

1. Mike Harley

2. _____

3. _____

4. _____

5. _____

PLEASE PREPARE REPLY FOR:

____ SECRETARY'S SIGNATURE

____ DIV/DIST DIR SIGNATURE

____ MY SIGNATURE

____ YOUR SIGNATURE

____ DUE DATE _____

ACTION/DISPOSITION

____ DISCUSS WITH ME

____ COMMENTS/ADVISE

✓ ____ REVIEW AND RETURN

____ SET UP MEETING

✓ ____ FOR YOUR INFORMATION

____ HANDLE APPROPRIATELY

____ INITIAL AND FORWARD

____ SHARE WITH STAFF

____ FOR YOUR FILES

COMMENTS:

Re: Emission Test Protocol

RECEIVED
SEP 15 1994
Emissions Monitoring

Mike,
Test Protocol looks good
Yogesh

Otherwise it is a violation!

FROM: Teresa DATE: 9/14 PHONE: _____

DEP 15-026 (12/93)

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

September 7, 1994

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: CEMS Certification and Source Testing Date
Permit No. AC53-214903 and PSD-FL-190
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Proses,

On behalf of Tiger Bay Limited Partnership, we are enclosing the initial source testing and continuous emission monitoring certification protocol. We plan to certify the continuous emission monitoring system (CEMS) and perform the initial compliance source testing between September 19 and 25.

Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:kro
Enclosure

cc: Teresa Heron, FDEP - Tallahassee

G:\1253\correspo\proses4.rsc

EMISSION TEST PROTOCOL
FOR
TIGER BAY COGENERATION
PROJECT
FORT MEADE, FLORIDA

Prepared for:

DESTEC Engineering, Inc.
2500 City West Boulevard, Suite 150
Houston, Texas 77042

Prepared by:

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
P.O. Box 1703
Gainesville, Florida 32602

ESE No. 3941227-0100-3100

September 1994

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APPENDICES

APPENDIX A--AIR PERMIT

APPENDIX B--SAMPLE CALCULATIONS

APPENDIX C--EXAMPLE DATA SHEETS, AND CALIBRATION DATA SHEETS

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1.0 INTRODUCTION

Environmental Science & Engineering (ESE), Inc. is under contract to Destec Engineering (Destec) to provide emissions testing support for emissions compliance sampling for a stationary combustion turbine (CT) recently constructed in Fort Meade, Florida. The combustion turbine facility is the Tiger Bay Cogeneration Project. This document is the test protocol for the initial emissions compliance test program as required by the Florida Department of Environmental Regulation (FDER) and as required by Federal New Source Performance Standards (NSPS) as well as for the initial continuous emissions monitoring system (CEMS) certification by relative accuracy test audit (RATA). The Florida Department of Environmental Protection (FDEP) construction permit for the facility is AC53-214903/PSD-FL-190.

The combustion turbine is a combined cycle General Electric Model (GE) PG7221FA (Frame 7FA) equipped with dry-low NO_X burners. The CT uses premix flame technology to control emissions of nitrogen oxides (NO_x) rather than conventional water injection technology. The CT is capable of firing either natural gas or liquid distillate fuel; however, at present the unit is only equipped to fire natural gas. The unit also includes a natural gas fired duct burner just prior to the heat recovery steam generation (HRSG) system for supplemental heat input. All emissions testing will take place at the combined cycle exhaust stack.

There are two phases to the scope of work for the test program including conducting CEM certifications by relative accuracy test audit (RATA) for the O_2 and NO_X analyzers as well as conducting initial compliance testing. For this test program, the tests will be conducted simultaneously.

Compliance testing includes conducting tests to satisfy the FDEP permit emissions limits as well as Federal NSPS initial performance testing requirements (40CFR60, Subpart GG). The permit conditions require testing for NO_x, CO, VOC, VE and particulate matter as well as for diluent oxygen and volumetric flowrate. The tests for initial permit compliance demonstration are required to be conducted at between 95% and 100% of maximum achievable load (ie peak load) for the given ambient conditions during the tests. A full set of testing is required while firing only the turbine and also while firing the duct burner at maximum load (6 total full load runs - 3 at each condition). All tests will be conducted at the combined cycle stack. If possible, the conditions will be alternated in order to obtain the most comparable results so that Run 1 for the turbine only can be most directly correlated to Run 1 while firing the duct burner, etc.

In addition to the full load testing required for the duct burner and for the turbine to demonstrate compliance with the FDEP permit emission limits, the unit is also subject to Federal NSPS (Subpart GG) initial performance tests at four discrete loads (for the turbine only.) This testing is conducted for O_2 and NO_x only. The permit compliance tests at maximum load for the turbine will constitute one of the test conditions. Three additional load conditions will then be required to be conducted over the normal operating range of the turbine. Three test runs will be conducted at each condition using EPA Method 20.

Compliance with the sulfur dioxide and sulfuric acid mist requirements of the permit will be demonstrated by fuel analysis due to the low concentrations expected. It should be noted that fuel analysis does not provide insight into the sulfuric acid mist emissions, nor is it practical to conduct EPA Method 8 sampling at the low levels of H_2SO_4 expected. ESE will therefore use emissions factors combined with the fuel analysis data to demonstrate compliance with these limits as we have done in the past for FDEP.

Currently, it is planned for Destec to collect the natural gas fuel samples and have them analyzed by an independent commercial laboratory.

The FDEP permit requires that NO_X and O_2 CEMS be installed for the unit for surveillance purposes. RATA certification of the NO_X and diluent O_2 CEMS will be conducted using EPA Method 20 and the procedures given for RATA in Performance Specifications 2 and 3 of 40CFR60, Appendix B. Destec will provide the data for the 7 day drift tests for the analyzers. The results of the 7 day drift test will be incorporated into the CEM Certification Test Report.

The test methods which will be used for this test program are listed briefly below:

EPA Method 1:	Determination of Sampling point location for particulate and velocity traverses.
EPA Method 2:	Determination of velocity and volumetric flow rate from stationary sources using calibrated type K thermocouples and type S pitot tubes.
EPA Method 3:	Determination of flue gas molecular weight, O_2 and CO_2 using an ORSAT analyzer.
EPA Method 3A:	Continuous determination of O_2 and CO_2 using a paramagnetic and a non-dispersive infrared analyzer, respectively.
EPA Method 4:	Determination of flue gas moisture content.

EPA Method 5:	Determination of particulate matter emissions from stationary sources.
EPA Method 9:	Determination of opacity as visible emissions (VE) by a qualified observer.
EPA Method 10:	Continuous determination of CO using a gas filter correlation/nondispersive infrared analyzer (GFC/NDIR).
EPA Method 18:	Determination of speciated gaseous organic compounds by analysis using gas chromatography. (optional - depending on the Method 25A result)
EPA Method 20:	Determination of nitrogen oxides using continuous emissions monitoring techniques with a chemiluminescent analyzer.
EPA Method 25A:	Continuous determination of volatile organic compounds as total gaseous organic concentration using a flame ionization analyzer.

All procedures and quality control guidelines specified in the appropriate methods will be strictly followed during the test program, in addition to ESE's more stringent internal quality control standards.

Note that EPA Method 17 may be substituted for EPA Method 5 depending on the temperature of the flue gas. EPA Method 18 will only be used to determine methane

content in the gas for subtraction from the Method 25A result if the Method 25A result exceeds the emission limit. Triplicate test runs will be performed at each condition. The emissions limits for the combustion turbine and duct burner are included in Table 1 in the facility permit included in Appendix A.

The emissions tests will be coordinated for Destec by Mr. Scott Kicker. Bill Mayhew will be the ESE project manager for the test program and will be on site during the tests as the field team leader and instrument operator.

FDEP has been notified in advance of the test date so that an agency representative may be present, if desired.

Section 2.0 of this document provides a brief process description of the sampling location. Section 3.0 presents the emissions testing strategy. Section 4.0 outlines the procedures and test methods to be used. Section 5.0 discusses the quality assurance/quality control measures to be followed during sampling and analysis. Section 6.0 discusses reporting for the test program. A copy of the FDEP air permits for these facility sources is included in Appendix A. Sample data and calibration sheets are contained in Appendix B and Appendix C contains sample calculations.

2.0 PROCESS DESCRIPTION AND SAMPLING POINT LOCATIONS

The Unit 1 combustion turbine at the Tiger Bay Cogeneration Facility is a General Electric PG7221FA (Frame 7FA) gas turbine driving a generator with a nominal electrical output rating of about 184 MW. The turbine is operated in the combined cycle mode.

The turbine is equipped with state-of-the-art multi-nozzle, quiet dry low-NO_x combustors. NO_x control is accomplished by using a premixed flame (rather than the conventional diffusion flame). The unit is equipped with a Deltak heat recovery steam generation system (HRSG) which provides high pressure steam to drive a steam turbine generator rated at approximately 84 MW electrical output. The unit also is equipped with a 100 MMBtu/hr (based on HHV) natural gas fired duct burner for supplemental heat input. The combined maximum electrical output of the steam turbine and the combustion turbine generators is approximately 258 MW.

The exhaust stack is circular with an outside diameter of 19'. Four test ports are located at 90° intervals around the stack at the 157' level. The test ports are 4" pipe with flanged covers. The sampling ports meet the criterion of EPA Method 1 for location of sampling points.

Using EPA Method 1 criteria, the maximum number of traverse points at this test location for particulate sampling is 24. EPA Method 20 requires that 48 points be used for an O_2 traverse to select the points for testing.

3.0 EMISSION TEST APPROACH

The test matrix for the emissions sampling program is given in Table 3-1. A total of 15 test runs will be conducted 3 at each condition. EPA Method 20 requires that each of the lowest 8 points of oxygen be tested in the stack for a duration of 1 minute plus the response time for each point. Therefore, the typical run time requirements for Method 20 is between 12 and 16 minutes. However, for this sampling program each test run will be at least 21 minutes in duration in order to meet the minimum run time for CEMS certification by RATA as given in PS2 of 40CFR60, Appendix B. During the maximum load tests, for both the turbine and duct burner, the test duration will be at least one hour for each parameter. Particulate matter samples will be collected for approximately two hours in order to meet the low detection limits required to demonstrate compliance with the emissions standard. A visible emissions test will be conducted simultaneously with one of the particulate matter tests during the maximum load tests both with and without the duct burner in service.

A preliminary oxygen traverse will be conducted to determine the lowest 8 points of oxygen in the exhaust stack. If stratification of the gas is determined to exist in the duct, the lowest eight points of oxygen will be traversed by Method 20 during the tests. If the gases are not stratified in terms of oxygen concentrations, then eight convenient points will be used for the Method 20 traverses for each run. The criteria that will be used to determine the existence of stratification will be a difference of greater than 0.4%V oxygen between any two traverse points. (Note that the maximum allowable error of the method is 0.5%V oxygen.)

3.1 SCHEDULE OF ACTIVITIES

The proposed schedule of activities for the test program is given below:

Week 1	Prepare emissions testing equipment and check out. Prepare and submit Compliance Test Protocol.
Week 2	On site testing.
Day 1	Travel to site and setup equipment. Conduct NO_X converter efficiency test and preliminary measurements as time permits. Conduct preliminary O_2 traverse.
Day 2	Conduct testing for 3 low loads for NSPS requirements for NO_X and O_2.
Day 3	Conduct 4 tests for NO_X, O_2, CO, Particulate Matter, VE, and VOC for maximum load for the turbine and/or duct burner.
Day 4	Conduct 2 tests for NO_X, O_2, CO, Particulate Matter, VE, and VOC for maximum load for the turbine and/or duct burner. - Demobilize equipment.
Day 5	Travel - Provide preliminary results to Destec.
Week 3	Finalize results and submit to Destec.
Week 4	Submit draft report to Destec.
Week 5	Submit final report to Destec.
Week 6:	Submit final report to FDEP.

Note that the actual order of the tests may be changed if required due to operational constraints. A more aggressive test schedule may also be observed if deemed appropriate by ESE and Destec.

Table 3-1. Emissions Test Matrix

Test Contidions	Turbine Load	Duct Burner Load	Test Parameter
1	Low Load	0	O_2, NO_X
2	Intermediate Load #1	0	O_2, NO_X
3	Intermediate Load #2	0	O_2, NO_X
4	Maximum	0	O_2, NO_X, CO, VOC, Particulate and VE
5	Maximum	Maximum	O_2, NO_X, CO, VOC, Particulate and VE

Source: ESE, 1994.

Note: Ambient conditions and process data will be measured during each test run in order to perform the ISO correction for NO_X.

4.0 PROCEDURES AND EPA TEST METHODS

This section includes a brief description of the test methods to be used and the sampling strategy to be followed for the testing.

4.1 METHOD 1: SAMPLE AND VELOCITY TRAVERSE

The location of the traverse points used to determine the velocity of the stack gas within the circular stack is based on the relation of the stack diameter to the upstream and downstream distances. The traverse points used for the velocity traverse will be determined from Figure 1-2 and Table 1-2 of Method 1, Appendix A, 40 CFR 60.

4.2 METHOD 2: VELOCITY AND VOLUMETRIC FLOW RATE

The average gas velocity in the stack will be determined from measurement of the velocity head with a Type "S" Pitot tube. Calibration will be performed to verify the face opening alignments, external tubing diameter, and base-to-opening plane distances. A base line coefficient value of 0.84 will be assigned to each pitot tube.

4.3 METHOD 3: ORSAT SAMPLING

Nitrogen, oxygen, and carbon dioxide stack gas concentrations will be determined with an ORSAT analyzer. Sample gas from the stack source will be collected in a leak-free Tedlar bag for the same sampling period as each test period. The Tedlar bag collected gas will be analyzed three times with the Orsat analyzer. The Tedlar bag will be evacuated, purged with air, evacuated again, and prepared for the next test run.

4.4 METHOD 4: MOISTURE CONTENT

The moisture content of a gas stream will be determined by extracting the gas sample at a known and regulated rate through a glass condenser train. The condenser train consists of four glass impingers connected in series with leak free glass U-tube

connectors. The gas sample will be extracted through the impinger train (maintained below 68°F in an ice bath) with a vacuum pump and the amount of gas sampled will be measured with a calibrated dry gas meter. The sample rate will be regulated with an orifice meter and at least twenty-one (21) standard cubic feet will be collected during the test period. The amount of moisture collected will be determined gravimetrically and the amount of gas drawn, corrected to dry, standard conditions will be determined. The meter box calibration forms are contained in Appendix B.

4.5 EPA METHOD 5 - PARTICULATE SAMPLING AND ANALYSIS

The sampling and analytical procedures used follow the procedures as outlined in EPA Method 5, in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 5, revised as of July 1, 1989. The sampling equipment consists of the following:

1. Sample Probe Assembly
   a. Nozzle--Stainless steel with a sharp, tapered leading edge.
   b. Probe--Stainless steel (S.S.) sheath with a 1/2 inch diameter glass insert wrapped with nichrome wire; rheostat controlled and capable of maintaining a temperature of 248 +/-25 degrees Fahrenheit (°F).
   c. Pitot--Type "S" constructed and attached to probe according to specifications outlined in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 2.
   d. Orsat Probe--Stainless steel 1/4 inch tubing attached to pitot tube in an interference-free arrangement.
   e. Thermocouple--Type "K" attached to the pitot tube such that the tip has no contact with metal and does not interfere with the pitot tube face openings.
2. Filter Holder--Glass with fitted glass filter support.

3. Filter Heating Assembly--Controlled heating element in aluminum module attached to end of probe; capable of maintaining 248 +/-25°F.
4. Impingers--Four impingers connected in series with glass ball/socket joint fittings and placed in an ice bath. A Greenburg-Smith impinger tip configuration is used for the second impinger. The first, third, and fourth impingers are the modified Greenburg-Smith design with a standard tip. Final gas exit temperature is measured to within +/-2°F with a type "K" thermocouple immersed in the gas stream.
5. Control Box--Model containing vacuum gauge, external leak-free pump, thermocouples capable of measuring temperature to within +/-2°F, dry gas meter with a minimum of 2 percent accuracy, valves and related equipment as required to maintain an isokinetic sampling rate, and to determine sample volume.

Prior to leaving the laboratory, glass fiber filters are numbered for identification, heated for 2 hours at 105° C, desiccated for 2 hours, and pre-weighed to the nearest 0.1 mg. Silica gel (indicating type, 6-16 Mesh) is also pre-weighed to 200 grams after drying for 2 hours.

Upon arrival at the sampling site, the control box is leak-checked from pump to orifice at 5 to 7 inches of water.

The sample train is prepared in the following manner: 100 mL of H_20 is added to the first and second impingers. The third impinger is left empty, and a pre-weighed quantity of silica gel is added to the fourth impinger for final moisture removal. After assembling the train with the pitobe as shown in the schematic, the system is leak-checked by plugging the inlet to the probe nozzle and pulling a vacuum of at least 15 inches of mercury "Hg. A leakage rate not in excess of 0.02 cfm is considered

acceptable. The pitot tube system is also leak-checked at 2 to 3 inches of water, and any leaks found are corrected.

The inside dimensions of each stack are measured and recorded. The number of sampling points and the location of these points on a traverse are determined by the guidelines set forth in the Code of Federal Regulations, Chapter I, Title 40, Part 60, Appendix A, Method 1. These points are then marked on the probe for easy visibility.

A preliminary traverse is conducted to determine the range of velocity head and the pressure of the stack. An approximate stack temperature is obtained during the same traverse, and an approximate moisture content is estimated based on knowledge of the emission source type and attendant characteristics and prior testing experience. From these data, the correct nozzle size and isokinetic K-factor are determined.

The probe is attached and the heater adjusted to provide a gas temperature of approximately 250°F. The filter heating system is turned on, and crushed ice placed around the impingers. After a suitable warmup period, the nozzle is placed at the first traverse point with the tip pointing directly into the gas stream. The pump is started and the sampling rate adjusted to isokinetic conditions. After the required time interval has elapsed, the probe is repositioned to the next traverse point, and isokinetic sampling re-established. This will be done for each point on the traverse until the run is completed. Readings are taken at least every 5 minutes, or when significant changes in stack conditions necessitated additional adjustments in flow rate. At the conclusion of each run, the pump is turned off and the final readings are recorded. A final leak-check of the system is performed as previously described at the highest vacuum encountered during testing, and a leak-check of the pitot system is repeated.

4.5.1 SAMPLE RECOVERY

The collection train is carefully moved to a convenient sample recovery area in order to minimize the loss of collected sample or the gain of extraneous particulate matter. The volume of condensate in the first three impingers is measured and recorded on the field data sheet. The probe, nozzle, and all sample-exposed surfaces are will rinsed with reagent grade acetone and put into a clean sample bottle marked "pre-filter". A brush is used to loosen any adhering particulate matter, and subsequent rinses are put into the "pre-filter" container. The filter is carefully removed from the fitted glass support and placed in its original container. The silica gel is removed from the fourth impinger and transferred to its original container. A sample of the acetone used in rinsing the probe is saved for a blank laboratory analysis.

4.5.2 ANALYTICAL PROCEDURES

The filter and any loose particulate matter are transferred from the sample container to a clean, tared glass weighing dish. The filter is placed in an oven at 105°C for 2 hours, desiccated for 2 hours, and then weighed. The original weight of the filter is deducted, and the weight gain recorded to the nearest 0.1 mg.

The "pre-filter" and blank solutions are transferred to clean, tared beakers, then evaporated to dryness and desiccated to a constant weight. The blank correction is made, and the weight gain recorded to the nearest 0.1 mg. The silica gel is weighed, and the weight gain recorded to the nearest 0.1 gram.

4.6 CONTINUOUS EMISSION MONITORING

Stack gas emissions of oxides of nitrogen (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) will be measured using continuous emission monitors (CEMS). Diluent oxygen concentration is also measured using CEM techniques. These tests will be performed in accordance with EPA Methods 3A for oxygen, 10 for CO, 20

for NO_x, and 25A for VOC as outlined in Title 40, Part 60, Appendix A of the Code of Federal Regulations. In addition, EPA Method 18 may be used to determine methane content for the determination of non-methane organic compounds. Copies of all on-line CEM data collected during the testing and copies of the backup strip charts will be presented in an Appendix to the report. Calibration records are also given with the data.

Flue gas sample is withdrawn from the stack at a constant rate via a stainless steel sample probe. The sample probe is equipped with an additional stainless steel line to enable probe tip calibrations. The probe is of sufficient length to allow traversing across the duct as required by EPA Method 20. Extracted sample is passed from the probe through a filter and a heated teflon sample line to the moisture removal system. The moisture removal system (gas conditioner) is designed for minimal contact between condensate and sample gas in order to prevent any reaction between the moisture and the measured pollutants. All components of the sampling and gas conditioning system are fabricated from borosilicate glass, teflon, or stainless steel. The gas conditioning system consists of a continuously downward teflon condenser coil (to prevent bubbling) and two glass knockout condenser traps. Moisture is continuously removed from the traps by an external peristaltic pump. The gas conditioning system is cooled in an ice water bath to facilitate complete moisture removal. Dry gas sample from the gas conditioner is transported to the instrument trailer via a heated 1/4-inch O.D. teflon tube to a teflon-lined diaphragm pump which delivers positive pressure sample to the instrument system. Flow control valves are used to deliver the stack gas at a regulated positive pressure to the continuous emissions monitors through a teflon and stainless steel manifold delivery network. Flow and pressure to all monitors is held constant by monitoring sample and bypass rotameters. A diagram of the CEM system used for the test program is given in Figure 4-1.

The sampling systems are leak checked by passing known calibration gas standards up through a calibration line to the end of the probe. The gas standards are then pulled back through the sampling probe at stack pressure and subsequently through the entire sampling system to the instrument system. An oxygen analyzer response of less than or equal to 0.5% V to a zero oxygen standard is considered an acceptable leak check.

Analyzer calibration error is calculated by the difference between the known calibration gas concentration and the concentration exhibited by the analyzer. Bias checks are performed by comparing calibration responses through the entire sampling system to these exhibited at the analyzer.

Acceptable system performance checks do not exceed +/-2% calibration error, +/-5% system bias check, +/-2% zero drift, and +/- 2% upscale drift.

Instrument response time is found by alternating zero nitrogen and upscale span gases through the bias check line and recording the upscale and downscale time. The response time of the CEM sampling system will be performed in accordance with EPA Method 20 to determine the length of time for the CEM's to respond to changes in the stack gas exhaust stream. Known, Protocol 1 NO_x reference gases and zero nitrogen are passed through the heated sample line, sample conditioning system and the manifold delivery network to the continuous emission monitors. Response time test results can be seen on an applicable field data worksheet and the NO_x strip chart recordings located in an Appendix to the report.

A preliminary oxygen traverse will be performed on the turbine exhaust for the purpose of selecting the eight points of lowest oxygen concentration which will be subsequently used for emissions sampling. The traverse will be performed at the lowest load to be

tested. For the preliminary oxygen traverse, the minimum number of traverse points are:

- 8 for stacks with area less than 16.1 ft^2;
- 8 + (Area of Stack (Ft^2))/2.2 , for stacks with areas between 16.1 to 107.6 ft^2; or
- 48 or 49 for stacks greater than 107.6 ft^2.

The minimum sampling time at each point is one minute plus the average system response time. Based on the results of the traverses, if all of the points are within 0.4% oxygen of each other, then 8 convenient sample points will be used for the testing.

4.7 CEM DATA ACQUISITION

The ESE data acquisition system (DAS) for the CEM analyzers consists of a DianaChart PC Acquisitor and a proprietary ESE Data Acquisition program. The data are stored on disk as well as on a printed hardcopy for each run. All data is also recorded on a strip chart recorder. The computer used is a 25-MHz 386 system with 4-MB of RAM and a math co-processor as well as a color VGA monitor. The system has 16-bit analog to digital conversion resolution (1 in 64,000) and a scan rate of approximately 1200 readings per minute. Data are averaged and reported by the DAS on a 60-second basis. The averaging time may be changed if desired. The system is capable of displaying the on line results in measured units and corrected to 15% oxygen and ISO conditions and in lb/MMBtu. Run averages are generated immediately at the end of each run.

4.8 CEM PRINCIPLES OF OPERATION

4.8.1 METHOD 3A: OXYGEN ANALYSIS

Flue gas sample is continuously analyzed for oxygen by a Servomex Model 1400A paramagnetic instrument. The Servomex 1400A analyzer uses electron paramagnetic

resonance to detect the presence of oxygen molecules. Unlike most substances, oxygen has a triplet electron ground state which leaves one electron unpaired, making it a paramagnetic molecule. This electron may have one of two quantum spin states (m_s = +/- 1/2). By applying an alternating electromagnetic field of the proper frequency, the Servomex 1400A O_2 analyzer induces resonance between the two spin quantum states. In effect, the O_2 analyzer measures the electromagnetic energy absorbed by O_2 molecules at the resonant frequency.

4.8.2 METHOD 20: OXIDES OF NITROGEN ANALYSIS

A Thermo Electron Model 10AR instrument will be used to analyze NO_x. The principle of operation of this instrument is a chemiluminescent reaction in which ozone (O_3) reacts with nitric oxide (NO) to form oxygen (O_2) and nitrogen dioxide (NO_2). During this reaction, a photon with a specific ultraviolet wavelength is emitted which is detected by a photomultiplier tube. The instrument is capable of analyzing total oxides of nitrogen (NO + NO_2) by thermally converting NO_2 to NO in a separate reaction chamber prior to the photomultiplier tube, if desired. The analyzer will be operated in the NO_x mode during sampling.

A convertor efficiency test will be performed on the Thermoelectron Model 10s during the compliance test series. A leak-free Tedlar bag will be partially filled with a Protocol 1 NO_x reference gas. The Tedlar bag is then filled to capacity with a Certified Oxygen reference gas standard. The contents are well mixed and immediately connected to the sample inlet of the analyzer. The Tedlar bag is analyzed by the analyzer in the "NO_x" mode for at least thirty minutes. A decrease in response in the NO_x mode of more than 2% indicates that corrective action is required.

4.8.3 METHOD 10: CARBON MONOXIDE ANALYSIS

A TECO 48 Gas Filter Correlation Non-Dispersive Infrared (GFC/NDIR) analyzer will be used for continuous CO analysis. The principle of operation of this analyzer is similar to traditional NDIR analyzers in that it relies on selective absorption; whereby, particular band widths of infrared energy are absorbed by a species based on its molecular orbital structure. Gas filter correlation NDIR differs from NDIR in the detection mechanism and because the GFC/NDIR does not require a reference cell. Infrared radiation passes through a rotating filter, through the sample cell and to the detector. The chopper wheel of the GFC/NDIR is a rotating disk separated into two chambers where one half is filled with nitrogen and the other half is filled with pure CO. These partitions act as alternating gas filters for the incident IR radiation from the IR source. The CO gas filter side acts to produce a signal which cannot be further attenuated by CO in the sample cell and is used as a reference signal. The nitrogen filter allows all incident radiation to pass. Carbon monoxide in the sample cell will, therefore, attenuate the signal proportionally to concentration. This is considered the measure cycle. Any other gases which absorb infrared radiation are absorbed equally during both the measure and reference cycles, providing a real-time reference and minimal interferences. The detector for this analyzer is a lead-selenium photodetector.

4.8.4 METHOD 25A: TOTAL HYDROCARBONS

EPA Method 25A will be used to measure VOC expressed as total hydrocarbons. The results will be reported on a parts per million by volume as carbon basis (ppmC). Methane in air will be the calibration standard. A gas sample is extracted from the source through a heated sample line and a glass fiber filter, directly into a hydrocarbon analyzer. The analyzer uses the flame ionization principle (FID) to detect hydrocarbons on a continuous basis.

4.8.5 METHOD 18: NON-METHANE VOLATILE ORGANIC COMPOUNDS

EPA Method 18 will only be used if it is determined that the VOC limits are not met using the total hydrocarbons measurement (EPA Method 25A). Because the unit burns natural gas, the potential exists for methane to be present in the gas stream. Since methane is a non-photoreactive hydrocarbon, it is not considered a VOC. If the results of the Method 25A total hydrocarbon analysis are found to be higher than the emission limit, then a sample will be collected in an evacuated canister for analysis of methane by GC/FID using EPA Method 18. Total non-methane volatile organic compound concentration would then be expressed on a carbon basis and will be calculated as the difference between the Method 25A and the Method 18 results.

4.9 PERFORMANCE SPECIFICATION TEST PROCEDURES FOR CEMS CERTIFICATION

Performance specifications for NO_x and oxygen (O_2) CEMS are contained in 40 CFR Part 60, Appendix B, Specifications 2 and 3 (PS2 and PS3). The performance specifications require an initial performance evaluation in which two criteria are evaluated: 1) calibration drift (CD), and 2) relative accuracy (RA). The performance specifications require that the magnitude of the calibration drift be determined once every 24 hours for 7 consecutive days. To determine relative accuracy, at least nine reference method test runs are collected simultaneously with CEM data for each analyzer. The performance specifications require an initial 168 hour conditioning period followed by a 7 - day calibration drift test.

4.9.1 CALIBRATION DRIFT EVALUATION

During the calibration drift evaluation, the facility must be operating at more than 50 percent of normal load. Since operating restrictions and load demand requirements do not allow operating all three of the units simultaneously at loads in excess of 50%, the

drift tests were conducted separately for each of the units in order to accommodate this requirement. Destec will conduct the calibration drift evaluation.

The calibration drift is measured at two points: zero and a high level value. For the Tiger Bay Cogeneration Facility CEMs, the high-level value must be between 1.5 times the pollution concentration corresponding to the emission standard and the span value.

4.9.2 RELATIVE ACCURACY EVALUATION

The performance specifications require that the relative accuracy evaluation be conducted while the facility is operating at more than 50% of normal load. Destec will operate the unit at greater than 50% load while firing natural gas during the RATA evaluation period. The NO_x, and O_2 analyzers will be certified by RATA against concentrations measured according to EPA Reference Method 20 and EPA Reference Method 3A. Performance specifications require a minimum of nine sets of reference method tests. More than nine tests may be conducted and up to three sets may be rejected, provided that at least 9 runs are used in the analysis. All data including the rejected data must be reported. Each set is at least 21 minutes in duration. Relative Accuracy comparisons are made based on the as measured parameters for O_2 and in the units of the standard (lb/MMBtu) for NO_X. NO_X emission rates in lb/MMBtu are calculated using F_d=8710, the raw NO_X concentration, and the raw O_2 concentration as described in EPA Method 19.

4.9.3 CORRELATION OF REFERENCE METHODS AND CEM DATA

The reference method and the CEM data are correlated over the reference method sampling period. The concentrations are adjusted to the same basis for moisture, temperature and diluent concentration. The CEM data are averaged over the sampling period and then compared to the reference method result. All measurements for both the reference method system and the CEMS were conducted on a dry basis.

4.9.4 CALCULATIONS

For determining relative accuracy, the differences are calculated between the reference method and CEMs value for all gas analysis, and between the reference method and the calculated flow protocol for total flow. Then, the mean difference, standard deviation of the differences, and confidence coefficient are used to calculate the relative accuracy. The equations used are contained in Section 8, of 40 CFR Part 60, Appendix B, Performance Specification 2. Sample calculations using test data from this program are included in Appendix B of this document.

4.9.5 ACCEPTANCE CRITERIA

The acceptance criteria for the respective analyzer systems are summarized in the Table 4-1. Relative Accuracy comparisons may be expressed as a percentage of the average reference method result or of the emissions standard. The calibration drift results are compared to the drift criteria each day. In the event that a daily drift does not meet the criteria, a new 7-day period can be started from the next day the drift is within the acceptance criteria.

Table 4-1. Analyzer Performance Acceptance Criteria		
Analyzer	Calibration Drift	Relative Accuracy
NO_x	< 2.5% of span	< 20% of RM result[a]
O_2	< 0.5% O_2	< 20% of RM result[b]

[a] Or 10% of the applicable emissions standard.
[b] Or 1.0 percent oxygen by volume relative to the average reference method result.

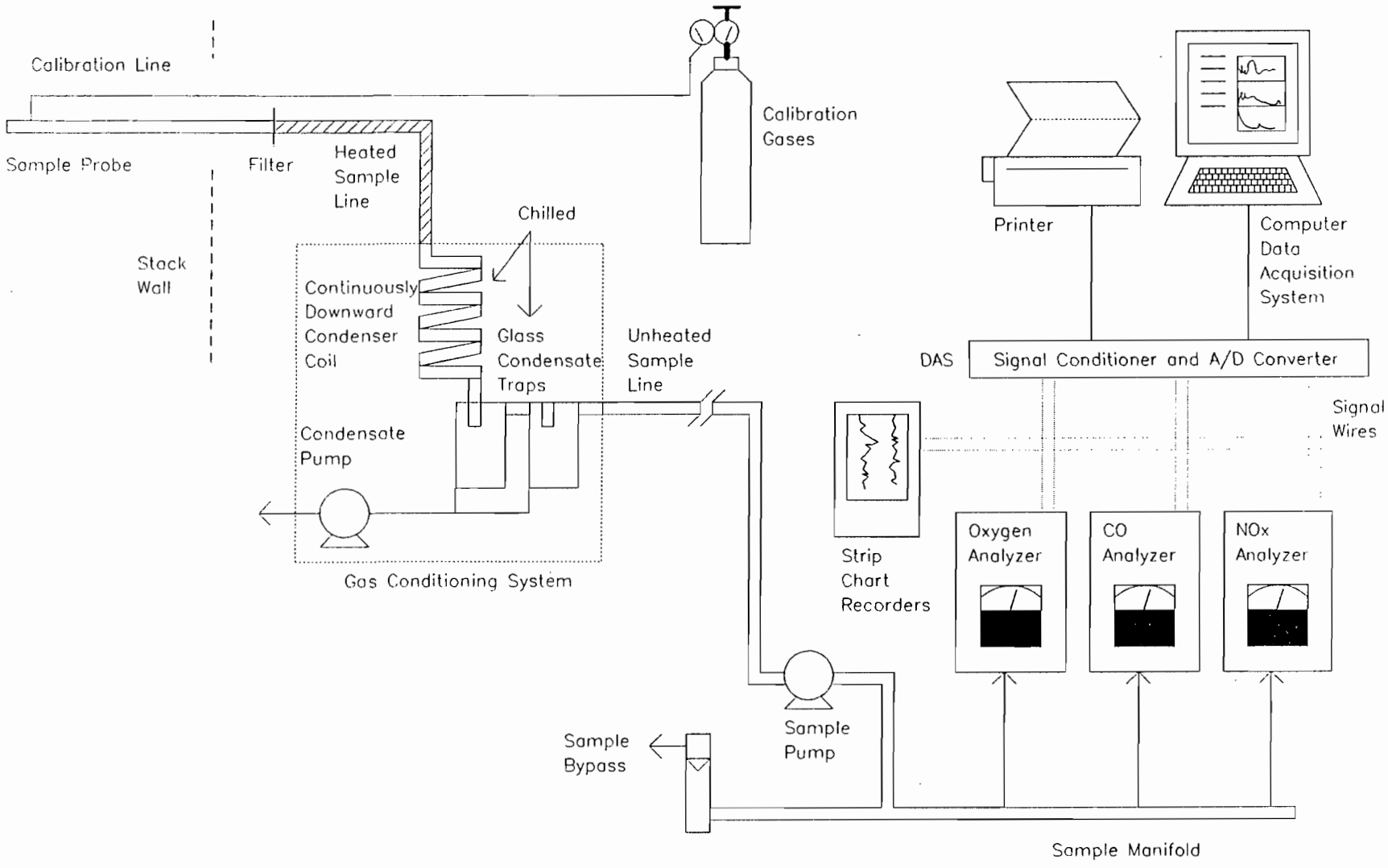


Figure 4-1. Schematic Diagram of ESE CEM System.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

Strict Quality Assurance/Quality Control (QA/QC) measures will be observed for all sampling and analysis performed for the Tiger Bay Cogeneration Facility test program. The QA/QC program is designed to provide the highest quality data in terms of the accuracy and precision of the measurements as well as the representativeness and comparability of the results.

5.1 MANUAL METHODS QA/QC

The ESE QA/QC program for this test series includes all of the QA/QC guidelines given in EPA Methods 1-4, 5 and 17 (40 CFR Pt 60, Appendix A) in addition to internal QA/QC standards. Primary components of the QA/QC program for the manual sampling techniques are listed below:

- Equipment Calibrations - including meter boxes, thermocouples, pitot tubes and analytical balance.
- Equipment Leak Checks - including pre- and post-test sample train leak checks, meter and pump leak checks, pitot leak checks and ORSAT system leak checks.
- Careful monitoring and documentation of sample train critical parameters including temperatures and meter pressure.
- Preliminary measurements to aid in calculating the sampling K-factor used to determine isokinetic sampling rate.
- Maintaining an isokinetic sampling rate so that the velocity through the sampling nozzle matches the surrounding flue gas stream velocity to within +/- 10%.

All sampling train leak rates will be less than the maximum acceptable leak rate of 0.02 cubic feet per minute. Sample train leak checks are performed at a vacuum of at least 5" Hg greater than the highest observed vacuum observed during sampling. All samples are desiccated and replicate analyses are performed until agreement of 0.5 mg between

weighings which were eight hours apart. Blanks are analyzed for the acetone used in sample recovery as well as for the filters used.

5.2 INSTRUMENTAL SAMPLING AND ANALYSIS

5.2.1 CALIBRATIONS AND DRIFT ASSESSMENTS

At the beginning of each test day, the EPA Reference Method 20, 3a, 10, and 25A test equipment will be calibrated, and adjusted as required, on a two-point basis. Subsequently, additional calibration standards will be introduced to the analyzers to check the linearity of the instrument response. If the linearity of the instrument is within +/-2% of full scale of the calibration standard value, the calibration is accepted. Otherwise, corrective maintenance will be performed, and the instrument will be calibrated. Final calibrations will be performed at the conclusion of each test day to determine calibration drift.

5.2.2 NO_2 CONVERTER EFFICIENCY

Prior to arrival on-site, an NO_2 to NO converter efficiency test will be performed as prescribed in EPA Method 20. The procedure used for testing the converter efficiency is given below:

- Fill a leak-free Tedlar bag approximately half-full with an NO in N_2 blend.
- Fill the remainder of the bag with 0.1 grade air.
- Immediately attach the NO/Air mixture to the inlet of the NO_x monitor being used.
- Allow the monitor to sample the gas in the bag for 30 minutes.

As the O_2 and NO in the bag are exposed to each other, a reaction occurs which changes the NO to NO_2. An attenuation in response over time of greater than five percent absolute indicates that the converter efficiency is unacceptable.

5.2.3 INSTRUMENT RESPONSE TIME

Instrument system response time will be determined by inserting the reference method sampling probe into the stack from ambient and noting the time required for NO_x monitor to achieve a change of 95% of the final stack concentration. The response time data sheet will be included in the final report.

5.2.4 LEAK CHECKS

Since all calibrations are performed through the entire sampling system, leak-checks are incorporated in each calibration. The criterion used for this test will be an oxygen response of less than 0.5% O_2 to an oxygen-free zero gas. Nitrogen will be passed through the entire sampling system at ambient pressure to check for an oxygen response of zero in all cases.

6.0 REPORTING

Test results will be reported to FDEP expressed in terms of as measured concentrations, and pollutant emissions limitations as expressed in the air permit. At a minimum the report for the test program will include the following sections:

1.0 Introduction
2.0 Process Description and Sampling Point Locations
3.0 Summary and Discussion of Results
4.0 Sampling and Analytical Procedures
5.0 Quality Assurance/Quality Control

Additionally, copies of all raw data, calculations, certifications, calibrations, analytical data, process data collected, and a list of project participants will be included in a set of appendices to the report.

The report will be submitted to FDER by Destec no later than 45 days of completion of the testing.

Separate reports will be issued for the CEMS RATA certification and for the compliance testing.

ANTICIPATED LIST OF PROJECT PARTICIPANTS

ESE

Clifton R. Bittle	Project Director
Bill Mayhew	Project Manager/Crew Chief
Norman Czarniak	Environmental Technician
M. Norman Czarniak	Environmental Technician

DESTEC

Scott Kicker	Coordinator

FDER

To be named	Test Observer

APPENDIX A

AIR PERMIT

Final Determination

Central Florida Power, Limited Partnership
Ft. Meade, Polk County, Florida

258 MW Cogeneration Facility

Permit Number: AC53-214903
PSD-FL-190

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

May 6, 1993

Final Determination

The Technical Evaluation and Preliminary Determination for the permit to construct a 258 cogeneration facility at Central Florida Power, Limited Partnership (CFPLP), in Ft. Meade, Polk County, Florida, was distributed on January 15, 1993. The Notice of Intent to Issue was published in The Polk County Democrat on February 4, 1993. Copies of the evaluation were available for public inspection at the Department's offices in Tampa and Tallahassee.

CFPLP's application for a permit to construct a 258 MW cogeneration facility has been reviewed by the Bureau of Air Regulation in Tallahassee. No adverse comments were submitted by the U.S. Environmental Protection Agency (EPA) in their letter dated February 16, 1993, or by the U.S. Department of the Interior (Fish and Wildlife Services) in their letter of February 5, 1993.

Comments regarding the Technical Evaluation and Preliminary Determination (Sypnosis of Application) and Permit Specific Conditions were submitted by Kennard F. Kosky, P.E., President of KBN Engineering and Applied Sciences, Inc. The Bureau has considered Mr. Kosky's comments and agreed to the changes proposed in the wording and adjustment of numerical limits to reflect manufacturer's specifications since these changes will not affect the potential emissions considered during the evaluation of this project. The amendments to the Specific Conditions of the permit are as follows:

RESPONSE TO COMMENTS NOS. 1, 2, 3, 4, AND 5

These changes will be incorporated in Table 1.

RESPONSE TO COMMENTS NOS. 5 AND 6

The table on page 9 of the BACT determination and Table 1 of the permit (Specific Condition No. 1) will be amended to reflect these comments.

BACT DETERMINATION BY DER (PAGE 8)

This paragraph will be added to the NO_x control section: For this turbine, an even lower NO_x emission level than 15 (gas)/42 (oil) ppmvd, corrected to 15% O_2, may become a condition of this permit pursuant to F.A.C. Rule 17-4.080, Modification of Permit Conditions.

RESPONSE TO ITEM NO. 2 ON KBN'S LETTER OF JANUARY 30, 1993

Information given to DER and to the U.S. Department of Interior (Fish and Wildlife Services) indicates that General Electric's goal is to attempt a NO_x level of 9 ppmvd when firing natural gas.

IN RESPONSE TO THE U.S. DEPARTMENT OF INTERIOR, SPECIFIC CONDITION NO. 15 WILL BE CHANGED AS FOLLOWS:

FROM: The permittee shall leave sufficient space in the heat recovery steam generator suitable for future installation of SCR equipment should the facility be unable to meet the NO_x standards, if required.

TO: **The permittee shall comply with the following by 12/31/97:**

a) For this turbine, if the 15 (gas)/42 (oil) ppmv emission rates cannot be met by 12/31/97, SCR or other control technology will be installed. Hence, the permittee shall install a duct module suitable for future installation of SCR equipment.

IN RESPONSE TO THE MARCH 11, 1993, LETTER FROM KENNARD F. KOSKY, KBN

The Department has determined the following:

Mandating SCR: The Department is giving the permittee the flexibility to incorporate any design feature to meet the 15 (gas) ppmvd at 15% O_2 NO_x emission limit. SCR or other control technology shall be installed if the 15 (gas) ppmvd cannot be met by 12/31/97.

Lowering the permit/BACT limit for NO_x: The Department may revise the permitted emission level for NO_x. For this turbine, an even lower NO_x emission level than 15 (gas)/42 (oil) ppmvd, corrected to 15% O_2, may become a condition of this permit, pursuant to F.A.C. Rule 17-4.080, Modification of Permit Conditions.

SPECIFIC CONDITION NO. 14 WILL BE MODIFIED AS FOLLOWS. THE PARAGRAPH IN BOLD WAS INADVERTENTLY OMITTED IN THE DRAFT PERMIT

Specific Condition No. 14: Test results will be the average of 3 valid runs. The Southwest District office will be notified at least 30 days in writing in advance of the compliance test(s). The sources, combustion turbine and duct burner, shall operate between 95% to 100% of the maximum capacity for the ambient conditions experienced during compliance test(s). **The turbine manufacturer's capacity vs temperature (ambient) curve shall be included with the compliance test results.** Compliance test results shall be submitted to the Southwest District office no later than 45 days after completion.

The final action of the Department will be to issue construction permit AC53-214903 (PSD-FL-190) with the changes noted above.

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Virginia B. Wetherell, Secretary

PERMITTEE:
Central Florida Power, L.P.
2500 City West Blvd., Ste. 150
Houston, Texas 77042

Permit Number: AC53-214903
PSD-FL-190
Expiration Date: January 1, 1996
County: Polk
Latitude/Longitude: 27°44'46.7"N
81°51'0.3"W
Project: A 258 MW Cogeneration Facility

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-210, 212, 275, 296, 297 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Central Florida Power, Limited Partnership, proposes to operate a 258 MW cogeneration facility consisting of one combustion turbine generator, one steam turbine generator, one duct burner-fired heat recovery steam generator and ancillary equipment. This facility is located near Ft. Meade, Polk County, Florida. The UTM coordinates are Zone 17, 416.22 km East and 3069.22 km North.

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

Attachments are listed below:

1. Central Florida Power, Limited Partnership's (CFPLP) application received on June 15, 1992.
2. Department's letters dated July 14 and October 9, 1992.
3. CFPLP's letters received on August 26, October 9, and October 23, 1992.

GENERAL CONDITIONS:

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

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

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

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

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

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

GENERAL CONDITIONS:

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

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

a. a description of and cause of non-compliance; and

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

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

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

GENERAL CONDITIONS:

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

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

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

13. This permit also constitutes:

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

14. The permittee shall comply with the following:

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

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

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;

GENERAL CONDITIONS:

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

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

SPECIFIC CONDITIONS:

Emission Limits

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

2. Visible emissions for full load operation shall not exceed 10% opacity when firing natural gas and 20% opacity when firing distillate fuel oil.

Operating Rates

3. This source is allowed to operate continuously (8,760 hours per year).

4. This source is allowed to use natural gas as the primary fuel for 8,760 hours per year and low sulfur distillate fuel oil (0.05% S) as the secondary fuel up to 3,742,327 gallons per calendar year.

5. The permitted materials and utilization rates for the combined cycle gas turbine system shall be as stated in the application. The operating parameters include, but are not limited to:

184 MW Combustion Turbine

a) The maximum heat input of 1,849.9 MMBtu/hr (LHV) at 27°F and at base load for distillate fuel oil.

b) The maximum heat input of 1,614.8 MMBtu/hr (LHV) at 27°F and at base load for natural gas.

SPECIFIC CONDITIONS:

Duct Burner

c) The maximum heat input of 100 MMBtu/hr (HHV) of natural gas.

6. Any change in the method of operation, equipment or operating hours pursuant to Rule 17-212.200, F.A.C., Definitions-Modifications, shall be submitted to DER's Bureau of Air Regulation and Southwest District offices.

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

Compliance Determination

8. Compliance with the NO_x, SO_2, CO, PM, PM_{10}, and VOC standards shall be determined (while operating at 95-100% of the permitted maximum heat rate input corresponding to the particular ambient conditions) within 180 days of initial operation of the maximum capability of the unit and annually thereafter, by the following reference methods as described in 40 CFR 60, Appendix A (July, 1992 version) and adopted by reference in F.A.C. Rule 17-297.

- Method 1 Sample and Velocity Traverses for Stationary Sources
- Method 2 Determination of Stack Gas Velocity and Volumetric Flow Rate
- Method 3 Gas Analysis
- Method 5 or Method 17 Determination of Particulate Emissions from Stationary Sources / Determination of Particulate Emissions from Stationary Sources
- Method 18 Measurement of Gaseous Organic Compound Emissions by Gas Chromatography
- Method 9 Visual Determination of the Opacity of Emissions from Stationary Sources
- Method 8 Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources
- Method 10 Determination of Carbon Monoxide Emission from Stationary Sources
- Method 20 Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines
- Method 25A Determination of Total Gaseous Organic Concentrations Using a Flame Ionization Analyzer

SPECIFIC CONDITIONS:

- Method 201A Determination of PM_{10} Emissions from Stationary
  and Sources
  Method 202 Determination of Condensible Particulate Emissions from Stationary Sources

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

9. Method 5 or Method 17 or Method 201A and Method 202 must be performed to determine the initial compliance status of particulate matter emissions of the unit. Thereafter, the opacity emissions test, Method 9, may be used unless the applicable opacity is exceeded. Also, the ambient particulate matter entering the gas turbine can be subtracted from the total particulate matter emissions if that quantity can be measured at the inlet of the gas turbine.

10. Compliance with the SO_2 and sulfuric acid mist emission limit can also be determined by calculations based on fuel analysis using ASTM D4294 for the sulfur content of liquid fuels and ASTM D3246-81 for sulfur content of gaseous fuel.

11. Trace elements of Beryllium (Be) shall be tested during initial compliance test using EMTIC Interim Test Method. As an alternative, Method 104 may be used; or Be may be determined from fuel sample analysis using either Method 7090 or 7091, and sample extraction using Method 3040 as described in the EPA solid waste regulations SW 846.

12. Mercury (Hg) shall be tested during initial compliance test using EPA Method 101 (40 CFR 61, Appendix B) or fuel sampling analysis using methods acceptable to the Department.

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

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

where:

SPECIFIC CONDITIONS:

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

$NO_{X\ obs}$ = Measured NO_X emission at 15 percent oxygen, ppmv.

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

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

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

e = Transcendental constant (2.718).

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

14. Test results will be the average of 3 valid runs. The Southwest District office will be notified at least 30 days in writing in advance of the compliance test(s). The sources, combustion turbine and duct burner, shall operate between 95% and 100% of maximum capacity for the ambient conditions experienced during compliance test(s). The turbine manufacturer's capacity vs temperature (ambient) curve shall be included with the compliance test results. Compliance test results shall be submitted to the Southwest District office no later than 45 days after completion.

15. The permittee shall comply with the following by 12/31/97:

a) For this turbine, if the 15 (gas)/42 (oil) ppmvd, corrected to 15% O_2 emission rates cannot be met by 12/31/97, SCR or other control technology will be installed. Hence, the permittee shall install a duct module suitable for future installation of SCR equipment.

16. The permittee shall install, calibrate, maintain, and operate a continuous emission monitor in the stack to measure and record the nitrogen oxides emissions from this source. The continuous emission monitor must comply with 40 CFR 60, Appendix B, Performance Specification 2 (July 1, 1992).

17. A continuous monitoring system shall be installed to monitor and record the fuel consumption on the CT and duct burner. While water/steam injection is being utilized for NO_X control, the water/steam to fuel ratio at which compliance is achieved shall be incorporated into the permit and shall be continuously monitored. The system shall meet the requirements of 40 CFR Part 60, Subpart GG.

SPECIFIC CONDITIONS:

18. Sulfur and nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be determined as specified in 40 CFR 60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Southwest District office. Any custom schedule approved by DER pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance. The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

Rule Requirements

19. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-210, 212, 275, 296, 297 and 17-4, Florida Administrative Code and 40 CFR 60 (July, 1992 version).

20. The sources shall comply with all requirements of 40 CFR 60, Subpart GG and Subpart Dc, and F.A.C. Rule 17-296.800,(2)(a), Standards of Performance for Stationary Gas Turbines and Standards of Performance for Industrial, Commercial, and Institutional Steam Generating Units.

21. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-210.300(1)).

22. This source shall be in compliance with all applicable provisions of F.A.C. Rules 17-210.650: Circumvention; 17-210.700: Excess Emissions; 17-296.800: Standards of Performance for New Stationary Sources (NSPS); 17-297: Stationary Sources-Emissions Monitoring; and, 17-4.130: Plant Operation-Problems.

23. If construction does not commence within 18 months of issuance of this permit, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which contruction has not commenced (40 CFR 52.21(r)(2)).

24. Quarterly excess emission reports, in accordance with the July 1, 1992 version of 40 CFR 60.7 and 60.334 shall be submitted to the Department's Southwest District office.

SPECIFIC CONDITIONS:

25. Fugitive dust emissions, during the construction period, shall be minimized by covering or watering dust generation areas.

26. Pursuant to F.A.C. Rule 17-210.300(2), Air Operating Permits, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur content and the lower heating value of the fuel being fired, fuel usage, hours of operation, air emissions limits, etc. Annual reports shall be sent to the Department's Southwest District office by March 1 of each calendar year.

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

28. An application for an operation permit must be submitted to the Southwest District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rules 17-4.055 and 17-4.220).

Issued this 17th day
of May, 1993

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Virginia B. Wetherell
Virginia B. Wetherell
Secretary

Table 1 - Allowable Emission Rates

Pollutant	Fuel[A]	Allowable Emission[C] Standard/Limitation	Basis
NO_x (CT)	Gas	15 ppmvd @ 15% O_2 (97.2 lbs/hr; 425.7 TPY)[B]	BACT
	Gas	25 ppmvd @ 15% O_2 (161.9 lbs/hr; 709.1 TPY)	BACT
	Oil	42 ppmvd @ 15% O_2 (326 lbs/hr; 48.9 TPY)	BACT
NO_x (DB)	Gas	0.1 lbs/MMBtu (10 lbs/hr, 43.8 TPY)	BACT
CO (CT)	Gas	15 ppmvd (48.8 lbs/hr; 213.7 TPY)[D]	BACT
	Oil	30 ppmvd (98.4 lbs/hr; 14.8 TPY)	BACT
CO (DB)	Gas	10 lbs/hr; 43.8 TPY	BACT
VOC (CT)	Gas	2.8 lbs/hr; 12.3 TPY	BACT
	Oil	7.5 lbs/hr; 1.1 TPY	BACT
VOC (DB)	Gas	2.9 lbs/hr; 12.7 TPY	BACT
PM_{10} (CT)	Gas	9 lbs/hr; 39.4 TPY	BACT
	Oil	17 lbs/hr; 2.6 TPY	BACT
PM_{10} (DB)	Gas	0.0100 lbs/MMBtu	BACT
SO_2 (CT)	Gas	4.86 lbs/hr; 21.3 TPY	Appl.
	Oil	99.7 lbs/hr; 15.0 TPY	Appl.
SO_2 (DB)	Gas	0.3 lbs/hr; 1.32 TPY	Appl.
H_2SO_4 (CT)	Gas	5.95×10^{-1} lbs/hr; 2.6 TPY	Appl.
	Oil	1.22 lbs/hr; 0.183 TPY	Appl.
H_2SO_4 (DB)	Gas	3.7×10^{-2} lbs/hr; 1.61×10^{-1} TPY	Appl.
Opacity	Gas	10% opacity[D]	BACT
	Oil	20% opacity[D]	BACT
Hg	Oil	3.0×10^{-6} lbs/MMBtu (5.55×10^{-3} lbs/hr; 8.32×10^{-4} TPY)	Appl.
As	Oil	4.2×10^{-6} lbs/MMBtu (7.77×10^{-3} lbs/hr; 1.17×10^{-3} TPY)	BACT
Be	Oil	2.5×10^{-6} lbs/MMBtu (4.62×10^{-3} lbs/hr; 6.94×10^{-4} TPY)	BACT
Pb	Oil	8.9×10^{-6} lbs/MMBtu (1.65×10^{-2} lbs/hr; 2.47×10^{-3} TPY)	Appl.

A) Fuel: Natural Gas: Emissions are based on 8760 hours per year operating time.
Fuel: Distillate Fuel Oil (0.05% S): Emissions are based on fuel usage equivalent to 300 hours per year at maximum capacity (i.e., 3,742,327 gallons per year).

B) The NO_x maximum limit will be lowered to 97.2 (lbs/hr) equivalent to 15 ppmvd @ 15% O_2 not later than 12/31/97 using appropriate combustion technology improvements or SCR.

C) Emission rates are based on 27°F at base load.

D) At full load conditions.

Best Available Control Technology (BACT) Determination
Central Florida Power, L.P.
Polk County
PSD-FL-190

The applicant proposes to construct a cogeneration facility near Ft. Meade, Polk County. This generator system will consist of a 184 MW General Electric PG7221FA combustion turbine generator (CT), equipped with a duct burner-fired heat recovery steam generator (HRSG), which will be used to power a nominal 74 MW steam turbine generator (ST).

The applicant has requested to burn natural gas for 8760 hours per year and distillate fuel oil, with a 0.05 percent sulfur content for a maximum 3,742,327 gallons per year. The applicant has indicated the maximum annual tonnage of regulated air pollutants emitted from the facility at base load, 27°F and type of fuel fired to be as follows:

Pollutant	Emissions (TPY) Gas		Oil	Total	PSD Significant Emission Rate (TPY)
	PG7221FA (8460 hrs)	Duct Burner (8760 hrs)	PG7221FA (300 hrs)		
NO_x	684.7	43.8	48.9	777.4	40
SO_2	20.5	1.3	15	36.8	40
PM/PM_{10}	38.1	4.4	2.6	45.1	25/15
CO	206.5	43.8	14.8	265.1	100
VOC	11.80	12.7	1.1	25.6	40
H_2SO_4	2.5	0.16	1.9	4.5	7
Be	nil	nil	6.94×10^{-4}	6.94×10^{-4}	0.0004
Hg	nil	nil	8.32×10^{-4}	8.32×10^{-4}	0.1
Pb	nil	nil	2.47×10^{-4}	2.47×10^{-4}	0.6
As	nil	nil	1.17×10^{-3}	1.17×10^{-3}	0

Florida Administrative Code (F.A.C.) Rule 17-212.400(2) (f) (3) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

Date of Receipt of a BACT Application

June 15, 1992

BACT Determination Requested by the Applicant

Pollutant	Proposed Limits
NO_x	25 ppmvd @ 15% O_2 (natural gas burning) 42 ppmvd @ 15% O_2 (for oil firing) Control Technology: Dry Low-NO_x Burners when firing natural gas and steam/water injection when firing distillate oil
SO_2	0.05% sulfur by weight (fuel oil firing)
CO, VOC	Combustion Control
PM/PM_{10}	Combustion Control

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 17-212, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, than the

next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

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

- Combustion Products (e.g., particulates). Controlled generally by good combustion of clean fuels.
- Products of Incomplete Combustion (e.g., CO). Control is largely achieved by proper combustion techniques.
- Acid Gases (e.g., NO_X). Controlled generally by gaseous control devices.

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

BACT POLLUTANT ANALYSIS

COMBUSTION PRODUCTS

Particulate Matter (PM/PM_{10})

The design of this system ensures that particulate emissions will be minimized by combustion control and the use of clean fuels. The particulate emissions from the combustion turbine when burning natural gas and fuel oil will not exceed 9 lbs/hr and 17 lbs/hr, respectively. The Department accepts the applicant's proposed control for particulate matter and heavy metals.

Lead, Mercury, Beryllium, Arsenic (Pb, Hg, Be, As)

The Department agrees with the applicant's rationale that there are no feasible methods to control lead, mercury, arsenic, and beryllium; except by limiting the inherent quality of the fuel.

Although the emissions of these toxic pollutants could be controlled by particulate control devices, such as a baghouse or scrubber, the amount of emission reductions would not warrant the added expense. As this is the case, the Department does not believe that the BACT determination for PM would be affected by the emissions of these pollutants.

PRODUCTS OF INCOMPLETE COMBUSTION

Carbon Monoxide (CO)

The emissions of carbon monoxide exceed the PSD significant emission rate of 100 TPY. The applicant has indicated that the carbon monoxide emissions from the proposed combined cycle turbine is on exhaust concentrations of 15 ppmv for natural gas firing and 30 ppmv for fuel oil firing.

The majority of BACT emissions limitations have been based on combustion controls for carbon monoxide and volatile organic compounds minimization, additional control is achievable through the use of catalytic oxidation. Catalytic oxidation is a postcombustion control that has been employed in CO nonattainment areas where regulations have required CO emission levels to be less than those associated with wet injection. These installations have been required to use LAER technology and typically have CO limits in the 10-ppm range (corrected to dry conditions).

In an oxidation catalyst control system, CO emissions are reduced by allowing unburned CO to react with oxygen at the surface of a precious metal catalyst such as platinum. Combustion of CO starts at about 300°F, with efficiencies above 90 percent occurring at temperatures above 600°F. Catalytic oxidation occurs at temperatures 50 percent lower than that of thermal oxidation, which reduces the amount of thermal energy required. For CT/HRSG combinations, the oxidation catalyst can be located directly after the CT or in the HRSG. Catalyst size depends upon the exhaust flow, temperature, and desired efficiency.

Due to the oxidation of sulfur compounds and excessive formation of H_2SO_4 mist emissions, oxidation catalyst are not considered to be technically feasible for gas turbines fired with fuel oil.

Catalytic oxidation has not been demonstrated on a continuous basis when using fuel oil.

Use of oxidation catalyst technology would be technically feasible for this natural gas-fired unit; however, the cost of $10,000 per ton for the PG7221FA of CO removed will have an adverse economic impact on this project.

The Department is in agreement with the applicant's proposal of combustor design and good operating practices as BACT for CO for this cogeneration project.

ACID GASES

Nitrogen Oxides (NO_x)

The emissions of nitrogen oxides represent a significant proportion of the total emissions generated by this project, and need to be controlled if deemed appropriate. As such, the applicant presented an extensive analysis of the different available technologies for NO_x control.

The applicant has stated that BACT for nitrogen oxides will be met by using water/steam injection (when firing distillate fuel oil) and advanced combustor design to limit emissions to 25 ppmvd (corrected to 15% O_2) when burning natural gas and 42 ppmvd (corrected to 15% O_2) when burning fuel oil.

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

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

The effect of exhaust gas temperature on NO_x reduction depends on the specific catalyst formulation and reactor design. Generally, SCR units can be designed to achieve effective NO_x control over a 100-300°F operating window within the bounds of 450-800°F, although recently developed zeolite-based catalysts are claimed to be capable of operating at temperatures as high as 950°.

Most commercial SCR systems operate over a temperature range of about 600-750°F. At levels above and below this window, the specific catalyst formulation will not be effective and NO_x reduction will decrease. Operating at high temperatures can permanently damage the catalyst through sintering of surfaces.

Increased water vapor content in the exhaust gas (as would result from water or steam injection in the gas turbine combustor) can shift the operating temperature window of the SCR reactor to slightly higher levels.

Although technically feasible, the applicant has rejected using SCR on the combined cycle because of economic, energy, and environmental impacts. The applicant has identified the following limitations:

a) Reduced power output.
b) Emissions of unreacted ammonia (slip).
c) Disposal of hazardous waste generated (spent catalyst).
d) Ammonium bisulfate and ammonium sulfate particulate emissions (ammonium salts) due to the reaction of NH_3 with SO_3 present in the exhaust gases.
e) The energy impacts of SCR will reduce potential electrical power generation of more than 7 million kwh per year.
f) Incremental cost effectiveness for the application of SCR technology to the Central Florida Power project was considered to be $7,400 per ton of NO_x removed.

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

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

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

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

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

The latest information available now indicates that SCR can be used for oil firing provided that adjustments are made in the ammonia to NO_x injection ratio. For natural gas firing operation, NO_x emissions can be controlled with up to a 90 percent efficiency using a 1 to 1 or greater ammonia injection ratio. By lowering the injection ratio for oil firing, testing has indicated that NO_x can be controlled with efficiencies ranging from 60 to 80 percent. When the injection ratio is lowered there is not a problem with ammonium bisulfate formation since essentially all of the ammonia is able to react with the nitrogen oxides present in the combustion gases. Based on this strategy SCR has been both proposed and established as BACT for oil fired combined cycle facilities with NO_x emission limits ranging from 11.7 to 25 ppmvd depending on the efficiency of control established.

The applicant has indicated that the total levelized annual operating cost to install SCR for this project at 100 percent capacity factor and burning natural gas is $3,364,400 for the PG7221FA. Taking into consideration the total annual cost, a cost/benefit analysis of using SCR can now be developed.

For this project, based on the information supplied by the applicant, it is estimated that the maximum annual NO_x emissions using dry low-NO_x (natural gas) and water injection (oil firing) will be 702.1 tons/year (at 72°F). Assuming that SCR would reduce the NO_x emissions by 65%, about 245.7 TPY would be emitted annually. When this reduction (456.4 TPY) is taken into consideration with the total levelized annual operating cost of $3,364,400; the cost per ton of controlling NO_x is $7,400. This calculated cost is higher than has previously been approved as BACT.

A review of the latest DER BACT determinations show limits of 15 ppmvd (natural gas) using low-NO_x burn technology for combined cycle turbines. General Electric is currently developing programs using both steam/water injection and dry low NO_x combustor to achieve NO_x emission control level of 9 ppm when firing natural gas. Therefore, since this technology will likely be available by

1997, the Department has accepted the water/steam injection (for distillate fuel oil firing), the dry low-NO_x burner design, and the 25 ppmvd (natural gas)/42 ppmvd (oil) at 15% O_2 as BACT for a limited time (up to 12/31/97).

BACT Determination by DER

NO_x Control

The information that the applicant presented and Department calculations indicates that the cost per ton of controlling NO_x for this turbine [$7,400 per ton (natural gas)] is high compared to other BACT determinations which require SCR. Based on the information presented by the applicant, the Department believes that the use of SCR for NO_x control is not justifiable as BACT at this time.

A review of the permitting activities for combined cycle proposals across the nation indicates that SCR has been required and most recently proposed for installations with a variety of operating conditions (i.e., natural gas, fuel oil, and various capacity factors). Although, the cost and other concerns expressed by the applicant are valid, the Department, in this case, is willing to accept water/steam injection and low NO_x burner design as BACT for this project for a limited time (up to 12/31/97).

It is the Department's understanding that General Electric is developing programs for the PG7221FA using either steam/water injection or dry low NO_x combustor technology to achieve a NO_x emission control level of 9 ppm when firing natural gas.

Based on this, the Department has determined to revise and lower the allowable BACT limit for this project to 15 ppmvd at 15% O_2 no later than 12/31/97. For this turbine, an even lower NO_x emission level than 15 (gas)/42 (oil) ppmvd, corrected to 15% O_2, may become a condition of the permit pursuant to F.A.C. Rule 17-4.080.

CO Control

Combustion control will be considered as BACT for CO and VOC when firing natural gas.

Other Emissions Control

The emission limitations for PM and PM_{10}, Be, Pb, and Hg are based on previous BACT determinations for similar facilities.

The emission limits for the Central Florida Power, L.P. project are thereby established as follows:

258 MW COMBINED CYCLE COMBUSTION TURBINE
100 MMBtu/hr Duct Burner

Pollutant	Emission Standards/Limitations(a) Oil(b)	Gas(c)	Method of Control
NO_x (CT)	42 ppmvd at 15% O_2; 362.2 lbs/hr	25 ppmvd at 15% O_2; 161.9 lbs/hr	Water Injection/ Dry Low-NO_x Combustor
		15 ppmvd at 15% O_2; 97.2 lbs/hr	Dry Low-NO_x Combustor or any other NO_x Control Technology
NO_x (DB)		0.1 lbs/MMBtu	
CO (CT)	98.4 lbs/hr	49 lbs/hr	Combustion
CO (DB)		10 lbs/hr	
PM/PM_{10} (CT)	17 lbs/hr	9 lbs/hr	Combustion
PM/PM_{10} (DB)		0.01 lbs/MMBtu	
SO_2 (CT)	99.7 lbs/hr	4.9 lbs/hr	Distillate Fuel Oil (0.05% S)
SO_2 (DB)		0.3 lbs/hr	
H_2SO_4 (CT)	1.2 lbs/hr	5.95×10^{-1} lbs/hr	Distillate Fuel Oil (0.05% S)
H_2SO_4 (DB)		3.7×10^{-2} lbs/hr	
VOC (CT)	7.5 lbs/hr	2.8 lbs/hr	Combustion
VOC (DB)		2.9 lbs/hr	
Hg	3.0×10^{-6} lbs/MMBtu (5.5×10^{-3} lbs/hr)		Fuel Quality
Pb	8.9×10^{-6} lbs/MMBtu (1.65×10^{-2} lbs/hr)		Fuel Quality
Be	2.5×10^{-6} lbs/MMBtu (4.62×10^{-3} lbs/hr)		Fuel Quality
As	4.2×10^{-6} lbs/MMBtu (7.77×10^{-3} lbs/hr)		Fuel Quality

APPENDIX B

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

NO_x Emissions Corrected to 15% Oxygen

NO_x @ 15% O_2 = NO_x * ((20.9-15)/(20.9-O_2))

Where:

NO_x = NOx concentration as measured in the sample gas in parts per million by volume (ppmV).
O_2 = Oxygen concentration as measured in the sample gas by volume (%V).
NO_x @ 15% O_2 = NO_x concentration (ppmV) corrected to 15% oxygen.

Example: Run 1 7/21/93 - Unit 2

NO_x = 22.9 ppmV O_2 = 15.4%

NO_x @ 15% O_2 = 22.9 * ((20.9-15)/(20.9-15.4))
= 24.5

(Corrections for CO to 15% Oxygen are made in the same manner)

NO_x Emissions at 15% Oxygen and ISO Conditions

$$NO_{xISO} = NO_x @ 15\% O_2 * (Pref/Pobs)^{0.5} * e^{19(Hobs-0.00633)} * (288/Tamb)^{1.53}$$

Where:

NO_x @ 15% O_2 = NO_x concentration (ppmV) corrected to 15% oxygen.
NO_{xISO} = NO_x concentration (ppmV) at 15% oxygen and ISO conditions.
Pref = Reference combustor inlet pressure (psia).
Pobs = Observed combustor inlet pressure (psia).
Hobs = Specific humidity of ambient air (lb H_2O/lb Dry Air) determined from the wet bulb and dry bulb readings and ASTM psychrometric eqn.
Tamb = Ambient temperature (K).

Example: Run 1 7/21/93 - Unit 2

NO_x @ 15% O_2 = 24.5 ppmV
Pbaro = 30.12" Hg * (14.696/29.92) = 14.794 psia
Pref = 125.99 psig +14.696 = 140.686 psia (see chart, Appendix D)
Pobs = 137.4 psig + Pbaro(14.794) = 152.19 psia
Hobs = 0.01114957 lb H_2O/lb DA
Tamb = (83.8 F - 32)*5/9 + 273 = 301.78 degrees K

$$NO_{xISO} = 24.5\ (140.686/152.19)^{0.5}\ e^{19(0.01114957 - 0.00633)}\ (288/301.78)^{1.53}$$
= 24.0 ppmV @ 15% O_2 and ISO conditions

7/21/93
RUN 1

[redacted] [redacted] 0 Unit: unit 2

VELOCITY AND VOLUMETRIC FLOWRATE DETERMINATION
EPA METHOD 2 CALCULATIONS

Parameter	Definition	Units
Cp	- Pitot Tube Coefficient	Dimensionless
Vs	- Gas Stream Velocity	ft/sec
Qsd	- Volumetric Flow Rate at Standard Conditions,Dry Basis	dscfm
Qact	- Actual Volumetric Flow Rate, Wet Basis	acfm
Bws	- Moisture Content	mole fraction
Dp	- Avg. Sq. Root of Velocity Head	(in. H2O)^0.5
Pb	- Absolute Barometric Pressure	in. Hg
Kp	- Constant = 89.49 (ft)(lb/lb-mol)(in.Hg^0.5)/(s)([R)(in.H2O)	
Ts	- Absolute Gas Stream Temperature	degrees R
Ms	- Sample Gas Molecular Weight, Wet Basis	lb/lb-mole
Sp	- Static Pressure of Gas Stream	in. H2O
528	- Absolute Standard Temperature	degrees R
CSA	- Stack Cross-Sectional Area	ft2
Ps	- Absolute Stack Gas Pressure	in. Hg
60	- Conversion Factor	sec/min.
Pi	- Constant Ratio - 3.1416	Dimensionless
D	- Duct Diameter	inches

TEST DATA RUN #2-1

Ms =	28.526	Cp =	0.84
Bws =	0.0536	Pb =	30.15
Sp =	-1.60	Ts =	1444.7
D =	222.00	Dp =	1.1412

Circular Duct

$Ps = Pb + (Sp/13.6) = 30.15 + (-1.60/13.6) = 30.03$ in.Hg

$Vs = (85.49)(Cp)(Dp)*[(Ts)/(Ms*Ps)]^{0.5}$

$= 85.49*0.84*1.1412*[1444.7/(28.526*30.03)]^{0.5}$

$= 106.421$ ft/s 106.421 ft/s

$CSA = (Pi)[(D)^2]/[(4)(144)] = 3.1416*(222.00^{0.5})/(4*144)$ 268.803 ft2

$Qact = (Vs)*CSA*60 = 106.421*268.803*60 = 1716377.$ acfm

$Qsd = \frac{(Qact)(1-Bws)(528)(Ps)}{(Ts)(29.92)} = \frac{1716377.3*(1 - 0.0536)*528*30.03}{1444.7*29.92}$

$= 595883.4$ dscfm 595883.4 dscfm

7/21/93
RUN 1

[redacted] 0 Unit: unit 2

MOLECULAR WEIGHT DETERMINATION
EPA METHOD 3 CALCULATIONS

Parameter	Definition	Units
Md	- Sample Gas Molecular Weight, Dry Basis	lb/lb-mole
Ms	- Sample Gas Molecular Weight, Wet Basis	lb/lb-mole
Bws	- Moisture Content	mole fraction
%CO2	- Carbon Dioxide Concentration, Dry Basis	% Volume
%CO	- Carbon Monoxide Concentration, Dry Basis	% Volume
%O2	- Oxygen Concentration, Dry Basis	% Volume
%N2	- Nitrogen Concentration, Dry Basis (gas balance)	% Volume
0.32	- Molecular Weight of Oxygen (O2), divided by 100%	lb/lb-mole
0.28	- Molecular Weight of Carbon Monoxide, divided by 100%	lb/lb-mole
0.28	- Molecular Weight of Nitrogen (N2), divided by 100%	lb/lb-mole
0.44	- Molecular Weight of Carbon Dioxide, divided by 100%	lb/lb-mole
18.0	- Molecular Weight of Water	lb/lb-mole

TEST DATA RUN #2-1

Bws =	0.0536	%CO =	0.00
%N2 =	81.43	%CO2 =	3.17
%O2 =	15.40		

Md = (0.44)(%CO2) + (0.32)(%O2) + (0.28)(%N2 + %CO)

= (0.44)*3.17 + (0.32)*15.40 + (0.28)*(81.43 + 0.00)

= 29.123 lb/lb-mol

Ms = (Md)(1 - Bws) + (18.0)(Bws)

= 29.123*(1 - 0.0536) + 18.0*0.0536

= 28.526 lb/lb-mol

[redacted] [redacted] 0 Unit: unit 2

7/21/93
RUN 1

MOISTURE CONTENT DETERMINATION
EPA METHOD 4 CALCULATIONS

Parameter	Definition	Units
Pm	- Absolute Meter Pressure	in. Hg
Po	- Average Meter Differential Pressure	in. H2O
Ps	- Absolute Stack Gas Pressure	in. Hg
Pstd	- Absolute Standard Barometric Pressure (29.92)	in. Hg
Pb	- Absolute Barometric Pressure	in. Hg
K	- Standard Volume H2O Vapor/Unit Weight Liquid Constant = 0.04715 cu.ft/g	ft3/g
Tm	- Average Meter Temperature	degrees R
Tstd	- Absolute Standard Temperature (528[R)	degrees R
DGMC	- Dry Gas Meter Correction Factor (gamma)	Dimensionless
Vlcg	- Total Condensate Collected	grams H2O
Vm	- Metered Dry Sample Gas Volume	dcf
Vmstd	- Metered Volume at Standard Conditions(528[R, 1atm)	dscf
Vwstd	- Volume of Water Vapor Collected, at Standard Conditions (528[R, 1atm)	scf
W(sat)	- Vapor Pressure of H2O at Stack Temperature	in. Hg
Bws	- Moisture Content	mole fraction
Bwd	- Moisture Content	% Volume

TEST DATA RUN #2-1

Pb =	30.15	Tm =	551.3
Vm =	44.124	Po =	1.66
Vlcg=	50.8	DGMC =	0.9887
W(sat)=	30.15	Ps =	30.03235

MEASURED MOISTURE CALCULATIONS

Pm = Pb + (Po/13.6) = 30.15 + (1.66/13.6) = 30.272 in. Hg

$$Vmstd = \frac{(Vm)(DGMC)(Pm)(Tstd)}{(Pstd)(Tm)} = \frac{44.124*0.9887*30.27*528}{29.92*551.3} = 42.273 \text{ ft3}$$

Vwstd = (K)(Vlcg) = (0.04715)*(50.8) = 2.395 ft3

Bws = (Vwstd)/{(Vwstd)+(Vmstd)} = 2.395/(2.395+42.273) = 0.0536 mol frac

Bwd = (Bws)*100 % = 0.0536*100% = 5.36%V

SATURATED MOISTURE CALCULATIONS

B(sat)= W(sat)/Ps = 30.15/30.03 = 1.003917 mol frac

VAPOR PHASE MOISTURE

Bws = 0.053622 Lower of Measured or Saturated Moisture

RELATIVE ACCURACY CALCULATIONS

Arithmetic Mean: Calculate the arithmetic mean of the difference, d, of a data set as follows.

$$\bar{d} = \frac{1}{n} \sum_{i=1}^{n} d_i$$

where

n = number of data points

$\sum_{i=1}^{n} d_i$ = Arithmetic sum of the individual differences d_i

Standard Deviation: Calculate the standard deviation, S_d as follows:

$$S_d = \left[\frac{\sum_{i=1}^{n} d_i^2 - \left(\sum_{i=1}^{n} d_i\right)^2 / n}{n-1}\right]^{1/2}$$

Confidence Coefficient: Calculate the 2.5 percent error confidence coefficient (one-tailed), CC, as follows:

$$CC = t_{0.975} \frac{S_d}{\sqrt{n}}$$

where $t_{0.975}$ = t-value (see Table 1)

Relative Accuracy: Calculate the RA of a set of data as follows:

$$RA = \frac{|\bar{d}| + |CC|}{\overline{RM}} \times 100$$

where

$|\bar{d}|$ = Absolute value of the mean of differences

$|CC|$ = Absolute value of the confidence coefficient

$\overline{RM}$ = Average reference method value or applicable standard

TABLE 1 t-VALUES

n^a	$t_{0.975}$	n^a	$t_{0.975}$	n^a	$t_{0.975}$
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179
4	3.182	9	2.306	14	2.160
5	2.776	10	2.262	16	2.145
6	2.571	11	2.228	16	2.131

[a]The values in this table are already corrected for n-1 degrees of freedom. Use n equal to the number of individual values.

APPENDIX C

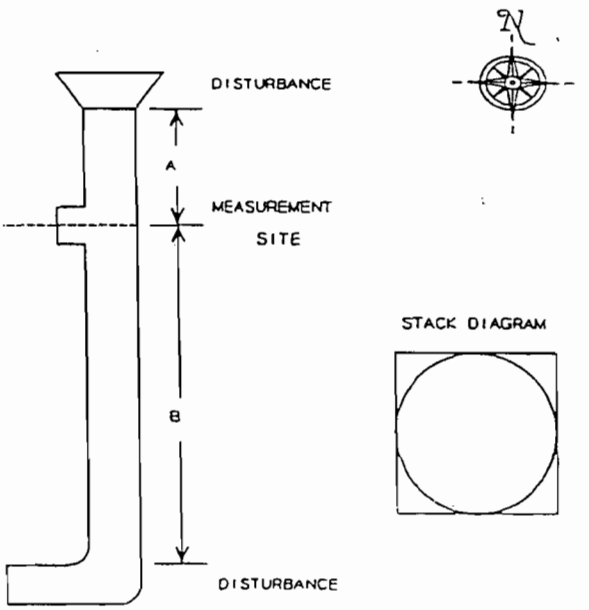
EXAMPLE DATA SHEETS,

AND CALIBRATION DATA SHEETS

EPA METHOD 1
TRAVERSE POINT LAYOUT

Environmental Science & Engineering, Inc.

CLIENT:	
PROJECT NUMBER:	
SOURCE I.D.:	
DATE:	
INSIDE DIAMETER:	in
UPSTREAM DISTANCE (A):	in
DOWNSTREAM DISTANCE (B):	in
COUPLING LENGTH:	in
NUMBER OF PORTS:	
UPSTREAM DIAMETERS:	
DOWNSTREAM DIAMETERS:	
CALCULATED BY:	



TRAVERSE POINT	TRAVERSE % DIAMETER		INSIDE DIAMETER		COUPLING LENGTH		TRAVERSE LOCATION
1		X		+		=	
2		X		+		=	
3		X		+		=	
4		X		+		=	
5		X		+		=	
6		X		+		=	
7		X		+		=	
8		X		+		=	
9		X		+		=	
10		X		+		=	
11		X		+		=	
12		X		+		=	

COMMENTS: _____

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

METER BOX CALIBRATION DATA AND CALCULATION FORM

(English units)

Date _____ Meter box number _____

Barometric pressure, P_b = _____ in. Hg Calibrated by _____

Orifice manometer setting (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperatures: Wet test meter (t_w), °F	Temperatures: Dry gas meter: Inlet (t_{d_i}), °F	Temperatures: Dry gas meter: Outlet (t_{d_o}), °F	Temperatures: Dry gas meter: Avg[a] (t_d), °F	Time (θ), min	Y_i	$\Delta H@_i$ in. H_2O
							Avg		

ΔH, in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6}) (t_w + 460)}$	$\Delta H@_i = \frac{0.0317\ \Delta H}{P_b (t_d + 460)} \left[\frac{(t_w + 460)\ \theta}{V_w}\right]^2$

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d.

(front side)

ESE ISOKINETIC SAMPLING FIELD DATA SHEET

Facility:	Meter #:	Baro. Press.:
Unit:	DH@	Ambient T:
Location:	DGM Factor:	Nozzle Dia:
Test Type:	Pitot #:	Static P:
Run #:	Pitot Coef:	Stack Dimensions:
Operator(s):	K–Factor:	Initial Leak Check: cfm @ "Hg
Date:	Filter #:	Final Leak Check: cfm @ "Hg

Traverse Point Number	Time	Gas Meter Reading Vm(ft3)	Velocity Head ("H2O)	Orifice Press. ("H2O)	Stack Temp. (F)	Probe Temp. (F)	Filter Temp. (F)	Impinger Temp. (F)	Dry Gas Meter Temp. Inlet (F)	Dry Gas Meter Temp. Outlet (F)	Vacuum ("Hg)
Avg/Tot.											

Impinger	1	2	3	4	5	Total	Orsat	1	2	3	4
Initial							O2				
Final							CO2				
Total											

CALIBRATION SUMMARY
07-21-1993 08:38:25
CALIBRATION FILE NAME =c:\ceadata\DPLUS.CAL

Chan.	Name	Units	Zero Conc.	Zero Resp.	Span Conc.	Span Resp.	Slope	Int.
1	O2	%V	0.00	0.0004	20.90	0.085	248.248	-0.11
2	CO	ppmV	0.00	0.0252	92.80	-9.223	-10.032	0.28
3	NOx	ppmV	0.00	0.0084	92.90	8.085	11.502	-0.10
4	NULL		0.00	0.0000	0.00	0.000	1.000	0.00
5	CO	ppm15	0.00	0.0000	0.00	0.000	1.000	0.00
6	NOx	ppm15	0.00	0.0000	0.00	0.000	1.000	0.00
7	NOx	ISO	0.00	0.0000	0.00	0.000	1.000	0.00

Press Shift-PrtSc to Print Out Table
Press <C> to Continue

[redacted]ronmental Science & Engineering RUN 2
[redacted]te Emissions Testing Dept. Tdb= 93.5
[redacted]tinuous Emissions Monitoring Data Twb= 68.4
[redacted] Hobs= 1.099953E-02
[redacted] Baro= 30.12
[redacted]ared for: [redacted] Pref 125.99
[redacted] Printed = 07-21-1993 Current Time = 18:27:45 Pobs= 137.3
[redacted] Name = c:\ceadata\072193.PRN Calibration File:c:\ceadata\DPLU2.CAL

[redacted]1-1993	O2	CO	NOx	NULL	CO	NOx	NOx
[redacted]e	ZV	ppmV	ppmV		ppm15	ppm15	ISD
[redacted]7:53	15.3	-0.4	22.9	-0.4	-0.4	24.4	23.9
[redacted]8:23	15.4	-0.5	22.0	-0.4	-0.5	24.5	24.0
[redacted]8:53	15.4	-0.4	23.1	-0.4	-0.4	24.6	24.1
[redacted]9:23	15.4	-0.4	23.0	-0.4	-0.4	24.5	24.0
[redacted]9:53	15.4	-0.5	22.9	-0.4	-0.5	24.5	24.0
[redacted]0:23	15.4	-0.4	23.0	-0.4	-0.4	24.5	24.0
[redacted]0:53	15.4	-0.4	22.9	-0.4	-0.4	24.4	23.9
[redacted]1:23	15.4	-0.4	22.9	-0.4	-0.5	24.5	24.0
[redacted]1:53	15.4	-0.4	22.9	-0.4	-0.4	24.5	23.9
[redacted]2:23	15.4	-0.4	22.9	-0.4	-0.5	24.5	24.0
[redacted]2:53	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
13:23	15.4	-0.4	22.8	-0.4	-0.4	24.4	23.9
[redacted]3:53	15.4	-0.4	22.8	-0.4	-0.4	24.4	23.9
[redacted]4:23	15.4	-0.4	22.8	-0.4	-0.4	24.4	23.9
14:53	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
15:23	15.4	-0.4	23.0	-0.4	-0.4	24.6	24.1
[redacted]5:53	15.4	-0.4	22.9	-0.4	-0.5	24.5	24.0
[redacted]6:23	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
16:53	15.4	-0.4	22.8	-0.4	-0.5	24.4	23.9
17:23	15.4	-0.4	23.0	-0.4	-0.4	24.6	24.1
[redacted]7:53	15.4	-0.4	22.9	-0.4	-0.5	24.5	24.0
18:23	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
18:53	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
[redacted]9:23	15.4	-0.4	22.7	-0.4	-0.4	24.3	23.8
[redacted]9:53	15.4	-0.4	22.8	-0.4	-0.5	24.4	23.9
20:23	15.4	-0.4	22.8	-0.4	-0.4	24.4	23.9
[redacted]0:53	15.4	-0.5	22.9	-0.4	-0.5	24.5	24.0
[redacted]1:23	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
21:53	15.4	-0.4	22.9	-0.4	-0.4	24.4	23.9
22:23	15.4	-0.4	22.7	-0.4	-0.4	24.3	23.8
[redacted]2:53	15.4	-0.4	22.9	-0.4	-0.4	24.4	23.9
[redacted]3:23	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
23:53	15.4	-0.4	23.1	-0.4	-0.5	24.7	24.2
[redacted]4:23	15.4	-0.4	22.9	-0.4	-0.4	24.4	23.9
[redacted]4:53	15.4	-0.4	23.0	-0.4	-0.4	24.5	24.0
25:23	15.4	-0.5	22.9	-0.4	-0.5	24.4	23.9
25:53	15.4	-0.5	23.0	-0.4	-0.5	24.6	24.1
[redacted]6:23	15.4	-0.5	23.0	-0.4	-0.5	24.6	24.1
[redacted]6:53	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
27:23	15.4	-0.4	23.0	-0.4	-0.4	24.7	24.2
27:53	15.4	-0.4	23.0	-0.4	-0.4	24.6	24.1
[redacted]8:23	15.4	-0.4	23.0	-0.4	-0.5	24.6	24.1
28:52	15.4	-0.4	23.0	-0.4	-0.4	24.6	24.1
29:23	15.4	-0.4	22.9	-0.4	-0.5	24.6	24.1
[redacted]9:53	15.4	-0.4	23.0	-0.4	-0.4	24.6	24.1
[redacted]0:23	15.4	-0.5	22.9	-0.4	-0.5	24.5	24.0

4-21-1993 Time	O2 %V	CO ppmV	NOx ppmV	NULL	CO ppm@15	NOx ppm@15	NOx ISO
8:50:53	15.4	-0.4	23.0	-0.4	-0.5	24.6	24.1
8:51:23	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.1
8:51:53	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
8:52:23	15.4	-0.5	22.9	-0.4	-0.5	24.6	24.1
8:52:53	15.4	-0.5	22.9	-0.4	-0.5	24.7	24.2
8:53:23	15.4	-0.4	22.8	-0.4	-0.5	24.6	24.1
8:53:53	15.4	-0.5	22.8	-0.4	-0.5	24.4	23.9
8:54:23	15.4	-0.4	22.9	-0.4	-0.4	24.5	24.0
8:54:53	15.4	-0.4	22.8	-0.4	-0.4	24.4	23.9
8:55:23	15.4	-0.4	22.8	-0.4	-0.5	24.4	23.9
8:55:53	15.4	-0.4	22.9	-0.4	-0.5	24.5	24.0
8:56:23	15.4	-0.4	22.8	-0.4	-0.4	24.4	23.9
8:56:53	15.4	-0.4	22.7	-0.4	-0.4	24.4	23.9
8:57:23	15.4	-0.4	22.8	-0.4	-0.4	24.5	24.0
Avg.=	15.4	-0.4	22.9	-0.4	-0.5	24.5	24.0

INSTRUMENTATION RESPONSE TIME WORKSHEET

Environmental Science & Engineering, Inc.

CLIENT:	PROJECT NO.:
FACILITY:	ANALYST:
SOURCE I.D. NO.:	DATE:

INSTRUMENT SPECIFICATIONS

ANALYZER:		
MODEL NO.:		
SPAN RANGE:		
SPAN GASES:		
CHART SPEED:		

RESPONSE TIME DATA

UPSCALE RESPONSE		
☐ SECONDS		
☐ MINUTES		
AVERAGE		
DOWNSCALE RESPONSE		
☐ SECONDS		
☐ MINUTES		
AVERAGE		

COMMENTS:

FORMS-7/102.51/TIME.CEM

REFERENCE METHOD
ANALYZER CALIBRATION RECORD

Instrument: _____ Range: _____
Date: _____ Fuel: Gas / Oil
Operator: _____ Units: %V / ppmV

Run #	Time	Load	Certified Gas Conc.	Observed Gas Conc.	Difference	Difference Percent of Scale
MP 1		NA	Zero: 0			
MP 2		NA	High:			
MP 3		NA	Mid:			
MP 4		NA	Low:			

Comments: MP = Multi-Point Calibration.

EXAMPLE RELATIVE ACCURACY FIELD DATA SHEET

Run No.	Date and time	SO_2 RM ppm[c]	SO_2 M ppm[c]	SO_2 Diff ppm[c]	NO_x[b] RM ppm[c]	NO_x[b] M ppm[c]	NO_x[b] Diff ppm[c]	CO_2 or O_2[a] RM %[c]	CO_2 or O_2[a] M %[c]	SO_2[a] RM mass/GCV	SO_2[a] M mass/GCV	SO_2[a] Diff mass/GCV	NO_x[a] RM mass/GCV	NO_x[a] M mass/GCV	NO_x[a] Diff mass/GCV
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
Average															
Confidence Interval															
Accuracy															

Make sure that RM and M data are on a consistent basis, either wet or dry.

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

August 3, 1994

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics Management Division
U. S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

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

RE: NSPS Custom Fuel Monitoring Schedule
Permit Nos. AC53-214903 and PSD-FL-190
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Ms. Harper and Mr. Fancy,

On behalf of Tiger Bay Limited Partnership, we request that your department approve our proposed custom fuel monitoring schedule. For your review I have attached are two examples of NSPS custom fuel monitoring schedules for similar facilities. We propose that you approve a similar schedule for the Tiger Bay cogeneration facility. The following documents are attached:

1. KBN's March 7, 1994 Letter.
2. USEPA's April 18, 1994 Letter.
3. FDEP's April 22, 1994 Letter.
4. USEPA's Letter to Mr. C.H. Fancy-FDEP.
5. Specific Condition No. 18.

Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer
RSC:kro
Attachments (4)

cc: Teresa Heron -FDEP
Chuck Cook

Post-it™ Fax Note 7671 | Date | # of pages ▶ 8

To ROBERT CHATHAM	From D.C. MCCANN
Co./Dept. DEP-TC	Co. KBN
Phone #	Phone # PROJ 11018-0320
Fax # 713-735-4571	Fax #

KBN

March 7, 1994

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics Management Division
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta GA 30365

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

Re: Mulberry Cogeneration Project
FDEP File No. AC53-211670; PSD-FL-187
NSPS Custom Fuel Monitoring Schedule

Dear Ms. Harper and Mr. Fancy:

This correspondence is submitted on behalf of Polk Power Partners, L.P. to request approval of a custom fuel monitoring schedule for the determination of sulfur content required under the New Source Performance Standards (NSPS) for Stationary Gas Turbines [40 Code of Federal Regulations (CFR) Part 60, Subpart GG). This request is made necessary by Section 60.334(b) and (b)(2) of Subpart GG, which states:

> *(b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:*
>
> > *(2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.*

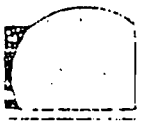
It is my understanding that the U.S. Environmental Protection Agency (EPA) has not delegated the authority to implement Section 60.334(4) to the Florida Department of Environmental Protection (FDEP). Therefore, a copy of this request has been transmitted jointly to EPA Region IV and FDEP.

21193A3/4

KBN ENGINEERING AND APPLIED SCIENCES, INC.

1034 Northwest 57th Street, Gainesville, Florida 32605, 904-331-9000, FAX 904-332-4180
5405 West Cypress Street, Suite 215, Tampa, Florida 33607, 813-287-1717 FAX 813-287-1716
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487, 407-994-9910, FAX 407-994-9393
6821 Southpoint Drive North, Suite 216, Jacksonville, Florida 32216, 904-296-9663 FAX 904-296-0146
One Church Street, Suite 801, Rockville, Maryland 20850, 301-738-1100, FAX 301-738-1105

EQUAL EMPLOYMENT OPPORTUNITY AN AFFIRMATIVE ACTION EMPLOYER



As indicated by Section 60.344(b)(2), the NSPS imply that daily sampling be performed when there is not an intermediate bulk storage tank, even if the fuel is pipeline natural gas. Discussions with EPA's Office of Air Quality Planning and Standards (OAQPS) confirm this interpretation of the rule and offer the attached memorandum as guidance. Specifically, a custom fuel monitoring schedule must be developed and approved for pipeline natural gas. The schedule should address the sulfur content of the fuel; the nitrogen content in natural gas is not required.

The sulfur content for natural gas submitted in the application was developed from data supplied by the natural gas pipeline company in Florida, i.e., Florida Gas Transmission Company (FGT). The data are summarized in Table 1. The emission limit proposed in the application was based on 1 grain sulfur per 100 cubic feet of gas (1 grain/100 cf) which is equivalent to about 0.003 percent sulfur by weight. This sulfur concentration was based on the highest recorded value over the 8-month study period (see Table 1) with a margin of 25 percent (i.e., 0.8 grains/100 cf times 1.25). The pipeline company (i.e., FGT) regularly samples for total sulfur in the natural gas to assure that the hydrogen sulfide content is low and that the concentrations of mercaptan are sufficient for safety reasons. Mercaptan is added to natural gas to assure that the gas has an odor that can be perceived if mistakenly released; otherwise natural gas would have no odor. Please note that the NSPS require that the sulfur content of the fuel be no more than 0.8 percent by weight; a difference of over two orders of magnitude from the basis of the emission limit. Thus, there is significant margin in complying with the NSPS limit.

The EPA guidance memorandum suggests that sampling be conducted twice monthly over the first six months, quarterly over the next six quarters and then during the first and third quarters of each calendar year. The 8 months of data listed in Table 1 (3 to 4 samples per month) demonstrate that the sulfur content meets the NSPS and is less than the basis of the emission limit for natural gas, i.e., 1 grain per 100 cf. FGT was recently contacted and supplied the following data from random analyses:

Analyses Date	Sulfur Content (grains/100cf)
03/10/92	0.50
06/30/92	0.40
09/29/92	0.26
01/05/93	0.31
03/02/93	0.27
06/01/93	0.16
09/28/93	0.12
12/14/93	0.42
02/09/94	0.04

Clearly, the data over that last several years have demonstrated that the NSPS limit is easily met. Thus, it is requested that EPA approve a custom fuel monitoring schedule that requires the facility to submit representative sulfur analyses supplied by the pipeline company each quarter over the first six quarters of turbine operation with the excess emissions report required under Section 60.7(c) of the CFR. After this

time period, sulfur analyses would be supplied during the first and third quarters of each calendar year. This would provide assurance to EPA and FDEP that the NSPS was being achieved.

Please call if you have any questions.

Sincerely,

Kennard F. Kosky, P.E.
President

KFK/lcb

cc: Ward Marshall, C&SW
William Malenius, Ark Energy
FDEP Southwest District
File (2)

Table 1. Sulfur Content, Heat Content, and SO_2 Emission Factors for Natural Gas

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

Source: Florida Gas Transmission Company, 1990.

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

AUG 14 1987

OFFICE OF AIR AND RADIATION

MEMORANDUM

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

FROM: John B. Rasnic, Chief
Compliance Monitoring Branch

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

Air Programs Branch Chiefs
Regions I-X

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

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

Enclosure

Conditions for Custom Fuel Sampling Schedule for Stationary Gas Turbines

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

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measuremant of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.

   c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample anaylsis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

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

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

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

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

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

Attachment

cc: John Cranshaw
George Walsh
Robert Ajax
Earl Salo

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

APR 18 1994

4APT-AEB

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

Re: Approval of NSPS Custom Fuel Monitoring Schedules for:
Mulberry Cogeneration Project, PSD-FL-187 (AC53-211670);
Lake Cogeneration Project, PSD-FL-176 (AC15-196459); and
Pasco Cogeneration Project, PSD-FL-177 (AC51-196460).

Dear Mr. Fancy:

This is to acknowledge letters from KBN Engineering and Applied Sciences, Inc. (KBN) dated March 7, 1994, and March 17, 1994, requesting approval of customized fuel monitoring schedules for the above referenced projects. These requests were jointly transmitted to the U.S. Environmental Protection Agency (EPA), and to you. Since the authority for implementing §60.334(b) of 40 CFR Part 60, Subpart GG has not been delegated to the State of Florida, we have reviewed KBN's custom fuel monitoring schedules.

Based on our review we have determined that the proposed schedules are acceptable, as long as each source also complies with items 2(d), 3, and 4 of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987. A copy of this memo was included in KBN's request as attachment.

If you have any questions regarding this letter, please contact Mr. Mirza P. Baig of my staff at 404/347-5014.

Sincerely yours,

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

cc: Kennard F. Kosky
KBN Engineering

Florida Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

April 22, 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Kevin Fullerton
Project Manager, Air Programs
Lake Cogen Limited
Post Office Box 2562
Tampa, Florida 33601

Dear Mr. Fullerton:

RE: Amendment to Construction Permit
AC 35-196459 (PSD-FL-176)
NSPS Custom Fuel Monitoring Schedule
Lake Cogen Limited

The Department has reviewed your March 17, 1994 letter, with supporting data, requesting an NSPS Custom Fuel Monitoring Schedule for sulfur dioxide (SO_2) and nitrogen oxide (NO_x) at the subject facility (refer to Attachment No. 1). The facility is required by the permit to comply with Subpart GG of the New Source Performance Standards (NSPS) 40 CFR 60. NSPS 40 CFR 60.334(b) and 60.334(b)(2) of Subpart GG state that for sources utilizing pipeline quality natural gas a custom fuel monitoring schedule, if supported by data which demonstrates compliance with NSPS emission limits, may be approved by the Administrator of EPA. This authority has been delegated to EPA's regional offices and a copy of the subject request was jointly submitted to EPA Region IV for their determination. The Department received a letter from EPA, by fax on April 15, 1994, stating that a custom fuel monitoring schedule for this facility was acceptable if it complied with specific items of a custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987 (Refer to attachment No. 2). Since monitoring data was provided by the applicant which demonstrated compliance with the requirements of 2.a and 2.b in the EPA guidance memo, 2.a and 2.b were deleted from the custom fuel monitoring schedule. In compliance with the EPA determination, the permit specific conditions will be amended as follows:

A. Specific Condition Number;

20. From

This source shall comply with all requirements of 40 CFR 60, Subparts GG and Dc and F.A.C. Rule 17-296.800(2)(a), Standard of Performance for Stationary Gas Turbines and Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

To

This source shall comply with all requirements of 40 CFR 60, Subparts GG and Dc and F.A.C. Rule 17-296.800(2)(a), Standard of Performance for Stationary Gas Turbines and Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. 40 CFR 60.334(b)(2) requires that a custom fuel monitoring schedule shall be followed for natural gas fired at this facility, as follows:

Custom Fuel Monitoring Schedule for Natural Gas

1. Monitoring of fuel nitrogen content shall not be required since natural gas is the only fuel being fired in the gas turbines.

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are ASTM D1072-80, ASTM D3031-81, ASTM D3246-81, and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. This custom fuel monitoring schedule shall become effective on the date this permit becomes valid. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters. If monitoring data is provided by the applicant which demonstrates consistent compliance with the requirements herein the applicant may begin monitoring as per the requirements of 2(c).

   c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

3. If there is a change in fuel supply, the owner or operator must notify the Department of such change for re-examination of this custom schedule. A substantial change in fuel quality shall be considered as a change in fuel supply. Sulfur monitoring shall

be conducted weekly during the interim period when this custom schedule is being re-examined.

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

B. Attachments to be Incorporated;

- KBN letter received March 21, 1994
- EPA letter received April 15, 1994

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

The Petition shall contain the following information:

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

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this amendment. Persons whose substantial interests will be affected by any decision

of the Department with regard to the request/application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this amendment in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This letter amendment must be attached to Construction Permit No. AC 35-196459 (PSD-FL-176), and shall become part of the permit.

Sincerely,

Howard L. Rhodes

Howard L. Rhodes
Director
Division of Air Resources
Management

HLR/CSL

Attachments

cc: A. Zahm, CD
J. Harper, EPA
J. Bunyak, NPS
K. Kosky, KBN

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this AMENDMENT and all copies were mailed by certified mail before the close of business on 5/2/94 to the listed persons.

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

Barbara F. Bowtwell 5/2/94
Clerk Date

March 17, 1994

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics Management Division
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta GA 30365

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

Re: Lake and Pasco Cogeneration Projects
FDEP File Nos. AC35-196459, PSD-FL-176; AC51-196460, PSD-FL-177
NSPS Custom Fuel Monitoring Schedule

Dear Ms. Harper and Mr. Fancy:

This correspondence is submitted on behalf of Lake Cogen Limited and Pasco Cogen Limited to request approval of a custom fuel monitoring schedule for the determination of sulfur content required under the New Source Performance Standards (NSPS) for Stationary Gas Turbines [40 Code of Federal Regulations (CFR) Part 60, Subpart GG). This request is made necessary by Section 60.334(b) and (b)(2) of Subpart GG, which states:

> *(b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:*
>
> > *(2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.*

It is my understanding that the U.S. Environmental Protection Agency (EPA) has not delegated the authority to implement Section 60.334(4) to the Florida Department of Environmental Protection (FDEP). Therefore, a copy of this request has been transmitted jointly to EPA Region IV and FDEP.

KBN ENGINEERING AND APPLIED SCIENCES, INC.

1034 Northwest 57th Street, Gainesville, Florida 32605, 904-331-9000, FAX 904-332-4189
5405 West Cypress Street, Suite 215, Tampa, Florida 33607, 813-287-1717 FAX 813-287-1716
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487, 407-994-9910, FAX 407-994-9393
6821 Southpoint Drive North, Suite 216, Jacksonville, Florida 32216, 904-296-9663 FAX 904-296-0146
One Church Street, Suite 801, Rockville, Maryland 20850, 301-738-1100, FAX 301-738-1105

As indicated by Section 60.344(b)(2), the NSPS imply that daily sampling be performed when there is not an intermediate bulk storage tank, even if the fuel is pipeline natural gas. Discussions with EPA's Office of Air Quality Planning and Standards (OAQPS) confirm this interpretation of the rule and offer the attached memorandum as guidance. Specifically, a custom fuel monitoring schedule must be developed and approved for pipeline natural gas. The schedule should address the sulfur content of the fuel; the nitrogen content in natural gas is not required.

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The EPA guidance memorandum suggests that sampling be conducted twice monthly over the first six months, quarterly over the next six quarters and then during the first and third quarters of each calendar year. The 8 months of data listed in Table 1 (3 to 4 samples per month) demonstrate that the sulfur content meets the NSPS and is less than the basis of the emission limit for natural gas, i.e., 1 grain per 100 cf. FGT was recently contacted and supplied the following data from random analyses:

Analyses Date	Sulfur Content (grains/100cf)
03/10/92	0.50
06/30/92	0.40
09/29/92	0.26
01/05/93	0.31
03/02/93	0.27
06/01/93	0.16
09/28/93	0.12
12/14/93	0.42
02/09/94	0.04

Clearly, the data over that last several years have demonstrated that the NSPS limit is easily met. Thus, it is requested that EPA approve a custom fuel monitoring schedule that requires the facility to submit representative sulfur analyses supplied by the pipeline company each quarter over the first six quarters of turbine operation with the excess emissions report required under Section 60.7(c) of the CFR. After this

time period, sulfur analyses would be supplied during the first and third quarters of each calendar year. This would provide assurance to EPA and FDEP that the NSPS was being achieved.

Please call if you have any questions.

Sincerely,

Kennard F. Kosky/lcb

Kennard F. Kosky, P.E.
President

KFK/lcb

cc: Kevin Fullerton, Lake Cogen Limited
Bruce Miller, Pasco Cogen Limited
Harry Kerns, FDEP Southwest District
Chuck Collins, FDEP Central District
File (2)

Table 1. Sulfur Content, Heat Content, and SO_2 Emission Factors for Natural Gas

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

Source: Florida Gas Transmission Company, 1990.

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

AUG 14 1987

OFFICE OF AIR AND RADIATION

MEMORANDUM

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

FROM: John B. Rasnic, Chief
Compliance Monitoring Branch

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

Air Programs Branch Chiefs
Regions I-X

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

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

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

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

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

Attachment

cc: John Cronshaw
George Walsh
Robert Ajax
Earl Salo

Enclosure

Conditions for Custom Fuel Sampling Schedule for Stationary Gas Turbines

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

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measuremant of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.

   c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample anaylsis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

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

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

US ENVIRONMENTAL PROTECTION AGENCY
Region IV

TO: Name: CHARLES LOGAN
Company: DEP - Tallahassee
Phone: _____ FAX: 404-622-6979
Date: 4-15-94 Pages (incl. cover) 2

FROM: Air Enforcement Branch Phone: (404) 347-5014
345 Courtland Street, NE
Atlanta, GA 30065 FAX: (404) 347-3059
Sender's Name: MIRZA P. BAIG.
Subject: Mulberry / Lake / Pasco Gas Turbine
Custom Fuel Monitoring Schedules.
COMMENTS:

Dear Charles:

I am faxing you the letter that approves custom fuel monitoring for the above referenced gas turbines.

The hard copy should get to you next week.

If you need anything else please let me know.

Thanks,

Mirza

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

4APT-AEB

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

Re: Approval of NSPS Custom Fuel Monitoring Schedules for:
Mulberry Cogeneration Project, PSD-FL-187 (AC53-211670);
Lake Cogeneration Project, PSD-FL-176 (AC15-196459); and
Pasco Cogeneration Project, PSD-FL-177 (AC51-196460).

Dear Mr. Fancy:

This is to acknowledge letters from KBN Engineering and Applied Sciences, Inc. (KBN) dated March 7, 1994, and March 17, 1994, requesting approval of customized fuel monitoring schedules for the above referenced projects. These requests were jointly transmitted to the U.S. Environmental Protection Agency (EPA), and to you. Since the authority for implementing §60.334(b) of 40 CFR Part 60, Subpart GG has not been delegated to the State of Florida, we have reviewed KBN's custom fuel monitoring schedules.

Based on our review we have determined that the proposed schedules are acceptable, as long as each source also complies with items 2(d), 3, and 4 of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987. A copy of this memo was included in KBN's request as attachment.

If you have any questions regarding this letter, please contact Mr. Mirza P. Baig of my staff at 404/347-5014.

Sincerely yours,

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

cc: Kennard F. Kosky
KBN Engineering

SPECIFIC CONDITIONS:

18. Sulfur and nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be determined as specified in 40 CFR 60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Southwest District office. Any custom schedule approved by DER pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance. The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

Rule Requirements

19. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-210, 212, 275, 296, 297 and 17-4, Florida Administrative Code and 40 CFR 60 (July, 1992 version).

20. The sources shall comply with all requirements of 40 CFR 60, Subpart GG and Subpart Dc, and F.A.C. Rule 17-296.800,(2)(a), Standards of Performance for Stationary Gas Turbines and Standards of Performance for Industrial, Commercial, and Institutional Steam Generating Units.

21. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-210.300(1)).

22. This source shall be in compliance with all applicable provisions of F.A.C. Rules 17-210.650: Circumvention; 17-210.700: Excess Emissions; 17-296.800: Standards of Performance for New Stationary Sources (NSPS); 17-297: Stationary Sources-Emissions Monitoring; and, 17-4.130: Plant Operation-Problems.

23. If construction does not commence within 18 months of issuance of this permit, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which contruction has not commenced (40 CFR 52.21(r)(2)).

24. Quarterly excess emission reports, in accordance with the July 1, 1992 version of 40 CFR 60.7 and 60.334 shall be submitted to the Department's Southwest District office.

Is your RETURN ADDRESS completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert S. Chatham, P.E.
Destec Energy, Inc.
P. O. Box 4411
Houston, Texas 77210-4411

4a. Article Number
P 872 563 653

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

7. Date of Delivery
AUG 22 1994

5. Signature (Addressee)

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

6. Signature (Agent)

PS Form **3811**, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

P 872 563 653

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

UNITED STATES POSTAL SERVICE

Sent to: Mr. Robert S. Chatham, P.E.	
Street and No.: P. O. Box 4411	
P.O., State and ZIP Code: Houston, TX 77210-4411	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: Mailed: 8-18-94 Permit: AC53-214903 PSD-FL-190	

PS Form **3800**, JUNE 1991

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

August 18, 1994

Mr. Robert S. Chatham, P.E.
Destec Energy, Inc.
P.O. Box 4411
Houston, Texas 77210-4411

RE: Custom Fuel Monitoring Schedule Request
Tiger Bay Cogeneration Facility
AC 53-214903 [PSD-FL-190]

Dear Mr. Chatham:

Thank you for your letter dated August 3, 1994 and the attached documents. Comments concerning the letter and attached documents are as follows:

1) Pursuant to Rules 17-4.050(4) and (5), F.A.C., the Department must receive the proper processing fee before action is taken on an applicant's request. The Department will begin processing the subject request once a fee of $250.00 has been received.

2) Please clarify that the data submitted on the sulfur content of the fuel were for the pipeline that supplies the turbine at Tiger Bay, without intermediate bulk storage.

3) Please provide the test(s) or analysis method(s) used to determine the sulfur content of the fuel referenced in your letter and in Table 1. Also, provide supporting documentation from the vendor. In addition, please provide any additional sulfur analysis data that is available for the past two years with supporting documentation and method(s) of determining sulfur content.

4) EPA has delegated authority for implementation of 40 CFR 60, Subpart GG, to the Department. The Department and EPA agree that all future requests be submitted to the Department and not EPA. The Department will then coordinate with EPA for approval of custom fuel monitoring schedules.

5) If available, please provide any information to substantiate that the fuel sampling location for the sulfur

content will clearly be representative of the fuel that is delivered to Tiger Bay.

If you have any questions concerning the above, please call Mr. Charles Logan at (904) 488-1344 or write to me at the above address.

Respectfully,

for John C Brown

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

CHF/csl/bjb

cc: B. Thomas, SWD
D. Zell, SWD
J. Harper, U.S. EPA
B. Beals, U.S. EPA
J. Brown, DEP

Cabinet #2
Drawer #4

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

August 3, 1994

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics Management Division
U. S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

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

RE: NSPS Custom Fuel Monitoring Schedule
Permit Nos. AC53-214903 and PSD-FL-190
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Ms. Harper and Mr. Fancy,

On behalf of Tiger Bay Limited Partnership, we request that your department approve our proposed custom fuel monitoring schedule. For your review I have attached are two examples of NSPS custom fuel monitoring schedules for similar facilities. We propose that you approve a similar schedule for the Tiger Bay cogeneration facility. The following documents are attached:

1. KBN's March 7, 1994 Letter.
2. USEPA's April 18, 1994 Letter.
3. FDEP's April 22, 1994 Letter.
4. USEPA's Letter to Mr. C.H. Fancy-FDEP.
5. Specific Condition No. 18.

Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer
RSC:kro
Attachments (4)

cc: Teresa Heron -FDEP
Chuck Cook

Tiger Bay Cogen

8/5

Patty

This needs a permit revision, but Mike needs to look at it. We did one of these recently. Please coordinate

Clay

8-9-94

Fee?

Patty, I assigned to Charles Logan.
Ben

Post-it™ Fax Note 7671	Date	# of pages ▶ 8
To ROBERT CHATHAM	From D.L. MCCANN	
Co./Dept. DEP-TLC	Co. KBN	
Phone #	Phone # (904) 332-3018-0320	
Fax # 713-735-4571	Fax #	

March 7, 1994

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics Management Division
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta GA 30365

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

Re: Mulberry Cogeneration Project
FDEP File No. AC53-211670; PSD-FL-187
NSPS Custom Fuel Monitoring Schedule

Dear Ms. Harper and Mr. Fancy:

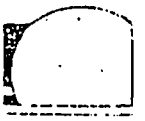
This correspondence is submitted on behalf of Polk Power Partners, L.P. to request approval of a custom fuel monitoring schedule for the determination of sulfur content required under the New Source Performance Standards (NSPS) for Stationary Gas Turbines [40 Code of Federal Regulations (CFR) Part 60, Subpart GG). This request is made necessary by Section 60.334(b) and (b)(2) of Subpart GG, which states:

> *(b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:*
>
> > *(2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.*

It is my understanding that the U.S. Environmental Protection Agency (EPA) has not delegated the authority to implement Section 60.334(4) to the Florida Department of Environmental Protection (FDEP). Therefore, a copy of this request has been transmitted jointly to EPA Region IV and FDEP.

KBN ENGINEERING AND APPLIED SCIENCES, INC.

1034 Northwest 57th Street, Gainesville, Florida 32605, 904-331-9000, FAX 904-332-4180
5405 West Cypress Street, Suite 215, Tampa, Florida 33607, 813-287-1717 FAX 813-287-1716
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487, 407-994-9910, FAX 407-994-9393
6821 Southpoint Drive North, Suite 216, Jacksonville, Florida 32216, 904-296-9663 FAX 904-296-0146
One Church Street, Suite 801, Rockville, Maryland 20850, 301-738-1100, FAX 301-738-1105



As indicated by Section 60.344(b)(2), the NSPS imply that daily sampling be performed when there is not an intermediate bulk storage tank, even if the fuel is pipeline natural gas. Discussions with EPA's Office of Air Quality Planning and Standards (OAQPS) confirm this interpretation of the rule and offer the attached memorandum as guidance. Specifically, a custom fuel monitoring schedule must be developed and approved for pipeline natural gas. The schedule should address the sulfur content of the fuel; the nitrogen content in natural gas is not required.

The sulfur content for natural gas submitted in the application was developed from data supplied by the natural gas pipeline company in Florida, i.e., Florida Gas Transmission Company (FGT). The data are summarized in Table 1. The emission limit proposed in the application was based on 1 grain sulfur per 100 cubic feet of gas (1 grain/100 cf) which is equivalent to about 0.003 percent sulfur by weight. This sulfur concentration was based on the highest recorded value over the 8-month study period (see Table 1) with a margin of 25 percent (i.e., 0.8 grains/100 cf times 1.25). The pipeline company (i.e., FGT) regularly samples for total sulfur in the natural gas to assure that the hydrogen sulfide content is low and that the concentrations of mercaptan are sufficient for safety reasons. Mercaptan is added to natural gas to assure that the gas has an odor that can be perceived if mistakenly released; otherwise natural gas would have no odor. Please note that the NSPS require that the sulfur content of the fuel be no more than 0.8 percent by weight; a difference of over two orders of magnitude from the basis of the emission limit. Thus, there is significant margin in complying with the NSPS limit.

The EPA guidance memorandum suggests that sampling be conducted twice monthly over the first six months, quarterly over the next six quarters and then during the first and third quarters of each calendar year. The 8 months of data listed in Table 1 (3 to 4 samples per month) demonstrate that the sulfur content meets the NSPS and is less than the basis of the emission limit for natural gas, i.e., 1 grain per 100 cf. FGT was recently contacted and supplied the following data from random analyses:

Analyses Date	Sulfur Content (grains/100cf)
03/10/92	0.50
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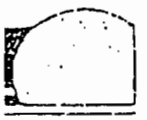
09/28/93	0.12
12/14/93	0.42
02/09/94	0.04

Clearly, the data over that last several years have demonstrated that the NSPS limit is easily met. Thus, it is requested that EPA approve a custom fuel monitoring schedule that requires the facility to submit representative sulfur analyses supplied by the pipeline company each quarter over the first six quarters of turbine operation with the excess emissions report required under Section 60.7(c) of the CFR. After this



time period, sulfur analyses would be supplied during the first and third quarters of each calendar year. This would provide assurance to EPA and FDEP that the NSPS was being achieved.

Please call if you have any questions.

Sincerely,

Kennard F. Kosky, P.E.
President

KFK/lcb

cc: Ward Marshall, C&SW
William Malenius, Ark Energy
FDEP Southwest District
File (2)

Table 1. Sulfur Content, Heat Content, and SO_2 Emission Factors for Natural Gas

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

Source: Florida Gas Transmission Company, 1990.

RECEIVED 09/20 14:49 1992 AT 9043324109 PAGE 1 (PRINTED PAGE 1)
SEP-20-1992 13:39 FROM OAQPS.ESD.CPB/ISB RTP NC TO 9043324109 P.01

05 07-92 11:45AM FROM EPA FPS/SSCD

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

AUG 14 1987

OFFICE OF AIR AND RADIATION

MEMORANDUM

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

FROM: John B. Rasnic, Chief
Compliance Monitoring Branch

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

Air Programs Branch Chiefs
Regions I-X

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

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

Enclosure

Conditions for Custom Fuel Sampling Schedule for Stationary Gas Turbines

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

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measuremant of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.

   c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample anaylsis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

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

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

be bimonthly, followed by quarterly, then semiannual, given at least six months of data demonstrating little variability in sulfur content and compliance with §60.334 at each monitoring frequency; nitrogen monitoring can be waived for pipeline quality natural gas, since there is no fuel-bound nitrogen and since the free nitrogen does not contribute appreciably to NO_x emissions. Please see the attached sample custom schedule for details. Given the increasing trend in the use of pipeline quality natural gas, we are investigating the possibility of amending Subpart GG to allow for less frequent sulfur monitoring and a waiver of nitrogen monitoring requirements where natural gas is used.

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

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

Attachment

cc: John Cranshaw
George Walsh
Robert Ajax
Earl Salo

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

APR 18 1994

4APT-AEB

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

Re: Approval of NSPS Custom Fuel Monitoring Schedules for:
Mulberry Cogeneration Project, PSD-FL-187 (AC53-211670);
Lake Cogeneration Project, PSD-FL-176 (AC15-196459); and
Pasco Cogeneration Project, PSD-FL-177 (AC51-196460).

Dear Mr. Fancy:

This is to acknowledge letters from KBN Engineering and Applied Sciences, Inc. (KBN) dated March 7, 1994, and March 17, 1994, requesting approval of customized fuel monitoring schedules for the above referenced projects. These requests were jointly transmitted to the U.S. Environmental Protection Agency (EPA), and to you. Since the authority for implementing §60.334(b) of 40 CFR Part 60, Subpart GG has not been delegated to the State of Florida, we have reviewed KBN's custom fuel monitoring schedules.

Based on our review we have determined that the proposed schedules are acceptable, as long as each source also complies with items 2(d), 3, and 4 of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987. A copy of this memo was included in KBN's request as attachment.

If you have any questions regarding this letter, please contact Mr. Mirza P. Baig of my staff at 404/347-5014.

Sincerely yours,

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

cc: Kennard F. Kosky
KBN Engineering

Florida Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

April 22, 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Kevin Fullerton
Project Manager, Air Programs
Lake Cogen Limited
Post Office Box 2562
Tampa, Florida 33601

Dear Mr. Fullerton:

RE: Amendment to Construction Permit
AC 35-196459 (PSD-FL-176)
NSPS Custom Fuel Monitoring Schedule
Lake Cogen Limited

The Department has reviewed your March 17, 1994 letter, with supporting data, requesting an NSPS Custom Fuel Monitoring Schedule for sulfur dioxide (SO_2) and nitrogen oxide (NO_x) at the subject facility (refer to Attachment No. 1). The facility is required by the permit to comply with Subpart GG of the New Source Performance Standards (NSPS) 40 CFR 60. NSPS 40 CFR 60.334(b) and 60.334(b)(2) of Subpart GG state that for sources utilizing pipeline quality natural gas a custom fuel monitoring schedule, if supported by data which demonstrates compliance with NSPS emission limits, may be approved by the Administrator of EPA. This authority has been delegated to EPA's regional offices and a copy of the subject request was jointly submitted to EPA Region IV for their determination. The Department received a letter from EPA, by fax on April 15, 1994, stating that a custom fuel monitoring schedule for this facility was acceptable if it complied with specific items of a custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987 (Refer to attachment No. 2). Since monitoring data was provided by the applicant which demonstrated compliance with the requirements of 2.a and 2.b in the EPA guidance memo, 2.a and 2.b were deleted from the custom fuel monitoring schedule. In compliance with the EPA determination, the permit specific conditions will be amended as follows:

A. Specific Condition Number;

20. From

This source shall comply with all requirements of 40 CFR 60, Subparts GG and Dc and F.A.C. Rule 17-296.800(2)(a), Standard of Performance for Stationary Gas Turbines and Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

To

This source shall comply with all requirements of 40 CFR 60, Subparts GG and Dc and F.A.C. Rule 17-296.800(2)(a), Standard of Performance for Stationary Gas Turbines and Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. 40 CFR 60.334(b)(2) requires that a custom fuel monitoring schedule shall be followed for natural gas fired at this facility, as follows:

Custom Fuel Monitoring Schedule for Natural Gas

1. Monitoring of fuel nitrogen content shall not be required since natural gas is the only fuel being fired in the gas turbines.

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are ASTM D1072-80, ASTM D3031-81, ASTM D3246-81, and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. This custom fuel monitoring schedule shall become effective on the date this permit becomes valid. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters. If monitoring data is provided by the applicant which demonstrates consistent compliance with the requirements herein the applicant may begin monitoring as per the requirements of 2(c).

   c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

3. If there is a change in fuel supply, the owner or operator must notify the Department of such change for re-examination of this custom schedule. A substantial change in fuel quality shall be considered as a change in fuel supply. Sulfur monitoring shall

be conducted weekly during the interim period when this custom schedule is being re-examined.

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

B. Attachments to be Incorporated;

- KBN letter received March 21, 1994
- EPA letter received April 15, 1994

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

The Petition shall contain the following information:

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

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this amendment. Persons whose substantial interests will be affected by any decision

of the Department with regard to the request/application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this amendment in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This letter amendment must be attached to Construction Permit No. AC 35-196459 (PSD-FL-176), and shall become part of the permit.

Sincerely,

Howard L Rhodes

Howard L. Rhodes
Director
Division of Air Resources
Management

HLR/CSL

Attachments

cc: A. Zahm, CD
J. Harper, EPA
J. Bunyak, NPS
K. Kosky, KBN

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this AMENDMENT and all copies were mailed by certified mail before the close of business on 5/2/94 to the listed persons.

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

Barbara J. Boutwell 5/2/94
Clerk Date

March 17, 1994

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics Management Division
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta GA 30365

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

Re: Lake and Pasco Cogeneration Projects
FDEP File Nos. AC35-196459, PSD-FL-176; AC51-196460, PSD-FL-177
NSPS Custom Fuel Monitoring Schedule

Dear Ms. Harper and Mr. Fancy:

This correspondence is submitted on behalf of Lake Cogen Limited and Pasco Cogen Limited to request approval of a custom fuel monitoring schedule for the determination of sulfur content required under the New Source Performance Standards (NSPS) for Stationary Gas Turbines [40 Code of Federal Regulations (CFR) Part 60, Subpart GG). This request is made necessary by Section 60.334(b) and (b)(2) of Subpart GG, which states:

> *(b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:*
>
> > *(2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.*

It is my understanding that the U.S. Environmental Protection Agency (EPA) has not delegated the authority to implement Section 60.334(4) to the Florida Department of Environmental Protection (FDEP). Therefore, a copy of this request has been transmitted jointly to EPA Region IV and FDEP.

KBN ENGINEERING AND APPLIED SCIENCES, INC.

1034 Northwest 57th Street
Gainesville, Florida 32605
904-331-9000
FAX 904-332-4189

5405 West Cypress Street,
Suite 215
Tampa, Florida 33607
813-287-1717 FAX 813-287-1716

1801 Clint Moore Road, Suite 105
Boca Raton, Florida 33487
407-994-9910
FAX 407-994-9393

6821 Southpoint Drive North,
Suite 216
Jacksonville, Florida 32216
904-296-9663 FAX 904-296-0146

One Church Street, Suite 801
Rockville, Maryland 20850
301-738-1100
FAX 301-738-1105

As indicated by Section 60.344(b)(2), the NSPS imply that daily sampling be performed when there is not an intermediate bulk storage tank, even if the fuel is pipeline natural gas. Discussions with EPA's Office of Air Quality Planning and Standards (OAQPS) confirm this interpretation of the rule and offer the attached memorandum as guidance. Specifically, a custom fuel monitoring schedule must be developed and approved for pipeline natural gas. The schedule should address the sulfur content of the fuel; the nitrogen content in natural gas is not required.

The sulfur content for natural gas submitted in the application was developed from data supplied by the natural gas pipeline company in Florida, i.e., Florida Gas Transmission Company (FGT). The data are summarized in Table 1. The emission limit proposed in the application was based on 1 grain sulfur per 100 cubic feet of gas (1 grain/100 cf) which is equivalent to about 0.003 percent sulfur by weight. This sulfur concentration was based on the highest recorded value over the 8-month study period (see Table 1) with a margin of 25 percent (i.e., 0.8 grains/100 cf times 1.25). The pipeline company (i.e., FGT) regularly samples for total sulfur in the natural gas to assure that the hydrogen sulfide content is low and that the concentrations of mercaptan are sufficient for safety reasons. Mercaptan is added to natural gas to assure that the gas has an odor that can be perceived if mistakenly released; otherwise natural gas would have no odor. Please note that the NSPS require that the sulfur content of the fuel be no more than 0.8 percent by weight; a difference of over two orders of magnitude from the basis of the emission limit. Thus, there is significant margin in complying with the NSPS limit.

The EPA guidance memorandum suggests that sampling be conducted twice monthly over the first six months, quarterly over the next six quarters and then during the first and third quarters of each calendar year. The 8 months of data listed in Table 1 (3 to 4 samples per month) demonstrate that the sulfur content meets the NSPS and is less than the basis of the emission limit for natural gas, i.e., 1 grain per 100 cf. FGT was recently contacted and supplied the following data from random analyses:

Analyses Date	Sulfur Content (grains/100cf)
03/10/92	0.50
06/30/92	0.40
09/29/92	0.26
01/05/93	0.31
03/02/93	0.27
06/01/93	0.16
09/28/93	0.12
12/14/93	0.42
02/09/94	0.04

Clearly, the data over that last several years have demonstrated that the NSPS limit is easily met. Thus, it is requested that EPA approve a custom fuel monitoring schedule that requires the facility to submit representative sulfur analyses supplied by the pipeline company each quarter over the first six quarters of turbine operation with the excess emissions report required under Section 60.7(c) of the CFR. After this

time period, sulfur analyses would be supplied during the first and third quarters of each calendar year. This would provide assurance to EPA and FDEP that the NSPS was being achieved.

Please call if you have any questions.

Sincerely,

Kennard F. Kosky/lcb

Kennard F. Kosky, P.E.
President

KFK/lcb

cc: Kevin Fullerton, Lake Cogen Limited
Bruce Miller, Pasco Cogen Limited
Harry Kerns, FDEP Southwest District
Chuck Collins, FDEP Central District
File (2)

Table 1. Sulfur Content, Heat Content, and SO_2 Emission Factors for Natural Gas

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

Source: Florida Gas Transmission Company, 1990.

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

AUG 14 1987

OFFICE OF
AIR AND RADIATION

MEMORANDUM

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

FROM: John B. Rasnic, Chief
Compliance Monitoring Branch

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

Air Programs Branch Chiefs
Regions I-X

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

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

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

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

Attachment

cc: John Cranshaw
George Walsh
Robert Ajax
Earl Salo

Enclosure

Conditions for Custom Fuel Sampling Schedule for Stationary Gas Turbines

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

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.

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

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

US ENVIRONMENTAL PROTECTION AGENCY
Region IV

TO: Name: CHARLES LOGAN
Company: DEP - Tallahassee
Phone: _____ FAX: 404-622-6979
Date: 4-15-94 Pages (incl. cover) 2

FROM: Air Enforcement Branch Phone: (404) 347-5014
345 Courtland Street, NE
Atlanta, GA 30065 FAX: (404) 347-3059
Sender's Name: MIRZA P. BAIG.
Subject: Mulberry | Lake | Pasco Gas Turbine
COMMENTS: Custom Fuel Monitoring Schedules.

Dear Charles:

I am faxing you the letter that approves custom fuel monitoring for the above referenced gas turbines.

The hard copy should get to you next week.

If you need anything else please let me know.

Thanks,

Mirza

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

4APT-AEB

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

Re: Approval of NSPS Custom Fuel Monitoring Schedules for:
Mulberry Cogeneration Project, PSD-FL-187 (AC53-211670);
Lake Cogeneration Project, PSD-FL-176 (AC15-196459); and
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Based on our review we have determined that the proposed schedules are acceptable, as long as each source also complies with items 2(d), 3, and 4 of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987. A copy of this memo was included in KBN's request as attachment.

If you have any questions regarding this letter, please contact Mr. Mirza P. Baig of my staff at 404/347-5014.

Sincerely yours,

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

cc: Kennard F. Kosky
KBN Engineering

SPECIFIC CONDITIONS:

18. Sulfur and nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be determined as specified in 40 CFR 60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Southwest District office. Any custom schedule approved by DER pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance. The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

Rule Requirements

19. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-210, 212, 275, 296, 297 and 17-4, Florida Administrative Code and 40 CFR 60 (July, 1992 version).

20. The sources shall comply with all requirements of 40 CFR 60, Subpart GG and Subpart Dc, and F.A.C. Rule 17-296.800,(2)(a), Standards of Performance for Stationary Gas Turbines and Standards of Performance for Industrial, Commercial, and Institutional Steam Generating Units.

21. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-210.300(1)).

22. This source shall be in compliance with all applicable provisions of F.A.C. Rules 17-210.650: Circumvention; 17-210.700: Excess Emissions; 17-296.800: Standards of Performance for New Stationary Sources (NSPS); 17-297: Stationary Sources-Emissions Monitoring; and, 17-4.130: Plant Operation-Problems.

23. If construction does not commence within 18 months of issuance of this permit, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which contruction has not commenced (40 CFR 52.21(r)(2)).

24. Quarterly excess emission reports, in accordance with the July 1, 1992 version of 40 CFR 60.7 and 60.334 shall be submitted to the Department's Southwest District office.

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

July 22, 1994

Mr. Bill Thomas
Administrator - Air Program
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: Custom Fuel Schedule For Sulfur and Nitrogen Content and Lower Heating Value
Permit Nos. AC53-214903 and PSD-FL-190
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Thomas:

On behalf of Tiger Bay Limited Partnership, we request that your department approve the following custom fuel monitoring schedule for sulfur and nitrogen content and lower heating value for natural gas firing pursuant to 40 CFR 60.334(b). We propose that the natural gas be sampled once during the first 20 days of each quarter for each calendar year (e.g., January, April, July, and October). Enclosed for your review is a copy of FGT's sulfur content for natural gas and a copy of Specific Condition 18.

Thank you for your prompt review of our request, and please provide in writing your decision.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:ko
Enclosure

cc: Chuck Cook
File 1253

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

		Initial / Date
1. TO: (NAME, OFFICE, LOCATION) PATTY ADAMS	AIR REGULATIONS TALLAHASSEE	Initial / Date
2.	RECEIVED	Initial / Date
3.	AUG 5 19	Initial / Date
4.	Bureau of Air Regulation	Initial / Date

REMARKS:

The attached request was submitted to SWD. After talking with Teresa Heron I believe that it should have been submitted to Air Regulations.

INFORMATION

- Review & Return
- Review & File
- Initial & Forward

DISPOSITION

- Review & Respond
- Prepare Response
- For My Signature
- For Your Signature
- Let's Discuss
- Set Up Meeting
- Investigate & Report
- Initial & Forward
- Distribute
- Concurrence
- For Processing
- Initial & Return

FROM: Bill Proses

DATE 8/1/94

PHONE SC 542-6100 EXT 417

01/03/91

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

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

Source: Florida Gas Transmission Company, 1990.

PERMITTEE:
Central Florida Power, L.P.

Permit Number: AC53-214903
PSD-FL-190
Expiration Date: January 1, 1996

SPECIFIC CONDITIONS:

18. Sulfur and nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be determined as specified in 40 CFR 60.334(b). Any request for a future custom monitoring schedule shall be made in writing and directed to the Southwest District office. Any custom schedule approved by DER pursuant to 40 CFR 60.334(b) will be recognized as enforceable provisions of the permit, provided that the holder of this permit demonstrates that the provisions of the schedule will be adequate to assure continuous compliance. The records of distillate fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.05 percent sulfur by weight.

Rule Requirements

19. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-210, 212, 275, 296, 297 and 17-4, Florida Administrative Code and 40 CFR 60 (July, 1992 version).

20. The sources shall comply with all requirements of 40 CFR 60, Subpart GG and Subpart Dc, and F.A.C. Rule 17-296.800,(2)(a), Standards of Performance for Stationary Gas Turbines and Standards of Performance for Industrial, Commercial, and Institutional Steam Generating Units.

21. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (F.A.C. Rule 17-210.300(1)).

22. This source shall be in compliance with all applicable provisions of F.A.C. Rules 17-210.650: Circumvention; 17-210.700: Excess Emissions; 17-296.800: Standards of Performance for New Stationary Sources (NSPS); 17-297: Stationary Sources-Emissions Monitoring; and, 17-4.130: Plant Operation-Problems.

23. If construction does not commence within 18 months of issuance of this permit, then the permittee shall obtain from the Department a review and, if necessary, a modification of the control technology and allowable emissions for the unit(s) on which contruction has not commenced (40 CFR 52.21(r)(2)).

24. Quarterly excess emission reports, in accordance with the July 1, 1992 version of 40 CFR 60.7 and 60.334 shall be submitted to the Department's Southwest District office.

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

July 25, 1994

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RE: Custom Fuel Sampling Schedule
Permit Nos. AC53-214903 and PSD-FL-190
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Facility

Dear Mr. Proses,

On July 25, 1994, we spoke about the NSPS requirement for natural gas sampling. Based on a previous custom fuel monitoring schedule (Polk Power Partners, L.P.), Tiger Bay Limited Partnership requests that the FDEP approve a similar custom fuel schedule that will require the facility to submit representative sulfur analyses each quarter over the first six quarters of gas turbine operation. After this time period, sulfur analyses would be sampled and supplied during the first and third quarters of each year. This should satisfy the EPA and FDEP that the NSPS is being achieved. The sampling and determination of the nitrogen content and daily heating value in natural gas should not be required as referenced in Specific Condition 18.

Should you have any questions, please feel free to contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:kro

cc: Chuck Cook
David Zell
File 1253

Florida Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

April 22, 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Kevin Fullerton
Project Manager, Air Programs
Lake Cogen Limited
Post Office Box 2562
Tampa, Florida 33601

Dear Mr. Fullerton:

RE: Amendment to Construction Permit
AC 35-196459 (PSD-FL-176)
NSPS Custom Fuel Monitoring Schedule
Lake Cogen Limited

The Department has reviewed your March 17, 1994 letter, with supporting data, requesting an NSPS Custom Fuel Monitoring Schedule for sulfur dioxide (SO_2) and nitrogen oxide (NO_x) at the subject facility (refer to Attachment No. 1). The facility is required by the permit to comply with Subpart GG of the New Source Performance Standards (NSPS) 40 CFR 60. NSPS 40 CFR 60.334(b) and 60.334(b)(2) of Subpart GG state that for sources utilizing pipeline quality natural gas a custom fuel monitoring schedule, if supported by data which demonstrates compliance with NSPS emission limits, may be approved by the Administrator of EPA. This authority has been delegated to EPA's regional offices and a copy of the subject request was jointly submitted to EPA Region IV for their determination. The Department received a letter from EPA, by fax on April 15, 1994, stating that a custom fuel monitoring schedule for this facility was acceptable if it complied with specific items of a custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987 (Refer to attachment No. 2). Since monitoring data was provided by the applicant which demonstrated compliance with the requirements of 2.a and 2.b in the EPA guidance memo, 2.a and 2.b were deleted from the custom fuel monitoring schedule. In compliance with the EPA determination, the permit specific conditions will be amended as follows:

A. Specific Condition Number;

20. From

This source shall comply with all requirements of 40 CFR 60, Subparts GG and Dc and F.A.C. Rule 17-296.800(2)(a), Standard of Performance for Stationary Gas Turbines and Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

To

This source shall comply with all requirements of 40 CFR 60, Subparts GG and Dc and F.A.C. Rule 17-296.800(2)(a), Standard of Performance for Stationary Gas Turbines and Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. 40 CFR 60.334(b)(2) requires that a custom fuel monitoring schedule shall be followed for natural gas fired at this facility, as follows:

Custom Fuel Monitoring Schedule for Natural Gas

1. Monitoring of fuel nitrogen content shall not be required since natural gas is the only fuel being fired in the gas turbines.

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are ASTM D1072-80, ASTM D3031-81, ASTM D3246-81, and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. This custom fuel monitoring schedule shall become effective on the date this permit becomes valid. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters. If monitoring data is provided by the applicant which demonstrates consistent compliance with the requirements herein the applicant may begin monitoring as per the requirements of 2(c).

   c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

3. If there is a change in fuel supply, the owner or operator must notify the Department of such change for re-examination of this custom schedule. A substantial change in fuel quality shall be considered as a change in fuel supply. Sulfur monitoring shall

be conducted weekly during the interim period when this custom schedule is being re-examined.

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

B. Attachments to be Incorporated;

- KBN letter received March 21, 1994
- EPA letter received April 15, 1994

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

The Petition shall contain the following information:

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

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this amendment. Persons whose substantial interests will be affected by any decision

of the Department with regard to the request/application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this amendment in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This letter amendment must be attached to Construction Permit No. AC 35-196459 (PSD-FL-176), and shall become part of the permit.

Sincerely,

Howard L. Rhodes

Howard L. Rhodes
Director
Division of Air Resources
Management

HLR/CSL

Attachments

cc: A. Zahm, CD
J. Harper, EPA
J. Bunyak, NPS
K. Kosky, KBN

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this AMENDMENT and all copies were mailed by certified mail before the close of business on 5/2/94 to the listed persons.

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

Barbara L. Boutwell 5/2/94
Clerk Date

KBN

March 17, 1994

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides, and Toxics Management Division
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta GA 30365

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

Re: Lake and Pasco Cogeneration Projects
FDEP File Nos. AC35-196459, PSD-FL-176; AC51-196460, PSD-FL-177
NSPS Custom Fuel Monitoring Schedule

Dear Ms. Harper and Mr. Fancy:

This correspondence is submitted on behalf of Lake Cogen Limited and Pasco Cogen Limited to request approval of a custom fuel monitoring schedule for the determination of sulfur content required under the New Source Performance Standards (NSPS) for Stationary Gas Turbines [40 Code of Federal Regulations (CFR) Part 60, Subpart GG). This request is made necessary by Section 60.334(b) and (b)(2) of Subpart GG, which states:

> *(b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:*
>
> > *(2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.*

It is my understanding that the U.S. Environmental Protection Agency (EPA) has not delegated the authority to implement Section 60.334(4) to the Florida Department of Environmental Protection (FDEP). Therefore, a copy of this request has been transmitted jointly to EPA Region IV and FDEP.

KBN ENGINEERING AND APPLIED SCIENCES, INC.

1034 Northwest 57th Street, Gainesville, Florida 32605
5405 West Cypress Street, Suite 215
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487
6821 Southpoint Drive North,
One Church Street, Suite 801

As indicated by Section 60.344(b)(2), the NSPS imply that daily sampling be performed when there is not an intermediate bulk storage tank, even if the fuel is pipeline natural gas. Discussions with EPA's Office of Air Quality Planning and Standards (OAQPS) confirm this interpretation of the rule and offer the attached memorandum as guidance. Specifically, a custom fuel monitoring schedule must be developed and approved for pipeline natural gas. The schedule should address the sulfur content of the fuel; the nitrogen content in natural gas is not required.

The sulfur content for natural gas submitted in the application was developed from data supplied by the natural gas pipeline company in Florida, i.e., Florida Gas Transmission Company (FGT). The data are summarized in Table 1. The emission limit proposed in the application was based on 1 grain sulfur per 100 cubic feet of gas (1 grain/100 cf) which is equivalent to about 0.003 percent sulfur by weight. This sulfur concentration was based on the highest recorded value over the 8-month study period (see Table 1) with a margin of 25 percent (i.e., 0.8 grains/100 cf times 1.25). The pipeline company (i.e., FGT) regularly samples for total sulfur in the natural gas to assure that the hydrogen sulfide content is low and that the concentrations of mercaptan are sufficient for safety reasons. Mercaptan is added to natural gas to assure that the gas has an odor that can be perceived if mistakenly released; otherwise natural gas would have no odor. Please note that the NSPS require that the sulfur content of the fuel be no more than 0.8 percent by weight; a difference of over two orders of magnitude from the basis of the emission limit. Thus, there is significant margin in complying with the NSPS limit.

The EPA guidance memorandum suggests that sampling be conducted twice monthly over the first six months, quarterly over the next six quarters and then during the first and third quarters of each calendar year. The 8 months of data listed in Table 1 (3 to 4 samples per month) demonstrate that the sulfur content meets the NSPS and is less than the basis of the emission limit for natural gas, i.e., 1 grain per 100 cf. FGT was recently contacted and supplied the following data from random analyses:

Analyses Date	Sulfur Content (grains/100cf)
03/10/92	0.50
06/30/92	0.40
09/29/92	0.26
01/05/93	0.31
03/02/93	0.27
06/01/93	0.16
09/28/93	0.12
12/14/93	0.42
02/09/94	0.04

Clearly, the data over that last several years have demonstrated that the NSPS limit is easily met. Thus, it is requested that EPA approve a custom fuel monitoring schedule that requires the facility to submit representative sulfur analyses supplied by the pipeline company each quarter over the first six quarters of turbine operation with the excess emissions report required under Section 60.7(c) of the CFR. After this

time period, sulfur analyses would be supplied during the first and third quarters of each calendar year. This would provide assurance to EPA and FDEP that the NSPS was being achieved.

Please call if you have any questions.

Sincerely,

Kennard F. Kosky/lcb

Kennard F. Kosky, P.E.
President

KFK/lcb

cc: Kevin Fullerton, Lake Cogen Limited
Bruce Miller, Pasco Cogen Limited
Harry Kerns, FDEP Southwest District
Chuck Collins, FDEP Central District
File (2)

Table 1. Sulfur Content, Heat Content, and SO_2 Emission Factors for Natural Gas

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

Source: Florida Gas Transmission Company, 1990.

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

AUG 14 1992

OFFICE OF AIR AND RADIATION

MEMORANDUM

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

FROM: John B. Rasnic, Chief
Compliance Monitoring Branch

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

Air Programs Branch Chiefs
Regions I-X

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

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

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

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

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

Attachment

cc: John Cranshaw
George Walsh
Robert Ajax
Earl Salo

Enclosure

Conditions for Custom Fuel Sampling Schedule for Stationary Gas Turbines

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

2. Sulfur Monitoring

   a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

   b. Effective the date of this custom schedule, sulfur monitoring shall be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring shall be conducted once per quarter for six quarters.

   c. If after the monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample anaylsis shall be conducted twice per annum. This monitoring shall be conducted during the first and third quarters of each calendar year.

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

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

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

US ENVIRONMENTAL PROTECTION AGENCY
Region IV

TO: Name: CHARLES LOGAN
Company: DEP - Tallahassee
Phone: _____ FAX: 404-622-6979
Date: 4-15-94 Pages (incl. cover) 2

FROM: Air Enforcement Branch Phone: (404) 347-5014
345 Courtland Street, NE
Atlanta, GA 30065 FAX: (404) 347-3059
Sender's Name: MIRZA P. BAIG.
Subject: Mulberry / Lake / Pasco Gas Turbine
COMMENTS: Custom Fuel Monitoring Schedules.

Dear Charles:

I am faxing you the letter that approves custom fuel monitoring for the above referenced gas turbines.

The hard copy should get to you next week.

If you need anything else please let me know.

Thanks,

Mirza

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

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

4APT-AEB

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

Re: Approval of NSPS Custom Fuel Monitoring Schedules for:
Mulberry Cogeneration Project, PSD-FL-187 (AC53-211670);
Lake Cogeneration Project, PSD-FL-176 (AC15-196459); and
Pasco Cogeneration Project, PSD-FL-177 (AC51-196460).

Dear Mr. Fancy:

This is to acknowledge letters from KBN Engineering and Applied Sciences, Inc. (KBN) dated March 7, 1994, and March 17, 1994, requesting approval of customized fuel monitoring schedules for the above referenced projects. These requests were jointly transmitted to the U.S. Environmental Protection Agency (EPA), and to you. Since the authority for implementing §60.334(b) of 40 CFR Part 60, Subpart GG has not been delegated to the State of Florida, we have reviewed KBN's custom fuel monitoring schedules.

Based on our review we have determined that the proposed schedules are acceptable, as long as each source also complies with items 2(d), 3, and 4 of the attachment to the custom fuel monitoring guidance memo issued by EPA Headquarters on August 14, 1987. A copy of this memo was included in KBN's request as attachment.

If you have any questions regarding this letter, please contact Mr. Mirza P. Baig of my staff at 404/347-5014.

Sincerely yours,

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

cc: Kennard F. Kosky
KBN Engineering

File Copy

Florida Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

April 11, 1994

Mr. Robert S. Chatham, P.E.
Destec Energy, Inc.
2500 Citywest Blvd., Suite 150
Houston, Texas 77210-4411

Dear Mr. Chatham:

Re: Tiger Bay Cogeneration Facility
FDEP Permit No. AC53-214903 & PSD-FL-190

This is in response to your March 16, 1994, letter notifying the Department of several design changes to your proposed Tiger Bay Cogeneration Facility. These design changes, as stated in your letter, will neither increase emissions nor result in a different ambient air impact. However, it is required that this and all other substantive changes in the final design and construction be reported in the operation permit application.

Thank you for the opportunity to review and comment on this letter.

Sincerely,

for Johnnie Brown Jr

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

CHF/TH/bjb

cc: Robert Taylor
Harry Kerns - FDEP, Southwest District
Ken Kosky - KBN

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

March 16, 1994

RECEIVED

MAR 18 1994

Bureau of
Air Regulation

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

Re: FDER Permit No. AC53-214903 & PSD-FL-190
Tiger Bay cogeneration facility
Tiger Bay Limited Partnership

Dear Mr. Lewis:

Since the Florida Department of Environmental Regulation (now the Florida Department of Environmental Protection, FDEP) issued the above-referenced permit to construct the Tiger Bay cogeneration facility, Destec on behalf of the Tiger Bay Limited Partnership has been finalizing the design details of the facility. Since our last update, several design changes have been identified which differ from information supplied to the FDEP; the purpose of this letter is to apprise you of these changes in accordance with the requirements of general condition 2 and specific condition 6 of the permit. We do not anticipate these changes, the addition of a waste water tank and two fuel oil tanks (the original application referenced four fuel oil tanks), will have any significant impact to your agency and, in that respect, we are asking for your concurrence.

Thank you in advance for your prompt consideration of this information. Should you need additional information, or have any questions, please feel free to contact me at your convenience at (713) 735-4087. Written confirmation of the conclusion reached in this correspondence is respectfully requested.

Sincerely,

Robert S. Chatham, P.E.

Enclosures
RSC

cc: Harry Kerns - FDEP, Southwest District
Robert Taylor
Ken Kosky - KBN

A:\CONST3.WPR

A. Waste Water Tank

During August 1993, Tiger Bay Limited Partnership (TBLP) notified the Florida Department of Environmental Protection (FDEP), Industrial Waste Water Section, that our steam host had requested that TBLP route any water USAC considers usable to USAC for use rather than unnecessarily sending it to the zero liquid discharge system (ZLD). This option is not intended to void the use of the ZLD.

In conjunction to the routing of waste water to USAC, TBLP proposes to construct and operate an open-top 1,400,000 gallon waste water tank. The tank dimensions are 92 feet diameter and 32 feet tall. This system has been designed to continuously transfer the 120 gpm (normal operation) flow of waste water from this waste water tank to the steam host. The tank is design to hold a minimum of five days (at maximum flow conditions) of waste water. This volume includes appropriate freeboard to account for the 8 inch storm event, therefore, the tank should have no significant impact on storm water flow.

The tank will normally operate near empty, between low level (30") and high level (54"), in order to provide the maximum amount of storage capacity in the event of an interruption of USAC's demand. Protection from an overflow event is provided by automatic closure of a block valve on the influent line, upon a high-high level (30 feet) alarm. A low-low level (18") alarm will shut down the export pumps for protection against operating dry. The current site plan, SK-1253-G-100.14 Rev A, reflects the most recent design information (see Attachment A).

B. Fuel Oil Tanks

The above referenced site plan shows the location of the two fuel oil storage tanks. The capacity of each tank is approximately 150,000 gallons. The original application, permit and SPCC plan referenced four fuel oil tanks. These fuel oil tanks will comply with the applicable sections of the application, permit and Florida Chapter 17-762.

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

March 16, 1994

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

Re: FDER Permit No. AC53-214903 & PSD-FL-190
Tiger Bay cogeneration facility
Tiger Bay Limited Partnership

Dear Mr. Lewis:

Since the Florida Department of Environmental Regulation (now the Florida Department of Environmental Protection, FDEP) issued the above-referenced permit to construct the Tiger Bay cogeneration facility, Destec on behalf of the Tiger Bay Limited Partnership has been finalizing the design details of the facility. Since our last update, several design changes have been identified which differ from information supplied to the FDEP; the purpose of this letter is to apprise you of these changes in accordance with the requirements of general condition 2 and specific condition 6 of the permit. We do not anticipate these changes, the addition of a waste water tank and two fuel oil tanks (the original application referenced four fuel oil tanks), will have any significant impact to your agency and, in that respect, we are asking for your concurrence.

Thank you in advance for your prompt consideration of this information. Should you need additional information, or have any questions, please feel free to contact me at your convenience at (713) 735-4087. Written confirmation of the conclusion reached in this correspondence is respectfully requested.

Sincerely,

Robert S. Chatham, P.E.

Enclosures
RSC

cc: Harry Kerns - FDEP, Southwest District
Robert Taylor
Ken Kosky - KBN

A:\CONST3.WPR

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In conjunction to the routing of waste water to USAC, TBLP proposes to construct and operate an open-top 1,400,000 gallon waste water tank. The tank dimensions are 92 feet diameter and 32 feet tall. This system has been designed to continuously transfer the 120 gpm (normal operation) flow of waste water from this waste water tank to the steam host. The tank is design to hold a minimum of five days (at maximum flow conditions) of waste water. This volume includes appropriate freeboard to account for the 8 inch storm event, therefore, the tank should have no significant impact on storm water flow.

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B. Fuel Oil Tanks

The above referenced site plan shows the location of the two fuel oil storage tanks. The capacity of each tank is approximately 150,000 gallons. The original application, permit and SPCC plan referenced four fuel oil tanks. These fuel oil tanks will comply with the applicable sections of the application, permit and Florida Chapter 17-762.

ATTACHMENT A

Patty, Copy/file

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

September 15, 1993

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

Re: FDER Permit No. AC53-214903, PSD-FL-190, and AC53-230744
Tiger Bay cogeneration facility
Tiger Bay Limited Partnership

Dear Mr. Lewis:

The purpose of this letter is to notify you on behalf of Tiger Bay Limited Partnership that construction of the Tiger Bay cogeneration plant commenced on August 16, 1993.

Should you have any questions, please feel free to contact me at your convenience at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.

Enclosures
RSC/tk

cc: Harry Kerns - FDEP, Southwest District
Robert Taylor
Ken Kosky - KBN

A:\CONST2.WPR

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

July 27, 1994

Mr. Cleveland Holladay
Bureau of Air Regulations
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Stack Diameter Change
Permit Nos. PSD-FL-190 and AC53-214903
Tiger Bay Limited Partnership
Tiger Bay Cogeneration Plant

Dear Mr. Holladay,

Yesterday I spoke with Teresa Heron and mentioned that the as-built diameter for the gas turbine/heat recovery steam generator stack is 19 feet. The permit application stated that the proposed stack diameter would be 18 feet. Ms. Heron suggested that I contact you about this change. It is our opinion that this change is minor and we respectfully request your concurrence.

Should you have questions or comments about this matter, please contact me at (713) 735-4087.

Sincerely,

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:kro

cc: Ms. Teresa Heron - FDEP
File 1253

Hollaway.WPR

August 27, 1993

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

Re: Tiger Bay Limited Partnership (formerly Central Florida Power L.P.)
Tiger Bay Cogeneration Plant
AC 53-214903, PSD-FL-190; AC 53-230744

Dear Mr. Fancy:

Enclosed please find an air quality impact analysis for the proposed cogeneration facility with the combustion turbine operating at 60 percent load. This information is provided for this operating load since the air quality impacts for the combustion turbine were originally modeled at 100 and 70 percent operating loads. Based on current operating plans for the unit, an operating load of 60 percent is anticipated to be the lower range of operation for the turbine. The air quality impact analysis is being submitted to inform the Department of this operational change and meet the requirements of the general conditions of the permit. The proposed operating load does not represent a significant change to the project's ambient air quality impacts nor will it affect the permit conditions.

As you know, the proposed facility consists of one combustion turbine and an associated duct-burner-fired heat recovery steam generator (HRSG). These air emission sources received an air construction permit (AC 53-214903) in May 1993. The facility also includes a natural-gas-fired spray dryer unit and baghouse associated with the wastewater treatment system for which an air construction permit (AC 53-230744) was received in June 1993. As part of the permit applications, the maximum pollutant concentrations were predicted for those emission sources. For this submittal, the air quality impact analysis was based on the methods and assumptions used in the previous analyses, which included the use of the ISC2 model using 5 years of meteorological data. The source and emission data for the combustion turbine operating at 60 percent load and the duct burner at 100 percent load are presented in Attachment 1. Information on the spray dryer is presented in Attachment 2. The stack, operating, and emission data considered in the air quality impact modeling are presented in Table 1. The emission rates of the criteria and regulated pollutants for the combustion turbine operating at 60 percent load are compared to the permitted emissions rates in Tables 2 and 3.

A summary of the maximum concentrations predicted for the facility with the combustion turbine operating at 60 percent load for ambient temperatures of 27 and 97 degrees Fahrenheit is presented in Table 4. These results are compared to the results presented in the original application. The total concentration also includes impacts due to duct firing and the spray dryer. For predicting short-term impacts, the emission rates for the combustion turbine were based on firing distillate fuel oil (emissions from firing natural gas are lower than those for natural gas firing) coupled with the exit velocity from firing natural gas (exit velocity from firing fuel oil was lower). For predicting annual impacts, the

KBN ENGINEERING AND APPLIED SCIENCES, INC.

1034 Northwest 57th Street, Gainesville, Florida 32605, 904-331-9000, FAX 904-332-4189
5680 West Cypress Street, Suite I, Tampa, Florida 33607, 813-287-1717, FAX 813-287-1716
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487, 407-994-9910, FAX 407-994-9393
6821 Southpoint Drive North, Suite 216, Jacksonville, Florida 32216, 904-296-9663 FAX 904-296-0146
One Church Street, Suite 801, Rockville, Maryland 20850, 301-738-1100, FAX 301-738-1105

cumulative emissions rates for distillate oil and natural gas (based on 300 and 8,460 hours, respectively) were used. This approach results in a conservative estimate of ambient impacts. As shown, the maximum concentrations for this analysis are well below the significant impact levels for the applicable pollutants and are generally less than or within 10 percent of the results presented in the original application. It should be noted that the impacts presented in the original application were based on the maximum concentrations predicted for a combustion turbine from two vendors [i.e., General Electric (GE) and Westinghouse] being considered at the time of the permit application. The combustion turbine selected for this project is the GE PG7221(FA) equipped with a dry low NOx combustor.

Because these results are less than the significant impact levels and are not significantly different from the previous results, the proposed operation of the combustion turbine at 60 percent load does not represent a significant change to the project's ambient air quality impacts and will not affect the permit conditions.

If you have any questions regarding this information, please do not hesitate to call. We appreciate your efforts in reviewing these results and written confirmation of the conclusion reached in this correspondence is respectfully requested.

Sincerely,

Kennard F. Kosky, P.E.
President

KFK/lcb

Enclosure

cc: Robert I. Taylor, Tiger Bay L.P.
Robert Chatham, Destec Energy, Inc.
Teresa Heron, FDEP
File (2)

Table 1. Stack, Operating, and Emission Data Considered in the Air Quality Impact Modeling for the Proposed Facility

Parameter	General Electric Turbine - 60% Load				Duct Burner	Spray Dryer/ Evaporator[c]
	Oil		Gas			
	27°F	97°F	27°F	97°F		
Stack Data (ft)						
Height	180	180	180	180	NA	73
Diameter	18	18	18	18	NA	1.3
Operating Data						
Temperature (°F)	190	190	190	190	NA	340
Velocity (ft/sec)	47.7	43.6	46.0[b]	42.6[b]	NA	63.4

Pollutant	Units	General Electric Turbine - 60% Load				Duct Burner	Spray Dryer/ Evaporator
		Oil		Gas			
		27°F	97°F	27°F	97°F		
PM	lb/hr	17.0	17.0	9.0	9.0	1.0	0.021
	TPY[a]	2.6	2.6	38.1	38.1	4.4	0.092[c]
NO_2	TPY[a]	35.3	29.2	493.0	419.4	43.8	1.41[c]
CO	lb/hr	68.2	62.2	34.4	31.2	10.0	0.061

Note: Attachment 1 presents emissions and stack parameter information used to develop this table. Total modeled gas turbine emission rate includes emissions from the duct burner. Higher emission rate of distillate oil used in the modeling to produce maximum short-term impacts. Cumulative emission rates for oil and natural gas (for 300 and 8,460 hours, respectively) for a given temperature were used to produce maximum annual impacts.
NA = Not applicable.

[a] Annual emission rates are based on burning distillate oil and natural gas for 300 and 8,460 hours, respectively, in the gas turbine and natural gas for 8,760 hours in the duct burner.

[b] Lower exit velocity of two fuels used in the modeling to produce maximum short-term impacts for given ambient temperature. Does not include additional exhaust from duct burner.

[c] At design conditions. Assume 8,760 hours of operation for annual emission rates.

Table 2. Maximum Emissions for Criteria Pollutants for the Tiger Bay Cogeneration Facility- GE PG7221(FA), Dry Low NOx II Combustion System, 60 Percent Load, and Duct Burner

Pollutant	Gas Turbine- Distillate Oil			Gas Turbine- Natural Gas			Duct Burner- Natural Gas			Maximum Emissions		
	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a
A			C			C			C			
Particulate:												
lb/hr	17.00	17.00	17.00	9.00	9.00	9.00	1.00	1.00	1.00	18.00	18.00	18.00
TPY	2.55	2.55	2.60	38.07	38.07	39.40	4.38	4.38	4.38	45.00	45.00	46.38
Sulfur Dioxide:												
lb/hr	73.03	60.39	99.70	3.55	3.02	4.86	0.30	0.30	0.30	73.33	60.69	100.00
TPY	10.95	9.06	15.00	15.03	12.77	21.30	1.32	1.32	1.32	27.30	23.15	37.62
Nitrogen Oxides:												
lb/hr	235.22	194.67	326.00	116.55	99.16	161.90	10.00	10.00	10.00	245.22	204.67	336.00
TPY	35.28	29.20	48.90	492.99	419.44	709.10	43.80	43.80	43.80	572.07	492.44	801.80
Carbon Monoxide:												
lb/hr	68.24	62.17	98.40	34.39	31.16	48.80	10.00	10.00	10.00	78.24	72.17	108.40
TPY	10.24	9.32	14.80	145.49	131.82	213.70	43.80	43.80	43.80	199.52	184.94	272.30
VOCs (as methane):												
lb/hr	5.46	2.01	7.50	2.23	2.02	2.80	2.90	2.90	2.90	8.36	4.91	10.40
TPY	0.82	0.30	1.10	9.42	8.54	12.30	12.70	12.70	12.70	22.94	21.54	26.10
Lead:												
lb/hr	1.21E-02	9.97E-03	1.65E-02	NA	NA	NA	NA	NA	NA	1.21E-02	9.97E-03	1.65E-02
TPY	1.81E-03	1.50E-03	2.47E-03	NA	NA	NA	NA	NA	NA	1.81E-03	1.50E-03	2.47E-03

^a Permitted emission rate at 100 percent load.

Table 3. Maximum Emissions of Other Regulated Pollutants for the Tiger Bay Cogeneration Facility
GE PG7221(FA), Dry Low NOx II Combustion System, 60 Percent Load, and Duct Burner

Pollutant		Gas Turbine- Distillate Oil			Gas Turbine- Natural Gas			Duct Burner- Natural Gas			Maximum Emissions		
		27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a
Arsenic	lb/hr	5.69E-03	4.70E-03	7.77E-03	NA	NA	NA	NA	NA	NA	5.69E-03	4.70E-03	7.77E-03
	TPY	8.53E-04	7.06E-04	1.17E-03	NA	NA	NA	NA	NA	NA	8.53E-04	7.06E-04	1.17E-03
Beryllium	lb/hr	3.39E-03	2.80E-03	4.62E-03	NA	NA	NA	NA	NA	NA	3.39E-03	2.80E-03	4.62E-03
	TPY	5.08E-04	4.20E-04	6.94E-04	NA	NA	NA	NA	NA	NA	5.08E-04	4.20E-04	6.94E-04
Mercury	lb/hr	4.06E-03	3.36E-03	5.55E-03	NA	NA	NA	NA	NA	NA	4.06E-03	3.36E-03	5.55E-03
	TPY	6.10E-04	5.04E-04	8.32E-04	NA	NA	NA	NA	NA	NA	6.10E-04	5.04E-04	8.32E-04
Fluoride	lb/hr	4.41E-02	3.64E-02	NA	NA	NA	NA	NA	NA	NA	4.41E-02	3.64E-02	NA
	TPY	6.61E-03	5.47E-03	NA	NA	NA	NA	NA	NA	NA	6.61E-03	5.47E-03	NA
Sulfuric Acid Mist	lb/hr	8.95E+00	7.40E+00	1.22E+00	4.35E-01	3.70E-01	5.95E-01	3.68E-02	3.68E-02	3.70E-02	8.98E+00	7.43E+00	1.22E+00
	TPY	1.34E+00	1.11E+00	1.83E-01	1.84E+00	1.56E+00	2.60E+00	1.61E-01	1.61E-01	1.61E-01	3.34E+00	2.84E+00	2.78E+00

^a Permitted emission rate at 100 percent load.

Table 4. Summary of Screening and Refined Air Modeling Impacts for the CT/DB and Spray Dryer/Evaporator Unit

DTIMP60
08/27/93

Ambient Temperature (°F)	Pollutant	Averaging Period	Highest Concentration ($\mu g/m^3$) 100% Load CT/DB Only^a	100% Load CT/DB + SD/Evap^b	70% Load CT/DB Only^a	70% Load CT/DB + SD/Evap^b	60% Load CT/DB Only^c	60% Load CT/DB + SD/Evap^b	Significant Impact Level ($\mu g/m^3$)
SCREENING IMPACTS									
27	PM	24-Hour	0.63	0.28	1.59	0.86	NM	1.35	5
		Annual	0.015	0.015	0.020	0.021	NM	0.024	1
	NO2	Annual	0.26	0.26	0.29	0.29	NM	0.31	1
	CO	1-Hour	25.8	16.9	34.3	19.3	NM	20.6	2000
		8-Hour	6.38	3.97	19.5	7.94	NM	8.75	500
97	PM	24-Hour	0.88	0.49	1.94	1.31	NM	1.49	5
		Annual	0.017	0.018	0.022	0.023	NM	0.026	1
	NO2	Annual	0.25	0.26	0.26	0.27	NM	0.29	1
	CO	1-Hour	29.8	18.0	33.0	19.3	NM	20.5	2000
		8-Hour	10.5	5.61	19.4	8.22	NM	8.91	500
REFINED IMPACTS									
97	PM	24-Hour	NM	NM	2.12	1.31	NM	1.49	5
		Annual	NM	NM	0.022	0.023	NM	0.026	1
27	NO2	Annual	NM	NM	0.29	0.29	NM	0.31	1
27/97	CO	1-Hour	NM	NM	45.8	20.4	NM	21.6	2000
		8-Hour	NM	NM	20.8	12.2	NM	13.2	500

Note: NM = not modeled.
Refinements presented for highest impacts for either the 100 or 70 percent load case, and the 60 percent load case.

^a As presented in the original PSD permit application. Emissions modeled were based on the highest emission rate from the GE or Westinghouse gas turbines. Stack velocity and temperature based on GE design information. Short-term rates are based on burning distillate oil in the gas turbine and natural gas in the duct burner. Annual emission rates are based on burning distillate oil and natural gas for 300 and 8,460 hours, respectively, in the gas turbine and natural gas for 8,760 hours in the duct burner.

^b Based on GE gas turbine emission rates and the spray dryer/evaporator operating at design conditions for 8,760 hours per year.

^c This scenario not modeled for this load condition.

ATTACHMENT 1

DESIGN INFORMATION AND STACK PARAMETERS FOR THE COMBUSTION TURBINE AT 60 PERCENT OPERATING LOAD AND DUCT BURNER AT 100 PERCENT OPERATING LOAD

Table 1. Design Information and Stack Parameters for the Tiger Bay Cogeneration Facility-GE PG7221(FA), Dry Low NOx II Combustion System, Distillate Oil, 60 Percent Load

Data		Gas Turbine Fuel Oil 27 °F	* Not Available * Gas Turbine Fuel Oil 64 °F	Gas Turbine Fuel Oil 72 °F	* Not Available * Gas Turbine Fuel Oil 79 °F	Gas Turbine Fuel Oil 97 °F
A	B	C	D	E	F	G
General						
Power (kW)		111,400.0		95,700.0		86,500.0
Heat Rate (Btu/kwh)		12,160.0		12,570.0		12,950.0
CT Exhaust Flow						
Mass Flow (lb/hr)		2,602,000		2,450,000		2,372,000
Temperature (oF)		1,194		1,200		1,200
Moisture (% Vol.)		11.84		12.09		12.18
Oxygen (% Vol.)		10.63		11.03		11.30
Molecular Weight		28.24		28.18		28.15
Heat Input (MMBtu/hr)= Power (kW) x Heat Rate (Btu/kwh) + 1,000,000 Btu/MMBtu						
Power (kW)		111,400.0		95,700.0		86,500.0
Heat Rate (Btu/kwh)		12,160.0		12,570.0		12,950.0
Heat Input (MMBtu/hr)		1,354.6		1,202.9		1,120.2
Fuel Oil Consumption (lb/hr)= Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu + Fuel Heat Content, LHV (Btu/lb)						
Heat Input (MMBtu/hr)		1,354.6		1,202.9		1,120.2
Heat Content,LHV (Btu/lb)		18,550		18,550		18,550
Fuel Oil (lb/hr)		73,025.6		64,849.0		60,386.8
Volume Flow (acfm)= [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] + [Molecular weight x 2116.8] + 60 min/hr						
Mass Flow (lb/hr)		2,602,000		2,450,000		2,372,000
Temperature (°F)		1,194		1,200		1,200
Molecular Weight		28.24		28.18		28.15
Volume Flow (acfm)		1,853,998		1,755,772		1,701,700
Volume Flow (scfm)= [(Mass Flow (lb/hr) x 1,545 x (68°F + 460°F)] + [Molecular weight x 2116.8] + 60 min/hr						
Mass Flow (lb/hr)		2,602,000		2,450,000		2,372,000
Temperature (°F)		68		68		68
Molecular Weight		28.24		28.18		28.15
Volume Flow (scfm)		591,845		558,462		541,264
HRSG Stack Data						
Stack Height (ft)		180		180		180
Diameter (ft)		18.0		18.0		18.0
Volume Flow (acfm) from HRSG= [Volume flow (acfm) x (HRSG temp.(°F)+ 460°F)] + [CT temp.(°F)+ 460°F]						
Volume Flow (acfm) from CT		1,853,998		1,755,772		1,701,700
CT Temperature (°F)		1,194		1,200		1,200
HRSG Temperature (°F)		190		190		190
Volume Flow (acfm) from HRSG		728,597		687,501		666,328
Velocity (ft/sec)= Volume flow (acfm) from HRSG + [((diameter)^2+ 4) x 3.14159] + 60 sec/min						
Volume Flow (acfm) from HRSG		728,597		687,501		666,328
Diameter (ft)		18.0		18.0		18.0
Velocity (ft/sec)		47.7		45.0		43.6

Note: Universal gas constant= 1,545 ft-lb(force)/°R; atmospheric pressure= 2,116.8 lb(force)/ft^2

Source: General Electric, 1992.

Table 2. Maximum Emissions for Criteria Pollutants for the Tiger Bay Cogeneration Facility-
GE PG7221(FA), Dry Low NOx II Combustion System, Distillate Oil, 60 Percent Load

Pollutant		Gas Turbine Fuel Oil 27 °F	* Not Available * Gas Turbine Fuel Oil 64 °F	Gas Turbine Fuel Oil 72 °F	* Not Available * Gas Turbine Fuel Oil 79 °F	Gas Turbine Fuel Oil 97 °F
A	B	C	D	E	F	G
Hours of Operation		300		300		300
Particulate (lb/hr)= Emission rate (lb/hr) from manufacturer						
Basis, lb/hr (manufactur.) (1)		17.0		17.0		17.0
lb/hr		17.0		17.0		17.0
TPY		2.6		2.6		2.6
Sulfur Dioxide (lb/hr)= Fuel oil (lb/hr) x sulfur content(fraction) x (lb SO2/lb S) x fraction emitted as SO2						
Fuel Oil (lb/hr)		73,025.6		64,849.0		60,386.8
Sulfur content (%)		0.05		0.05		0.05
lb SO2/lb S (64/32)		2.0		2.0		2.0
SO2 Fraction emitted		1.00		1.00		1.00
lb/hr		73.03		64.85		60.39
TPY		11.0		9.7		9.1
Nitrogen Oxides (lb/hr)= NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr ÷ [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]						
Basis, ppm* (1)		42.0		42.0		42.0
Moisture (%)		11.84		12.09		12.18
Oxygen (%)		10.63		11.03		11.3
Volume Flow (acfm)		1,853,998		1,755,772		1,701,700
Temperature (°F)		1194		1200		1200
lb/hr		235.2		209.1		194.7
TPY		35.3		31.4		29.2
Carbon Monoxide (lb/hr)= CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr ÷ [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]						
Basis, ppm+ (1)		30.0		30.0		30.0
Moisture (%)		11.84		12.09		12.18
Volume Flow (acfm)		1,853,998		1,755,772		1,701,700
Temperature (°F)		1194		1200		1200
lb/hr		68.2		64.2		62.2
TPY		10.2		9.6		9.3
VOCs (lb/hr)= VOC(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr ÷ [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]						
Basis, ppm+ (1)		4.2		4.1		1.7
Moisture (%)		11.84		12.09		12.18
Volume Flow (acfm)		1,853,998		1,755,772		1,701,700
Temperature (°F)		1194		1200		1200
lb/hr		5.46		5.01		2.01
TPY		0.8		0.8		0.3
Lead (lb/hr)= Lead (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (2)		8.9		8.9		8.9
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		1.21E-02		1.07E-02		9.97E-03
TPY		1.81E-03		0.0		0.0

* corrected to 15% O2 dry conditions
+ corrected to dry conditions

Source: (1) General Electric, 1992; (2) EPA, 1990

Table 3. Maximum Emissions of Other Regulated Pollutants for the Tiger Bay Cogeneration Facility
GE PG7221(FA), Dry Low NOx II Combustion System, Distillate Oil, 60 Percent Load

Pollutant	Units	Gas Turbine Fuel Oil 27 °F	* Not Available * Gas Turbine Fuel Oil 64 °F	Gas Turbine Fuel Oil 72 °F	* Not Available * Gas Turbine Fuel Oil 79 °F	Gas Turbine Fuel Oil 97 °F
A	B	C	D	E	F	G
Hours of Operation		300		300		300
Arsenic (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		4.2		4.2		4.2
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		5.69E-03		5.05E-03		4.70E-03
TPY		8.53E-04		7.58E-04		7.06E-04
Beryllium (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		2.5		2.5		2.5
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		3.39E-03		3.01E-03		2.80E-03
TPY		5.08E-04		4.51E-04		4.20E-04
Mercury (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		3		3		3
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		4.06E-03		3.61E-03		3.36E-03
TPY		6.10E-04		5.41E-04		5.04E-04
Fluoride (lb/hr)= Basis (pg/J) x 2.324 x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, pg/J (2)		14		14		14
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		4.41E-02		3.91E-02		3.64E-02
TPY		6.61E-03		5.87E-03		5.47E-03
Sulfuric Acid Mist (lb/hr) = Fraction of SO2 Emission Rate x SO2 Emission Rate x lb H2SO4/lb SO2						
Fraction SO2 (%)		8		8		8
SO2 (lb/hr)		73.0		64.8		60.4
lb H2SO4/lb SO2 (98/64)		1.53		1.53		1.53
lb/hr		8.95E+00		7.94E+00		7.40E+00
TPY		1.34E+00		1.19E+00		1.11E+00

Note: Multiply by 2.324 to convert picogram/Joule (pg/J) to lb/10E+12 Btu.

Sources: (1) EPA, 1990; (2) EPA, 1980

Table 4. Maximum Emissions of Non-Regulated Pollutants for the Tiger Bay Cogeneration Facility-GE PG7221(FA), Dry Low NOx II Combustion System, Distillate Oil, 60 Percent Load

Pollutant	Units	Gas Turbine Fuel Oil 27 °F	* Not Available * Gas Turbine Fuel Oil 64 °F	Gas Turbine Fuel Oil 72 °F	* Not Available * Gas Turbine Fuel Oil 79 °F	Gas Turbine Fuel Oil 97 °F
A	B	C	D	E	F	G
Hours of Operation		300		300		300
Manganese (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		14		14		14
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		1.90E-02		1.68E-02		1.57E-02
TPY		2.84E-03		2.53E-03		2.35E-03
Nickel (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		170		170		170
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		2.30E-01		2.05E-01		1.90E-01
TPY		3.45E-02		3.07E-02		2.86E-02
Cadmium (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		10.5		10.5		10.5
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		1.42E-02		1.26E-02		1.18E-02
TPY		2.13E-03		1.89E-03		1.76E-03
Chromium (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		47.5		47.5		47.5
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		6.43E-02		5.71E-02		5.32E-02
TPY		9.65E-03		8.57E-03		7.98E-03
Copper (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		280		280		280
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		3.79E-01		3.37E-01		3.14E-01
TPY		5.69E-02		5.05E-02		4.70E-02
Vanadium (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		69.5		69.5		69.5
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		9.41E-02		8.36E-02		7.79E-02
TPY		1.41E-02		1.25E-02		1.17E-02
Selenium (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		23.42		23.42		23.42
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		3.17E-02		2.82E-02		2.62E-02
TPY		4.76E-03		4.23E-03		3.94E-03
Polycyclic Organic Matter (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		0.278		0.278		0.278
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		3.77E-04		3.34E-04		3.11E-04
TPY		5.65E-05		5.02E-05		4.67E-05
Formaldehyde (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) + 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		405		405		405
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		5.49E-01		4.87E-01		4.54E-01
TPY		8.23E-02		7.31E-02		6.81E-02

Source: (1) EPA, 1990

Table 5. Maximum Emissions for Additional Non-Regulated Pollutant for the Tiger Bay Cogeneration Facility-GE PG7221(FA), Dry Low NOx II Combustion System, Distillate Oil, 60 Percent Load

Pollutant		Gas Turbine Fuel Oil 27 °F	* Not Available * Gas Turbine Fuel Oil 64 °F	Gas Turbine Fuel Oil 72 °F	* Not Available * Gas Turbine Fuel Oil 79 °F	Gas Turbine Fuel Oil 97 °F
A	B	C	D	E	F	G
Hours of Operation		300		300		300
Antimony (lb/hr)= Basis (pg/J) x 2.324 x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, pg/J (1)		9.4		9.4		9.4
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		2.96E-02		2.63E-02		2.45E-02
TPY		4.44E-03		3.94E-03		3.67E-03
Barium (lb/hr)= Basis (pg/J) x 2.324 x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, pg/J (1)		8.4		8.4		8.4
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		2.64E-02		2.35E-02		2.19E-02
TPY		3.97E-03		3.52E-03		3.28E-03
Cobalt (lb/hr)= Basis (pg/J) x 2.324 x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, pg/J (1)		3.9		3.9		3.9
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		1.23E-02		1.09E-02		1.02E-02
TPY		1.84E-03		1.64E-03		1.52E-03
Zinc (lb/hr)= Basis (pg/J) x 2.324 x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, pg/J (1)		294		294		294
HIR (MMBtu/hr)		1,354.6		1,202.9		1,120.2
lb/hr		9.26E-01		8.22E-01		7.65E-01
TPY		1.39E-01		1.23E-01		1.15E-01
Chlorine (lb/hr)= Basis (ppm) x Fuel oil (lb/hr) ÷ 1,000,000 (adj. for ppm)						
Basis, ppm		0.5		0.5		0.5
Fuel Oil (lb/hr)		73,025.6		64,849.0		60,386.8
lb/hr		3.65E-02		3.24E-02		3.02E-02
TPY		5.48E-03		4.86E-03		4.53E-03

Note: Multiply by 2.324 to convert picogram/Joule (pg/J) to lb/10E+12 Btu.

Source: (1) EPA, 1979

Table 6. Design Information and Stack Parameters for the Tiger Bay Cogeneration Facility-GE PG7221(FA), Dry Low NOx II Combustion System, Natural Gas, 60 Percent Load

Data		Gas Turbine Natural Gas 27 °F	Gas Turbine Natural Gas 64 °F	Gas Turbine Natural Gas 72 °F	Gas Turbine Natural Gas 79 °F	Gas Turbine Natural Gas 97 °F
A	B	C	D	E	F	G
General						
Power (kW)		102,100.0	91,000.0	89,200.0	86,400.0	80,200.0
Heat Rate (Btu/kwh)		11,570.0	11,970.0	12,050.0	12,206.0	12,520.0
CT Exhaust Flow						
Mass Flow (lb/hr)		2,526,000	2,453,000	2,403,000	2,375,000	2,319,000
Temperature (oF)		1,200	1,200	1,200	1,200	1,200
Moisture (% Vol.)		7.71	8.78	9.11	9.56	9.71
Oxygen (% Vol.)		12.55	12.58	12.58	12.55	12.68
Molecular Weight		28.47	28.34	28.30	28.25	28.22
Heat Input (MMBtu/hr)= Power (kW) x Heat Rate (Btu/kwh) ÷ 1,000,000 Btu/MMBtu						
Power (kW)		102,100.0	91,000.0	89,200.0	86,400.0	80,200.0
Heat Rate (Btu/kwh)		11,570.0	11,970.0	12,050.0	12,206.0	12,520.0
Heat Input (MMBtu/hr)		1,181.3	1,089.3	1,074.9	1,054.6	1,004.1
Natural Gas Consumption (lb/hr)= Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu ÷ Fuel Heat Content, LHV (Btu/lb) (cf/hr)= Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu ÷ Fuel Heat Content, LHV (Btu/cf)						
Heat Input (MMBtu/hr)		1,181.3	1,089.3	1,074.9	1,054.6	1,004.1
Heat Content,LHV (Btu/lb)		21,515	21,515	21,515	21,515	21,515
Natural Gas (lb/hr)		54,905.7	50,628.4	49,958.6	49,016.9	46,670.0
Heat Content,LHV (Btu/cf)		950	950	950	950	950
Natural Gas (cf/hr)		1,243,471	1,146,600	1,131,432	1,110,104	1,056,952
Volume Flow (acfm)= [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] ÷ [Molecular weight x 2116.8] ÷ 60 min/hr						
Mass Flow (lb/hr)		2,526,000	2,423,000	2,403,000	2,375,000	2,319,000
Temperature (°F)		1,200	1,200	1,200	1,200	1,200
Molecular Weight		28.47	28.34	28.30	28.25	28.22
Volume Flow (acfm)		1,791,791	1,726,673	1,714,707	1,697,954	1,659,410
Volume Flow (scfm)= [(Mass Flow (lb/hr) x 1,545 x (68°F + 460°F)] ÷ [Molecular weight x 2116.8] ÷ 60 min/hr						
Mass Flow (lb/hr)		2,526,000	2,453,000	2,403,000	2,375,000	2,319,000
Temperature (°F)		68	68	68	68	68
Molecular Weight		28.47	28.34	28.30	28.25	28.22
Volume Flow (scfm)		569,919	556,007	545,401	540,072	527,812
HRSG Stack Data						
Stack Height (ft)		180	180	180	180	180
Diameter (ft)		18.0	18.0	18.0	18.0	18.0
Volume Flow (acfm) from HRSG= [Volume flow (acfm) x (HRSG temp.(°F)+ 460°F)] ÷ [CT temp.(°F)+ 460°F]						
Volume Flow (acfm) from CT		1,791,791	1,726,673	1,714,707	1,697,954	1,659,410
CT Temperature (°F)		1,200	1,200	1,200	1,200	1,200
HRSG Temperature (°F)		190	190	190	190	190
Volume Flow (acfm) from HRSG		701,605	676,107	671,421	664,861	649,769
Velocity (ft/sec)= Volume flow (acfm) from HRSG ÷ [((diameter)²÷ 4) x 3.14159] ÷ 60 sec/min						
Volume Flow (acfm) from HRSG		701,605	676,107	671,421	664,861	649,769
Diameter (ft)		18.0	18.0	18.0	18.0	18.0
Velocity (ft/sec)		46.0	44.3	44.0	43.5	42.6

Note: Universal gas constant= 1,545 ft-lb(force)/°R; atmospheric pressure= 2,116.8 lb(force)/ft²

Source: General Electric, 1992.

Table 7. Maximum Emissions for Criteria Pollutants for the Tiger Bay Cogeneration Facility-GE PG7221(FA), Dry Low NOx II Combustion System, Natural Gas, 60 Percent Load

Pollutant	Gas Turbine Natural Gas 27 °F	Gas Turbine Natural Gas 64 °F	Gas Turbine Natural Gas 72 °F	Gas Turbine Natural Gas 79 °F	Gas Turbine Natural Gas 97 °F
A B	C	D	E	F	G
Hours of Operation	8460	8460	8460	8460	8460
Particulate (lb/hr)= Emission rate (lb/hr) from manufacturer					
Basis, lb/hr (manufactur.) (1)	9.0	9.0	9.0	9.0	9.0
lb/hr	9.0	9.0	9.0	9.0	9.0
TPY	38.07	38.07	38.07	38.07	38.07
Sulfur Dioxide (lb/hr)= Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO2/lb S) + 100					
Natural Gas (cf/hr)	1,243,471	1,146,600	1,131,432	1,110,104	1,056,952
Basis, gr/100 cf	1.0	1.0	1.0	1.0	1.0
lb SO2/lb S (64/32)	2.0	2.0	2.0	2.0	2.0
lb/hr	3.55	3.28	3.23	3.17	3.02
TPY	15.03	13.86	13.67	13.42	12.77
Nitrogen Oxides (lb/hr)= NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr + [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]					
Basis, ppm* (1)	25.0	25.0	25.0	25.0	25.0
Moisture (%)	7.71	8.78	9.11	9.56	9.71
Oxygen (%)	12.55	12.58	12.58	12.55	12.68
Volume Flow (acfm)	1,791,791	1,726,673	1,714,707	1,697,954	1,659,410
Temperature (°F)	1200	1200	1200	1200	1200
lb/hr	116.5	108.1	106.2	104.1	99.2
TPY	492.99	457.19	449.20	440.37	419.44
Carbon Monoxide (lb/hr)= CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr + [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]					
Basis, ppm+ (1)	15.0	15.0	15.0	15.0	15.0
Moisture (%)	7.71	8.78	9.11	9.56	9.71
Volume Flow (acfm)	1,791,791	1,726,673	1,714,707	1,697,954	1,659,410
Temperature (°F)	1200	1200	1200	1200	1200
lb/hr	34.4	32.8	32.4	31.9	31.2
TPY	145.49	138.57	137.12	135.10	131.82
VOCs (lb/hr)= VOC(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr + [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]					
Basis, ppm+ (1)	1.7	1.6	1.6	1.6	1.7
Moisture (%)	7.71	8.78	9.11	9.56	9.71
Volume Flow (acfm)	1,791,791	1,726,673	1,714,707	1,697,954	1,659,410
Temperature (°F)	1200	1200	1200	1200	1200
lb/hr	2.23	2.00	1.98	1.95	2.02
TPY	9.42	8.45	8.36	8.23	8.54
Lead (lb/hr)= Negligible					
Basis, lb/10E+12 Btu	NA	NA	NA	NA	NA
HIR (MMBtu/hr)	NA	NA	NA	NA	NA
lb/hr	NA	NA	NA	NA	NA
TPY	NA	NA	NA	NA	NA

* corrected to 15% O2 dry conditions
\+ corrected to dry conditions

Source: General Electric, 1992.

Table 8. Maximum Emissions of Other Regulated Pollutants for the Tiger Bay Cogeneration Facility
GE PG7221(FA), Dry Low NOx II Combustion System, Natural Gas, 60 Percent Load

Pollutant	Units	Gas Turbine Natural Gas 27 °F	Gas Turbine Natural Gas 64 °F	Gas Turbine Natural Gas 72 °F	Gas Turbine Natural Gas 79 °F	Gas Turbine Natural Gas 97 °F
A	B	C	D	E	F	G
Hours of Operation		8460	8460	8460	8460	8460
Arsenic (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Beryllium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Mercury (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Fluoride (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Sulfuric Acid Mist (lb/hr) = Fraction of SO2 Emission Rate x SO2 Emission Rate x lb H2SO4/lb SO2						
Fraction SO2 (%)		8	8	8	8	8
SO2 (lb/hr)		3.55	3.28	3.23	3.17	3.02
lb H2SO4/lb SO2 (98/64)		1.53	1.53	1.53	1.53	1.53
lb/hr		4.35E-01	4.01E-01	3.96E-01	3.89E-01	3.70E-01
TPY		1.84E+00	1.70E+00	1.68E+00	1.64E+00	1.56E+00

Source: (1) EPA, 1990

Table 9. Maximum Emissions of Non-Regulated Pollutants for the Tiger Bay Cogeneration Facility-GE PG7221(FA), Dry Low NOx II Combustion System, Natural Gas, 60 Percent Load

Pollutant	Units	Gas Turbine Natural Gas 27 °F	Gas Turbine Natural Gas 64 °F	Gas Turbine Natural Gas 72 °F	Gas Turbine Natural Gas 79 °F	Gas Turbine Natural Gas 97 °F
A	B	C	D	E	F	G
Hours of Operation		8460	8460	8460	8460	8460
Manganese (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Nickel (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Cadmium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Chromium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Copper (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Vanadium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Selenium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Polycyclic Organic Matter (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		1.113	1.113	1.113	1.113	1.113
HIR (MMBtu/hr)		1,181.3	1,089.3	1,074.9	1,054.6	1,004.1
lb/hr		1.31E-03	1.21E-03	1.20E-03	1.17E-03	1.12E-03
TPY		5.56E-03	5.13E-03	5.06E-03	4.97E-03	4.73E-03
Formaldehyde (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		88.12	88.12	88.12	88.12	88.12
HIR (MMBtu/hr)		1,181.3	1,089.3	1,074.9	1,054.6	1,004.1
lb/hr		1.04E-01	9.60E-02	9.47E-02	9.29E-02	8.85E-02
TPY		4.40E-01	4.06E-01	4.01E-01	3.93E-01	3.74E-01

Source: (1) EPA, 1990

Table 10. Maximum Emissions for Additional Non-Regulated Pollutant for the Tiger Bay Cogeneration Facility-GE PG7221(FA), Dry Low NOx II Combustion System, Natural Gas, 60 Percent Load

Pollutant		Gas Turbine Natural Gas 27 °F	Gas Turbine Natural Gas 64 °F	Gas Turbine Natural Gas 72 °F	Gas Turbine Natural Gas 79 °F	Gas Turbine Natural Gas 97 °F
A	B	C	D	E	F	G
Hours of Operation		8460		8460		8460
Antimony (lb/hr)= Negligible						
Basis, pg/J		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Barium (lb/hr)= Negligible						
Basis, pg/J		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Cobalt (lb/hr)= Negligible						
Basis, pg/J		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Zinc (lb/hr)= Negligible						
Basis, pg/J		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Chlorine (lb/hr)= Negligible						
Basis, ppm		NA	NA	NA	NA	NA
Natural gas (cf)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA

Table 11. Design Information for the Tiger Bay Cogeneration Facility-
Duct Burner, Supplemental Firing, Natural Gas

Data		Natural Gas 27 °F	Natural Gas 64 °F	Natural Gas 72 °F	Natural Gas 79 °F	Natural Gas 97 °F
A	B	C	D	E	F	G
General						
Power (kW)		NA	NA	NA	NA	NA
Heat Rate (Btu/kwh)		NA	NA	NA	NA	NA
DB Exhaust Flow						
Mass Flow (lb/hr)		5,244	5,244	5,244	5,244	5,244
Temperature (oF)		190	190	190	190	190
Moisture (% Vol.)		NA	NA	NA	NA	NA
Oxygen (% Vol.)		NA	NA	NA	NA	NA
Molecular Weight		28.00	28.00	28.00	28.00	28.00
Heat Input (MMBtu/hr)= As given						
Power (kW)		NA	NA	NA	NA	NA
Heat Rate (Btu/kwh)		NA	NA	NA	NA	NA
Heat Input (MMBtu/hr)		100.0	100.0	100.0	100.0	100.0
Natural Gas Consumption (lb/hr)= Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu ÷ Fuel Heat Content, LHV (Btu/lb)						
(cf/hr)= Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu ÷ Fuel Heat Content, LHV (Btu/cf)						
Heat Input (MMBtu/hr)		100.0	100.0	100.0	100.0	100.0
Heat Content,LHV (Btu/lb)		23,839	23,839	23,839	23,839	23,839
Natural Gas (lb/hr)		4,194.8	4,194.8	4,194.8	4,194.8	4,194.8
Heat Content,LHV (Btu/cf)		950	950	950	950	950
Natural Gas (cf/hr)		105,263	105,263	105,263	105,263	105,263
Volume Flow (acfm)= [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] ÷ [Molecular weight x 2116.8] ÷ 60 min/hr						
Mass Flow (lb/hr)		5,244	5,244	5,244	5,244	5,244
Temperature (°F)		190	190	190	190	190
Molecular Weight		28.00	28.00	28.00	28.00	28.00
Volume Flow (acfm)		1,481	1,481	1,481	1,481	1,481
Volume Flow (scfm)= [(Mass Flow (lb/hr) x 1,545 x (68°F + 460°F)] ÷ [Molecular weight x 2116.8] ÷ 60 min/hr						
Mass Flow (lb/hr)		5,244	5,244	5,244	5,244	5,244
Temperature (°F)		68	68	68	68	68
Molecular Weight		28.00	28.00	28.00	28.00	28.00
Volume Flow (scfm)		1,203	1,203	1,203	1,203	1,203
HRSG Stack Data						
Stack Height (ft)		180	180	180	180	180
Diameter (ft)		18.0	18.0	18.0	18.0	18.0
Volume Flow (acfm) from DB= [Volume flow (acfm) x (HRSG temp.(°F)+ 460°F)] ÷ [CT temp.(°F)+ 460°F]						
Volume Flow (acfm) from DB		1,481	1,481	1,481	1,481	1,481
Assumed DB Exhaust Temp.(°F)		190	190	190	190	190
HRSG Temperature (°F)		190	190	190	190	190
Volume Flow (acfm) from DB		1,481	1,481	1,481	1,481	1,481
Velocity (ft/sec)= Volume flow (acfm) from DB ÷ [((diameter)²+ 4) x 3.14159] ÷ 60 sec/min						
Volume Flow (acfm) from DB		1,481	1,481	1,481	1,481	1,481
Diameter (ft)		18.0	18.0	18.0	18.0	18.0
Velocity (ft/sec)		0.1	0.1	0.1	0.1	0.1

Note: Universal gas constant= 1,545 ft-lb(force)/°R; atmospheric pressure= 2,116.8 lb(force)/ft²

Source: Destec Engineering, Inc., 1992

Table 12. Maximum Emissions for Criteria Pollutants for the Tiger Bay Cogeneration Facility-Duct Burner, Supplemental Firing, Natural Gas

Pollutant	Natural Gas 27 °F	Natural Gas 64 °F	Natural Gas 72 °F	Natural Gas 79 °F	Natural Gas 97 °F
A B	C	D	E	F	G
Hours of Operation	8760	8760	8760	8760	8760
Particulate (lb/hr)= Basis (lb/MMBtu) x HIR (MMBtu/hr)					
Basis, lb/MMBtu	0.01	0.01	0.01	0.01	0.01
HIR, MMBtu/hr	100.0	100.0	100.0	100.0	100.0
lb/hr	1.00	1.00	1.00	1.00	1.00
TPY	4.38	4.38	4.38	4.38	4.38
Sulfur Dioxide (lb/hr)= Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO2/lb S) ÷ 100					
Natural Gas (cf/hr)	105,263	105,263	105,263	105,263	105,263
Basis, gr/100 cf	1.0	1.0	1.0	1.0	1.0
lb SO2/lb S (64/32)	2.0	2.0	2.0	2.0	2.0
lb/hr	0.30	0.30	0.30	0.30	0.30
TPY	1.32	1.32	1.32	1.32	1.32
Nitrogen Oxides (lb/hr)= Basis (lb/MMBtu/hr) x HIR (MMBtu/hr)					
Basis, lb/MMBtu	0.10	0.10	0.10	0.10	0.10
HIR, MMBtu/hr	100.0	100.0	100.0	100.0	100.0
lb/hr	10.00	10.00	10.00	10.00	10.00
TPY	43.80	43.80	43.80	43.80	43.80
Carbon Monoxide (lb/hr)= Basis (lb/MMBtu) x HIR (MMBtu/hr)					
Basis, lb/MMBtu	0.10	0.10	0.10	0.10	0.10
HIR, MMBtu/hr	100.0	100.0	100.0	100.0	100.0
lb/hr	10.00	10.00	10.00	10.00	10.00
TPY	43.80	43.80	43.80	43.80	43.80
VOCs (lb/hr)= Basis (lb/MMBtu) x HIR (MMBtu/hr)					
Basis, lb/MMBtu	0.029	0.029	0.029	0.029	0.029
HIR, MMBtu/hr	100.0	100.0	100.0	100.0	100.0
lb/hr	2.90	2.90	2.90	2.90	2.90
TPY	12.70	12.70	12.70	12.70	12.70
Lead (lb/hr)= Negligible					
Basis, lb/MMBtu	NA	NA	NA	NA	NA
HIR (MMBtu/hr)	NA	NA	NA	NA	NA
lb/hr	NA	NA	NA	NA	NA
TPY	NA	NA	NA	NA	NA

Table 13. Maximum Emissions of Other Regulated Pollutants for the Tiger Bay Cogeneration Facility
Duct Burner, Supplemental Firing, Natural Gas

Pollutant	Units	Natural Gas 27 °F	Natural Gas 64 °F	Natural Gas 72 °F	Natural Gas 79 °F	Natural Gas 97 °F
A	B	C	D	E	F	G
Hours of Operation		8760	8760	8760	8760	8760
Arsenic (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Beryllium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Mercury (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Fluoride (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Sulfuric Acid Mist (lb/hr) = Fraction of SO2 Emission Rate x SO2 Emission Rate x lb H2SO4/lb SO2						
Fraction SO2 (%)		8	8	8	8	8
SO2 (lb/hr)		0.30	0.30	0.30	0.30	0.30
lb H2SO4/lb SO2 (98/64)		1.53	1.53	1.53	1.53	1.53
lb/hr		3.68E-02	3.68E-02	3.68E-02	3.68E-02	3.68E-02
TPY		1.61E-01	1.61E-01	1.61E-01	1.61E-01	1.61E-01

Source: EPA, 1990

Table 14. Maximum Emissions of Non-Regulated Pollutants for the Tiger Bay Cogeneration Facility-Duct Burner, Supplemental Firing, Natural Gas

Pollutant	Units	Natural Gas 27 °F	Natural Gas 64 °F	Natural Gas 72 °F	Natural Gas 79 °F	Natural Gas 97 °F
A	B	C	D	E	F	G
Hours of Operation		8760	8760	8760	8760	8760
Manganese (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Nickel (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Cadmium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Chromium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Copper (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Vanadium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Selenium (lb/hr)= Negligible						
Basis, lb/10E+12 Btu (1)		NA	NA	NA	NA	NA
HIR (MMBtu/hr)		NA	NA	NA	NA	NA
lb/hr		NA	NA	NA	NA	NA
TPY		NA	NA	NA	NA	NA
Polycyclic Organic Matter (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		1.113	1.113	1.113	1.113	1.113
HIR (MMBtu/hr)		100.0	100.0	100.0	100.0	100.0
lb/hr		1.11E-04	1.11E-04	1.11E-04	1.11E-04	1.11E-04
TPY		4.87E-04	4.87E-04	4.87E-04	4.87E-04	4.87E-04
Formaldehyde (lb/hr)= Basis (lb/10E+12 Btu) x Heat Input Rate (MMBtu/hr) ÷ 1,000,000 MMBtu/10E+12 Btu						
Basis, lb/10E+12 Btu (1)		88.12	88.12	88.12	88.12	88.12
HIR (MMBtu/hr)		100.0	100.0	100.0	100.0	100.0
lb/hr		8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03
TPY		3.86E-02	3.86E-02	3.86E-02	3.86E-02	3.86E-02

Source: (1) EPA, 1990

Table 15. Maximum Emissions for Criteria Pollutants for the Tiger Bay Cogeneration Facility- GE PG7221(FA), Dry Low NOx II Combustion System, 60 Percent Load, and Duct Burner

Pollutant	Gas Turbine- Distillate Oil			Gas Turbine- Natural Gas			Duct Burner- Natural Gas			Maximum Emissions		
	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a
A			C			C			C			
Particulate:												
lb/hr	17.00	17.00	17.00	9.00	9.00	9.00	1.00	1.00	1.00	18.00	18.00	18.00
TPY	2.55	2.55	2.60	38.07	38.07	39.40	4.38	4.38	4.38	45.00	45.00	46.38
Sulfur Dioxide:												
lb/hr	73.03	60.39	99.70	3.55	3.02	4.86	0.30	0.30	0.30	73.33	60.69	100.00
TPY	10.95	9.06	15.00	15.03	12.77	21.30	1.32	1.32	1.32	27.30	23.15	37.62
Nitrogen Oxides:												
lb/hr	235.22	194.67	326.00	116.55	99.16	161.90	10.00	10.00	10.00	245.22	204.67	336.00
TPY	35.28	29.20	48.90	492.99	419.44	709.10	43.80	43.80	43.80	572.07	492.44	801.80
Carbon Monoxide:												
lb/hr	68.24	62.17	98.40	34.39	31.16	48.80	10.00	10.00	10.00	78.24	72.17	108.40
TPY	10.24	9.32	14.80	145.49	131.82	213.70	43.80	43.80	43.80	199.52	184.94	272.30
VOCs (as methane):												
lb/hr	5.46	2.01	7.50	2.23	2.02	2.80	2.90	2.90	2.90	8.36	4.91	10.40
TPY	0.82	0.30	1.10	9.42	8.54	12.30	12.70	12.70	12.70	22.94	21.54	26.10
Lead:												
lb/hr	1.21E-02	9.97E-03	1.65E-02	NA	NA	NA	NA	NA	NA	1.21E-02	9.97E-03	1.65E-02
TPY	1.81E-03	1.50E-03	2.47E-03	NA	NA	NA	NA	NA	NA	1.81E-03	1.50E-03	2.47E-03

^a Permitted emission rate at 100 percent load.

Table 16. Maximum Emissions of Other Regulated Pollutants for the Tiger Bay Cogeneration Facility
GE PG7221(FA), Dry Low NOx II Combustion System, 60 Percent Load, and Duct Burner

Pollutant		Gas Turbine- Distillate Oil			Gas Turbine- Natural Gas			Duct Burner- Natural Gas			Maximum Emissions		
		27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a
Arsenic	lb/hr	5.69E-03	4.70E-03	7.77E-03	NA	NA	NA	NA	NA	NA	5.69E-03	4.70E-03	7.77E-03
	TPY	8.53E-04	7.06E-04	1.17E-03	NA	NA	NA	NA	NA	NA	8.53E-04	7.06E-04	1.17E-03
Beryllium	lb/hr	3.39E-03	2.80E-03	4.62E-03	NA	NA	NA	NA	NA	NA	3.39E-03	2.80E-03	4.62E-03
	TPY	5.08E-04	4.20E-04	6.94E-04	NA	NA	NA	NA	NA	NA	5.08E-04	4.20E-04	6.94E-04
Mercury	lb/hr	4.06E-03	3.36E-03	5.55E-03	NA	NA	NA	NA	NA	NA	4.06E-03	3.36E-03	5.55E-03
	TPY	6.10E-04	5.04E-04	8.32E-04	NA	NA	NA	NA	NA	NA	6.10E-04	5.04E-04	8.32E-04
Fluoride	lb/hr	4.41E-02	3.64E-02	NA	NA	NA	NA	NA	NA	NA	4.41E-02	3.64E-02	NA
	TPY	6.61E-03	5.47E-03	NA	NA	NA	NA	NA	NA	NA	6.61E-03	5.47E-03	NA
Sulfuric Acid Mist	lb/hr	8.95E+00	7.40E+00	1.22E+00	4.35E-01	3.70E-01	5.95E-01	3.68E-02	3.68E-02	3.70E-02	8.98E+00	7.43E+00	1.22E+00
	TPY	1.34E+00	1.11E+00	1.83E-01	1.84E+00	1.56E+00	2.60E+00	1.61E-01	1.61E-01	1.61E-01	3.34E+00	2.84E+00	2.78E+00

^a Permitted emission rate at 100 percent load.

Table 17. Maximum Emissions of Non-Regulated Pollutants for the Tiger Bay Cogeneration Facility- GE PG7221(FA), Dry Low NOx II Combustion System, 60 Percent Load, and Duct Burner

Pollutant		Gas Turbine- Distillate Oil			Gas Turbine- Natural Gas			Duct Burner- Natural Gas			Maximum Emissions		
		27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a
Manganese	lb/hr	1.90E-02	1.57E-02	NA	NA	NA	NA	NA	NA	NA	1.90E-02	1.57E-02	NA
	TPY	2.84E-03	2.35E-03	NA	NA	NA	NA	NA	NA	NA	2.84E-03	2.35E-03	NA
Nickel	lb/hr	2.30E-01	1.90E-01	NA	NA	NA	NA	NA	NA	NA	2.30E-01	1.90E-01	NA
	TPY	3.45E-02	2.86E-02	NA	NA	NA	NA	NA	NA	NA	3.45E-02	2.86E-02	NA
Cadmium	lb/hr	1.42E-02	1.18E-02	NA	NA	NA	NA	NA	NA	NA	1.42E-02	1.18E-02	NA
	TPY	2.13E-03	1.76E-03	NA	NA	NA	NA	NA	NA	NA	2.13E-03	1.76E-03	NA
Chromium	lb/hr	6.43E-02	5.32E-02	NA	NA	NA	NA	NA	NA	NA	6.43E-02	5.32E-02	NA
	TPY	9.65E-03	7.98E-03	NA	NA	NA	NA	NA	NA	NA	9.65E-03	7.98E-03	NA
Copper	lb/hr	3.79E-01	3.14E-01	NA	NA	NA	NA	NA	NA	NA	3.79E-01	3.14E-01	NA
	TPY	5.69E-02	4.70E-02	NA	NA	NA	NA	NA	NA	NA	5.69E-02	4.70E-02	NA
Vanadium	lb/hr	9.41E-02	7.79E-02	NA	NA	NA	NA	NA	NA	NA	9.41E-02	7.79E-02	NA
	TPY	1.41E-02	1.17E-02	NA	NA	NA	NA	NA	NA	NA	1.41E-02	1.17E-02	NA
Selenium	lb/hr	3.17E-02	2.62E-02	NA	NA	NA	NA	NA	NA	NA	3.17E-02	2.62E-02	NA
	TPY	4.76E-03	3.94E-03	NA	NA	NA	NA	NA	NA	NA	4.76E-03	3.94E-03	NA
Polycyclic Organic Matter	lb/hr	3.77E-04	3.11E-04	NA	1.31E-03	1.12E-03	NA	1.11E-04	1.11E-04	NA	1.43E-03	1.12E-03	NA
	TPY	5.65E-05	4.67E-05	NA	5.56E-03	4.73E-03	NA	4.87E-04	4.87E-04	NA	6.11E-03	4.77E-03	NA
Formaldehyde	lb/hr	5.49E-01	4.54E-01	NA	1.04E-01	8.85E-02	NA	8.81E-03	8.81E-03	NA	5.57E-01	4.54E-01	NA
	TPY	8.23E-02	6.81E-02	NA	4.40E-01	3.74E-01	NA	3.86E-02	3.86E-02	NA	5.61E-01	4.42E-01	NA

^a Permitted emission rate not applicable for this pollutant.

Table 18. Maximum Emissions for Additional Non-Regulated Pollutant for the Tiger Bay Cogeneration Facility- GE PG7221(FA), Dry Low NOx II Combustion System, 60 Percent Load, and Duct Burner

Pollutant		Gas Turbine- Distillate Oil			Gas Turbine- Natural Gas			Duct Burner- Natural Gas			Maximum Emissions		
		27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a	27 °F	97 °F	Permitted^a
Antimony													
	lb/hr	2.96E-02	2.45E-02	NA	NA	NA	NA	NA	NA	NA	2.96E-02	2.45E-02	NA
	TPY	4.44E-03	3.67E-03	NA	NA	NA	NA	NA	NA	NA	4.44E-03	3.67E-03	NA
Barium													
	lb/hr	2.64E-02	2.19E-02	NA	NA	NA	NA	NA	NA	NA	2.64E-02	2.19E-02	NA
	TPY	3.97E-03	3.28E-03	NA	NA	NA	NA	NA	NA	NA	3.97E-03	3.28E-03	NA
Cobalt													
	lb/hr	1.23E-02	1.02E-02	NA	NA	NA	NA	NA	NA	NA	1.23E-02	1.02E-02	NA
	TPY	1.84E-03	1.52E-03	NA	NA	NA	NA	NA	NA	NA	1.84E-03	1.52E-03	NA
Zinc													
	lb/hr	9.26E-01	7.65E-01	NA	NA	NA	NA	NA	NA	NA	9.26E-01	7.65E-01	NA
	TPY	1.39E-01	1.15E-01	NA	NA	NA	NA	NA	NA	NA	1.39E-01	1.15E-01	NA
Chlorine													
	lb/hr	3.65E-02	3.02E-02	NA	NA	NA	NA	NA	NA	NA	3.65E-02	3.02E-02	NA
	TPY	5.48E-03	4.53E-03	NA	NA	NA	NA	NA	NA	NA	5.48E-03	4.53E-03	NA

^a Permitted emission rate not applicable for this pollutant.

ATTACHMENT 2

EMISSION RATE BASES AND ESTIMATES FOR THE STRAY DRYER AND EVAPORATOR UNITS

Table 1. Design Information and Stack Parameters for Tiger Bay Cogeneration Facility- Zero Liquid Discharge System- Spray Dryer/ Evaporator

Data	Average Operating Conditions	Design Operating Conditions
General		
Heat Input Rate (MMBtu/hr)	1.35	3.066
Hours of Operation	8560	200
Exhaust Flow Conditions		
Flow rate (acfm)	2,120	5,050
Temperature (°F)	340	340
Moisture Content (% Vol.)	20.00	20.00
Natural Gas Consumption (cf/hr)= Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu ÷ Fuel Heat Content, HHV (Btu/cf)		
Heat Content, HHV (Btu/cf)	1,022	1,022
Natural Gas Consumption (cf/hr)	1,321	3,000
Natural Gas Consumption (MMcf/hr)	0.001321	0.003000
Volume Flow (dscfm)= Volume flow (acfm) x [(68°F + 460°F)÷(Exhaust Temperature(°F) + 460°F)] x [(100-(Moisture Content(%)) ÷ 100]		
Volume Flow (acfm)	2,120	5,050
Exhaust Temperature (°F)	340	340
Moisture Content (%)	20.00	20.00
Volume Flow (dscfm)	1,119	2,666
Stack Data		
Stack Height (ft)	73	73
Diameter (ft)	1.3	1.3
Operating Data		
Velocity (ft/sec)= Volume flow (acfm) ÷ [((diameter)²÷ 4) x 3.14159] ÷ 60 sec/min		
Volume Flow (acfm)	2,120	5,050
Diameter (ft)	1.3	1.3
Velocity (ft/sec)	26.6	63.4

Table 2. Maximum Emissions of Criteria Pollutants for the Tiger Bay Cogeneration Facility- Zero Liquid Discharge System- Spray Dryer/ Evaporator

Pollutant	Average Operating Conditions	Design Operating Conditions	Total Emissions (Maximum)
Hours of Operation	8560	200	
Particulate (lb/hr)= Emission rate (lb/hr) from manufacturer			
Basis, lb/hr (vendor guarantee)	0.009	0.021	
lb/hr	0.009	0.021	0.021
TPY	0.039	0.0021	0.041
Sulfur Dioxide (lb/hr)= Sulfur Content (gr/100 cf) x Fuel Consumption (cf/hr) x 1 lb/7000 gr x (lb SO2/lb S) ÷ 100			
Sulfur content basis, gr/100 cf	1.0	1.0	
Fuel Consumption (cf/hr)	1,321	3,000	
lb SO2/lb S (64/32)	2.0	2.0	
lb/hr	0.0038	0.0086	0.0086
TPY	0.016	0.001	0.017
Nitrogen Oxides (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.105	0.105	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.142	0.322	0.322
TPY	0.607	0.032	0.639
Carbon Monoxide (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.020	0.020	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.027	0.061	0.061
TPY	0.116	0.006	0.122
Volatile Organic Compounds (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.006	0.006	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.008	0.018	0.018
TPY	0.035	0.002	0.037

Patty

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

August 9, 1993

RECEIVED
AUG 11 1993
Division of Air
Resources Management

Mr. G. Preston Lewis, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Tiger Bay Limited Partnership (formerly Central Florida Power Limited Partnership) Tiger Bay cogeneration plant
PSD-FL-190
AC 53-214903

Dear Mr. Lewis:

Please be advised that the ownership name for the Tiger Bay cogeneration facility has been changed from Central Florida Power Limited Partnership to Tiger Bay Limited Partnership. The name change has been made to distinguish the project for marketing purposes and has no effect on the ownership structure.

Should you or your department have questions or comments about this letter please contact me at (713) 735-4087.

Sincerely,

for RSC

Robert S. Chatham, P.E.
Senior Environmental Engineer

RSC:tk

cc: Mr. B. Thomas - SW District
J. Heron
J. Harper, EPA
J. Bunyak, NPS
L. Novak, Polk Co.

P:\PROJECTS\ENVIRON\1253\PLEWIS2.WPR

DESTEC ENERGY

DESTEC ENERGY, INC.
2500 CITYWEST BLVD., SUITE 150
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 735-4000

July 30, 1993

RECEIVED

AUG 03 1993

Division of Air
Resources Management

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

Re: FDER Permit No. AC53-214903 & PSD-FL-190
Tiger Bay cogeneration facility
Central Florida Power, L.P.

Dear Mr. Lewis:

Since the Florida Department of Environmental Regulation (FDER) issued the above-referenced permit to construct the Tiger Bay cogeneration facility, Destec on behalf of the Central Florida Power, L.P. has been finalizing the design details of the facility. During this period, several design changes have been identified which differ from information previously supplied to FDER; the purpose of this letter is to apprise you of these changes in accordance with the requirements of general condition 2 and specific condition 6 of the permit. We do not anticipate this project having any significant impacts to your agency and, in that respect, we are asking for your concurrence. August 9, 1993 is the projected start date for construction activities.

Thank you in advance for your prompt consideration of this information. Should you need additional information, or have any questions, please feel free to contact me at your convenience at (713) 735-4087. Written confirmation of the conclusion reached in this correspondence is respectfully requested.

Sincerely,

Robert S. Chatham, P.E.

Attachments
RSC/tk

cc: Harry Kerns - FDEP, Southwest District
Robert Taylor
Ken Kosky - KBN

A. Need for Additional Temporary Construction Yard

Efforts to schedule construction activities has convinced Destec of the need to develop a temporary laydown area during the approximate 16 month construction period. As shown in Attachment A, the areas proposed to be used are (1) a parcel located immediately south of the cogeneration site boundary which will be used for equipment laydown and (2) a parcel of land located to the east of the cogeneration site which will be used for the construction trailer village and parking.

Laydown Area

Presently, this site is being used as a laydown area by USAC, therefore, Destec anticipates no improvements will be required. Because no earthmoving or grading will be performed in this area, Destec is not proposing to regrade this site to drain into the permitted construction sedimentation pond along the north end of the project site adjacent to County Road 630.

The purpose of this area will be to receive and store in an orderly manner the components and materials needed to construct the facility during the period after they have been shipped by the manufacturer until needed for installation. The materials and equipment to be stored in this area will consist of structural steel, pipe, and equipment such as the transformers, waste water treatment system, and the like.

Trailer Village and Construction Parking

This site has been previously mined and relatively flat. Mobile office trailers and parking will be provided for construction personnel. No earthmoving or grading will be performed in this area. In order to protect against erosion, portions of this site will be graveled and a silt fences will be installed along its perimeter as shown on Attachment A. Upon completion of construction, the gravel will be removed (if requested) and the site will be stabilized.

B. Plot Plan Changes

Attachment B contains the current plot plan and reflects the most recent design information. By incorporating this information you will notice more detail and some minor changes, such as:

1. Elimination of the fuel oil storage tanks.

2. The relocation of the administration and maintenance buildings.

3. The stormwater pond configuration.

4. Other minor equipment changes or moves.

Storm Water Pond

Environmental Consulting & Technology, Inc. (ECT) has investigated the potential for flotation or uplift of the proposed stormwater management pond liner due to buoyant forces. In evaluating the potential for uplift, the minimum groundwater elevation which could be expected to cause uplift was calculated and compared to expected groundwater elevations. ECT has recommended that measures to prevent pond liner uplift should be taken because the occurrence of groundwater levels necessary for pond liner uplift is expected. Based upon this analysis, ECT recommends placement of the liner elevation at 151.00 ft and applying a soil cover measuring 2.75 ft thick. The pond volume and bottom elevation would remain the same. The application of a soil layer is preferable to a drainage layer from both construction cost and environmental performance data.

ATTACHMENTS

1. Cogeneration Facility Plot Plan

2. Site Plan

May 4, 1993

Dr. Richard D. Garrity, Director
Florida Department of Environmental Regulation
Southwest District Office
3804 Coconut Palm Drive
Tampa, FL 33619-8218

Re: Central Florida Power Limited Partnership
Tiger Bay Cogeneration Plant
Wastewater Treatment System for Proposed Cogeneration Facility

Attention: Mr. Bill Thomas

Dear Bill:

Enclosed please find four copies of an air construction permit application for a minor source associated with the wastewater treatment plant for the proposed 206-MW cogeneration facility. The cogeneration facility, which consists of one combustion turbine and an associated duct-burner-fired heat recovery steam generator, has received an air construction permit number and undergone prevention of significant deterioration (PSD) review (AC 53-214903, PSD-FL-190). The wastewater treatment system, which is based on zero liquid discharge, will consist of a single spray dryer unit processing the concentrated waste blowdown from two falling-film evaporator units. A baghouse, with removal efficiency greater than 99.9 percent, will be used to reduce particulate matter emissions. This minor source was not originally designed as part of the cogeneration facility but evolved as a result of the wastewater treatment plant design. The wastewater treatment plant has undergone review by the Florida Department of Environmental Regulation (FDER) which is expected to issue a final permit by next week.

After discussions with FDER staff in the Southwest District and Tallahassee, it appears appropriate that the District process this permit since it is a minor source, PSD applicability for the facility does not change, and the District is issuing the wastewater permit.

This application includes the necessary information to process the permit, including a flow diagram of the zero liquid discharge system (Attachment 1), emission rate bases and estimates for the spray dryer and evaporator units (Attachment 2), an air quality impact assessment (Attachment 3), and letter of authorization (Attachment 4). A check in the amount of $250.00 is enclosed to cover the appropriate permit fees for this source (construction permit for a source having potential emissions of less than 5 tons per year of each pollutant). Disk and paper copies of the air quality modeling results are being sent under separate cover.

I will be contacting you within the next week to review the initial comments your staff may have. We appreciate the assistance of you and your staff in processing this permit for an anticipated construction

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

KBN

date in August 1993. If you have questions or comments that would expedite this effort, please do not hesitate to call me or Robert Chatham, Destec Energy, Inc. [(713) 735-4087].

Sincerely,

Kennard F. Kosky, P.E.
President

Enclosure

KFK/ehj

cc: Robert I. Taylor, Central Florida Power, L.P.
Robert Chatham, Destec Energy, Inc.
Teresa Heron, FDER, Tallahassee
File (2)

12018Y1/F1/1

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: *Cogeneration Plant* [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: *Central Florida Power Limited Partnership* COUNTY: *Polk*

Identify the specific emission point source(s) addressed in this application (i.e., Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) *Wastewater treatment/ Spray dryer unit with baghouse*

SOURCE LOCATION: Street *County Road 630* City *5 miles west of Ft. Meade*

UTM: East *416.28 km Zone 17* North *3069.29 km*

Latitude *27* ° *44* ' *50*"N Longitude *81* ° *50* ' *57* "W

APPLICANT NAME AND TITLE: *Robert I. Taylor, Project Manager*

APPLICANT ADDRESS: *Suite 150, 2500 City West Blvd., Houston, Texas 77042*

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of *Central Florida Power Limited Partnership*

I certify that the statements made in this application for an *air construction* permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: R. I. Taylor

Robert I. Taylor, Project Manager
Name and Title (Please Type)

Date: _____ Telephone No. *(713) 735-4330*

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)
This is to certify that the engineering features of this pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgement, that

[1]See Florida Administration Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed _____

Kennard F. Kosky

Name (Please Type)

KBN Engineering and Applied Sciences, Inc.

Company Name (Please Type)

1034 NW 57th Street, Gainesville, FL 32605

Mailing Address (Please Type)

Florida Registration No. *14996* Date: *5/4/93* Telephone No. *(904) 331-9000*

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

A spray dryer and baghouse associated with wastewater treatment system for operation of cogeneration facility. The system, based on zero liquid discharge, consists of a single natural-gas-fired spray dryer unit processing the concentrated waste blowdown from two falling-film evaporator units. A baghouse with removal efficiency greater than 99.9 percent will be used to reduce particulate matter emissions.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction *8/1/93* Completion of Construction *1/1/95*

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

A baghouse, with removal efficiency greater than 99.9 percent, will be used to reduce particulate matter emissions. The spray dryer and baghouse cost is approximately $600,000.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

No previous DER permits

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;
If power plant, hrs/yr _____; if seasonal, describe: _____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? *No*
   a. If yes, has "offset" been applied? _____
   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____
   c. If yes, list non-attainment pollutants. _____
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. *No*
3. Does the State "Prevention of Significant Deterioration" (PSD) requirement apply to this source? If yes, see Sections VI and VII. *No*[a]
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? *No*
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? *No*

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? *No*
   a. If yes, for what pollutants? _____
   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

[a] *Air quality review analyses attached to determine predicted impacts relative to significance impact levels and air quality standards (see Attachment 3). Although PSD regulations apply to the facility, the emissions associated with the spray dryer do not change the PSD applicability for any pollutant (i.e., no additional pollutants are required to undergo PSD review). The air quality impact analyses were performed to ensure that the impacts due to this minor source added to those from the combustion turbine and duct-burner-fired heat recovery steam generator (AC 53-214903, PSD-FL-190) comply with applicable ambient standards.*

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Wastewater Brine	*Particulate*	*17.75*	*1,029 (average)/ 1,552 (design)*	*See Attachment 1*

B. Process Rate, if applicable: (See Section V, Item 1) *Not applicable*

1. Total Process Input Rate (lbs/hr):___

2. Product Weight (lbs/hr):_____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Particulate Matter	*0.021*	*0.041*	*3.1 lb/hr**	*3.1 lb/hr**	*0.021*	*0.041*	*See*
Carbon Monoxide	*0.061*	*0.12*			*0.061*	*0.12*	*Attach-ment 1*
Nitrogen Dioxide	*0.322*	*0.64*			*0.322*	*0.64*	
Sulfur Dioxide	*0.0086*	*0.017*			*0.0086*	*0.017*	
VOCs	*0.018*	*0.037*			*0.018*	*0.037*	

**Rule 17-296.310(1)(b), General Particulate Emission Limiting Standards; $E = 3.59\ P^{0.62}$, where P is process weight, tons per hour.*

[1]See Section V, Item 2. *Actual emission based on operating at design conditions for 200 hours and at average conditions for 8,560 hours.*

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated with~~out~~ control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
*Baghouse**	*Particulate matter*	*>99.9*	*<10 microns*	*Vendor guarantee*

**See Attachment 2 for typical baghouse description.*

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural gas	*0.001321 MMcf/hr*	*0.003000 MMcf/hr*	*1.35 (avg)/3.066 (design)*

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, others--lbs/hr.

Fuel Analysis:

Percent Sulfur: *1 gr/100 cf* Percent Ash: *Negligible*

Density: *Not applicable* lbs/gal Typical Percent Nitrogen: *Negligible*

Heat Capacity: *1,022 Btu/cf (HHV)* BTU/lb *Not applicable*

BTU/gal

Other Fuel Contaminants (which may cause air pollution): *Negligible*

F. If applicable, indicate the percent of fuel used for space heating. *Not Applicable*

Annual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

Solid waste will be disposed of in an approved manner; has been accepted by the Polk County landfill. No liquid waste will be generated.

H.Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: *73.5* ft. Stack Diameter: *1.3* ft.

Gas Flow Rate: *5,050 (design)* ACFM *2,666 (design)* DSCFM Gas Exit Temperature: *340* °F.

Water Vapor Content: *20* % Velocity: *63.4 (design)* FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr)_____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr._____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control devices: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify)_____

Brief description of operating characteristics of control devices: _____

_____

_____

_____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

_____

_____

_____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
   See Attachment 1.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods, 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
   See Attachment 2.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   Manufacturer's guarantees for PM/PM10, NO_2, CO, and VOC; sulfur content of natural gas for SO_2. See Attachment 2.
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
   Cloth-to-air ratio: 2.0 (average)/4.0 design. See Attachment 2.
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency). *Manufacturer's guarantees form the basis of emission estimates for PM/PM10, NO_2, CO, and VOC; sulfur content of natural gas for SO_2. See Attachment 2.*
6. An 8 ½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. *See Attachment 1.*
7. An 8 ½" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Examples: Copy of relevant portion of USGS topographic map).
   See Attachment 3.
8. An 8 ½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   See Attachment 3.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation. *Applicable fee is attached*

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit. *Not Applicable*

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY *Not Applicable*

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Devices:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

See Attachment 3

A. Company Monitored Data ***Not Applicable***

1. _____ no. sites _____ TSP _____ ( ) SO^{2*} _____ Wind spd/dir

Period of Monitoring ___/___/___ to ___/___/___
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling *See Section 2, Attachment 3*

1. _____ Year(s) of data from _____/_____/_____ to _____/_____/_____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location) _____

4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used *See Section 2, Attachment 3*

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant		Emission Rate	
TSP	*(PM/PM10)*	*0.0026*	grams/sec
SO_2		*0.0011*	grams/sec

E. Emission Data Used in Modeling *See Section 2, Attachment 3*

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review. *See Attachment 3*

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e, jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. *See Section 3, Attachment 3*

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology. *Not Applicable*

ATTACHMENT 1

FLOW DIAGRAM OF THE ZERO LIQUID DISCHARGE SYSTEM

RECEIVED
MAY 21 1993
Division of Air
Resources Management

May 20, 1993

Dr. Richard D. Garrity, Director
Florida Department of Environmental Regulation
Southwest District Office
3804 Coconut Palm Drive
Tampa, FL 33619-8218

Re: Central Florida Power Limited Partnership
Tiger Bay Cogeneration Plant
Wastewater Treatment System for Proposed Cogeneration Facility

Attention: Mr. David Zell

Dear David:

Based on our recent discussions, additional information has been requested to process the air construction permit application for the minor source associated with the wastewater treatment plant for the proposed facility (application submittal date of May 4, 1993). Specifically, information was requested concerning the estimated maximum emissions from the natural-gas-fired spray dryer operating at maximum (design) capacity and a description of gases venting to the atmosphere from the pressure deaerator.

Maximum Emissions

The maximum emissions for the natural-gas-fired spray dryer were based on the expected operation of this system: 8,560 hours at average conditions and 200 hours at design conditions. The maximum emissions for this operation are presented in Table 2 of Attachment 2 in the permit application. If the unit were to operate at design capacity for the entire year, the maximum emissions would be:

1. Particulate matter--0.092 ton per year (TPY);
2. Sulfur dioxide--0.038 TPY;
3. Nitrogen dioxide--1.41 TPY;
4. Carbon monoxide--0.27 TPY; and
5. Volatile organic compounds--0.081 TPY.

A summary of these emissions is presented in the attached Table 2A. These emissions, which represent an increase of less than 1 TPY above those presented in the permit application, would still classify the source as a minor source having potential emissions of less than 5 TPY. It should be noted that, as a very conservative estimate of air quality impacts, the air modeling analysis presented in Attachment 3 of the permit application was based on the unit operating at design conditions for every hour in the year. Based on these results, the maximum impacts were less than significant impact levels and well below applicable ambient air quality standards.

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

Deaerator

The gases venting to the atmosphere from the deaerator consists mainly of carbon dioxide gas, oxygen, and water vapor. These gases are scrubbed out of the wastewater by using excess steam from the evaporator which acts as a stripping agent. These gases are scrubbed in order to reduce or eliminate the formation of calcium carbonate scale which would inhibit the evaporator from operating properly.

Please note that one of the flow streams (No. 11) in the process flow diagram of the zero liquid discharge system, presented in Attachment 1 of the permit application, is shown as exiting the deaerator and entering the falling-film evaporator. Flow stream No. 11, a steam line, should be shown as entering the deaerator.

If you have questions or comments, please call me or Robert Chatham, Destec Energy, Inc. (713 735-4087), at your earliest convenience.

Sincerely,

Robert G. McCann
for

Kennard F. Kosky, P.E.
President

KFK/tyf

Enclosure

cc: Robert I. Taylor, Central Florida Power, L.P.
Robert Chatham, Destec Energy, Inc.
Teresa Heron, FDER, Tallahassee
File (2)

Table 2A. Maximum Emissions of Criteria Pollutants for the Tiger Bay Cogeneration Facility- Zero Liquid Discharge System- Spray Dryer/ Evaporator (Design Conditions)

Pollutant	Average Operating Conditions	Design Operating Conditions	Total Emissions (Design)
Hours of Operation	0	8760	
Particulate (lb/hr)= Emission rate (lb/hr) from manufacturer			
Basis, lb/hr (vendor guarantee)	0.009	0.021	
lb/hr	0.009	0.021	0.021
TPY	0.000	0.092	0.092
Sulfur Dioxide (lb/hr)= Sulfur Content (gr/100 cf) x Fuel Consumption (cf/hr) x 1 lb/7000 gr x (lb SO2/lb S) + 100			
Sulfur content basis, gr/100 cf	1.0	1.0	
Fuel Consumption (cf/hr)	1,321	3,000	
lb SO2/lb S (64/32)	2.0	2.0	
lb/hr	0.0038	0.0086	0.0086
TPY	0.000	0.038	0.038
Nitrogen Oxides (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.105	0.105	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.142	0.322	0.322
TPY	0.000	1.410	1.410
Carbon Monoxide (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.020	0.020	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.027	0.061	0.061
TPY	0.000	0.269	0.269
Volatile Organic Compounds (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.006	0.006	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.008	0.018	0.018
TPY	0.000	0.081	0.081

Addendum to: Central Florida Power Limited Partnership
Air Construction Permit Application- 5/4/93
Spray Dryer Unit with Baghouse
Attachment 2, Emission Rates and Estimates for the Spray Dryer and Evaporator Units

ATTACHMENT 2

EMISSION RATE BASES AND ESTIMATES FOR THE SPRAY DRYER AND EVAPORATOR UNITS

Table 1. Design Information and Stack Parameters for Tiger Bay Cogeneration Facility- Zero Liquid Discharge System- Spray Dryer/ Evaporator

Data	Average Operating Conditions	Design Operating Conditions
General		
Heat Input Rate (MMBtu/hr)	1.35	3.066
Hours of Operation	8560	200
Exhaust Flow Conditions		
Flow rate (acfm)	2,120	5,050
Temperature (°F)	340	340
Moisture Content (% Vol.)	20.00	20.00
Natural Gas Consumption (cf/hr)= Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu ÷ Fuel Heat Content, HHV (Btu/cf)		
Heat Content, HHV (Btu/cf)	1,022	1,022
Natural Gas Consumption (cf/hr)	1,321	3,000
Natural Gas Consumption (MMcf/hr)	0.001321	0.003000
Volume Flow (dscfm)= Volume flow (acfm) x [(68°F + 460°F)÷(Exhaust Temperature(°F) + 460°F)] x [(100-(Moisture Content(%)) ÷ 100]		
Volume Flow (acfm)	2,120	5,050
Exhaust Temperature (°F)	340	340
Moisture Content (%)	20.00	20.00
Volume Flow (dscfm)	1,119	2,666
Stack Data		
Stack Height (ft)	73	73
Diameter (ft)	1.3	1.3
Operating Data		
Velocity (ft/sec)= Volume flow (acfm) ÷ [((diameter)²÷ 4) x 3.14159] ÷ 60 sec/min		
Volume Flow (acfm)	2,120	5,050
Diameter (ft)	1.3	1.3
Velocity (ft/sec)	26.6	63.4

Table 2. Maximum Emissions of Criteria Pollutants for the Tiger Bay Cogeneration Facility- Zero Liquid Discharge System- Spray Dryer/ Evaporator

Pollutant	Average Operating Conditions	Design Operating Conditions	Total Emissions (Maximum)
Hours of Operation	8560	200	
Particulate (lb/hr)= Emission rate (lb/hr) from manufacturer			
Basis, lb/hr (vendor guarantee)	0.009	0.021	
lb/hr	0.009	0.021	0.021
TPY	0.039	0.0021	0.041
Sulfur Dioxide (lb/hr)= Sulfur Content (gr/100 cf) x Fuel Consumption (cf/hr) x 1 lb/7000 gr x (lb SO2/lb S) ÷ 100			
Sulfur content basis, gr/100 cf	1.0	1.0	
Fuel Consumption (cf/hr)	1,321	3,000	
lb SO2/lb S (64/32)	2.0	2.0	
lb/hr	0.0038	0.0086	0.0086
TPY	0.016	0.001	0.017
Nitrogen Oxides (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.105	0.105	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.142	0.322	0.322
TPY	0.607	0.032	0.639
Carbon Monoxide (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.020	0.020	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.027	0.061	0.061
TPY	0.116	0.006	0.122
Volatile Organic Compounds (lb/hr)= Emission Factor (lb/MMBtu) x Heat Input Rate (MMBtu/hr)			
Emission Factor (lb/MMBtu) [vendor guarantee]	0.006	0.006	
Heat Input Rate (MMBtu/hr)	1.35	3.066	
lb/hr	0.008	0.018	0.018
TPY	0.035	0.002	0.037

SPECIFICATION NO. 1253.08-M-023.14
REVISION 0
MARCH 1, 1993

STACK DRYER EMISSIONS DATA SHEETS

Stack Data

Diameter		
Elevation of Stack Exit (referenced from grade)	73'-6"	
	Normal	~~Design~~ MAX.
Stack Exit Temperature, °F		
(1) Stack Gas Flow, ACFM		
(1) Stack Gas Velocity, fps		
(2) PM / PM_{10}, lb/hr	0.009	0.021

Air Heater Emissions Data

Emissions due to Natural Gas Combustion

	Normal	~~Design~~ MAX.
Heated Gas Flow, ACFM		
(3) Heated Gas Velocity, fps		
(3) Heated Gas Temperature, °F		
(2) NO_x, lb/hr	0.142	0.323
(2) CO, lb/hr	0.0284	0.065
(4) PM / PM_{10}, lb/hr	—	—
(4) SO_2, lb/hr	—	—
(2) VOC, lb/hr	0.0075	0.017

(1) AT STACK EXIT.
(2) GUARANTEE REQUIRED AT NORMAL AND MAX. CONDITIONS. "NORMAL" AND "MAX." REFER TO FEED FLOWRATES OF BRINE TO PATE.
(3) AT AIR HEATER EXIT.
(4) EQUAL TO AMOUNT ENTERING WITH FUEL GAS AND AMBIENT AIR.

MSCH\TXERBAY\ZERO\MKEDATA.SHT

PROCESS COMBUSTION CORPORATION

PO Box 12866, Pittsburgh, PA 15241 • Phone 412-655-0955 • Telex 81-2389, Fax 412/655-0961

4/13/93
POR-0493-11-E
Proposal Page 2

3.0 Air Heater Data

Capacity	
Design heat release	3.066 x 10^6 BTU/hr
Heated Air (Process)	
Flow rate (Normal)	11,430 lb/hr (7470 acfm)
Inlet temp	-20 deg F to 100 deg F
Inlet pressure	Ambient
Outlet temp	1100 deg F
Process stream pressure outlet	Neg. 8" to 10" w.c.
Combustion Air	
Flow rate, max	1020 scfm
Inlet temp	-20 deg F to 100 deg F
Available pressure	6" w.c.
Natural gas	
Pressure	5 psig regulated by others
Heat value (HHV)	1022 BTU/scf
Flow rate	3,000 scfh
Temperature	70 deg F
Pilot Gas (Natural Gas)	
Pressure	5 psig
Heat value	1022 BTU/scf
Flow rate	100 scfh

Fuel pressure to be regulated as specified by others unless otherwise quoted.

Guarantees:

NOx emissions based on 3.066 MM BTU/HR air heater burner firing to 1100 deg F:

		Total for 3.066 MM BTU/Hr
Estimated:	0.09 #/MM BTU/Hr	
Guaranteed:	0.105 #/MM BTU/Hr	0.323 #/Hr

PROCESS COMBUSTION CORPORATION
PO Box 12866, Pittsburgh, PA 15241 • Phone 412-655-0855 • Telex 81-2389, Fax 412/655-0861

4/13/93
PDR-0493-11-E
Proposal Page 3

CO emissions:

		Total for 3.066 MM BTU/Hr
Estimated:	0.19 #/MM BTU	
Guaranteed:	0.02 #/MM BTU	0.065

SO_2 emissions are a direct result of the sulfur loading that enters the system. This loading is by others in the form of fuel, and is out of PCC's control. All sulfur (this includes #25) entering the system will result in SO_2 out (with a small percentage of the SO_2 in the form of SO_3).

VOC NOx emissions:

		Total for 3.066 MM BTU/Hr
Estimated:	0.005 #/MM BTU	
Guaranteed:	0.006 #/MM BTU	0.017 #/Hr

4.0 EQUIPMENT

Each heater will include:

4.1 Item No. 1 ... Quantity 1
PCC burner suitable for a maximum heat release of 3.066 MM BTU/hr when burning natural gas complete with spark ignited natural gas pilot. Burner furnished complete with refractory, observation and scanner viewing ports. Burner pressure drop is 8" w.c.

4.2 Item No. 2 ... Quantity 1
PCC spark ignited natural gas pilot (100,000 BTU/hr) for intermittant duty, comprising:

1 - PCC pilot, burner and spark plug
1 - Pressure gauge, Ashcroft 4-1/2" dial
1 - Gas Asco solenoid shutoff valves
1 - Gas trim valve
1 - Gas ratio regulator
1 - Gas isolating cock
1 - Air valve
1 - Ignition transformer

SPECIFICATION NO. 1253.08-M-023.14
REVISION NO. 0
DECEMBER 18, 1992

GAS FUEL SPECIFICATION DATA SHEET

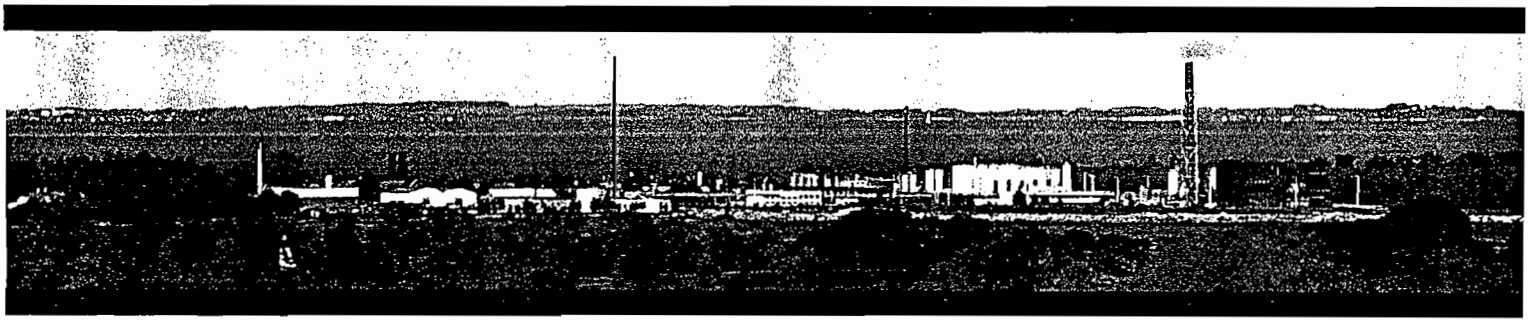
Gaseous Fuel Properties

Type:	Natural Gas
Higher Heating Value, Btu/Std. ft.^{3}	1022
Lower Heating Value, Btu/Std. ft.^{3}	Later
Chemical Analysis, % by Volume	
CH_4	96.637%
C_2H_6	1.993%
C_3H_8	0.175%
C_4H_{10}	0.011%
C_5H_{12}	0.0004%
C_6H_{14}	0.023%
H_2	0
N_2	0.392
O_2	0
CO	0
CO_2	0.751
NH_3	0
Contaminants:	
Total Sulfur	0.33 gr/CCF
H_2S	0.05 gr/CCF
H_2O	1.0 lb/MCF

Continued on next page

NIRO ATOMIZER

Powdered chemicals



by spray drying

Spray drying chemicals

Spray drying is a one-step process converting a liquid feed to powder. Acceptable feeds include slurries, solutions, pastes and suspensions/emulsions which may be aqueous or non-aqueous. The main advantage to chemical producers is the ability to control powder form. Once constant operating conditions have been established, powder qualities are easily and consistently reproduced. The process is designed to produce the desired powder properties including particle size, bulk density, moisture content, flow characteristics, and degree of fines.

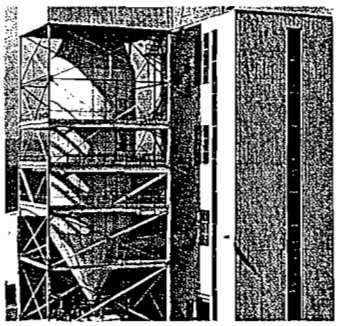
What products can be spray dried?

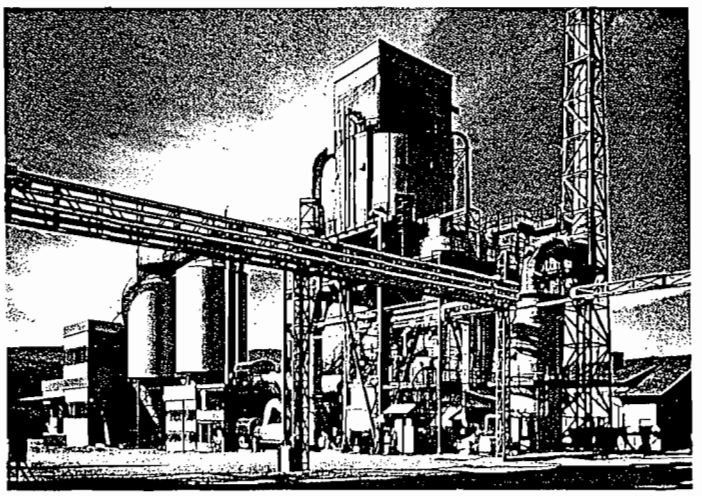
Hundreds of organic and inorganic chemicals ranging from aluminium and amino to zinc compounds are spray dried.

High inlet temperatures are used for drying non-heat sensitive products for maximum dryer capacity and energy utilization. By the nature of the process, spray drying is also suitable for handling heat sensitive products in special layouts at optimum energy economy. The process is recommended for many products which exhibit thermoplastic and hygroscopic tendencies.

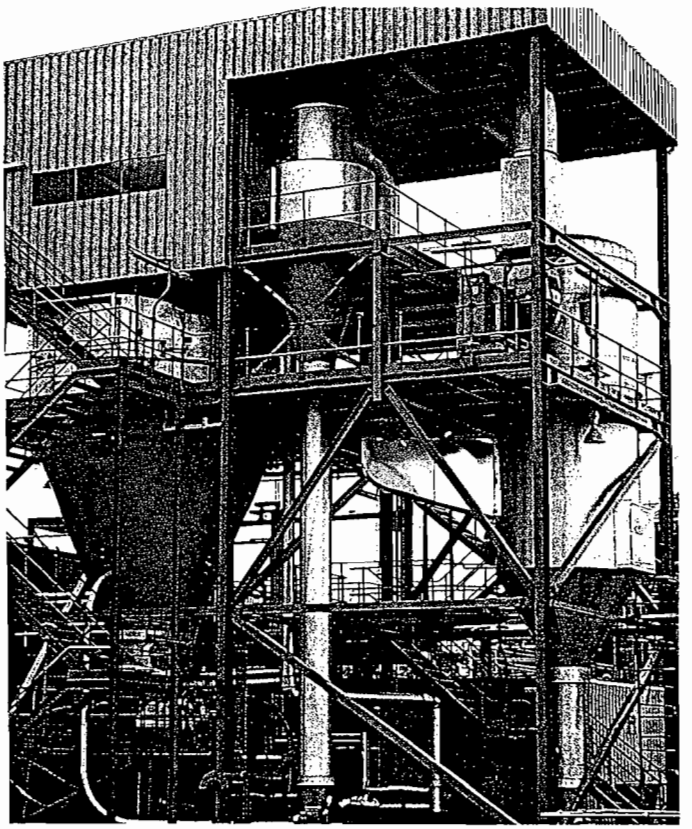
Materials posing explosion hazards can be accommodated by the use of pressure shock resistant drying chambers with explosion venting or suppression systems. Closed cycle and semi-closed cycle spray drying processes are available for materials which require an inert or non-oxidizing atmosphere.

Tall form spray dryer with nozzle atomizer





Spray dryer with rotary atomizer



Fluidized spray dryer

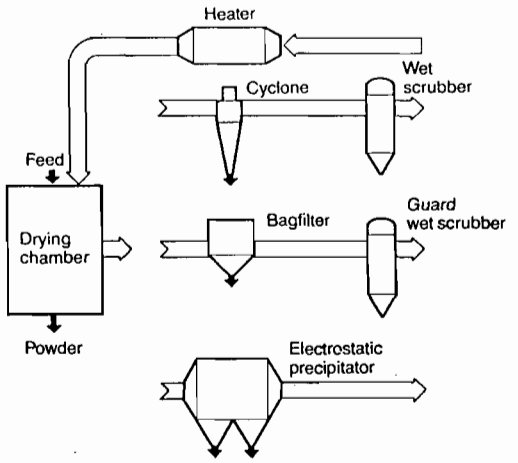
The spray drying process

Pumpable feedstocks are atomized into sprays of droplets using either rotary (wheel) atomizers or nozzles. The sprays are contacted with a heated drying medium (air or inert gas) to promote evaporation of volatiles from each droplet resulting in the formation of a dry particle. The process is completed with the recovery of the airborne particles which are discharged from the spray dryer as a constant flow of powder.

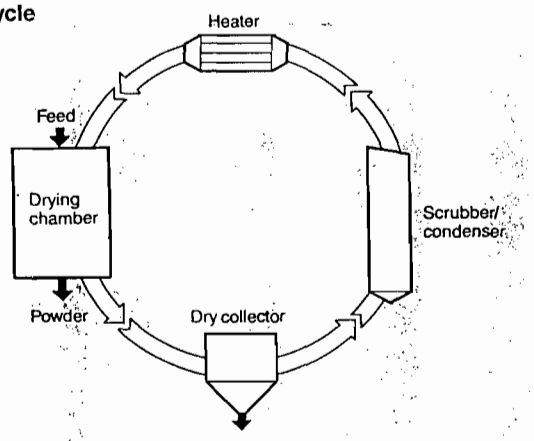
The desired properties of the powder are met through selection of the atomizer, process conditions, and drying chamber design. Rotary (wheel) atomizers produce fine to medium coarse powders, low pressure nozzles produce coarse.

▶

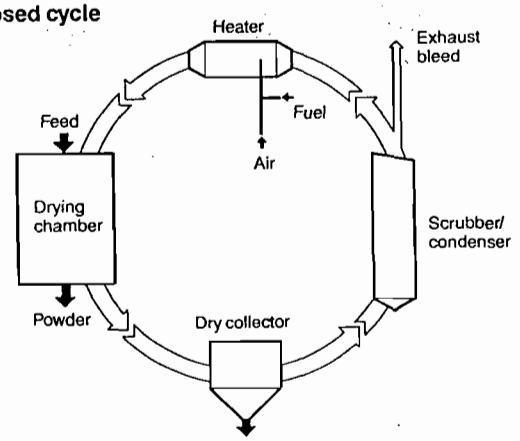
Open cycle



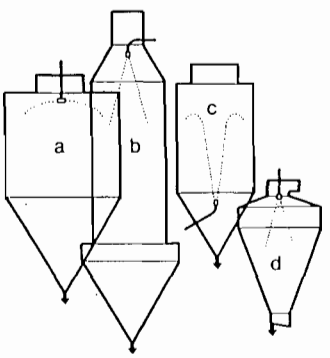
Closed cycle



Semi-closed cycle



Common dryer chamber designs



System selection

The properties of the chemical together with safety and emission requirements decide the choice.

Open cycle

The standard layout where drying air is drawn from atmosphere and, after passing through the drying chamber and air cleaning equipment, discharged to atmosphere. This system is used with aqueous feedstocks. Emission standards require the appropriate choice of air cleaning equipment where cyclone/bag filter/scrubber combinations are selected in accordance with the maximum permitted particulate emission levels. Preventing odour emissions can require special systems, e.g. exhaust air incineration with heat recovery or chemical scrubbing.

Closed cycle

A gas- and dust-tight layout, where inert gas is the drying medium. The system is used for drying feedstocks containing organic solvents. The scrubber/condenser gives complete recovery of evaporated solvent and conditions the recycling drying medium to achieve optimum spray drying chamber performance.

Semi-closed cycle

The recycle self-inertizing layout generates a low oxygen drying atmosphere. It is used when powders resulting from aqueous feeds can form explosive mixtures in air. Direct fired heaters provide the low oxygen condition, and the only bleed from the spray dryer is the volume equivalent to that generated in the heater combustion process. Semi-closed processing is an attractive alternative where odour is created during drying, since the air volume requiring incineration is much reduced.

Four types of Niro Atomizer drying chambers feature prominently in the chemical industry:

a) ***R-series:*** conical based chambers with rotary atomizer for standard powders (50-150 micron)

b) ***TFD-series:*** tall form nozzle towers for coarse, heat sensitive powders

c) ***N-series:*** fountain nozzle chambers for coarse, non-heat sensitive powders

d) ***FSD-series:*** fluidized spray drying chambers with integrated fluid bed for agglomerated, readily dispersable, free-flowing, low dust powders

Areas of Niro Atomizer Technology

Drying

Spray dryers:	powders from fluid feeds
Fluid bed dryers:	powders from semi-wet solids

Concentration

Falling film evaporators:	preparing high solid feeds for spray drying
Rotary thin-film evaporators:	concentrating feeds that tend to foam or crystallize

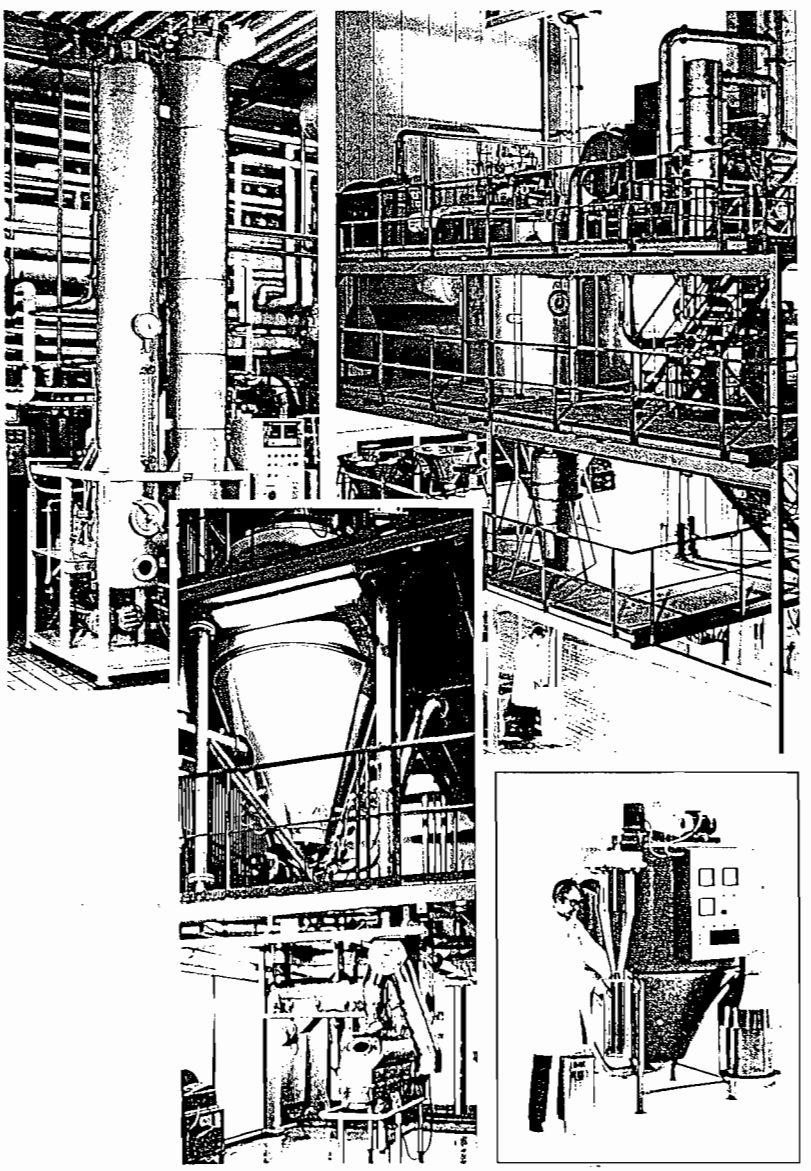
Extraction

Batch or continuous extractors (atmospheric or pressurized):	preparing feeds for spray drying by liquid-solid extraction

Associated Processing

Flash dryers:	for semi-wet dispersable solids – often operating with fluid bed dryers
Swirl fluidizers:	powders from selected wet cakes
Spray fluidizers:	granulated powders from fluid feeds
Fluid bed coolers:	cooling powders from spray and fluid bed dryers
Spray dryer absorbers *:	dry scrubbing of toxic gases

* supplied on licence basis



The Company

Niro Atomizer is an international engineering company, based in Copenhagen, Denmark. The company has installed over 3500 industrial spray dryers worldwide in addition to another 2000 plants for laboratory and pilot scale production.

The extent of delivery ranges from individual spray dryer supply to fully engineered process lines that include spray drying and other areas of Niro Atomizer technology.

The Niro Atomizer service includes front end engineering, process design, mechanical design, in-house fabrication, erection, commissioning, and a comprehensive after-sales service. Plant performance is guaranteed based upon the experience and know-how gained from the range of operating industrial plants together with the back-up from test stations located worldwide and extensive R & D facilities in Copenhagen.

Many of the world's leading manufacturing companies produce powders on Niro Atomizer plants – products such as catalysts, ceramics, coffee/tea (instant), dairy products, detergents, dyestuffs, food products, inorganic chemicals, minerals, organic chemicals, pesticides, pharmaceuticals, pigments, polymers, tannins.

Product development and process evaluation

One of Niro Atomizer's many services to industry is the test station facilities available in Denmark, Brazil, Mexico, Japan, and the USA.

These facilities represent the most comprehensive offered by any company in the spray drying business. Here feasibility of spray drying can be established and testwork carried out to optimize processing conditions and even provide powder for marketing analyses.

The main test station in Copenhagen features conventional, tall form, and integrated fluid bed spray dryers with possibilities to operate in open, semi-closed, and closed cycle.

NIRO

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Columbia, MD 21045-1991
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NIRO ATOMIZER FOOD & DAIRY INC.
1600 County Road "E"
Hudson, WI 54016
Tel: 715/386 9371
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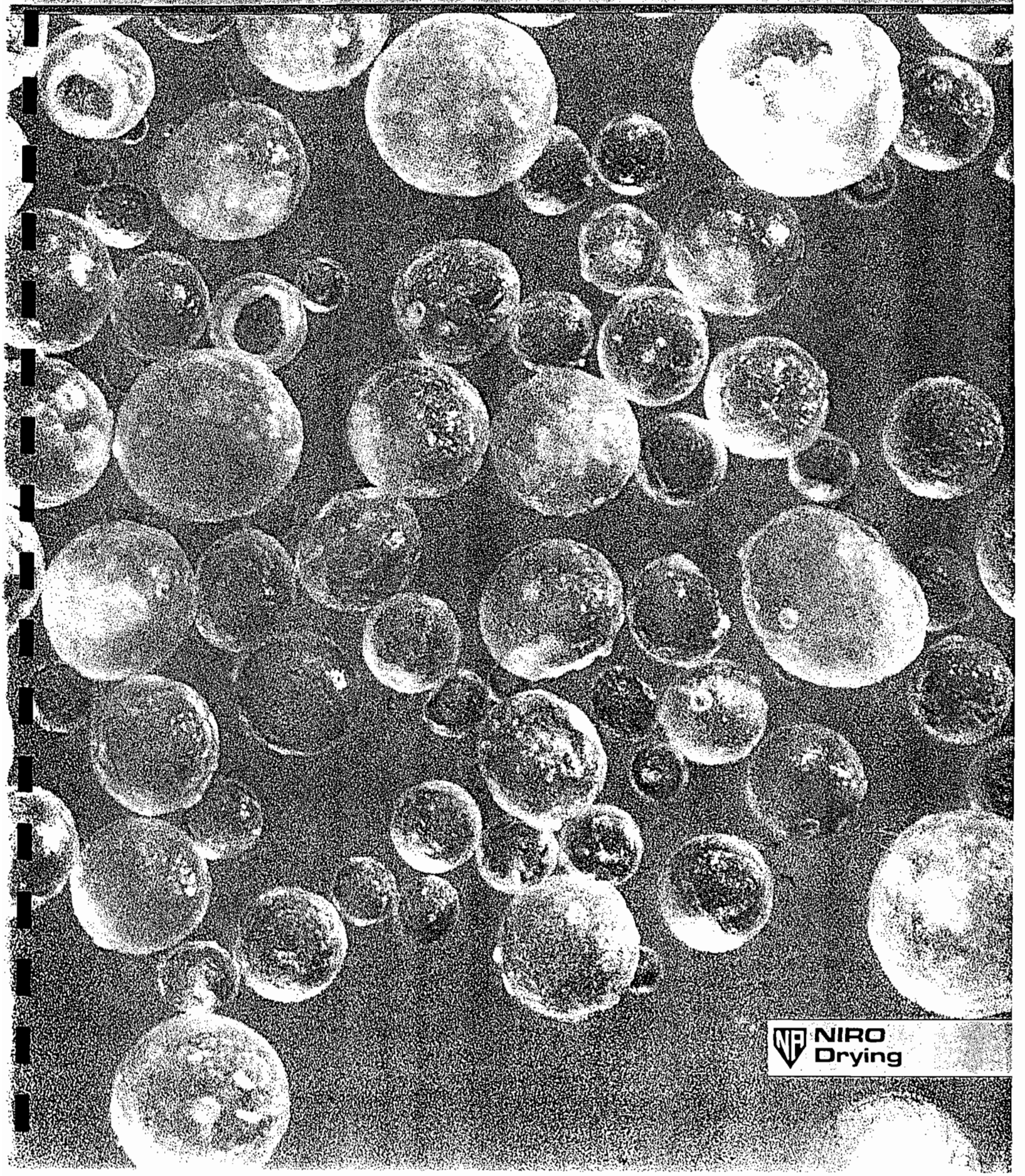
Telex: 910 575 8060

Spray Drying



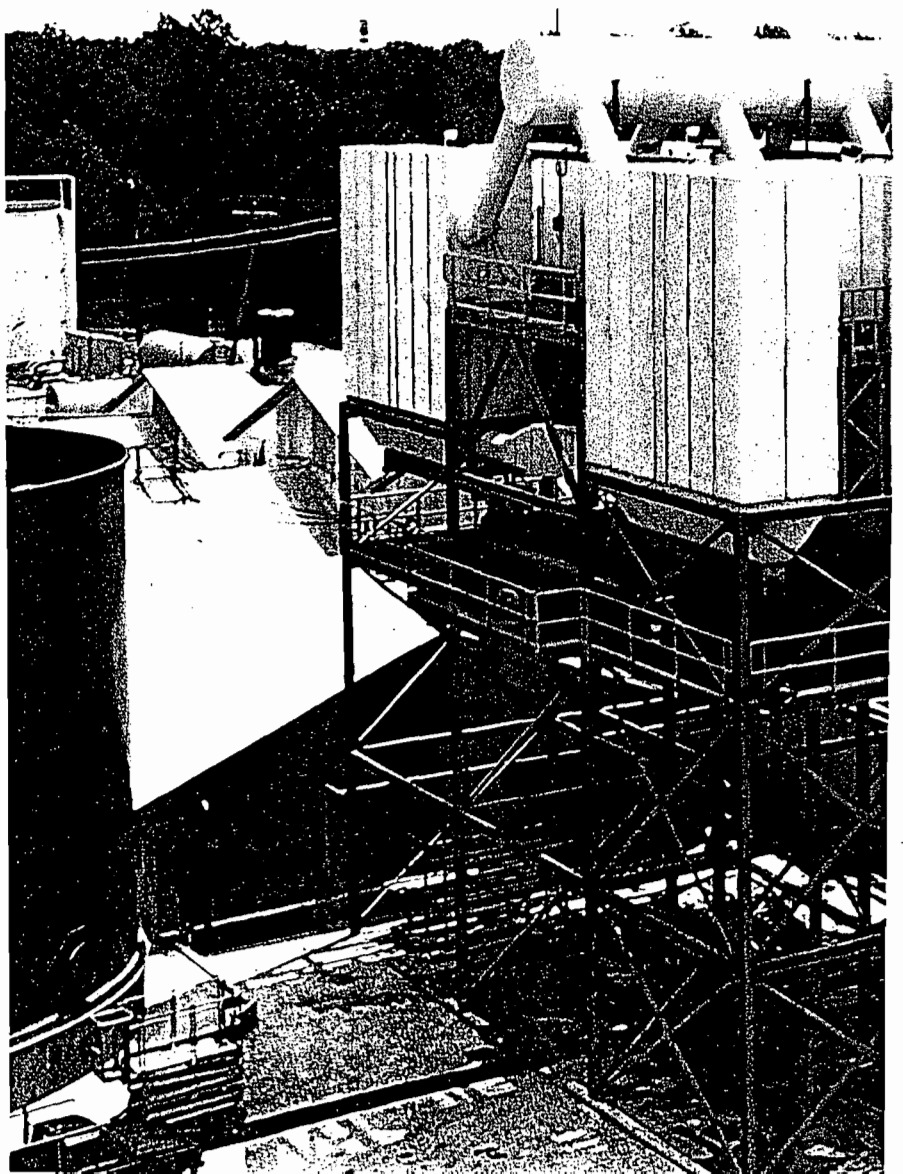
NIRO Drying

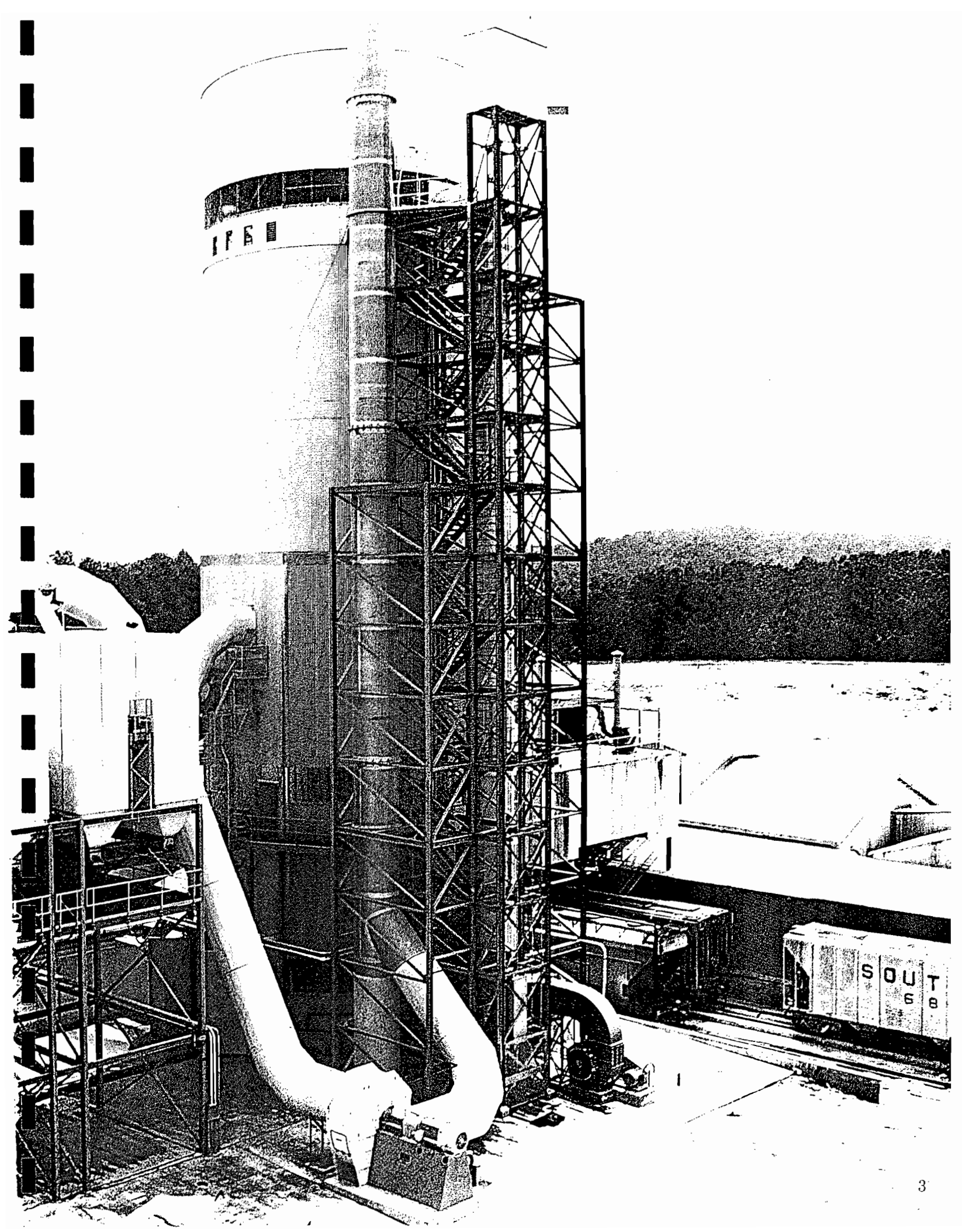
NIRO is an international company specializing in the development, design and engineering of liquid and powder processing equipment for the manufacture of products in powder, granular or agglomerate form.
Spray dryers and coolers, fluid bed systems, solid/liquid extractors, evaporators, homogenizers, membrane filtration systems, agglomerators, granulators, and coating units feature in a comprehensive delivery program marketed world-wide through an extensive network of subsidiaries and representatives.
Today's plants are designed for operational and environmental safety, featuring concepts that give the lowest energy consumption, while achieving the highest product qualities. Many of the world's leading manufacturers are NIRO customers.
Substantial product and process know-how, commitment to customers, a qualified staff, and a flexible organization have been important elements in establishing a good international reputation. With this strategy, the company has achieved an important world market presence with more than 7000 spray dryer installations supplied to many industries.
A major objective of NIRO is not only to expand its activities through internal research and development, but also to identify and participate in the development of technology in associated fields.
NIRO is a member of the Danisco Group, one of Denmark's largest industrial concerns.

Spray dryers for the production of

- Foodstuffs
- Dairy products
- Coffee
- Flavors
- Pharmaceuticals
- Biochemicals
- Proteins
- Enzymes
- Agro-chemicals
- Dyestuffs
- Ceramics
- Polymers
- Mineral concentrates
- Detergents
- Fine/bulk chemicals
- Catalysts

in powder, granular or agglomerate form.

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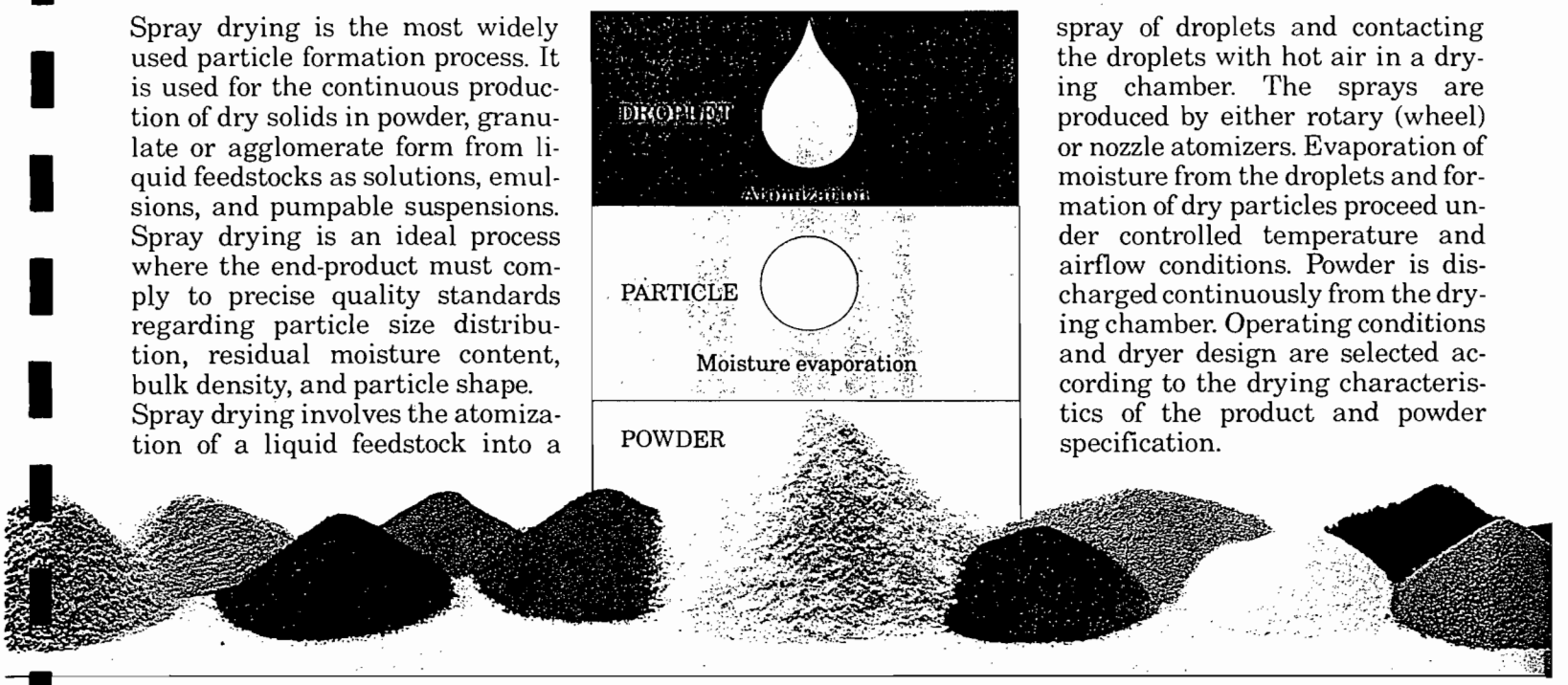
Process

Spray drying is the most widely used particle formation process. It is used for the continuous production of dry solids in powder, granulate or agglomerate form from liquid feedstocks as solutions, emulsions, and pumpable suspensions. Spray drying is an ideal process where the end-product must comply to precise quality standards regarding particle size distribution, residual moisture content, bulk density, and particle shape.
Spray drying involves the atomization of a liquid feedstock into a spray of droplets and contacting the droplets with hot air in a drying chamber. The sprays are produced by either rotary (wheel) or nozzle atomizers. Evaporation of moisture from the droplets and formation of dry particles proceed under controlled temperature and airflow conditions. Powder is discharged continuously from the drying chamber. Operating conditions and dryer design are selected according to the drying characteristics of the product and powder specification.



Principles

Every spray dryer consists of feed pump, atomizer, air heater, air disperser, drying chamber, and systems for exhaust air cleaning and powder recovery.
Widely varying drying characteristics and quality requirements of the thousands of products spray dried determine the selection of the atomizer, the most suitable airflow pattern, and the drying chamber design.

Atomization

The formation of sprays having the required droplet size distribution is vital to any successful spray dryer operation.
Atomization is a high technology area, where Niro has played a central role in the development with a range of rotary atomizers handling feedstocks up to 200 t/h.

Airflow

The initial contact between spray droplets and drying air controls evaporation rates and product temperatures in the dryer. There are three modes of contact:

Co-current

Drying air and particles move through the drying chamber in the same direction. Product temperatures on discharge from the dryer are lower than the exhaust air temperature, and hence this is an ideal mode for drying heat sensitive products. When operating with rotary atomizer, the air disperser creates a high degree of air rotation, giving uniform temperatures throughout the drying chamber. However, an alternative non-rotating airflow is often used in tower-type spray dryers using nozzle atomizers.

Counter-current

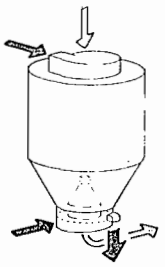
Drying air and particles move through the drying chamber in opposite directions. This mode is suitable for products which require a degree of heat treatment during drying. The temperature of the powder leaving the dryer is usually higher than the exhaust air temperature.

Mixed flow

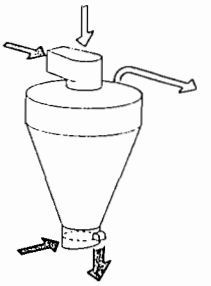
Particle movement through the drying chamber experiences both co-current and counter-current phases. This mode is suitable for heat stable products where coarse powder requirements necessitate the use of nozzle atomizers, spraying upwards into an incoming airflow. The new fluidized spray dryer design (FSD) also uses the mixed flow mode, where the atomizer sprays droplets downwards towards the integrated fluid bed and the air inlet and outlet are located at the top of the drying chamber.

Spray Dryer Chamber Design

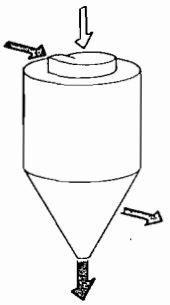
As drying characteristics and product specifications vary from product to product, there is no one spray drying chamber design suitable for all applications.
By offering a full range of designs, Niro impartially selects the most suitable type of plant.



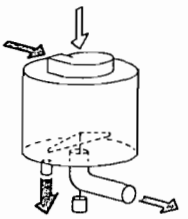
Co-current, with integrated fluid bed, rotary or nozzle atomizer, for dairy/food products.



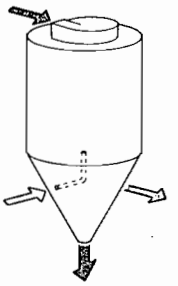
Mixed flow, with integrated fluid bed, rotary or nozzle atomizer, for non-dusty, free-flowing products.



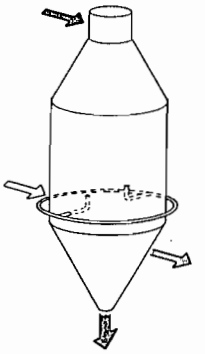
Co-current, conical base, with rotary atomizer, for both heat sensitive and stable products.



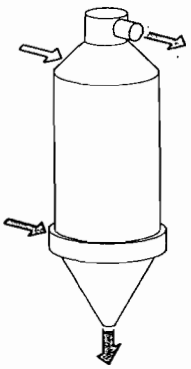
Co-current, flat base, with rotary atomizer, for special products. Also suitable for spray cooling.



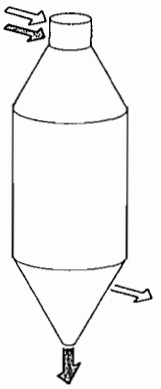
Mixed flow, with nozzle atomizer, for coarse powders of heat stable products.



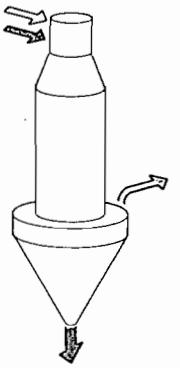
Mixed flow, with nozzle atomizer, for ceramic products.



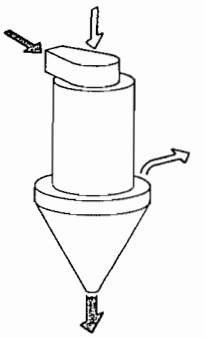
Counter-current, with nozzle atomizer, for products requiring heat treatment.



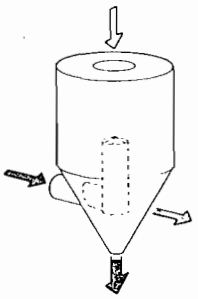
Co-current, with nozzle atomizer, for chemicals.



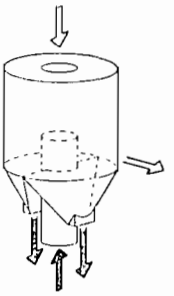
Co-current, with nozzle atomizer, for instant coffee.



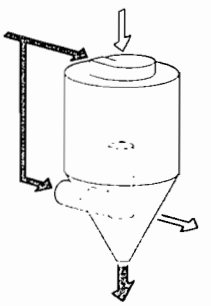
Co-current, with nozzle atomizer, for dairy/food products.



Co-current, with rotary atomizer, for drying chemicals at high inlet air temperatures.



Co-current, with rotary atomizer, for drying mineral concentrates at ultra-high inlet air temperatures.



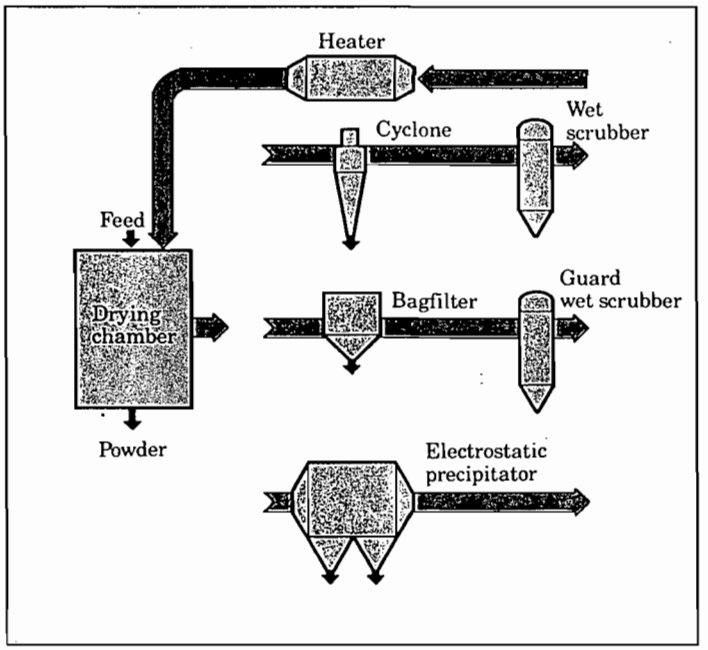
Co-current, compound air disperser with rotary atomizer, for very large volumes of low inlet air temperatures.

- Drying air
- Feed to atomizer
- Powder discharge
- Exhaust air

Spray Drying Systems

The essential elements of the spray dryer: atomizer, air disperser, drying chamber, inlet and exhaust air handling are combined into a system that meets individual operational safety, environmental protection, and powder handling requirements. All systems can be provided with post-treatment equipment: fluid bed dryer/cooler and conveyor.

Open

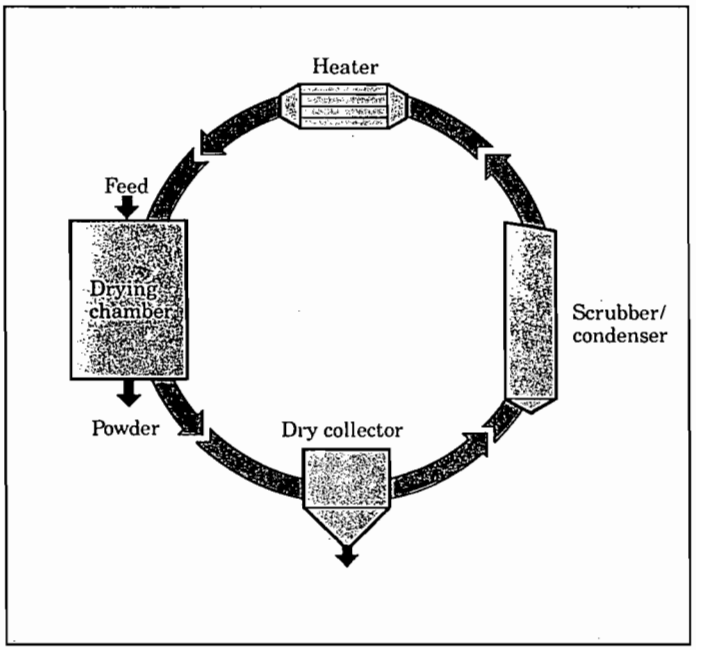


Featuring once-through airflow with exhaust to atmosphere.
The majority of industrial spray dryers handle aqueous feedstocks and use this system. Both direct and indirect airheating are applicable. Exhaust air cleaning in cyclones, bag filters, electrostatic precipitators, and scrubbers.

Special features

- Air dispersers for rotary and nozzle atomizer assemblies
- Pressure shock resistant drying chambers with venting or suppression for explosion protection
- Semi- or fully automatic cleaning systems (CIP)
- Biological wet scrubbers for odor removal from exhaust air
- Conventional or computerized control systems
- Air/air or air/liquid/air waste heat recovery units
- Air-broom and air-sweep attachments for drying chamber
- Noise attenuation of components
- Weatherproof finish for outdoor installations

Closed cycle



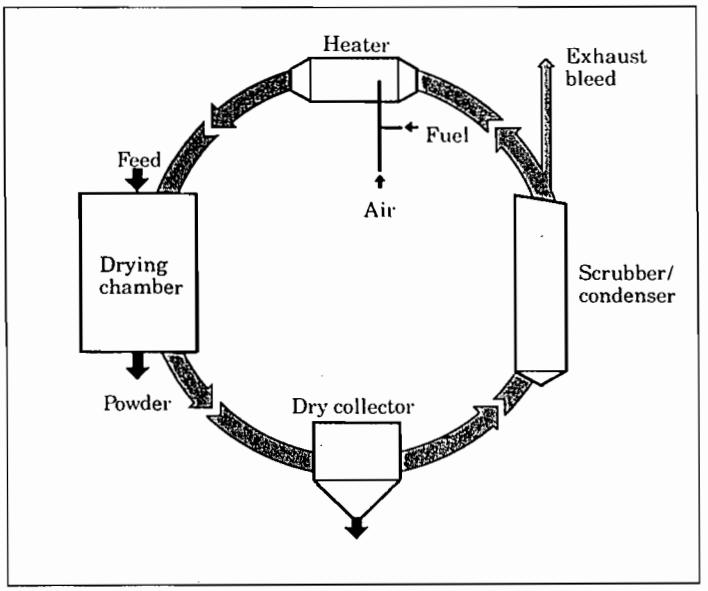
Featuring drying in an inert gas atmosphere where nitrogen recycles within the dryer. This system must be used for the spray drying of feedstocks containing organic solvents or where the product must not contact oxygen during drying. Closed cycle plants are gas and powder tight, and are designed to the strictest safety standards. The inflammable solvent vapors are fully recovered in liquid form.

Special features

- Rotary atomizers with inert gas purging
- Semi- or fully automatic solvent cleaning systems
- Package plant – test erected prior to shipment
- Available with cyclones or bag filters
- Condenser systems to ÷22° F

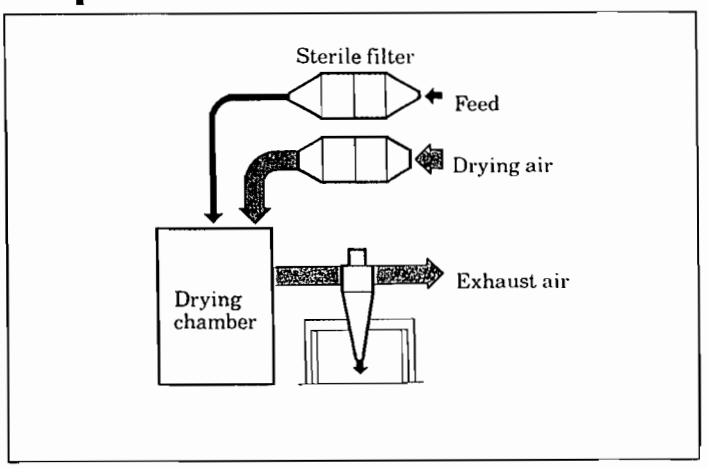
Atomizers

Semi-closed cycle

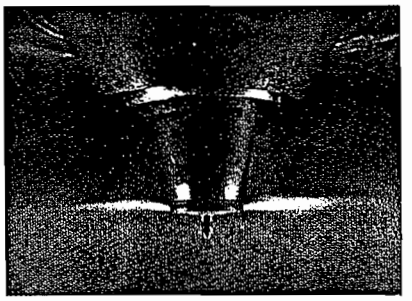


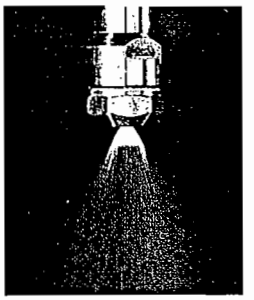
Featuring either the partial recycle mode (recycle of up to 60% of the exhaust air as inlet air to the dryer, for effective waste heat utilization) or the self-inertizing mode, where direct air heating and a minimal air bleed create the low oxygen atmosphere necessary for drying aqueous feedstocks that form explosive powder-air mixtures. If odor is generated during drying, the small volumes of air vented from the system can be effectively and economically incinerated.

Aseptic



Featuring sterile feed atomization and air filtering systems. These dryers are used where any form of powder contamination must be avoided. They are fabricated to special standards of finish and operate under a slight pressure. Fully automatic cleaning and sterilization systems are available. Plant layout is integrated with the laminar flow packing room.





Three types of atomizers are used in industrial drying:

Rotary
Atomization by centrifugal energy

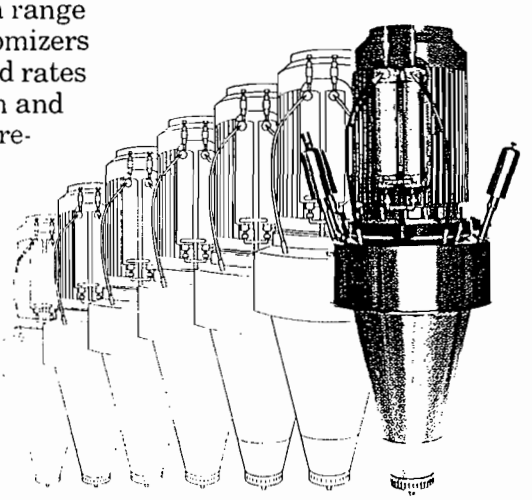
Pressure nozzle
Atomization by pressure energy

Two-fluid nozzle
Atomization by kinetic energy

The choice of atomizer depends upon the properties of the feed and the dried product specification. In cases where more than one atomizer type is suitable, the rotary atomizer is generally preferred due to its greater flexibility and ease of operation. The advantages include:

- Handling of high feed rates without need for atomizer duplication
- Handling of abrasive feeds
- No blockage problems
- Low pressure feed system
- Ease of droplet size control through wheel speed adjustment

Niro offers a range of rotary atomizers covering feed rates up to 200 t/h and power requirements up to 800 kW.



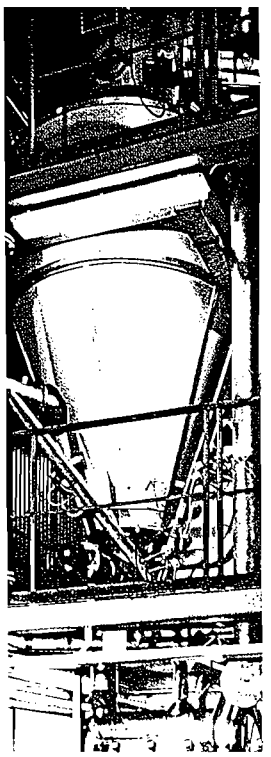
Spray Dryers for Industrial Production

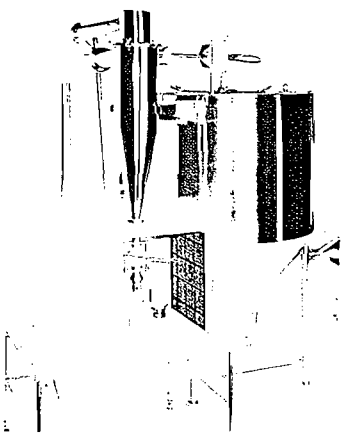
Pharmaceutical Industry

Pharmaceuticals in powder or agglomerate form:

- Analgesics
- Antibiotics
- Enzymes
- Plasma/plasma substitutes
- Vaccines
- Vitamins
- Yeasts

Spray dryers designed specially for integrating into batch or continuous operations under sanitary or aseptic conditions. Systems also available for taste masking and encapsulation.
The new FSD dryer is ideal for producing non-dusty powders for perfect tabletting. Other equipment in Niro's supply to the pharmaceutical processing industries includes concentrators, tablet coaters, powder blenders, and deodorizing bioscrubbers.



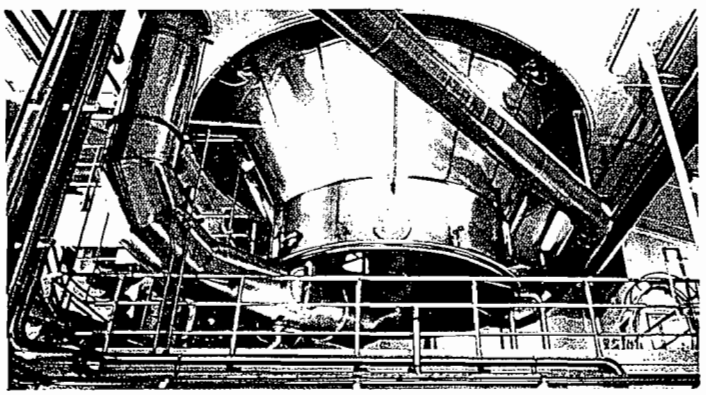


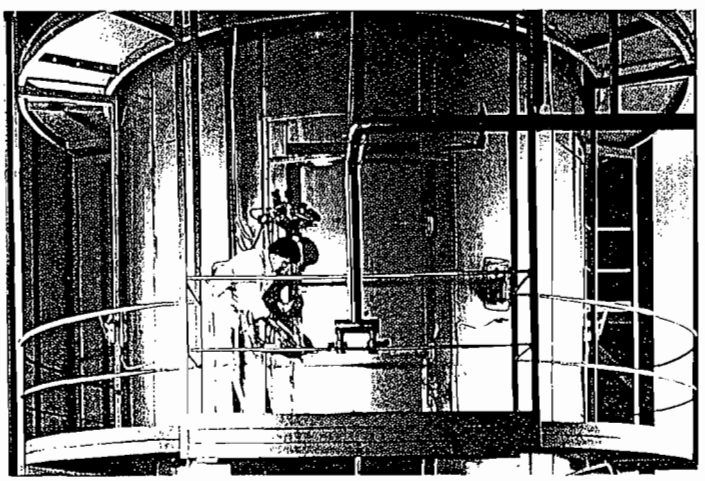
Food and Dairy Industry

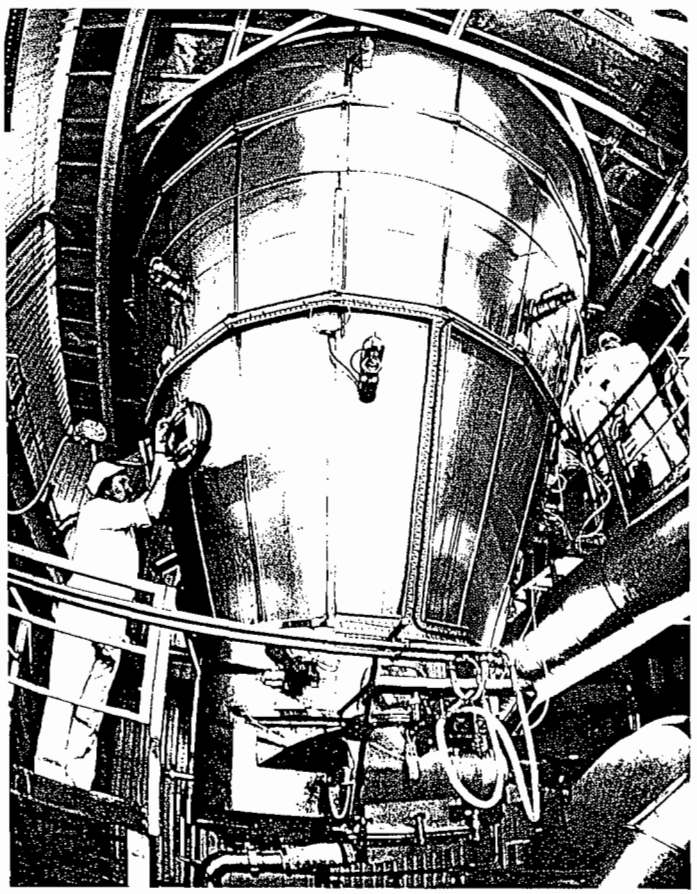
Foodstuffs and dairy products in powder or agglomerate form:

- Milk
- Baby food
- Cheese/whey products
- Coffee whiteners
- Eggs
- Tomato
- Spices/herb extracts
- Soup mixes
- Coffee/coffee substitutes
- Coconut milk
- Flavors
- Soy-based food

Spray drying is ideal for these heat sensitive products, where selection of system and operation is the key to high nutritive and quality powders of precise specification. "Instant", highly soluble powders are a speciality of spray dryers featuring fluid beds. All components in contact with product comply with hygienic processing standards. Today's plants have special features as automatic cleaning (CIP) and bagging-off systems. Associated equipment includes evaporators, powder blenders, agglomerators, lecithination units, and deodorizing bioscrubbers. Complete processing lines for instant coffee and dairy products are part of the Niro delivery program.





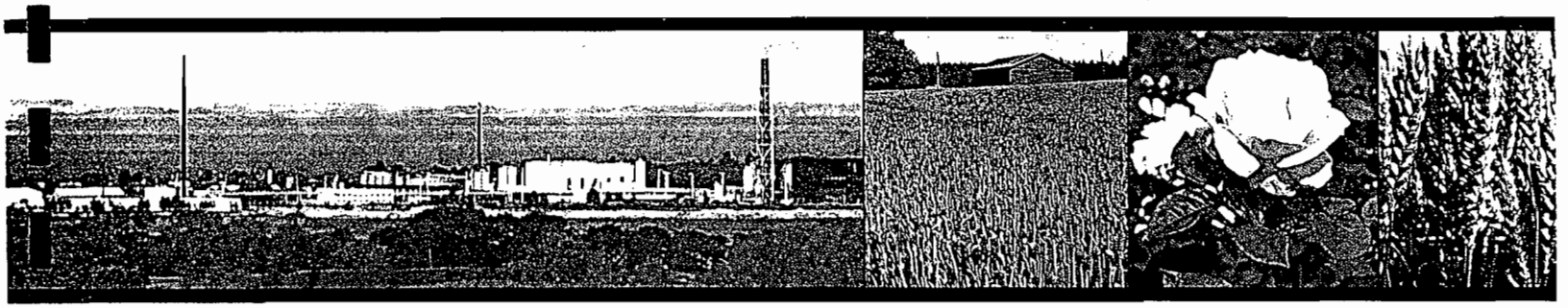


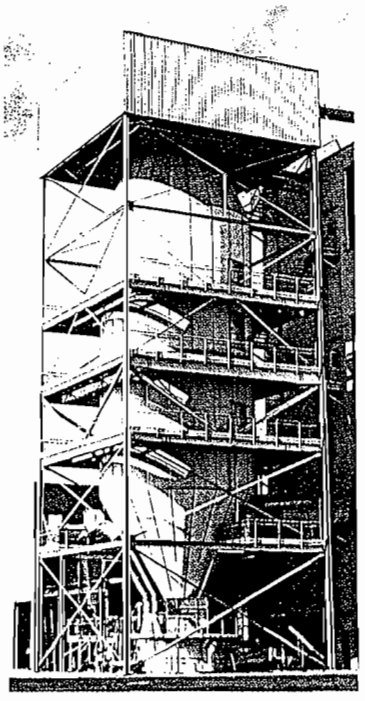
Chemical Industry

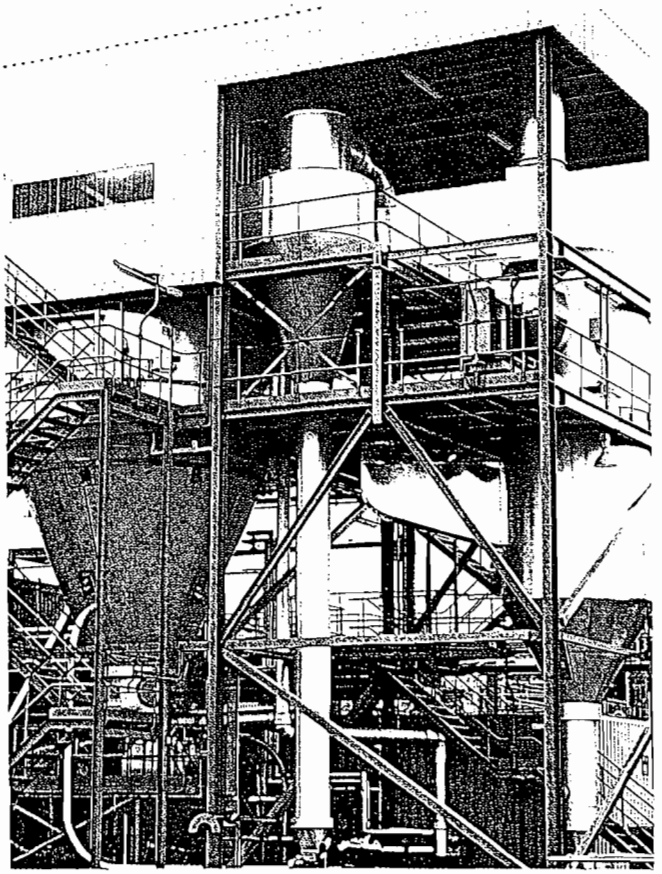
Speciality chemicals	Agro-chemicals
● Catalysts	● Fungicides
● Dyestuffs/pigments	● Insecticides
● Detergents	● Herbicides
● Tannins	● Fertilizers
● Fine organic/ inorganic grades	● Chelates

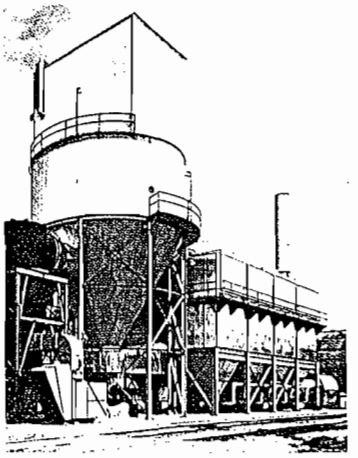
Spray dryers for the chemical industries produce powdered, granulated, and agglomerated products in systems that minimize formation of gaseous particulate and liquid effluent.

High efficiency scrubber systems and high performance bag filters prevent powder emission, while recycle systems eliminate problems of handling solvents, product toxicity, and fire explosion risks. Special component designs (e.g. atomizers) are available for abrasive and corrosive feedstocks. High thermal efficiencies, low maintenance costs, full environmental protection, computerized control, dust-free working area are some of the features of today's spray dryers.









Polymer Industry

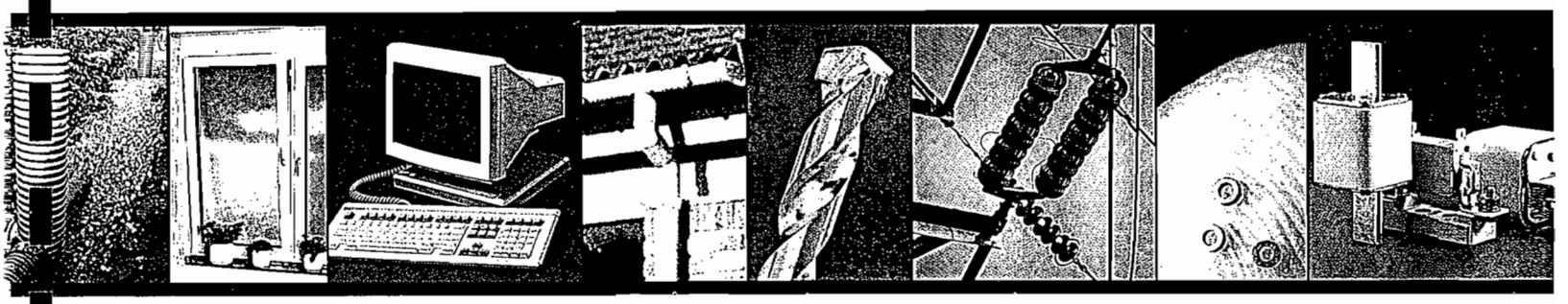
- e-PVC
- UF/MF resins
- ABS
- PMMA

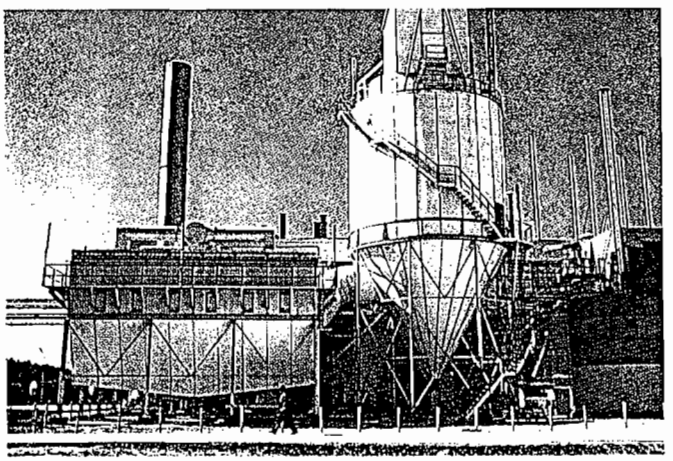
Polymer dispersions and solutions in water or organic solvents are spray dried under closely controlled operating conditions, producing powders to precise particle size, heat treatment, and redispersibility specifications. Low softening point products are produced continuously in plants with air-brooms, air-sweeps or integrated fluid beds. For drying moist polymer powders, Niro offers fluid beds.

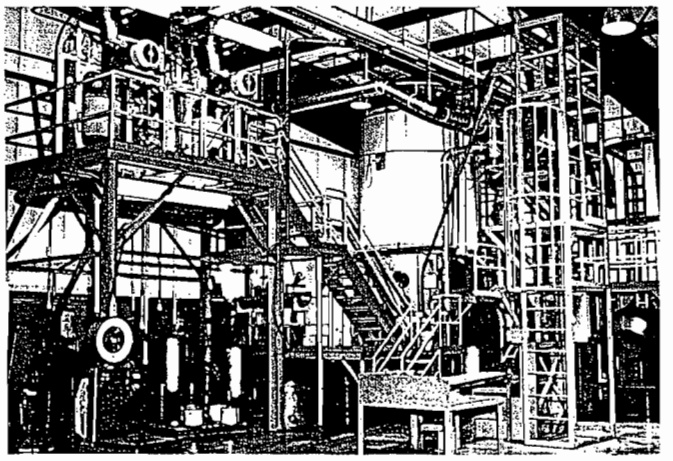
Ceramic Industry

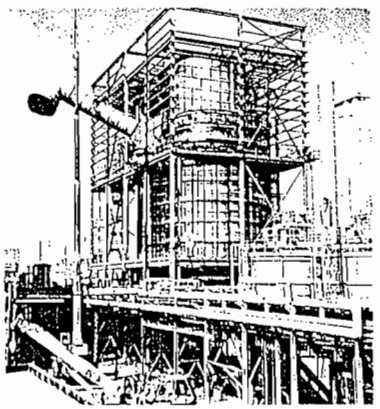
- Carbides
- Ferrites
- Nitrides
- Oxides
- Silicates
- Steatites
- Titanates

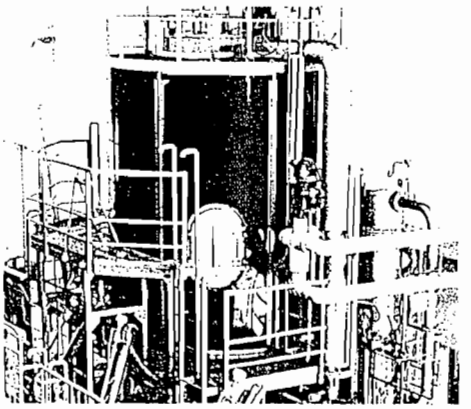
Spray drying is applicable to tile and electronic press powders, and plays an important role in the industrial development of high performance (advanced) ceramics. The ability to meet particle size distribution requirements, produce a spherical particle form, and handle abrasive feedstocks is an important reason for the widespread use of spray dryers in the ceramic industries.











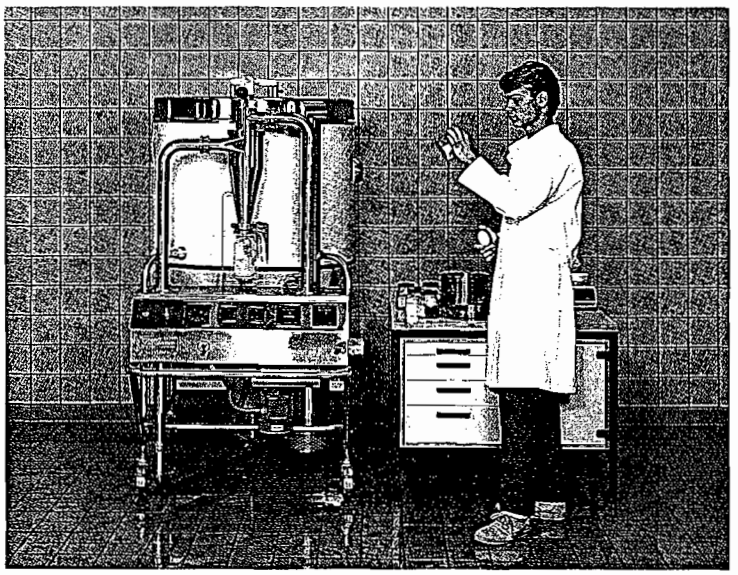
Spray dryers for testing and

– comprehensive range of series produced and package units available

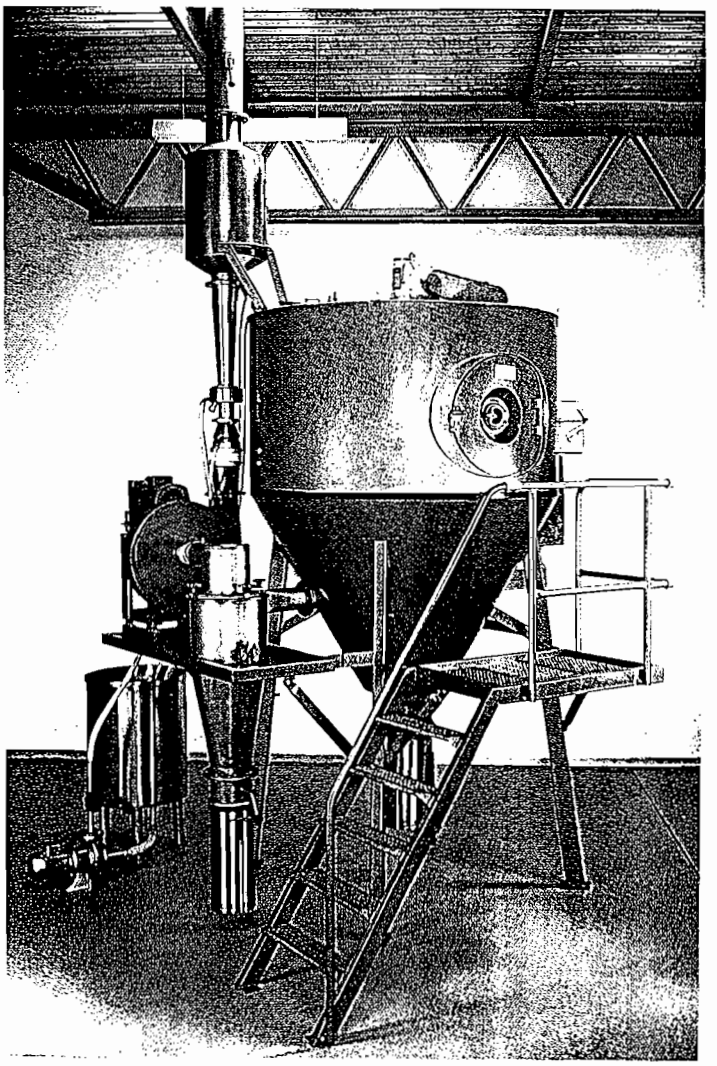
The Portable unit is the smallest dryer, and a special Type HT model handles organic solvent feedstocks. The Utility unit and the P-6.3 spray dryer are the next larger sizes, offering choice of atomizers, heating systems, and powder discharge. Closed cycle versions are custom designed.

The FSD pilot plant is the only small scale integrated fluid bed spray dryer on the market. It produces dustless and agglomerated powders representative of powders produced on large industrial installations.

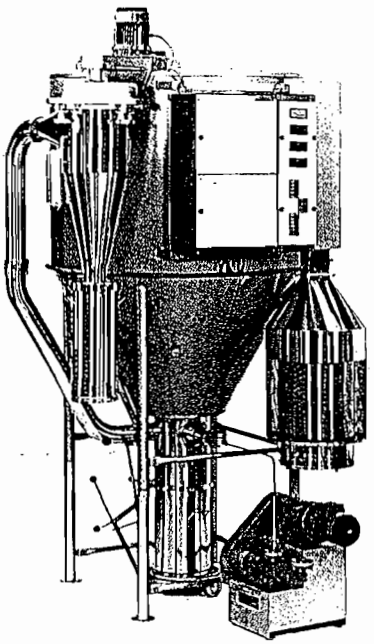
All industrial size package units have a fixed layout and are supplied complete with supporting structure. Available with rotary or nozzle atomizers, cyclones, bag filters, or scrubbers. A range of package closed cycle plants is also available.



Type: Portable unit
Water evaporative capacity: up to 15 lb/hr

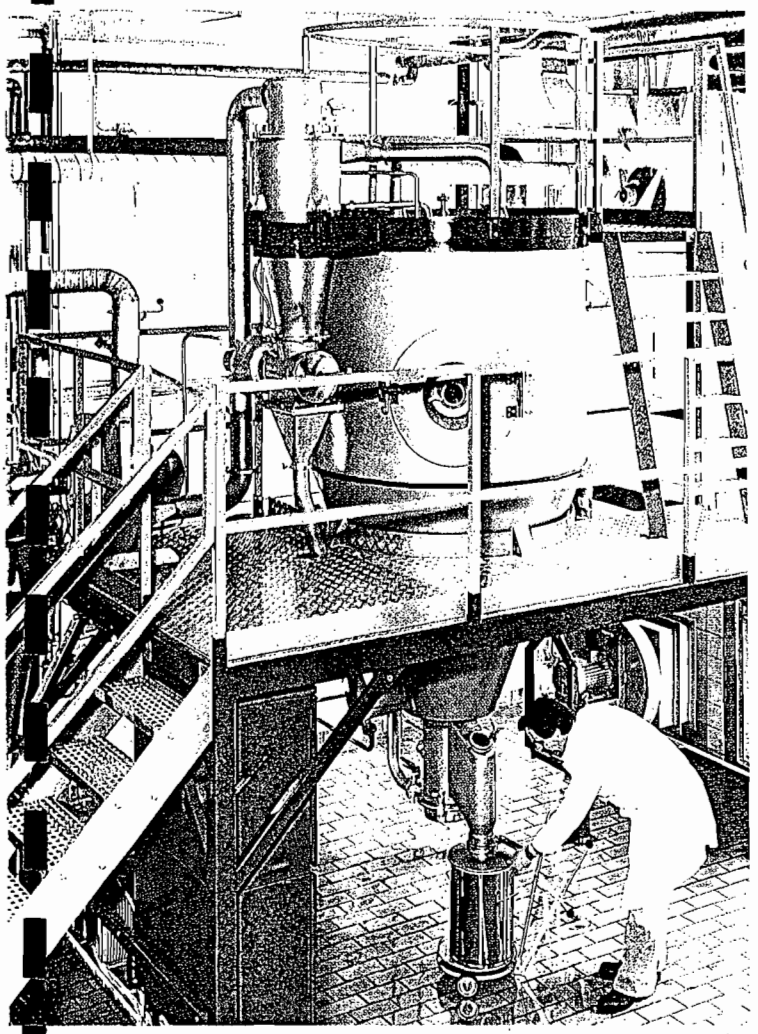


Type: P-6.3
Water evaporative capacity: up to 132 lb/hr



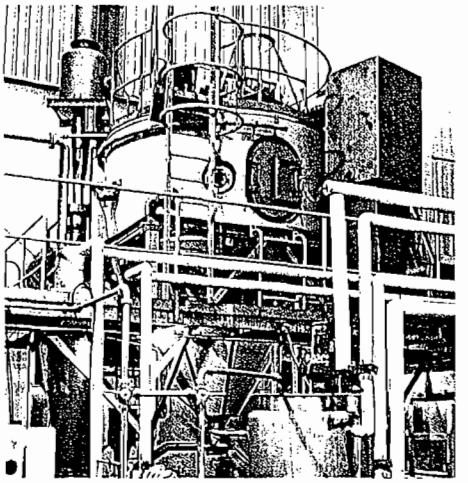
Type: Utility unit
Water evaporative capacity: up to 77 lb/hr

small scale industrial production

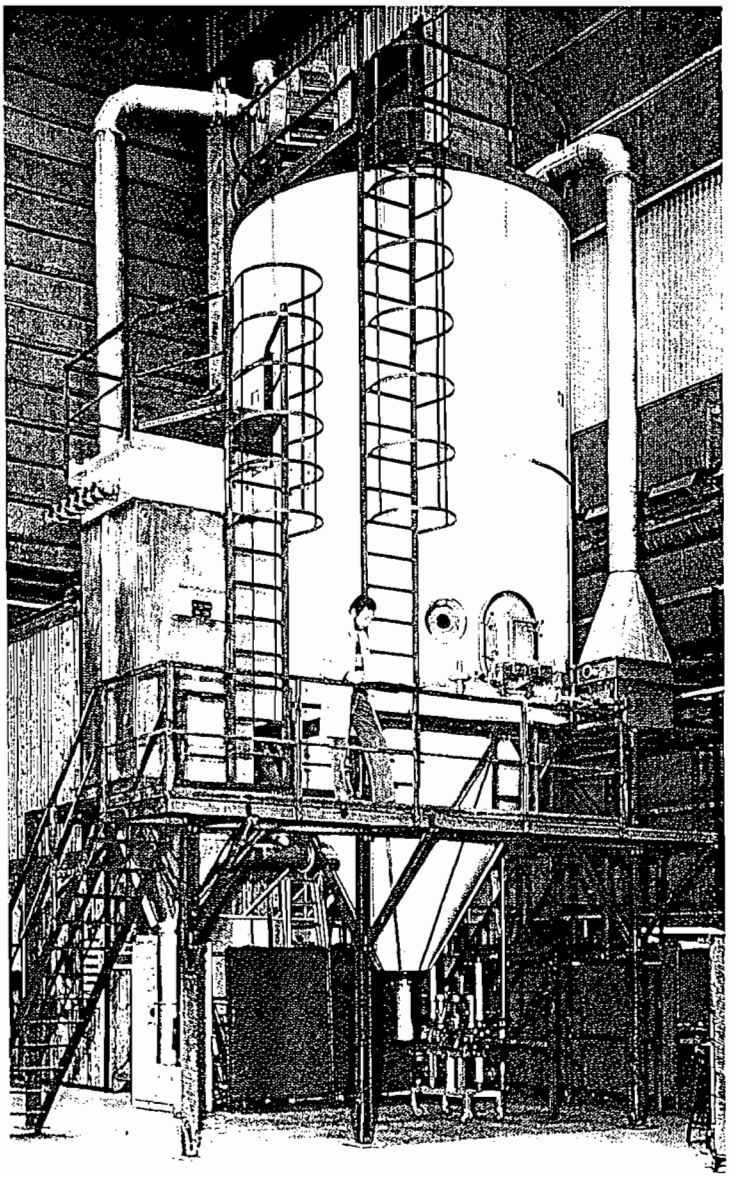


Spray dryer for solvent based feedstocks operating in closed cycle.

Type: FSD Pilot
Water evaporative capacity: up to 93 lb/hr



Type: SD-12.5-R
Water evaporative capacity: up to 352 lb/hr

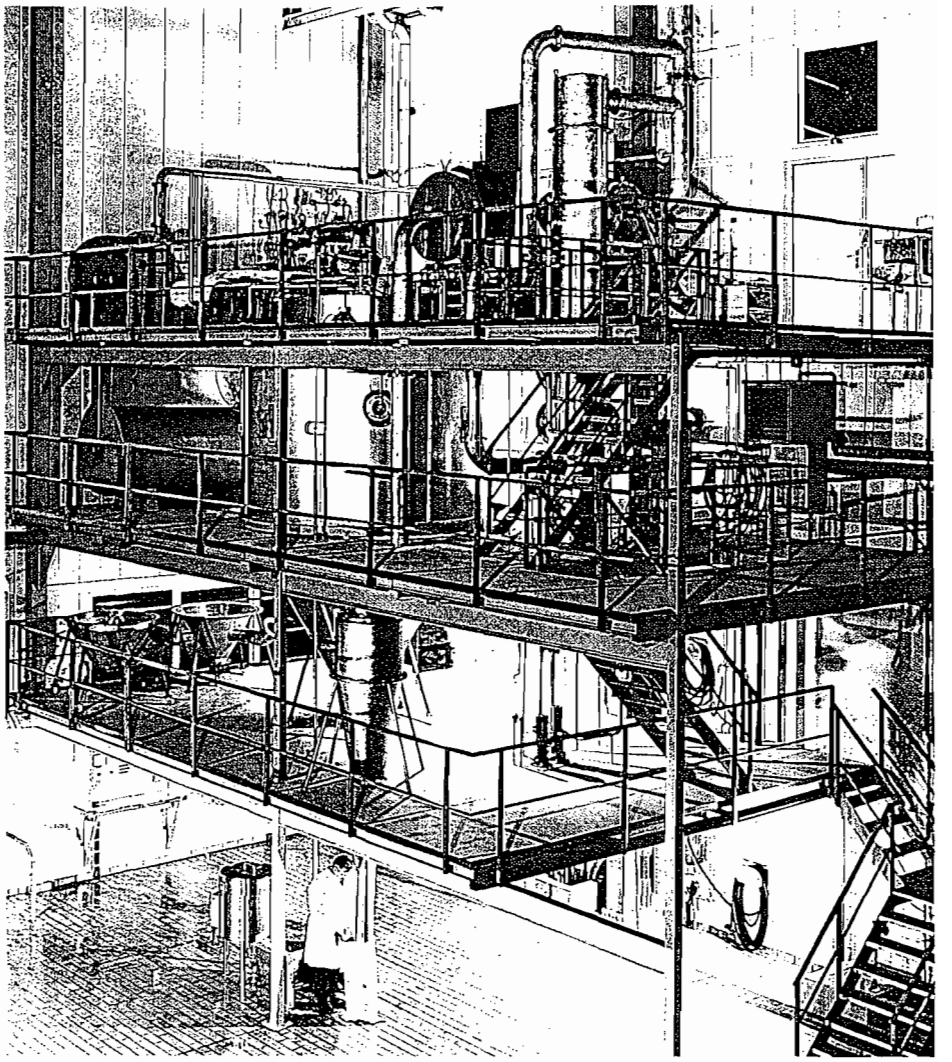


Spray dryer, type SD-25-N, bag filter version, under test erection prior shipment.

Service to Industry

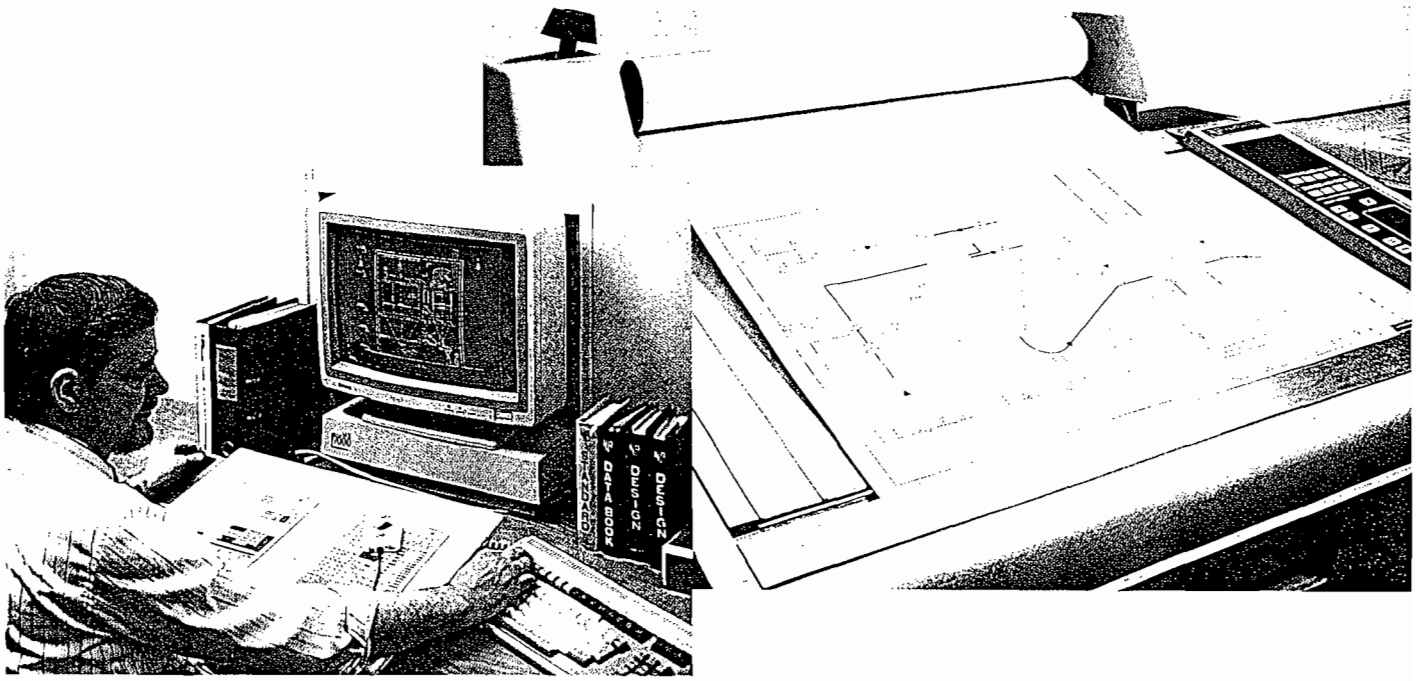
- Product testing and process evaluation
- Design and engineering
- Plant delivery, erection, and commissioning

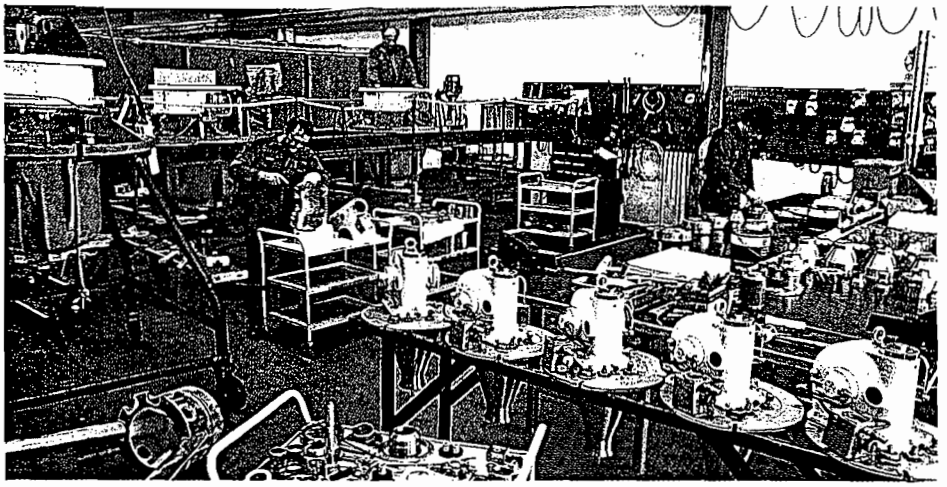
Establishing a close collaboration with customers secures successful spray dryer operation in the shortest possible time.



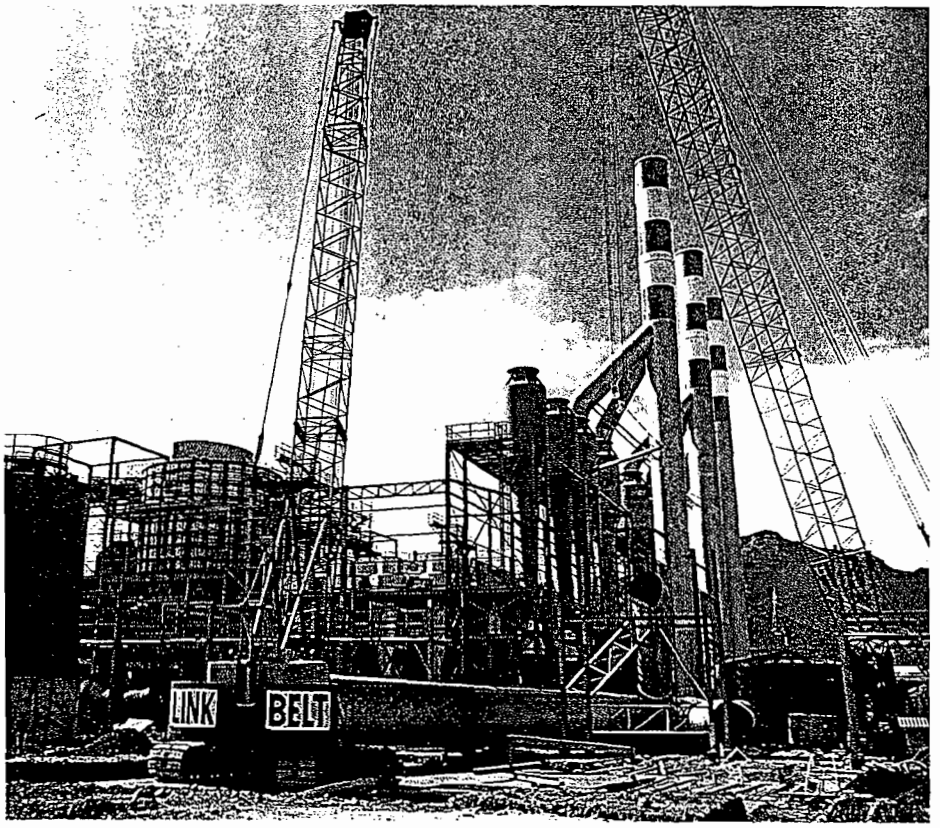
Product testing and process evaluation
Pilot plant test facilities with accompanying analytical laboratories are available in Brazil, Denmark, United Kingdom, Mexico, Japan, and USA for establishing the feasibility of using Niro equipment, optimizing process conditions, and providing samples for market analyses.

Design and engineering
With process data confirmed during testwork, the spray dryer is specified and designed based upon the latest technology and industrial experience. The most modern design aids are used. Operation and maintenance manuals are individually prepared for each project.



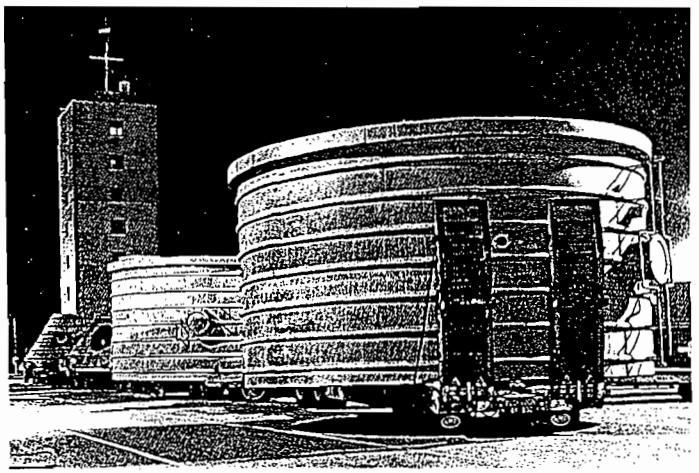


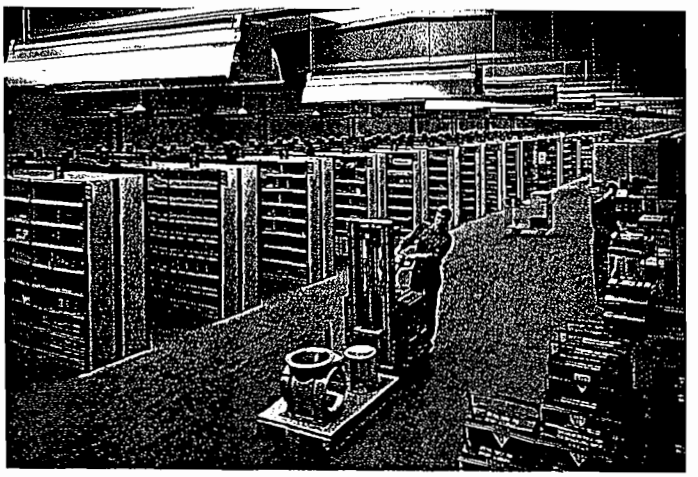
Fabrication
All components are fabricated in Niro's own workshop.



Plant delivery, erection, and commissioning
Punctuality of delivery is essential to today's business, and Niro is known for plant delivery on time. Responsibility for total plant erection is accepted, and site erection supervision can be supplied. The company's own engineers are present during the commissioning phase.

A round-the-clock spare parts service is maintained.





MikroPul

MIKROPUL CORPORATION • 10 Chatham Road, Summit, NJ 07901—(201) 273-6360

OWNER'S MANUAL

TR & TRH
MIKRO- PULSAIRE
DRY DUST COLLECTOR

(TOP REMOVAL AND
WALK-IN PLENUM UNITS)

- INSTALLATION
- OPERATION
- MAINTENANCE
- TROUBLESHOOTING

STD. 0-06

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TABLE I. FILTER BAG MATERIAL COMPARISON

BAG MATERIAL	MAX. OPER. TEMP. [°F]	ACID RESIST	ALKALI RESISTANCE	NOTES
Polyester	275	Good	Good	1,2,3
Polypropylene	200	Excellent	Excellent	1,2,3
Nomex	400	Fair	Good	1,3
Acrylic	250	Good	Fair	1,3
Nylon	200	Poor	Good	1,3
Wool	180	Fair	Poor	1
Teflon	475	Excellent	Excellent	—
Glass ***	550	Good**	Poor	—

NOTES:

1. HCE II treatment available
2. Hi-Gloss or Eggshell finish available
3. Singed finish available

** Glass is destroyed by gaseous HF at dew point temperatures
*** Use of glass bags is severely limited by poor flex-abrasion qualities

II. SPECIFICATIONS

ARRANGEMENT:

Number of Bags ..... PerSpec
Diameter of Bags ..... 4½ In.
Length of Bags ..... 6,8, or 10 Ft.
Area of Cloth/Bag -6 Ft. ..... 7.07 Sq. Ft.
-8 Ft. ..... 9.42 Sq. Ft.
-10 Ft. ..... 11.77 Sq. Ft.
Bag Material (Dependent on Temp., Product, Etc.) ..... Per Spec
Air Pressure Requirement for Cleaning ..... 90-110 (125 psig max.)

III. ASSEMBLY INSTRUCTIONS

A. General

Due to the construction of some Mikro-Pulsaire components, field assembly and installation is a necessity. This Section provides instructions covering installation and assembly required at the job site.

B. Unpacking

Remove all components from the packing and check against the shipping ticket. Report shortages to the carrier at once. Inspect all components for evidence of shipping damage. If damage exists it should be reported to the carrier at once and a damage claim filed.

C. Assembly of Parts

1a. Manometer

Connect the manometer to the couplings provided on the clean air plenum and the collector housing (Figure 9). Fill the manometer with the fluid supplied. Use of any other fluid is not recommended, since any change in fluid density will affect the accuracy.

b. Magnehelic

Connect the high pressure tap of the magnehelic gauge to the collector housing pressure tap. Connect the low pressure tap of the magnehelic gauge to the collector plenum pressure tap.

NOTE: The manometer or magnehelic gauge should be located where it can be easily read.

2. Timer

Connect electrically to the power source and the solenoid valves (Figure 2). See owner's manual for time supplied.

CAUTION: The timer is a rugged mechanism. However, timer failure will be minimized if the timer is mounted in a vibration-free environment remote from the collector. In addition, installation indoors is recommended to eliminate potential problems caused by temperature fluctuations.

3. Compressed Air

The compressed air supply (90-110 PSIG) shall be connected to the header supplied with the collector. Observe the following precautions:

a. Use a minimum size pipe of 1" inside diameter for the main air line. Larger systems will require an appropriately sized airline.

b. Before connecting to the collector, purge airline thoroughly to remove dirt, oil, moisture, and/or loose rust scale.

c. Air must be kept clean and dry to insure trouble-free operation of the solenoid and diaphram valves. An adequately sized filter must be installed in the line to remove moisture and oil. Air filters should be sized for 50 Micron particle removal. Oil content should not exceed 10ppm/wt. More elaborate instrument air dryers are required only when sensitive process conditions or severe freezing situations are encountered.

4. Filter Bags

a. Slip the filter bag over a wire retainer with the bag seam 180° from the slot in the top of the retainer (Figure 3). Pull the bag over the retainer until bottom of bag is against the bottom of the retainer.

b. Fold the top of the filter bag inside the retainer (Figure 4) and loosely install a bag clamp around the top of the bag/retainer assembly, with the clamp screw located approximately 90° off the bag seam.

c. Slip the bag/retainer assembly over a venturi collar with a gasket in place on the venturi (Figure 5), making sure that the retainer groove is aligned with the venturi collar groove.

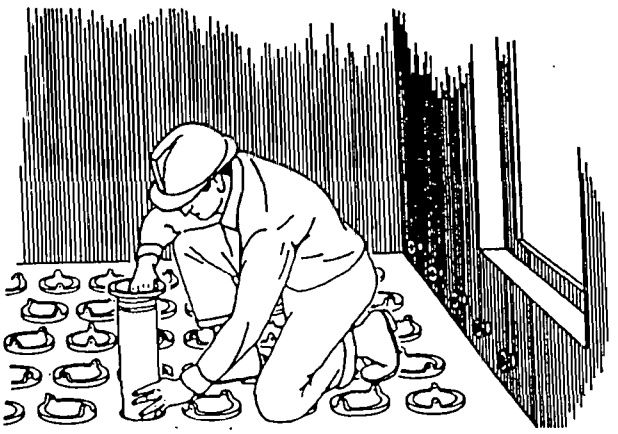
d. Using a 5/16" inch socket wrench, tighten the clamp securely. It is important to use a greater than usual torque on the clamp for this application (50-60 in-lbs.). It is very important that the axis through the venturi and that of the bag/retainer assembly coincide, so that the bag will be vertical once installed in the tubesheet.

CAUTION:

Relaxation of felt fibers, caused by the physical or chemical condition, could result in leakage or the filter bag slipping off the collar if the bag clamp is not tight and grooves engaged.

e. Install the bag/retainer/venturi assemblies in the tubesheet, making certain to lock the venturies in place with a twist clockwise.

f. Inspect collector to insure that bags are not touching each other or the collector walls.

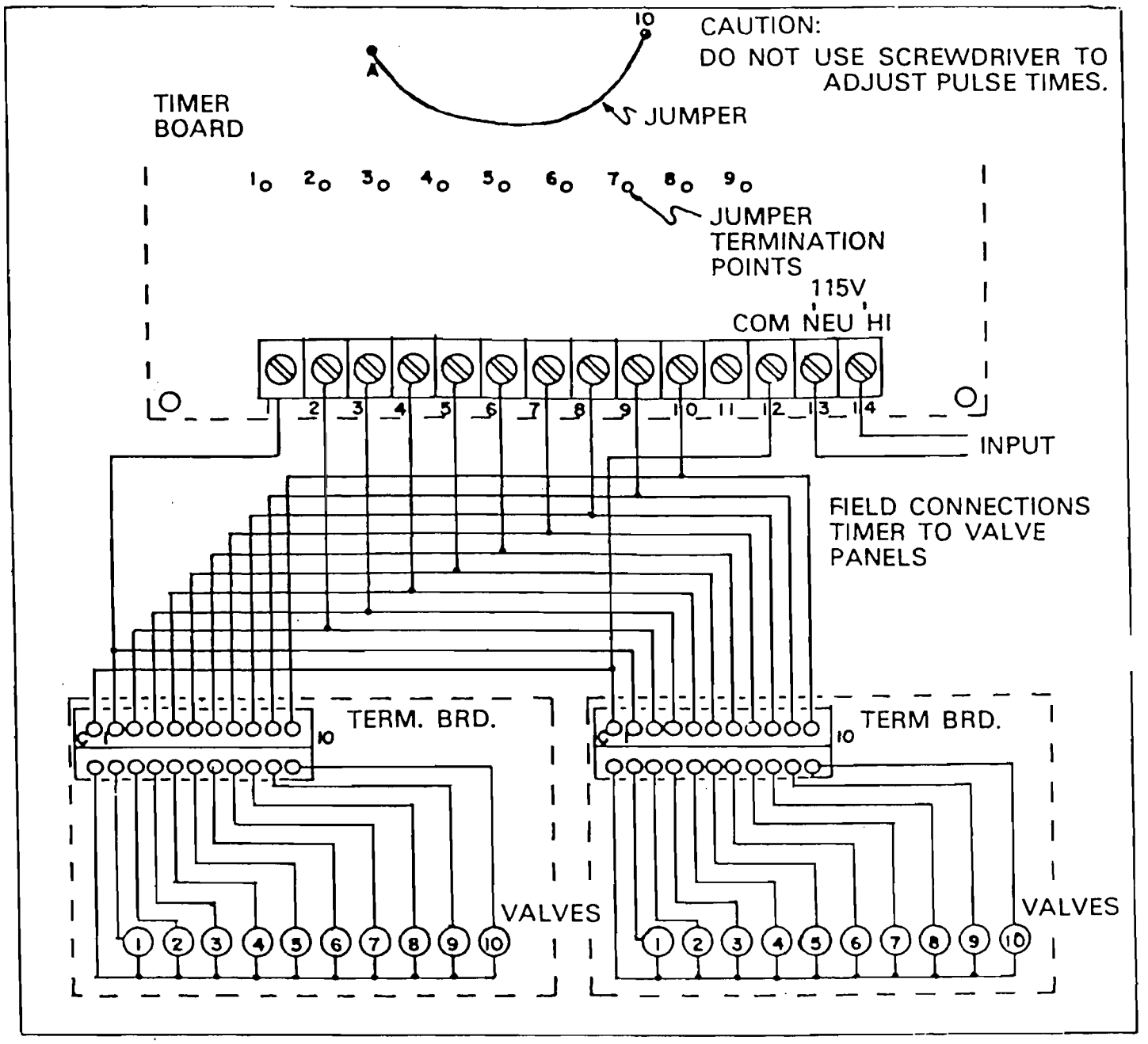


NOTE:

When installing fiberglass felt filter bags, extreme care is required during handling, assembling and installation.

The following recommendation and precautions will insure that you derive the maximum service from the fiberglass felt bags. As a general rule of thumb, handle the bags as if they are fragile glass tubes. Anything that would damage a glass tube will similarily affect the fiberglass felt. Every effort should be made to prevent creasing the bags. When received, the shipping carton should be handled so it is not crushed or allowed to get wet. It should be stored in a horizontal position with the top up. When it is time to install the bags a table should be set up to assemble the bag and retainer. The table should be somewhat longer than the bag and should be covered with heavy paper or other material to provide a smooth clean surface. The bags should be handled by at least two people at all times to avoid excessive bending. Work should be done in an area that is at least 70°F.

Figure 2. Timer - Solenoid Valve Wiring



Bag/Retainer
Installation Technique

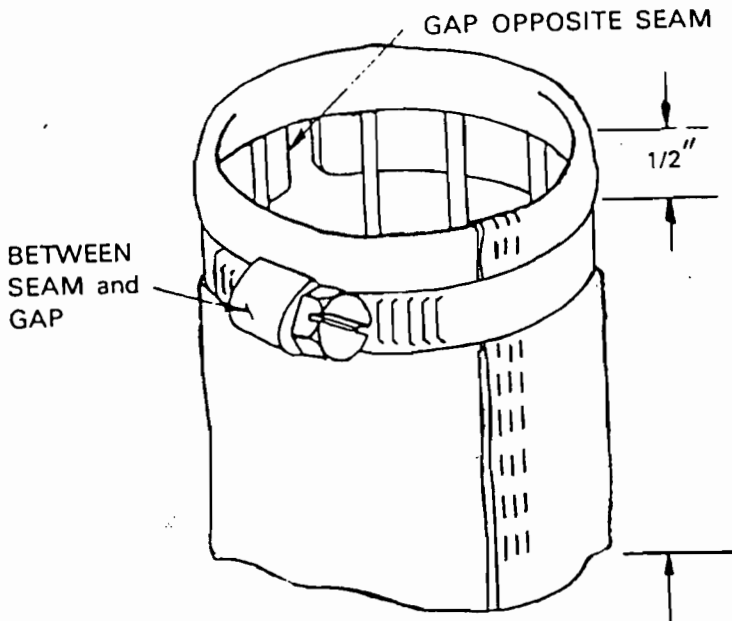


Figure 3

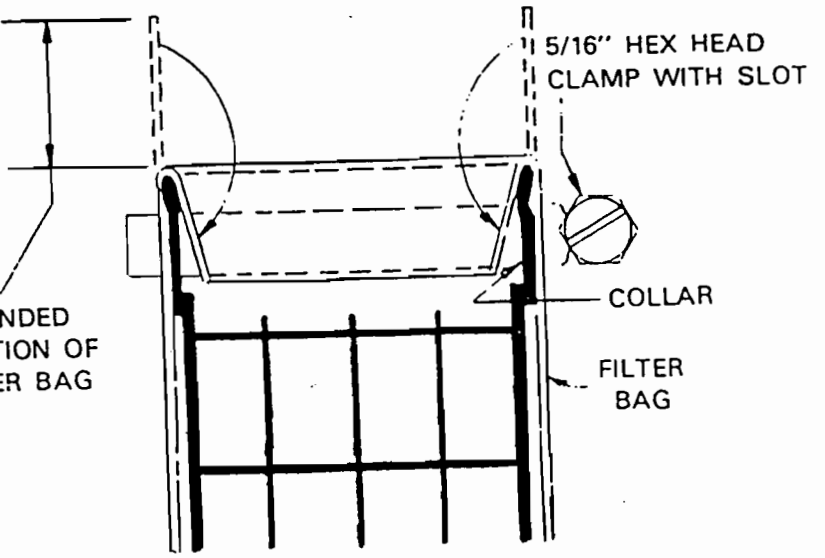


Figure 4

EXTENDED
PORTION OF
FILTER BAG

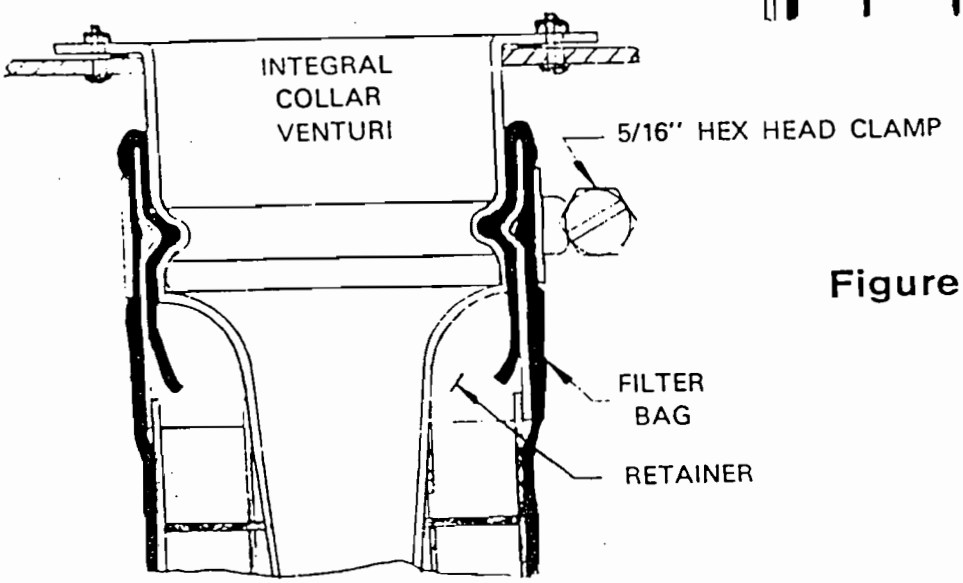
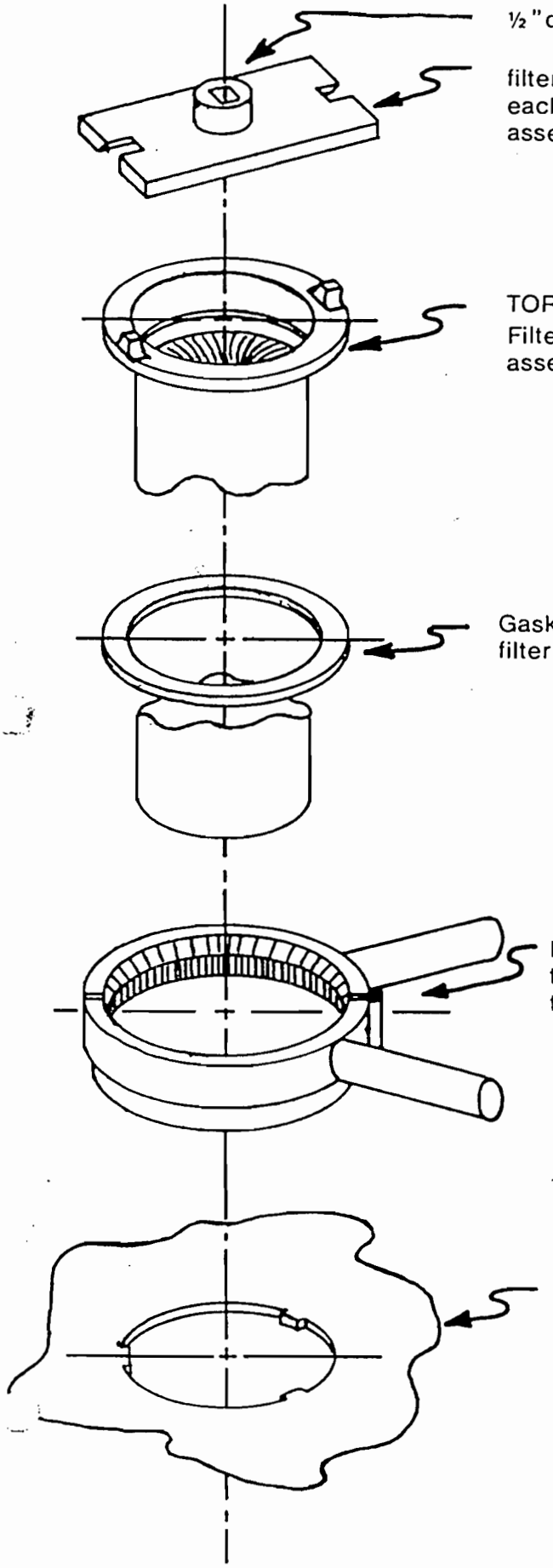


Figure 5

Figure 6 INSTALLATION OF TOP REMOVAL FILTER ELEMENTS



½" drive connection for torque wrench.

filter element venturi installation tool (P/N 391001) is supplied with each fabric filter. This tool is used to lock venturi and element assembly to the tubesheet.

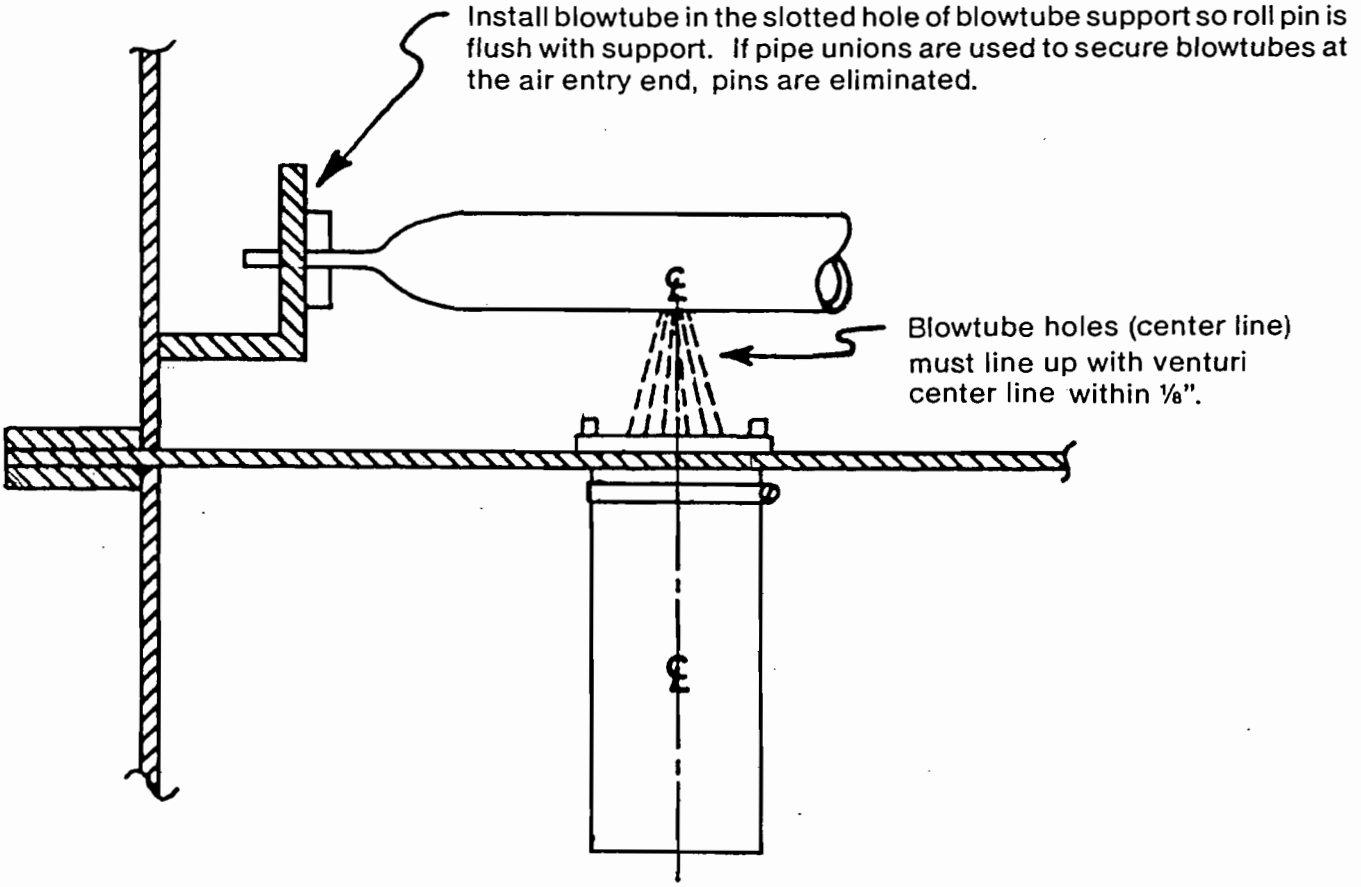
TORQUE VENTURI: 120/130 FT. LBS.
Filter element assembly - Venturi, retainer, bag, and clamp assembled, as per instructions (see page 7)

Gasket is to be installed on venturi before installing assembled filter elements in the tubesheet.

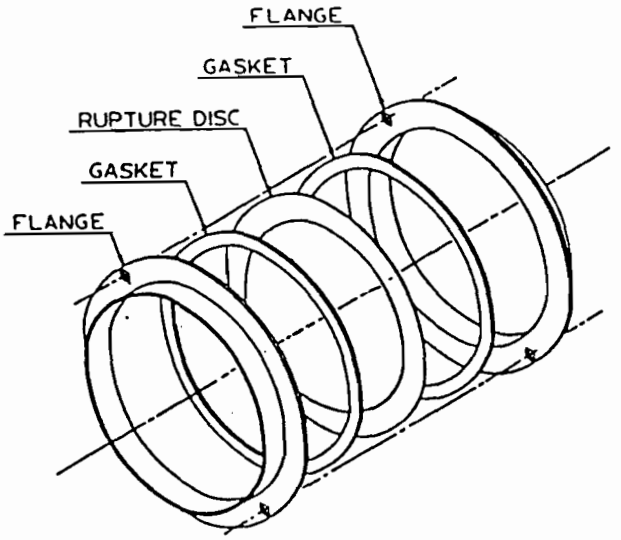
For the protection of some filter media, optional element installation tool (P/N 391008) may be required. Tool is removed from the tubesheet opening just prior to locking the venturi in place.

Tubesheet of fabric filter.

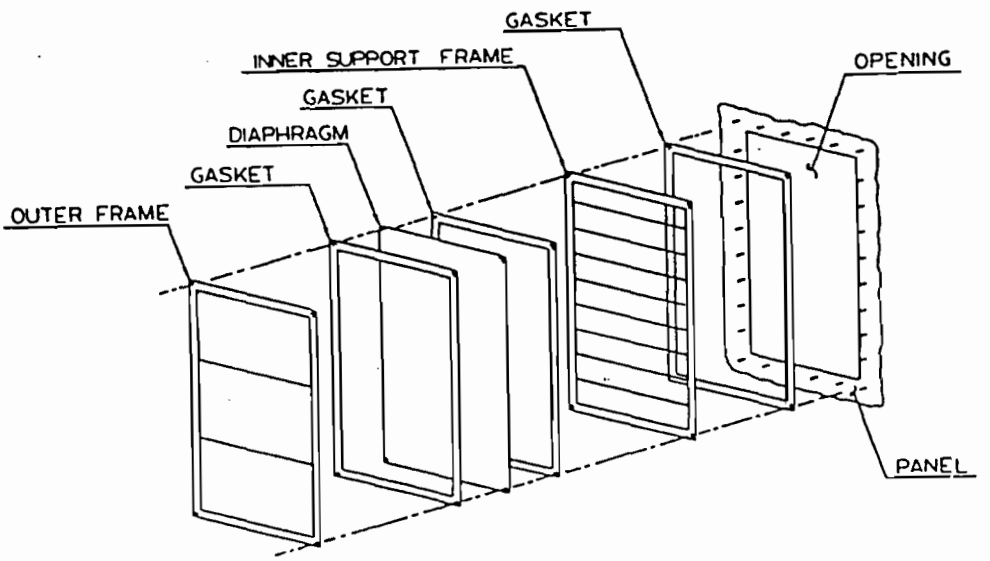
Figure 7 INSTALLATION OF TOP REMOVAL BLOWTUBES



Supplement information to owner's manual STD. 0-06.
Page 7 and Page 15



DISC TYPE
EXPL. VENT ASSY



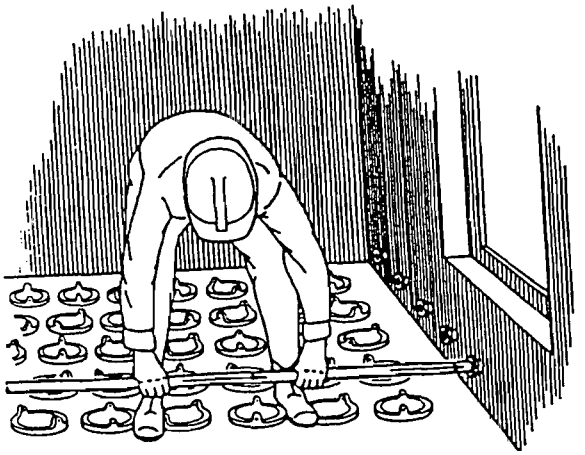
DIAPHRAGM TYPE
EXPLOSION VENT

Figure 8. Typical Field Assembly of Diaphragm And Disc Type Explosion Vents

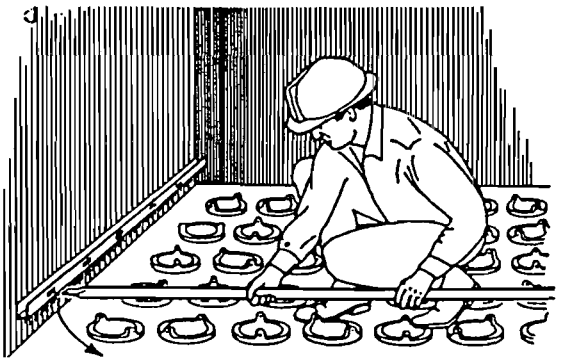
5. Blowtubes

The blowtubes are lengths of schedule 40 pipe with orifice holes spaced along their lengths. One end of each blowtube is open.

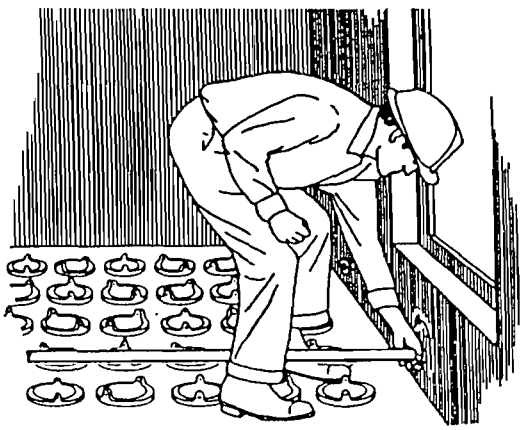
a. Insert the open end of the blowtube (holes aiming toward the tubesheet) into the open coupling located on the inside wall of plenum. Push the blowtube far enough into the coupling to permit the other end of the blowtube to clear the slotted bracket.



b. With the crimp of the blowtube aligned with the slot in the bracket, slide the blowtube back fully into the slot, allowing the locating pin to push against the bracket. (see figure 7)



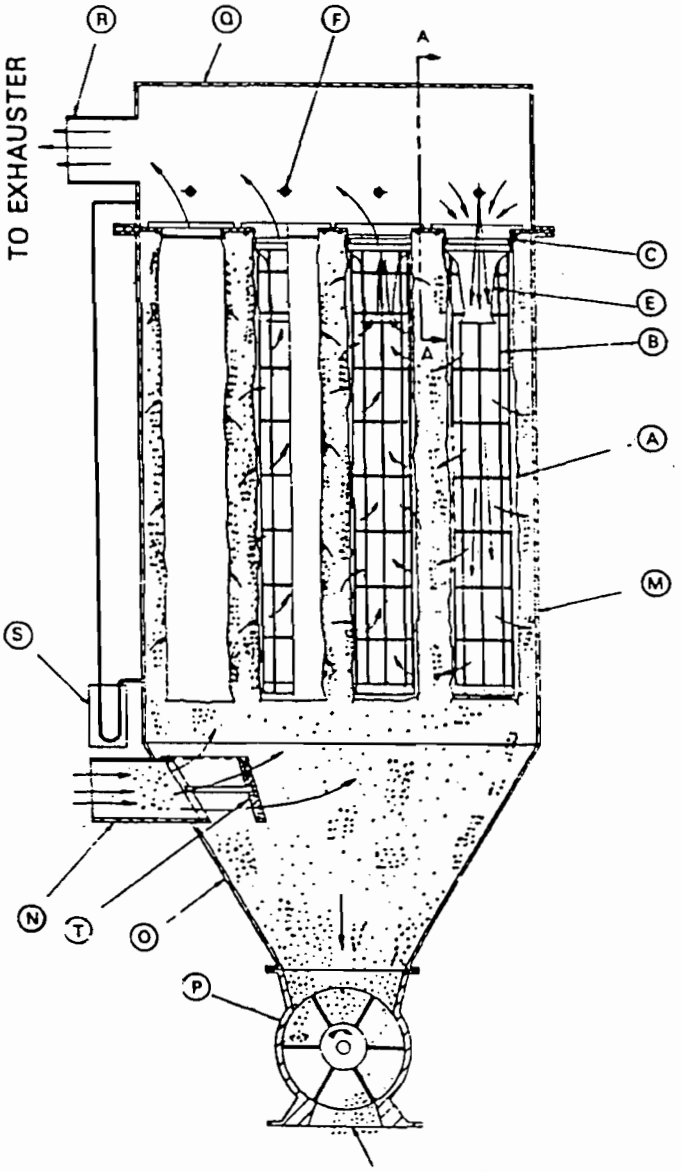
c. Tighten the nut on the coupling secure with a pipe wrench. The blowtubes may also be removed by reversing this sequence.



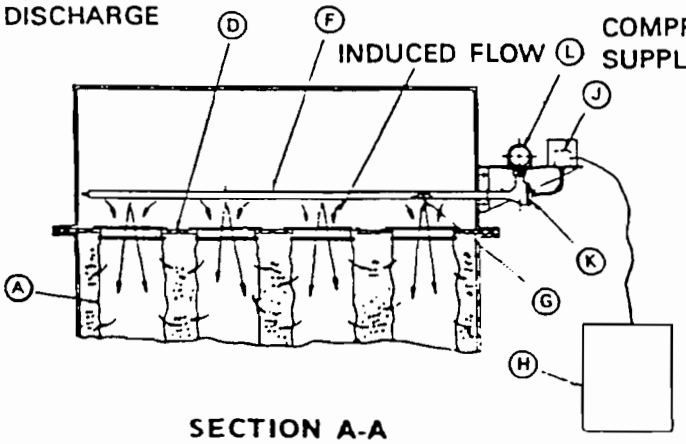
6. Diaphragm or Disc Type Explosion Vents

Install diaphragm or disc type explosion vents in accordance with figure 8.

Figure 9. Operational Components



A FILTER BAG
B RETAINER
C BAG CLAMP
D TUBE SHEET
E VENTURI
F BLOWTUBE
G ORIFICE
H TIMER, REMOTELY LOCATED
J SOLENOID VALVE IN WIRING TROUGH
K DIAPHRAGM VALVE
L COMPRESSED AIR MANIFOLD
M COLLECTOR HOUSING
N INLET
O HOPPER
P AIRLOCK
Q UPPER PLENUM
R EXHAUST
S MANOMETER
T DIFFUSER



SECTION A-A

SCHEMATIC OF MIKRO
PULSAIRE COLLECTOR

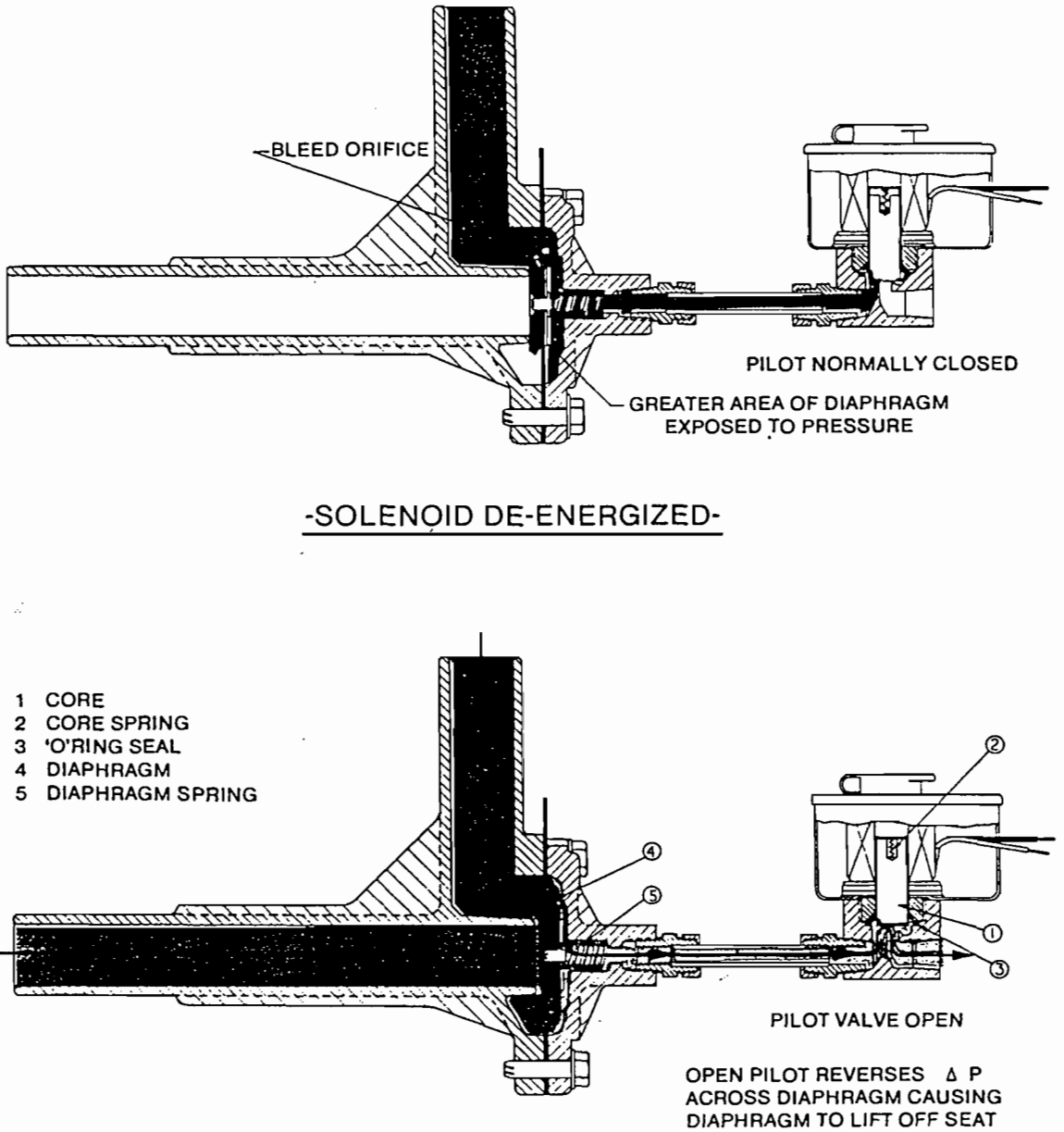


Figure 10. Diaphragm/Solenoid Valve Operation

IV. THEORY OF OPERATION

Dust laden air under suction or pressure enters the lower section of the collector (Figure 9). The air travels through the filter bags, which retain the dust particles, on up through the venturis, into the clean air plenum and out the collector exhaust.

Dust collects on the outside of the filter bags and causes a reduction in the porosity of the bags. The result is a pressure differential across the collector, a cyclic timer actuates a series of normally closed solenoid valves at present intervals causing them to open. The diaphragm valve opens as a result of the decrease in pressure from the opening of the solenoid (for detailed operation of the solenoid and diaphragm valves, see Figure 10). A momentary inrush of high pressure air (90-110PSIG) flows from the compressed air manifold to the blowtube and is expelled from the blowtube through orifices at a high velocity. Air from each orifice induces a secondary airflow several times the volume of surge air as it passes through the venturi throat. The combined effect of the primary and induced secondary air causes an instantaneous pressure rise on the clean side of the filter bags, causing a reverse flow of air through the filter bags sufficent for cleaning. Through this mechanism, the collected dust is released from the bags and falls into the hopper. As dust falls into the hopper, it is discharged into a collection system which may be a bin under the hopper or a conveying system which carries the dust to a remote disposal area.

Since only a fraction of the total filter area of the collector is cleaned at any one instant, continuous flow through the collector at rated capacities is assured.

V. START-UP

A. Checklist

Perform a pre-start check to ascertain that the collector will function properly. Refer to Section VII, Maintenance Procedures, for specific instructions on performing adjustments which may be required.

1. Compressed Air System

Check the compressed air system for leaks. Insure that 90-110 psig pressure is available at the collector. Open main air valve momentarily and verify that there are no leaks in the solenoid and diaphragm valves.

WARNING: Turn off the compressed air and bleed the valve system before attempting to adjust or service valves.

NOTE: Air lines must be clean and free of moisture.

2. Timer Circuit

Check line voltage to the timing circuit. It must be 110 volts plus or minus 10%. Check electrical connections. Refer to the timer Owner's Manual and adjust as instructed. Apply power to the timer. Check that timer is operating by listening for clicking in each of the solenoid valves connected to the timer. Remove power from the timer.

3. Auxiliary Equipment

Insure that all auxiliary equipment (fans, airlocks, conveyors, etc.) are performing correctly and rotating in the correct directions.

B. Start-Up Procedures

1. Spray Dryer or Process Equipment

Initial adjustments must be made on the system before installing bags in the collector. An incorrectly functioning dryer or other process equipment may result in destruction of the bags if temperature or moisture is not in control. When used with drying equipment, preheat the collector for 30 minutes to 1 hour before start-up with material to eliminate the danger of condensation in the collector.

2. Start-Up with New Filter Bags

Close inlet or exhaust dampers approximately 50% before attempting to start up with new filter bags. High speed impingement, due to low resistance to air flow, can cause dust penetration of the filter bags. This will be particularly true when the air stream carries materials which tend to "blind" the bags. Open the inlet damper to design flow only after the filter bags have built up resistance (3 to 4 inches w.g. on the manometer). The timer controlling the compressed air pulsing should not be turned on until the differential pressure has reached 4 to 5 in. w.g., unless unattainable or if operating conditions will not permit this pressure drop.

3. *Normal Start-Up (with seasoned bags)*

Apply power to all auxiliary equipment (except fan). Energize timer and turn on compressed air. Introduce gases to the collector by opening dampers and starting fans.

CAUTION: Low collector resistance may overload the fan.

4. *Differential Pressure Control*

The expected differential pressure operating range is 1 to 6 inches w.g. If this tolerance cannot be maintained, adjust the cleaning cycle on the timer.

a. To reduce differential pressure, adjust time delay so that cleaning pulses occur at a more frequent rate (shorter OFF time).

b. To increase differential pressure that is on the low side, adjust time delay so that cleaning pulses occur at a less frequent rate (longer OFF time).

VI. SAFETY

IMPORTANT: Prior to operating this equipment, read this list of safety recommendations through in its entirety, along with the Operating Instructions.

A. During baghouse erection, objects lifted by crane or hoist must be securely fastened and carefully handled to prevent injury to personnel. If lifting lugs are available they should be used according to sound engineering practice. When overhead work is being performed, all areas below the collector must be restricted for unauthorized personnel. Personnel in the area must wear safety gear complying with plant safety standards.

B. Work crews should always consist of two or more persons. Never allow personnel to work inside the collector alone. After work has been completed, all tools should be removed from within the baghouse and ALL PERSONNEL MUST BE ACCOUNTED FOR PRIOR TO CLOSING THE UNIT AND STARTING UP.

C. Before entering the plenum of a MikroPulsaire, switch off the power to the exhaust fan (blower), screw conveyor (where applicable), airlock, timer and other related equipment. A means of locking these switches in the "off" position should be made, and the key to the lock(s) should be with one of the personnel entering the unit. The compressed air should also be off and a suitable respirator and eye protection worn. Purge system of all gases and vapors other than air. Be certain gas flow has ceased and temperatures are at a safe level.

D. When installing or removing filter bags within the plenum, do not walk on the blowtubes and exercise care to avoid tripping.

E. The compressed air manifold assembly is designed to safely handle up to 125 psig compressed air. Precautions should be taken to see that this maximum pressure is not exceeded.

F. Use caution when wiring the pilot valves or timer to avoid shock. The power should always be off when this is done.

G. Whenever adjusting either the on-time or off-time of the timer, be very careful not to touch any components on the timer that are electrically "hot". The potentiometers are easily adjusted by hand and a screwdriver should not be used.

H. If frequent access to the unit is required, a sturdy external catwalk assembly should be installed, along with handrailings, ladder and safety cage. If the unit is a top-removal style, then handrailing should be installed around the perimeter of the plenum roof area.

I. Whenever servicing or adjusting the pilot valves or diaphragm valves, be certain that the compressed air has been turned off and the system thoroughly bled to atmospheric pressure.

J. If the material being collected by the MikroPulsaire is explosive (by nature) or can become explosive under conditions that may exist in the unit, explosion-venting protection should be installed. Depending on the severity of the condition, fire and explosion suppression equipment may also have to be installed to afford safe operation of the baghouse system.

K. As an additional safety precaution to avoid dust explosions, filter bags with ground straps or conductive bags can be employed. At the same time, all sections of the baghouse and accessory equipment should be effectively grounded.

L. When explosion-vents are used on MikroPulsaires located inside a building, the vent areas should be ducted to the outside of the building. This will provide safety for passers-by and will not permit any burning dust or bag material to be scattered inside the building.

M. If the cleaned exhaust from the MikroPulsaire is to be recycled back into the building for heat recovery or makeup air, provisions must be made to bypass the return flow outside the building should a filter bag develop a hole or some other problem. A back-up filter should also be used when the exhaust air is recycled to work areas. This will protect personnel in the plant from inhaling the dust in the event of a baghouse problem.

N. The fan discharge from the MikroPulsaire collector should be directed to an area away from pedestrian traffic in the event of a bag failure.

O. When dust or product is present in the baghouse or related equipment connected to the baghouse, no welding or other spark producing operation (e.g., grinding, drilling) should be performed on the equipment until the system is shut down and thoroughly cleaned of the dust or product. If welding is to be performed in the area of the filter bags, the bags should first be removed and stored in a dry, remote location.

VII. MAINTENANCE

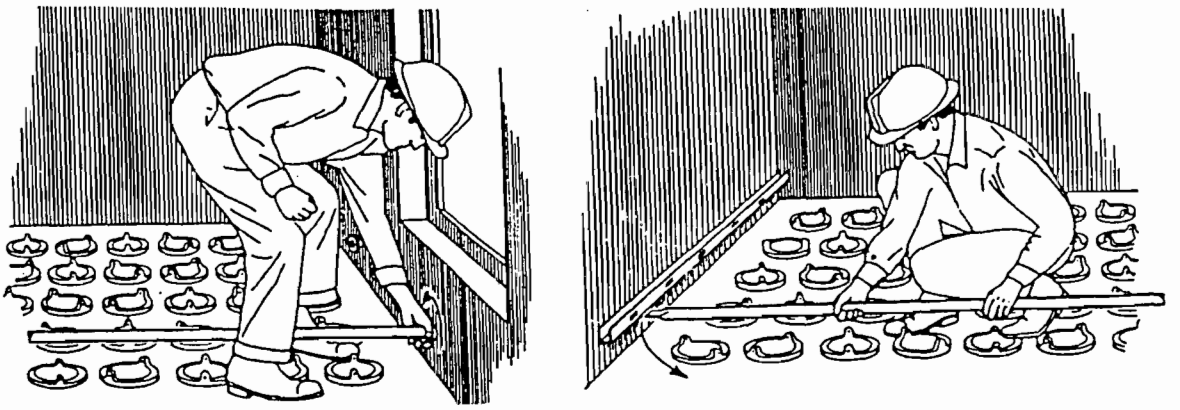
A. General

A sound preventive maintenance program will eliminate most breakdown situations and insure long life from the collector. The tables in this section provide recommended maintenance and troubleshooting procedures. Recommended time periods may be changed as a result of experience or unusual operating conditions as determined after a reasonable period of operation.

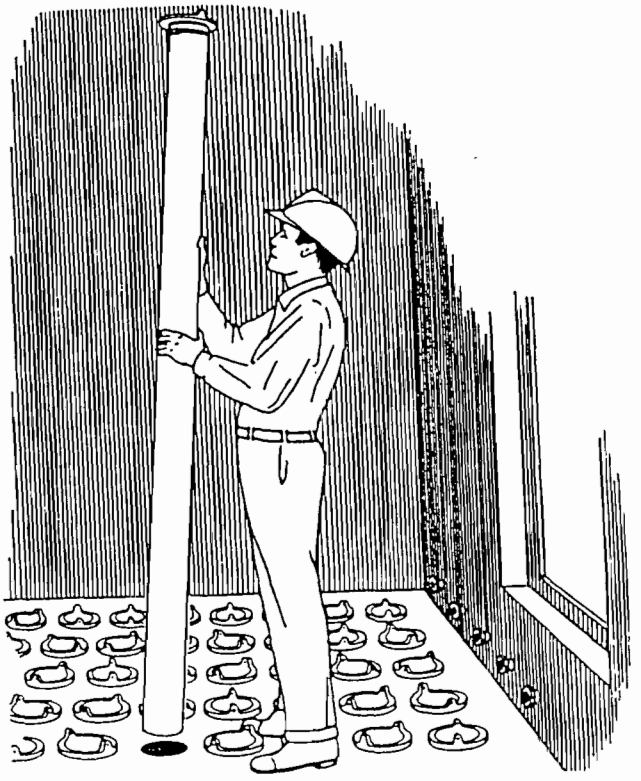
B. Maintenance Procedures

1. Bag Replacement

a. Loosen the coupling nut and remove the corresponding blowtube.



b. Remove all filter bags from the row and strip the old bags from the retainers.



NOTE: If only a few filter bags are damaged, as a result of puncture or other mechanical source, replace only those damaged bags.

c. It is generally desirable to replace the venturi gasket whenever replacing the filter bag.

d. Slip a new bag over the retainer with the seam located 180° from the slot in the retainer collar (figure 3) and pull up tight.

NOTE: The bottom of the bag must be snug against the bottom of the retainer.

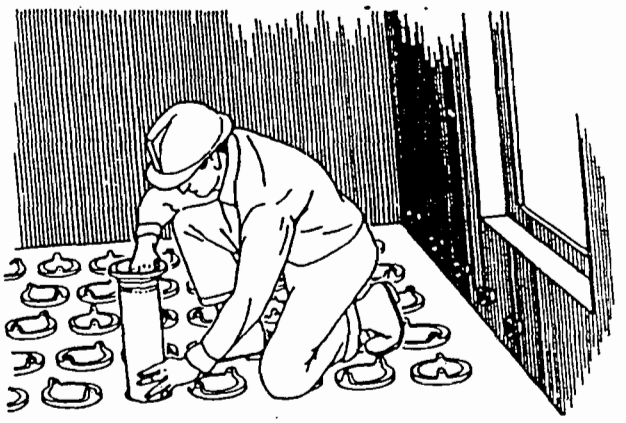
e. Fold the top of the bag into the retainer (figure 4) and install a bag clamp loosely.

f. Install the venturi gasket in place on the venturi.

g. Install the bag/retainer assembly over the venturi collar (figure 5), making sure the retainer groove is aligned with the collar groove.

h. Tighten the clamp firmly using as much hand torque as possible, preferably using a 5/16" socket wrench (50-60 in-lbs. torque).

i. Replace the bag/retainer/venturi assembly into the tubesheet, locking it in place with a strong clockwise twist.



j. Properly installed bag assemblies should hang straight and bags should not touch each other or the walls of the collector.

k. Replace blowtube and tighten the coupling.

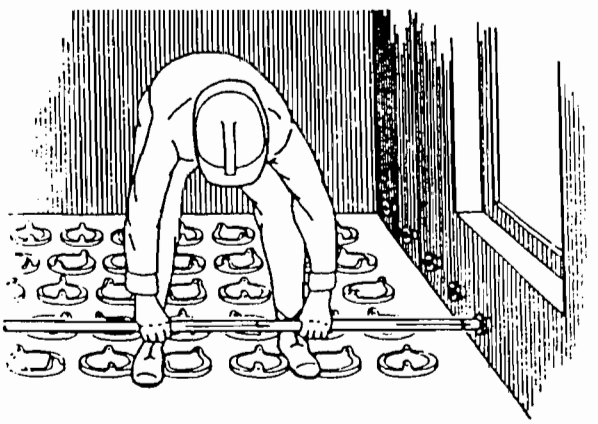


TABLE II. MAINTENANCE SCHEDULE

INSPECTION FREQUENCY	COMPONENT	PROCEDURE
Daily	Collector	*Check exhaust for visible dust; refer to troubleshooting.
	Compressed Air System	*Check for air leakage (low pressure); repair as necessary. Check valves.
	Manometer	*Check and record reading; if out of limits, refer to troubleshooting. Watch for a trend.
Weekly	Filter Bags	*Check for tears, holes, proper fastening; repair or replace as necessary.
	Hopper	*Check for bridging or plugging; clean out.
Annually	Collector	*Inspect thoroughly, clean, touch up paint where necessary.

2. Bag Cleaning

NOTE: The cost involved in removing, cleaning and replacing bags may be greater than for installing new bags, considering labor expenses. If cleaning is performed, it should be done locally.

a. Vacuum clean each bag prior to cleaning.

b. Clean bags in the manner noted in Table III.

CAUTION: Any shrinkage will make bags unfit for use, as will swelling of the felt fabric.

3. Emergency Operation

When new bags are not immediately available and unit operation is necessary, press a venturi stopper, part number 25198, into the venturi to remove the damaged bag from service until it can be replaced. This should only be done on a temporary basis since it alters the air-to-cloth ratio.

4. Solenoid Valve Repair

WARNING: High pressure air supply must be shut off and timer de-energized before attempting to service valves.

a. Disconnect air line between solenoid valve and diaphragm valve.

TABLE III. BAG CLEANING INSTRUCTIONS

MATERIAL	PROCESS	REMARKS
Wool	Dryclean	Use pure cleaning solvent - drycleaning detergents and additives using water will cause shrinkage — hang in drying rooms — do not tumble dry.
Cotton	Dryclean	Same as for wool
Synthetic Fabrics	Launder or Dryclean	Wash in cool or warm water (140° F. max.) using mild soap or clean in Stoddard solvent — hang in drying room.

b. Remove Red Cap from solenoid valve. Remove valve body from coil assembly.

c. Using tool supplied with replacement kits, carefully remove core assembly from valve body.

d. Remove core, spring and "O" ring from core assembly.

e. Carefully clean out core cylinder and valve body with a dry, lint-free cloth.

f. Replace core, spring and "O" ring with components supplied in replacement kit.

g. Reassamble core assembly to valve body.

h. Install the valve body stem through the solenoid coil, retaining it in place with Red Cap.

i. Reconnect air line and test operation of solenoid valve. If still a problem, entire valve should be replaced.

5. Diaphragm Valve Repair

WARNING: High pressure air supply must be shut off and timer de-energized before attempting to service valves.

a. Disconnect air line between diaphragm valve and solenoid valve.

b. Remove cap screws holding valve body and bonnet together.

c. Lift bonnet from body.

d. Replace diaphragm and spring.

e. Reassemble valve and connect air line. Check operation of valve. If still a problem, entire valve will probably have to be replaced.

6- Manometer

During operation, the manometer should usually indicate a value between 1 and 6 inches pressure differential. If the differential is 0 or over 7 inches with the collector in operation, the following conditions should be checked and repaired as necessary:

a. Check manometer tubing for blockage and verify that manometer contains oil of proper specific gravity.

b. Check manometer filter in coupling on housing for blockage. Replace if necessary.

c. Check flow of gas through collector.

d. Shut down collector and check hopper for material accumulation. If hopper is full of material, remove the material through hopper door or through discharge opening.

7- Exhaust

Continuous emissions of smoke or dust is an indication of bag problems.

a. Check filter bags to insure they are securely and properly attached to the tubesheet.

b. Check filter bags for rips, tears, or holes along entire length.

Caution: Damaged bags should be replaced immediately as they will damage other bags and may cause damage to fan bearings due to internal loading.

C. Troubleshooting

Perform troubleshooting of the collector in accordance with Table IV.

TABLE IV. TROUBLESHOOTING

TROUBLE	CAUSE	REMEDY
Visible dust from outlet	a. Bags improperly installed	*Check bag installation; repair as necessary
	b. Bag clamps too loose	*Tighten bag clamps
	c. Torn or damaged bags	*Replace damaged bags
	d. Leakage at tube sheet level	*Check tube sheet joints; repair as necessary
	e. Venturi fasteners loose or missing	*Repair as necessary
Bag filtering action rapidly impaired	a. Inadequate cleaning air supply	*Check air supply; correct to between 90 and 100 psig
	b. Improper solenoid valve operation	*Check solenoid valves; steady rush of air indicates open valve; no air pulse indicates plugged valve; repair as necessary.
	c. Defective timer	*Replace timer mechanism
	d. Excessive moisture entering collector and blinding bags	*Check collector for excessive moisture; minor wetting is corrected by closing dampers and running cleaning mechanism (if not corrected in 24 to 30 hours, replace bags); correct moisture level in air stream
	e. Incorrect gas flow (too high or too low)	*Check fan rotation, fan speed, damper position, outlet CFM; correct as necessary to obtain specified gas flow

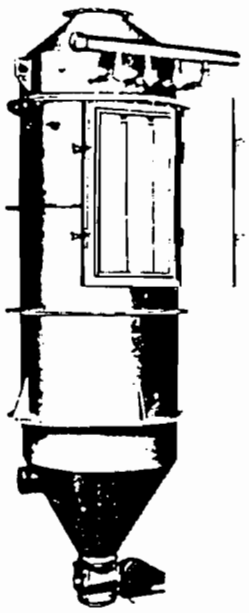
TABLE IV. TROUBLESHOOTING [Cont]

TROUBLE	CAUSE	REMEDY
High manometer pressure drop (above 8 in. W.G.) (cont)	h. Dust in clean air plenum	*Clean plenum; check bags for dirt on clean air side; clean or replace bags.
	i. Static electricity in collector	*Increase relative humidity in collector
Gas flow through system below design rating	a. Incorrect fan rotation	*Check fan rotation; correct if wrong
	b. High differential pressure drop	*Refer to high manometer pressure drop trouble immediately above
	c. Fan belts slipping	*Check tension on fan belts; adjust if necessary
	d. Air leakage in gas system	*Check doors, plenum, manifolds, duct work; repair leaks
	e. Leakage in dust collection system	*Check hopper, discharge device, leakage at discharge; repair as necessary
	f. Blocked gas system	*Check bags for blinding, obstruction in duct passages, closed damper; clean or repair as necessary
Pressure of cleaning air keeps falling off	a. Faulty or undersized compressor	*Check compressor manual
	b. Leakage in main air line	*Locate and repair leak
	c. Solenoid or Diaphragm valve sticking open	*Examine the valve; clean; repair as necessary

TABLE IV. TROUBLESHOOTING [Cont]

TROUBLE	CAUSE	REMEDY
Filter bags deteriorate rapidly	a. High Collector temperature	*Check reason for high temperature; correct if possible.
		*Check temperature rating of bag material (Table I); replace bags if not within range of collector temperature.
	b. Chemical composition of gas stream incompatible with bag material	*Check composition of gases; if incompatible with bag material, replace with bags of compatible material.
	c. Shrinkage in filter bags	*Replace shrunken bags.
	d. Hopper bridging	*Locate cause of bridging and correct; clean out hopper.
	e. Incorrect bag installlation	*Check for physical contact with collector wall or other bags; check tightness of clamp; correct as necessary.
	f. Abrasion by impingement of high velocity particles	*Check for impingement; it evident, experiment with diffuser in gas steam.

Need Service? — Call the MikroPul Experts!



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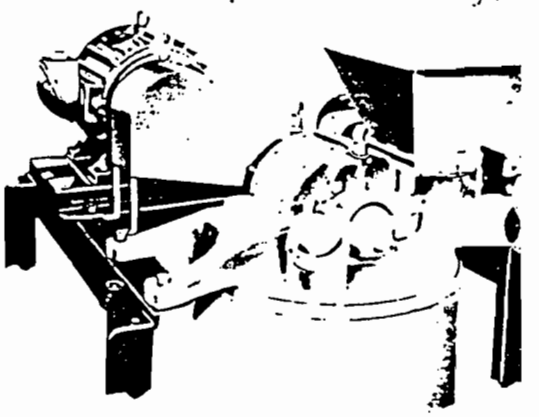

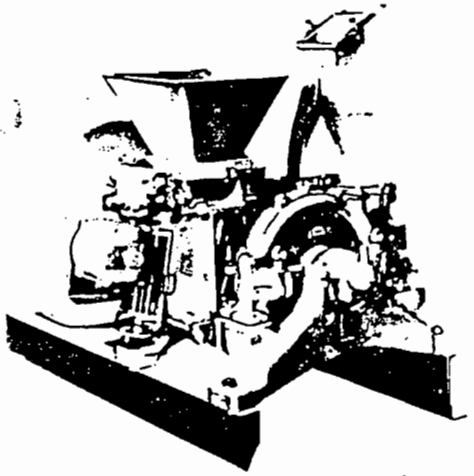

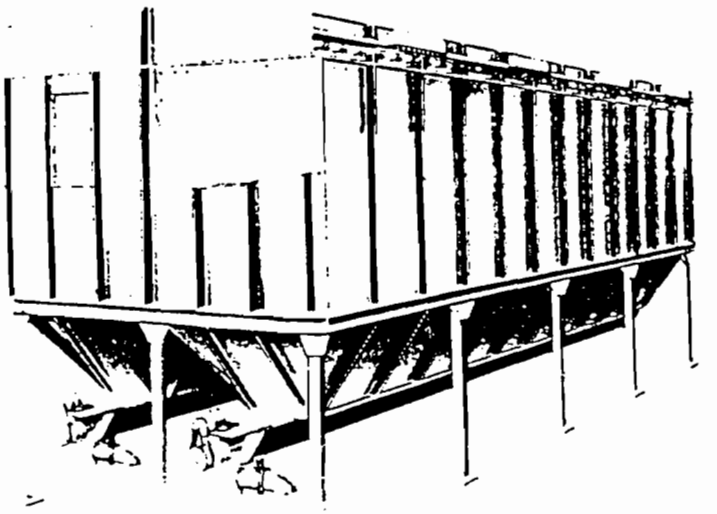

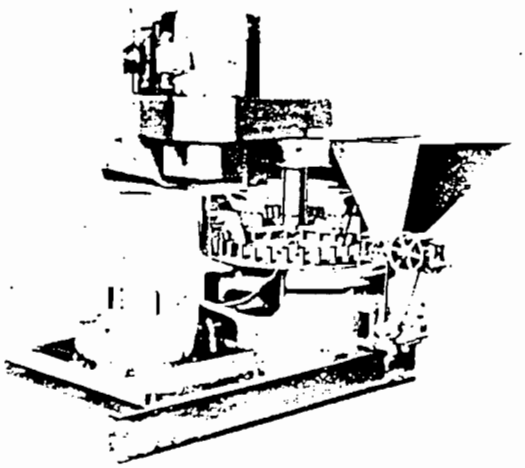

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MIKRO-PRODUCTS

ATTACHMENT 3

AIR QUALITY IMPACT ASSESSMENT

ATTACHMENT 3

AIR QUALITY IMPACT ANALYSES FOR THE PROPOSED FALLING FILM EVAPORATOR AND SPRAY DRYER FOR THE CENTRAL FLORIDA COGENERATION PLANT

1.0 INTRODUCTION

KBN Engineering and Applied Sciences, Inc. (KBN), has performed air quality impact analyses to determine the maximum concentrations for the operation of the combustion turbine (CT) and duct burner (DB), and a wastewater spray dryer and evaporator unit for the integrated cogeneration facility proposed by Central Florida Power Limited Partnership. Air quality impacts [i.e., emissions from the heat recovery steam generator (HRSG) stack] have been identified for the facility, which is referred to as the Central Florida Cogeneration Plant, as part of the air construction permit application (AC53-214903, PSD-FL-190). The spray drying equipment includes two falling film evaporators, a spray dryer, and a baghouse. The spray dryer will be fired with natural gas with an estimated heat input rate of 1.35 and 3.066 million British thermal units per hour (MMBtu/hr) for average and design operating conditions, respectively. The modeling analyses take into account the exhaust through the HRSG unit (which includes emissions from the CT and DB) and the evaporator and spray dryer (which are vented through a separate stack). The results presented in the present analysis supplement the previous analyses and address total impacts from both stacks (i.e., HRSG and spray dryer). These results are compared to the prevention of significant deterioration (PSD) Class I and Class II significance levels to determine whether additional analyses (i.e., analyses that were not performed for the original permit application) would be required due to the additional emissions from the spray dryer stack. Impacts are also compared to the concentrations predicted for the HRSG stack only.

The following sections present the approaches, methods, and results of the air quality impact analyses.

2.0 EMISSION DATA AND AIR QUALITY IMPACT METHODS

An air quality modeling analysis was performed to determine the maximum pollutant concentrations, including the regulated pollutants of particulate matter (PM), particulate matter

with an aerodynamic diameter of 10 micrometers (PM10), nitrogen dioxide (NO_2), and carbon monoxide (CO) from the operation of the CT, DB, and spray dryer/evaporator. Concentrations were calculated with the Industrial Source Complex Short-Term 2 (ISCST2) model using the emissions from the proposed combustion turbine for the maximum emission case [i.e., 27 degrees Fahrenheit (°F)] and minimum exit gas flow rate (i.e., 97°F) for two operating loads (i.e., 70 and 100 percent). For the CT, emission data for fuel oil were used for all short-term emissions rates, while annual emission rates were based on burning distillate oil and natural gas for 300 and 8,460 hours, respectively. For the duct burner and spray dryer/evaporator, emission rates were based on natural gas use only. The design information, stack parameters, and emissions for the spray dryer/evaporator are presented below. The design information, stack parameters, and emissions for the CT and duct burner were presented in the original permit application. Spray dryer/evaporator emissions were modeled for the design operating conditions based on an operation time of 8,760 hours per year. This is a conservative estimate of concentrations because the spray dryer is expected to operate at design condition for 200 hours or less in a year. The following data were used in the modeling analysis:

- Stack height = 73.0 feet (ft),
- Stack diameter = 1.3 ft,
- Exit velocity = 63.4 feet per second (ft/s),
- Exit temperature = 340°F,
- PM emissions = 0.021 pound per hour (lb/hr) = 0.092 ton per year (ton/yr),
- CO emissions = 0.061 lb/hr = 0.28 ton/yr, and
- NO_2 emissions = 0.322 lb/hr = 1.4 ton/yr.

Because the proposed spray dryer stack will be less than Good Engineering Practice (GEP) height, the potential for downwash effects on the spray dryer stack from other building structures were included in the modeling analysis. A summary of building structures that potentially influence the spray dryer stack is presented in Table 1.

As presented in the original construction permit application, the maximum emissions of two CT types (i.e. General Electric (GE) and Westinghouse) were considered for the modeling analysis for each load and temperature scenario. Because the GE CT has now been selected for this

project, only the GE emissions were considered in the present analysis. A summary of emissions used in the previous and present modeling analysis is presented in Table 2.

The impacts were predicted using the ISCST2 model using the same methodology presented in the construction permit application. These include:

1. Five-year meteorological record collected from 1982 through 1986 of surface and mixing height data from the National Weather Service (NWS) stations in Tampa and Ruskin, respectively;
2. Building downwash effects for the HRSG stack; and
3. A general receptor grid consisting of 36 radials spaced at 10-degree increments at the plant property and at distances of 300, 500, 700, 1,000, 1,500, 2,000, 3,000, 4,000, and 5,000 meters (m) from the HRSG stack.

Because the ISCST2 model is unable to calculate a concentration within the cavity region of a building, selected plant property receptor locations were adjusted outward from the spray dryer stack to a distance where a concentration could be predicted by the model. Additional near-field receptors were placed beyond the plant boundary in the vicinity of the spray dryer stack to capture maximum impacts. The plant property and near-field receptors used in the analysis are presented in Table 3.

3.0 MODEL RESULTS

Maximum screening and refined impacts predicted for the proposed facility with the CT/DB and spray dryer/evaporator in operation are presented in Table 4. These results are presented for the CT/DB operating at two load and temperature conditions and are based on the highest impacts from the 5-year meteorological record. For comparison purposes, impacts for the CT/DB only, as presented in the original permit application, are also included. These results indicate that, except for NO_2 and annual PM/PM10 impacts, there is a decrease in predicted impacts with the additional emissions from the spray dryer/evaporator compared to the impacts from stack emissions of the CT/DB alone. This decrease is a result of only considering GE CT emissions rather than the highest of either the GE or Westinghouse as presented in the original permit application.

For NO_2 and PM/PM10, there is a slight increase in predicted annual average impacts due to the operation of the spray dryer/evaporator unit. However, for all pollutants, the maximum concentrations are predicted to be less than PSD Class II significance levels. Therefore, additional modeling analyses with other sources are not warranted.

Maximum predicted PM/PM10 and NO_2 concentrations at the Chassahowitzka National Wildlife Refuge (NWR) due to the CT/DB and spray dryer/evaporator are presented in Table 5. Impacts are expected to be approximately equal to or less than the impacts presented in the original permit application due to the CT/DB alone. All predicted impacts are less than the National Park Service (NPS) suggested Class I significance values. Therefore, additional Class I modeling analyses with other sources are not warranted.

4.0 CONCLUSIONS

With the addition of the spray dryer/evaporator unit, the proposed facility's impacts are expected to be less than the allowable PSD Class II and suggested PSD Class I significance levels. Therefore, no additional modeling analyses with other sources are needed.

Table 1. Building Structures That Potentially Influence the Spray Dryer Stack for Use in the Building Downwash Analysis

DTEVTAB1
04/27/93

Wind Direction Radials (degrees)	Influencing Building Structure(s)	Building Height (m)	Building Width (m)
10	Cooling Tower	15.24	35.89
20	Cooling Tower	15.24	38.08
30	HRSG Building	24.38	18.45
40	HRSG Building	24.38	18.96
50	HRSG Building	24.38	19.01
60	Gas Turbine	19.51	25.73
70	Gas Turbine	19.51	25.93
80	Gas Turbine	19.51	25.88
90	Gas Turbine	19.51	25.29
100	Gas Turbine	19.51	25.63
110	Spray Dryer/Baghouse	12.19	8.38
120	Spray Dryer/Baghouse	12.19	9.61
130	Spray Dryer/Baghouse	12.19	10.56
140	Spray Dryer/Baghouse	12.19	11.18
150	Spray Dryer/Baghouse	12.19	11.47
160	Spray Dryer/Baghouse	12.19	11.48
170	Spray Dryer/Baghouse	12.19	11.38
180	Spray Dryer/Baghouse	12.19	11.04
190	Spray Dryer/Baghouse	12.19	11.56
200	Spray Dryer/Baghouse	12.19	11.72
210	Spray Dryer/Baghouse	12.19	11.72
220	Spray Dryer/Baghouse	12.19	11.49
230	Spray Dryer/Baghouse	12.19	10.92
240	Spray Dryer/Baghouse	12.19	10.01
250	Spray Dryer/Baghouse	12.19	8.79
260	Spray Dryer/Baghouse	12.19	7.31
270	Spray Dryer/Baghouse	12.19	6.27
280	Spray Dryer/Baghouse	12.19	7.09
290	Spray Dryer/Baghouse	12.19	8.38
300	Spray Dryer/Baghouse	12.19	9.61
310	Spray Dryer/Baghouse	12.19	10.56
320	Spray Dryer/Baghouse	12.19	11.18
330	Spray Dryer/Baghouse	12.19	11.47
340	Cooling Tower	15.24	42.31
350	Cooling Tower	15.24	34.78
360	Cooling Tower	15.24	24.36

Note: Downwash parameters developed using the BREEZEWAKE program.

Table 2. Summary of Emission Rates Used in the Air Dispersion Modeling for the HRSG and Spray Dryer/Evaporator Unit DTEVTAB2 05/03/93

Pollutant	Units	CT/DB - Original Submittal^a				CT/DB - Permit Conditions^b				Spray Dryer/ Evaporator Unit^c
		100% Load		70% Load		100% Load		70% Load		
		27°F	97°F	27°F	97°F	27°F	97°F	27°F	97°F	
Particulate Matter (PM)	lb/hr	41.4	37.7	35.2	30.2	18.0	18.0	18.0	18.0	0.021
	TPY	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	0.092
Nitrogen Dioxide (NO2)	TPY	802.5	655.2	629.8	528.4	777.5	655.2	623.3	528.4	1.4
Carbon Monoxide (CO)	lb/hr	174.0	157.0	152.0	131.0	108.4	93.2	84.3	75.6	0.061

a As presented in the original PSD permit application. Emissions modeled were based on the highest emission rate from the GE or Westinghouse gas turbines. Stack velocity and temperature based on GE design information. Short-term rates are based on burning distillate oil in the gas turbine and natural gas in the duct burner. Annual emission rates are based on burning distillate oil and natural gas for 300 and 8,460 hours, respectively, in the gas turbine and natural gas for 8,760 hours in the duct burner.

b All emissions and stack operating parameters based on the GE gas turbine since this unit has been selected for the project.

^c Emissions based on design operating conditions and 8,760 hours of operation per year. Emission rates based on vendor's guarantee.

Table 3. Summary of Plant Boundary and Near-Field Receptors Used in the Modeling Analysis

DTEVTAB3
4/27/93

Receptor Location		Receptor Location	
Direction (degrees)	Distance (meters)	Direction (degrees)	Distance (meters)
10	149	190	69/100
20	125	200	71/100
30	124/150/200/250	210	84/100
40	141/150/200/250	220	86/100
50	140/150/200/250	230	86/100
60	132/150/200/250	240	83/100
70	77/100	250	80/100
80	76/100	260	74/100
90	76/100	270	74/100
100	77/100	280	72/100
110	79/100	290	69/100
120	85/100	300	65/100
130	94/100	310	59/100
140	84/100	320	51/100
150	81/100	330	43/100
160	77/100	340	59/100
170	69/100	350	100
180	69/100	360	184

Note: For radial directions 30 to 60 degrees and 200 to 320 degrees, the first distance represents the closest distance that the ISCST2 model can calculate a concentration (i.e., 3 building heights) due to the extent of the building cavity region.

Table 4. Summary of Screening and Refined Air Modeling Impacts for the CT/DB and Spray Dryer/Evaporator Unit

DTEVTAB4
05/03/93

CT Operating Load (percent)	Ambient Temperature (°F)	Pollutant	Averaging Period	Highest Concentration (μg/m³) CT/DB Only^a	Highest Concentration (μg/m³) CT/DB + SD/Evap^b	Significant Impact Level (μg/m³)
SCREENING IMPACTS						
100	27	PM	24-Hour	0.63	0.28	5
			Annual	0.015	0.015	1
		NO2	Annual	0.26	0.26	1
		CO	1-Hour	25.8	16.9	2000
			8-Hour	6.38	3.97	500
100	97	PM	24-Hour	0.88	0.49	5
			Annual	0.017	0.018	1
		NO2	Annual	0.25	0.26	1
		CO	1-Hour	29.8	18.0	2000
			8-Hour	10.5	5.61	500
70	27	PM	24-Hour	1.59	0.86	5
			Annual	0.020	0.021	1
		NO2	Annual	0.29	0.29	1
		CO	1-Hour	34.3	19.3	2000
			8-Hour	19.5	7.94	500
70	97	PM	24-Hour	1.94	1.31	5
			Annual	0.022	0.023	1
		NO2	Annual	0.26	0.27	1
		CO	1-Hour	33.0	19.3	2000
			8-Hour	19.4	8.22	500
REFINED IMPACTS						
70	97	PM	24-Hour	2.12	1.31	5
			Annual	0.022	0.023	1
70	27	NO2	Annual	0.29	0.29	1
70	27/97^c	CO	1-Hour	45.8	20.4	2000
			8-Hour	20.8	12.2	500

^a As presented in the original PSD permit application. Emissions modeled were based on the highest emission rate from the GE or Westinghouse gas turbines. Stack velocity and temperature based on GE design information. Short-term rates are based on burning distillate oil in the gas turbine and natural gas in the duct burner. Annual emission rates are based on burning distillate oil and natural gas for 300 and 8,460 hours, respectively, in the gas turbine and natural gas for 8,760 hours in the duct burner.

^b Based on GE gas turbine emission rates and the spray dryer/evaporator operating at design conditions for 8,760 hours per year.

^c For CT/DB only impacts, maximum concentrations were predicted for the 27°F case. For CT/DB and spray dryer/evaporator total impacts, maximum concentrations were predicted for the 97°F case.

Table 5. Summary of Maximum Predicted PM and NO2 Concentrations Due to the CT/DB and Spray Dryer/Evaporator Unit at the Chassahowitzka NWA

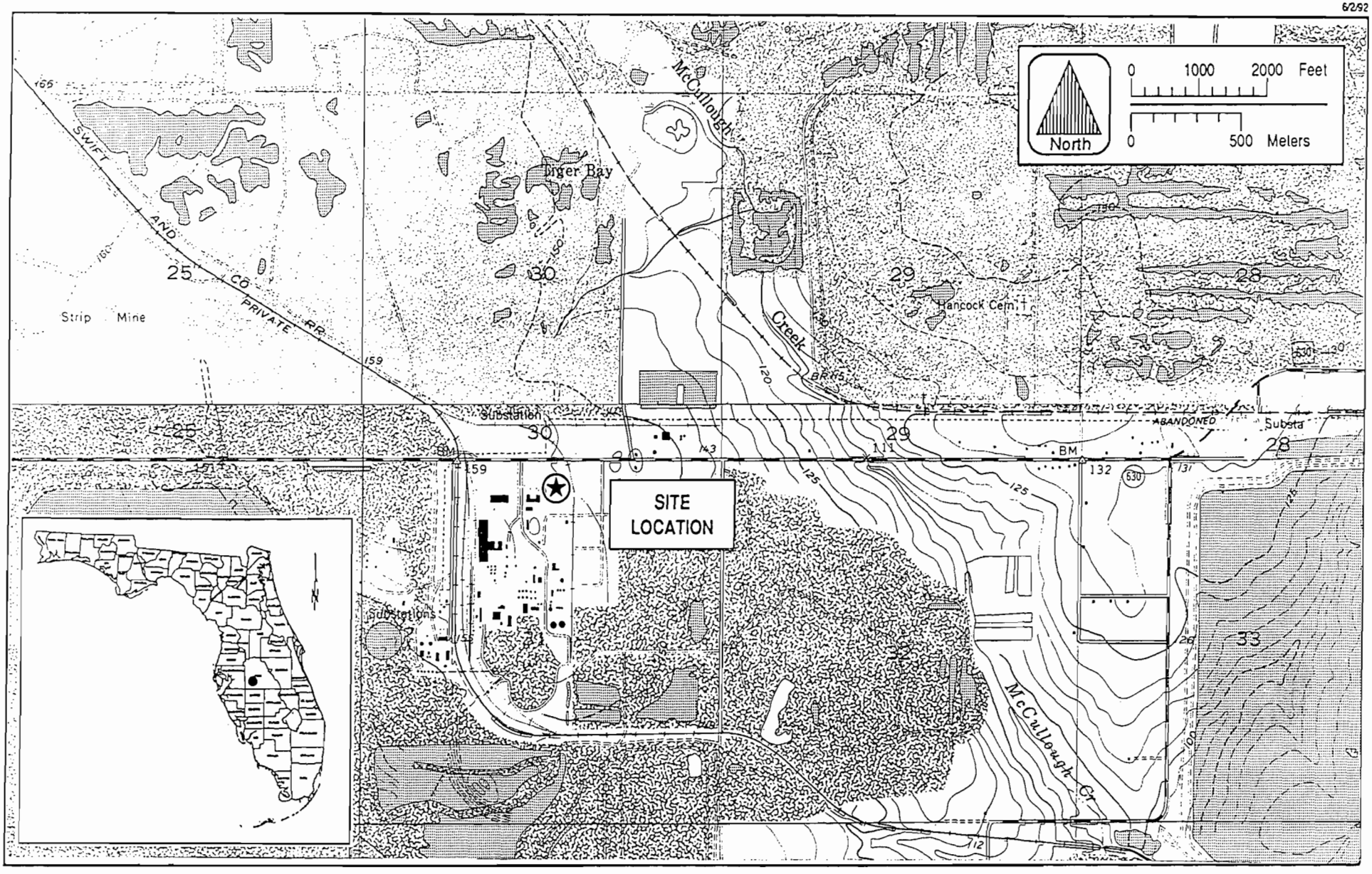
DTEVTAB5
04/27/93

CT Operating Load (percent)	Ambient Temperature (°F)	Pollutant	Averaging Period	Highest Concentration (µg/m³) CT/DB Only^a	Highest Concentration (µg/m³) CT/DB + SD/Evap^b	NPS Recommended Significance Level (µg/m³)
100	27	PM	24-Hour	0.046	0.020	0.33
			Annual	0.0008	0.00077	0.1
		NO2	Annual	0.014	0.013	0.024
100	97	PM	24-Hour	0.043	0.020	0.33
			Annual	0.0008	0.00079	0.1
		NO2	Annual	0.011	0.012	0.024
70	27	PM	24-Hour	0.041	0.021	0.33
			Annual	0.0008	0.00083	0.1
		NO2	Annual	0.011	0.011	0.024
70	97	PM	24-Hour	0.036	0.021	0.33
			Annual	0.0008	0.00084	0.1
		NO2	Annual	0.010	0.0099	0.024

^a As presented in the original PSD permit application. Emissions modeled were based on the highest emission rate from the GE or Westinghouse gas turbines. Stack velocity and temperature based on GE design information. Short-term rates are based on burning distillate oil in the gas turbine and natural gas in the duct burner. Annual emission rates are based on burning distillate oil and natural gas for 300 and 8,460 hours, respectively, in the gas turbine and natural gas for 8,760 hours in the duct burner.

^b Based on GE gas turbine emission rates and the spray dryer/evaporator operating at design conditions for 8,760 hours per year.

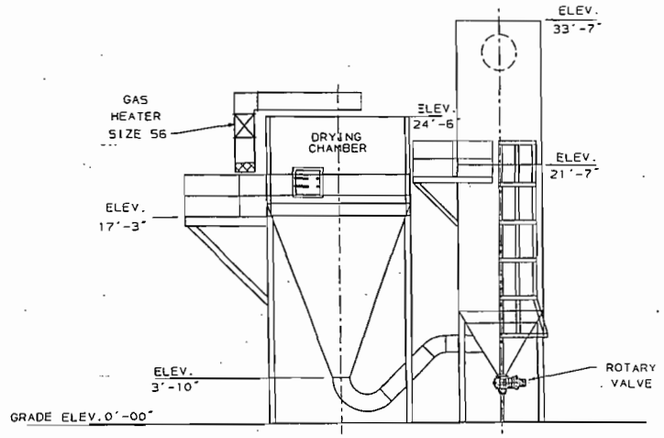
6/2/92

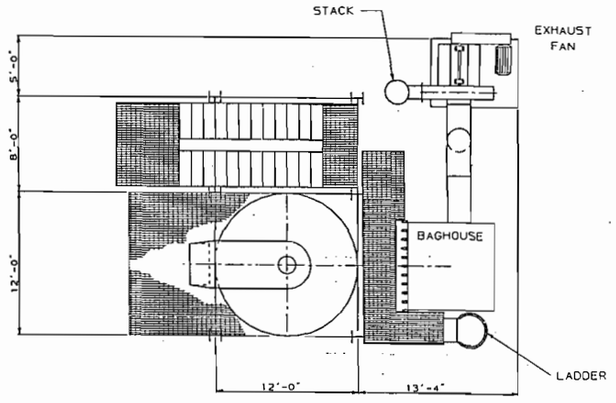


SITE VICINITY MAP
TIGER BAY COGENERATION FACILITY

SOURCES: USGS, 1986; KBN, 1992.

KBN





REV.	DATE	BY	CHK'D	APV'D	DESCRIPTION

DRAWING TITLE
GENERAL ARRANGEMENT
DRYING SYSTEM

CUSTOMER
DESTEC ENGINEERING, INC.
HOUSTON, TEXAS

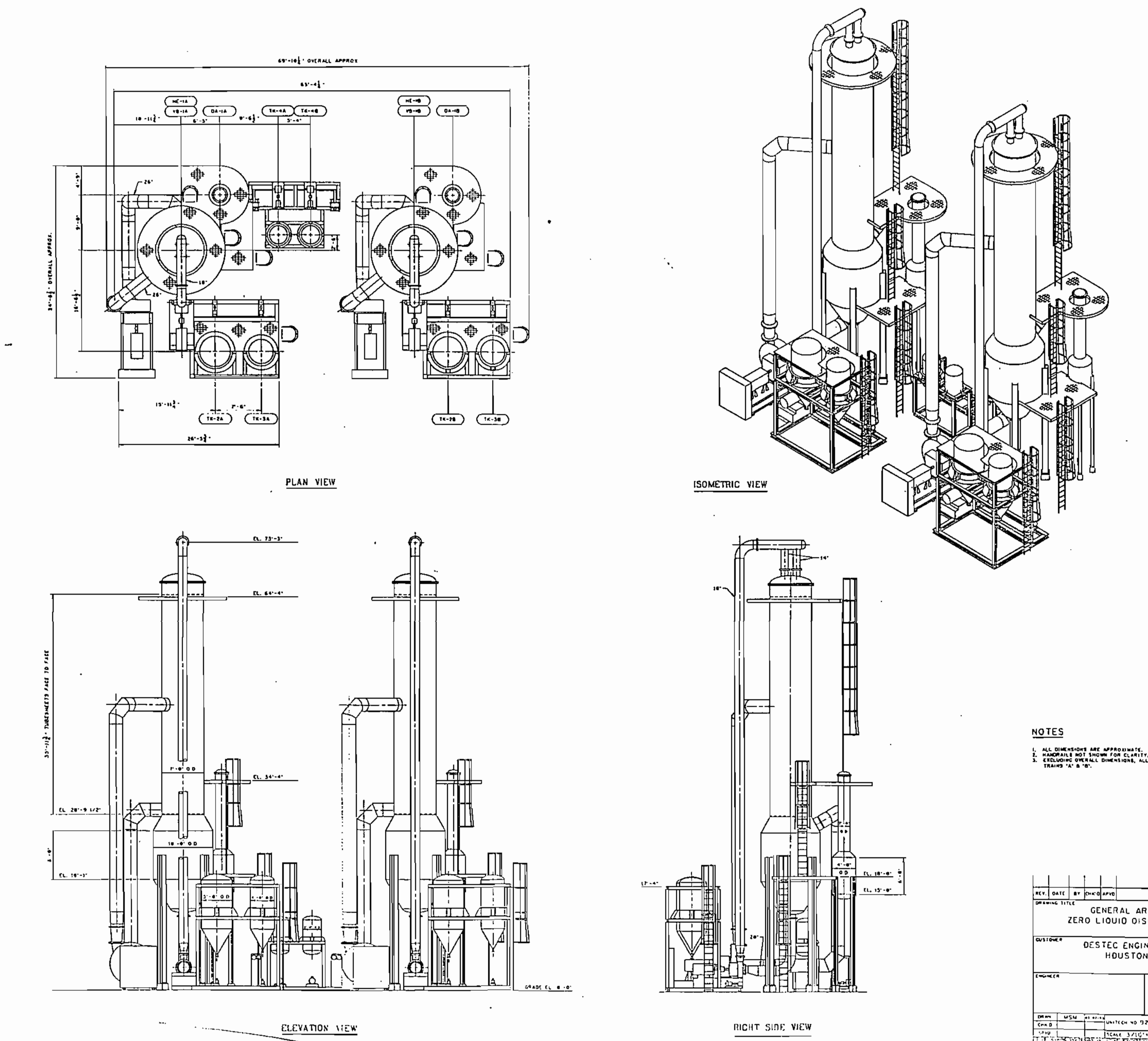
ENGINEER

UNITECH
Division of The Graver Company

DRWN.	MSM	01-27-93	UNITECH NO. 92138
CHK'D.			
APV'D.			SCALE NONE

DRAWING NUMBER: D-92138-7 REV. Ø

DO NOT SCALE THIS DRAWING USE DIMENSIONS ONLY



NOTES

1. ALL DIMENSIONS ARE APPROXIMATE.
2. HANDRAILS NOT SHOWN FOR CLARITY.
3. EXCLUDING OVERALL DIMENSIONS, ALL DIMENSIONS ARE TYPICAL FOR TRAINS "A" & "B".

REV.	DATE	BY	CHK'D	APVD	DESCRIPTION

DRAWING TITLE
GENERAL ARRANGEMENT
ZERO LIQUID DISCHARGE SYSTEM

CUSTOMER
DESTEC ENGINEERING, INC.
HOUSTON, TEXAS

ENGINEER

UNITECH
Division of The Graver Company

DRAWN MSM
CHK'D
APVD
UNITECH NO 92138
SCALE 3/16"=1'-0"
DRAWING NUMBER E-92138-5
REV 0

ATTACHMENT 4

LETTER OF AUTHORIZATION

DESTEC
ENGINEERING

DESTEC ENGINEERING, INC.
2500 CITYWEST BLVD., SUITE 1700
P.O. BOX 4411
HOUSTON, TEXAS 77210-4411
(713) 974-8200

June 12, 1992

TO WHOM IT MAY CONCERN:

Subject: Letter of Authorization

Please be advised that Robert I. Taylor, Project Manager, is authorized to represent Central Florida Power Limited Partnership in matters relating to necessary permits and approvals required from federal, state, county, and local regulatory authorities in the areas of air, water and land issues.

Sincerely,

Robert O. Rogers

Robert O. Rogers
President, Central Florida DGE Inc.
Managing General Partner of
Central Florida Power Limited Partnership

tk

ATTACHMENT 5

TIGER BAY COGENERATION FACILITY
FULL-SCALE PLOT PLAN

BEST AVAILABLE COPY

P 062 921 956

Receipt for Certified Mail

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

Sent to	Robert Taylor
Street and No.	Central Fl Power
P.O., State and ZIP Code	Houston, TX
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	1-15-93

AC 53-214903
PSD-FL-190

PS Form 3800, June 1991

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ **Show to whom, date and address of delivery.**
2. ☐ **Restricted Delivery.**

3. **Article Addressed to:**
Robert D. Taylor
Central Fl Power, LP
500 City West Blvd - Suite 450
Houston, TX 77042

4. **Type of Service:**
☐ Registered ☐ Insured
☐ Certified ☐ COD
☐ Express Mail

Article Number
P 062 921 956

Always obtain signature of addressee or agent and DATE DELIVERED.

5. **Signature – Addressee**

6. **Signature – Agent**

7. **Date of Delivery**
1-19-93

8. **Addressee's Address** *(ONLY if requested and fee paid)*

P 230 524 300

Receipt for Certified Mail

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

UNITED STATES POSTAL SERVICE

Sent to: Mr. Robert I. Taylor, Centra	
Street and No.: 2500 City West Blvd. Ste FL Power 150	
P.O., State and ZIP Code: Houston, TX 77042	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: Mailed: 5-17-93 Permit: AC 53-214903 PSD-FL-190	

PS Form 3800, June 1991

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert I. Taylor
Project Manager
Central Florida Power, L.P.
2500 City West Blvd., Suite 150
Houston, TX 77042

4a. Article Number
P 230 524 300

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

7. Date of Delivery
5-20-93

5. Signature (Addressee)

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

6. Signature (Agent)

PS Form 3811, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

AFFIDAVIT OF PUBLICATION
THE LEDGER
Lakeland, Polk County, Florida

Case No .....

STATE OF FLORIDA)
COUNTY OF POLK)

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

.....

Public Notice of Intent

.....

in the matter of.....

to Issue Air Construction Permit

.....

DEP File No. 1050223-009-AC

.....

in the.....

.....

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

.....

7-31;2000

.....

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

Signed.....
Nelson Kirkland
Classified Advertising Manager
Who is personally known to me.

Sworn to and subscribed before me this.....3rd.....

day of.....August..... A.D. 20.....00.....

.....
Notary Public

JENNIFER L. CLENDENING
MY COMMISSION # CC 900938
EXPIRES: January 10, 2004
Bonded Thru Notary Public Underwriters

(Seal)

JENNIFER L. CLENDENING

My Commission Expires.....1/10/04.....

7R740070 E282 Attn: Dianne Blyler

Attach Notice Here

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 1050223-009-AC

Florida Power Corporation
Tiger Bay Cogeneration Facility
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to W. Jeffrey Pardue, Director, Environmental Services, for the Tiger Bay Cogeneration Facility located at 3219 State Road 630 East, Ft. Meade, Polk County. The permit is to add a natural gas-fired auxiliary package steam boiler in order to provide a backup supply of steam during periods of non-operation of the facility's combustion turbine. This steam will be used strictly to meet the requirements of a steam contract with the facility's property host. The maximum steam production capacity of 85,000 lb/hr corresponds to a maximum heat input capacity of 100 MMBtu/hr. Emissions of NO_x will be limited to 30 tons/year in order to avoid PSD applicability. The applicant's mailing address is: P.O. Box 14042, MAC BB1A, St. Petersburg, Florida 33733.

A Best Available Control Technology (BACT) determination was required for particulate matter (PM) and sulfur dioxide (SO_2) pursuant to Rule 62-296.406, F.A.C.

Nitrogen Oxides (NO_x) emissions will be restricted to 30 tons per year by limiting NO_x emissions to 0.1 lb/MMBtu and hours of operation to 6,000 per year. Emissions of sulfur dioxide (SO_2) and particulate matter (PM/PM_{10}) will be very low because of the exclusive firing of inherently clean burning pipeline quality natural gas. There will be no provisions for firing fuel oil.

Total emissions of pollutants shall not exceed the annual emission rates in tons per year:

Pollutant	Emissions	Increase (Decrease)	Specifically Limited?
PM/PM_{10}	2.40	2.40	No
SO_2	0.42	0.42	No
NO_x	30.0	30.0	Yes
VOC	1.80	1.80	No
CO	25.2	25.2	No

An air quality impact analysis was not conducted. Emissions from the facility will not consume PSD increment and will not significantly contribute to or cause a violation of any state or federal ambient air quality standards.

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 14 (fourteen) days from the date of publication of this Public Notice of Intent to Issue Air Construction 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, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 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, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

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 permit. 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
Suite 4, 111 S. Magnolia Drive
Tallahassee, Florida, 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Dept. of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100

The complete project file includes the application, technical evaluations, Draft permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, Title V Section, or the Department's reviewing engineer for this project, Jonathan Holtom, P.E., at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

E-282 - 7-31; 2000

Z 094 212 851

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to W. Jeffrey Pardue, Directo	
Street & Number P.O. Box 14042, MAC BB1A	
Post Office, State, & ZIP Code St. Petersburg, FL 33733	
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 7/27/00 DEP File No. 1050223-009-AC Tiger Bay Cogeneration	

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. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

W. Jeffrey Pardue, Director
Environmental Services
Florida Power Corporation
P.O. Box 14042, MAC BB1A
St. Petersburg, FL 33733

4a. Article Number

Z 094 212 851

4b. Service Type

☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery

AUG 21 2000

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*

X

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

Thank you for using Return Receipt Service.

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

UNITED STATES POSTAL SERVICE

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

• Print your name, address, and ZIP Code in this box •

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR RESOURCES MANAGEMENT
BUREAU OF AIR REGULATION - TITLE V
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

MS 5505

RECEIVED
AUG 02 2000
BUREAU OF AIR REGULATION

Z 333 638 225

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to W. Jeffrey Pardue	
Street & Number P. O. Box 14042, MAC BB1A	
Post Office, State, & ZIP Code St. Petersburg, FL 33733	
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 8/22/00 Permit No.1050223-009- AC - FPC Tiger Bay Cogen. Facility	

PS Form **3800**, April 1995

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:

W. Jeffrey Pardue, Director
Environmental Services
Florida Power Corporation
P.O. Box 14042, MAC BB1A
St. Petersburg, Florida
33733

4a. Article Number
Z 333 638 225

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

7. Date of Delivery
AUG 24 2000

PETERSBURG, FL 33733 CALLER SERVICE

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

UNITED STATES POSTAL SERVICE

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

• Print your name, address, and ZIP Code in this box •

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR RESOURCES MANAGEMENT
BUREAU OF AIR REGULATION - TITLE V
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

MS 5505

RECEIVED
AUG 28 2000
BUREAU OF AIR REGULATION

P 230 524 382

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

UNITED STATES POSTAL SERVICE

Sent to Mr. Robert S. Chatam, P.E.	
Street and No. 2500 Citywest Blvd.	
P.O., State and ZIP Code P.O. Box 4411 Houston, TX	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date mailed - 8/10/93 Permit No. - AC53-214903 PSD-FL-190	

PS Form **3800**, June 1991

Is your RETURN ADDRESS completed on the reverse side?

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. Robert S. Chatam, P.E.
DESTEC ENERGY, INC.
2500 Citywest Blvd., Suite 150
P. O. Box 4411
Houston, Texas 77210-4411

4a. Article Number
P 230524382

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

7. Date of Delivery
AUG 13 1993

5. Signature (Addressee)

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

6. Signature (Agent) C. Robertson

PS Form **3811**, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

P 062 922 005

Receipt for Certified Mail

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

Sent to Mr. Robert I. Taylor,	
Street and No. Central FL Power 2500 City West Blvd.	
P.O., State and ZIP Code Houston, TX 77042	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Mailed: 10-9-92 Permit: AC 53-214903 PSD-FL-190	

PS Form 3800, June 1991

SENDER:

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

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. Robert I. Taylor, Proj. Mgr.
Central Florida Power, L.P.
2500 City West Blvd., Suite 150
Houston, TX 77042

4a. Article Number
P 062 922 005

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

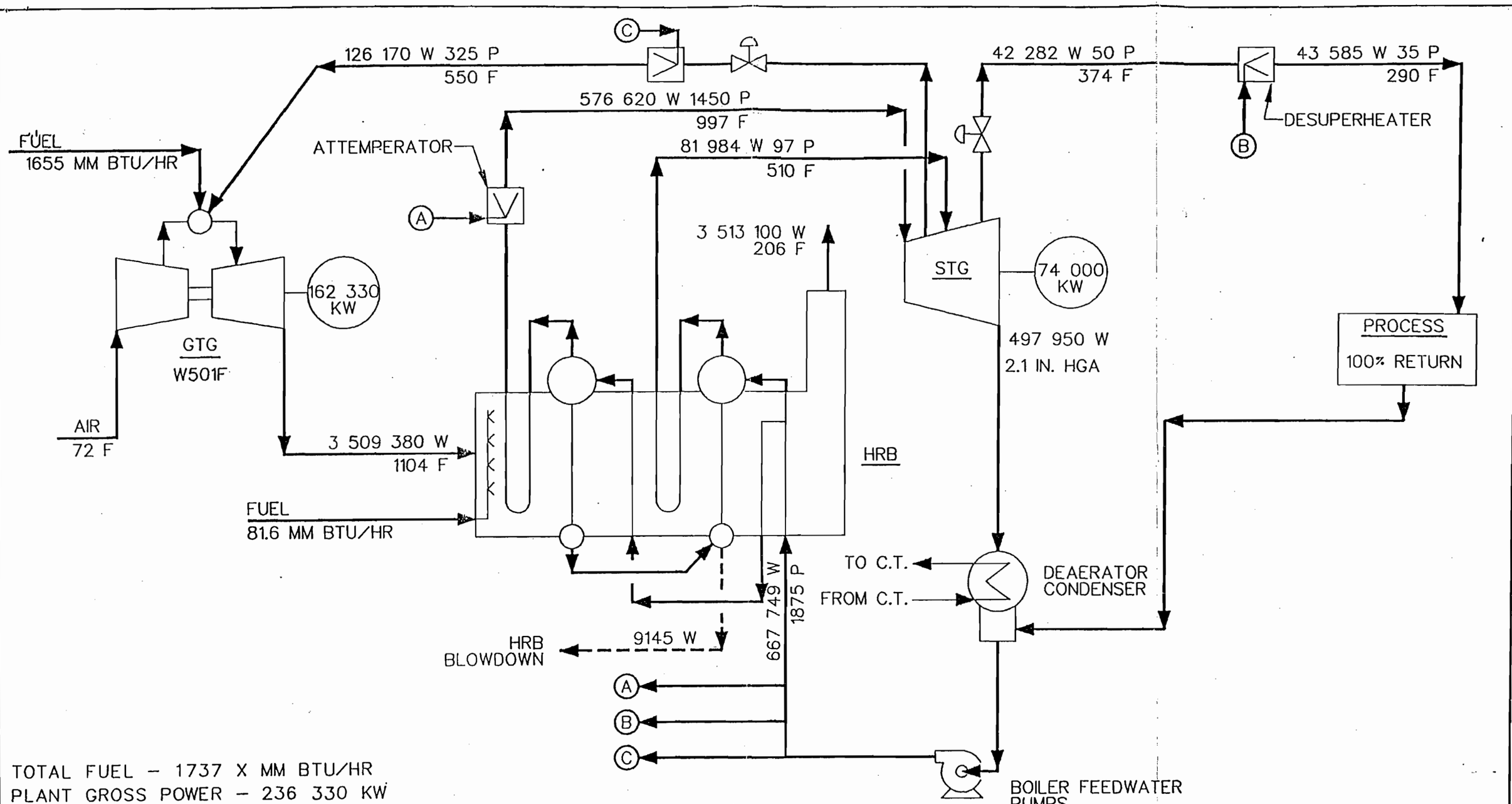
7. Date of Delivery
10-13-92

5. Signature (Addressee)

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

6. Signature (Agent)
H. Chatman

PS Form 3811, November 1990 ~~& U.S. GPO: 1991—287-066~~ **DOMESTIC RETURN RECEIPT**



TOTAL FUEL – 1737 X MM BTU/HR
PLANT GROSS POWER – 236 330 KW

LEGEND
P = PSIG
H = BTU/LB
F = °F
KW = KILOWATTS
W = LB/HR

NO.	DATE	REVISION	BY	APPV.

SCALE : NONE

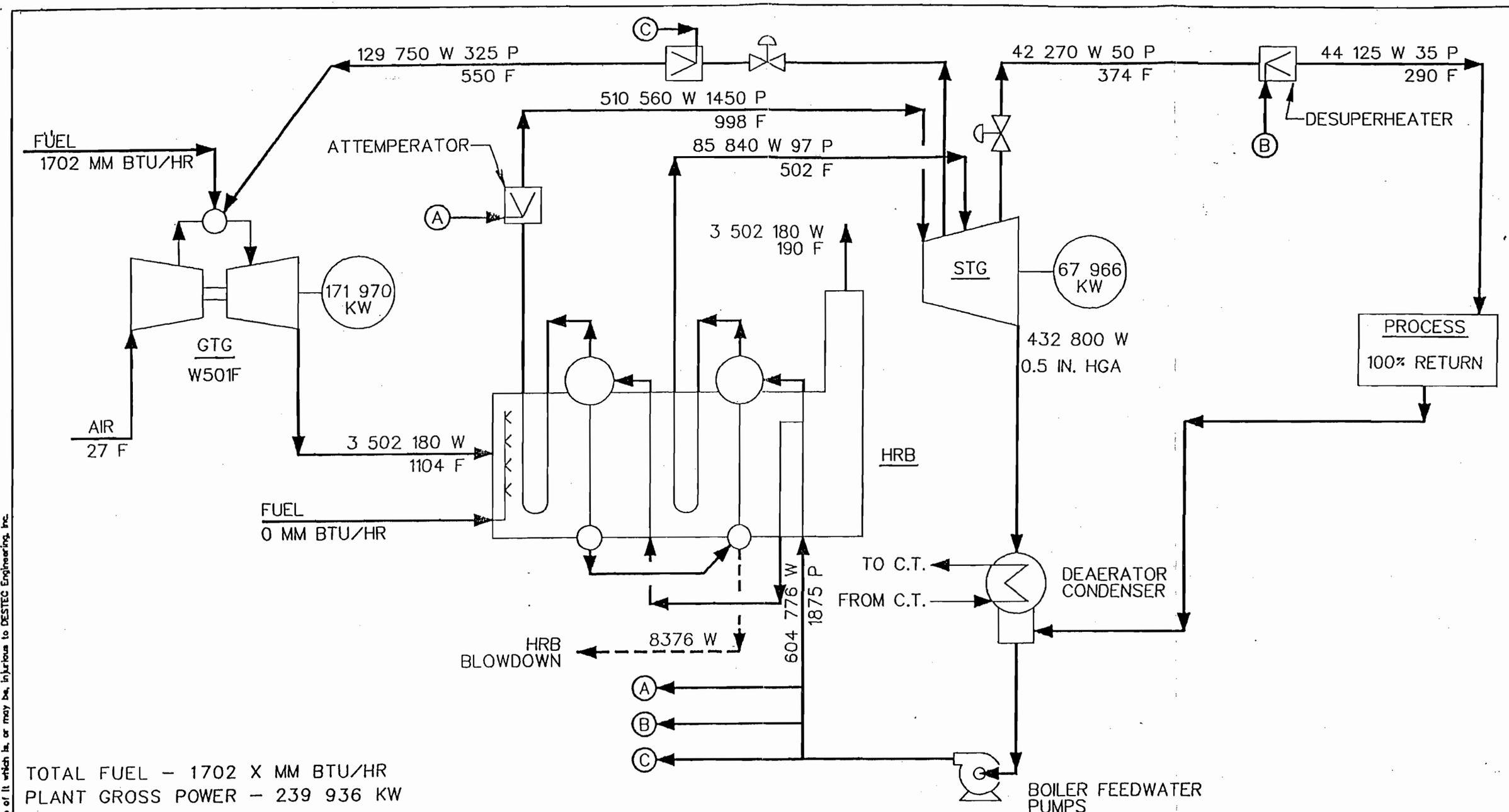
CALC. TCE	DATE 8-25-92
DWN. RDP	DATE 8-25-92
CHK.	DATE
APPV.	DATE

DESTEC ENGINEERING

W501F
FLOW DIAGRAM
CASE: AVG AMB OIL FIRED

PROJECT NO.: 1253
CLIENT: TIGER BAY COGEN
DWG. NO.: 1253-M-017.01
REV.: 0

DWG NO. 082592
RDP



TOTAL FUEL – 1702 X MM BTU/HR
PLANT GROSS POWER – 239 936 KW

LEGEND
P = PSIG
H = BTU/LB
F = °F
KW = KILOWATTS
W = LB/HR

NO.	DATE	REVISION	BY	APPV.

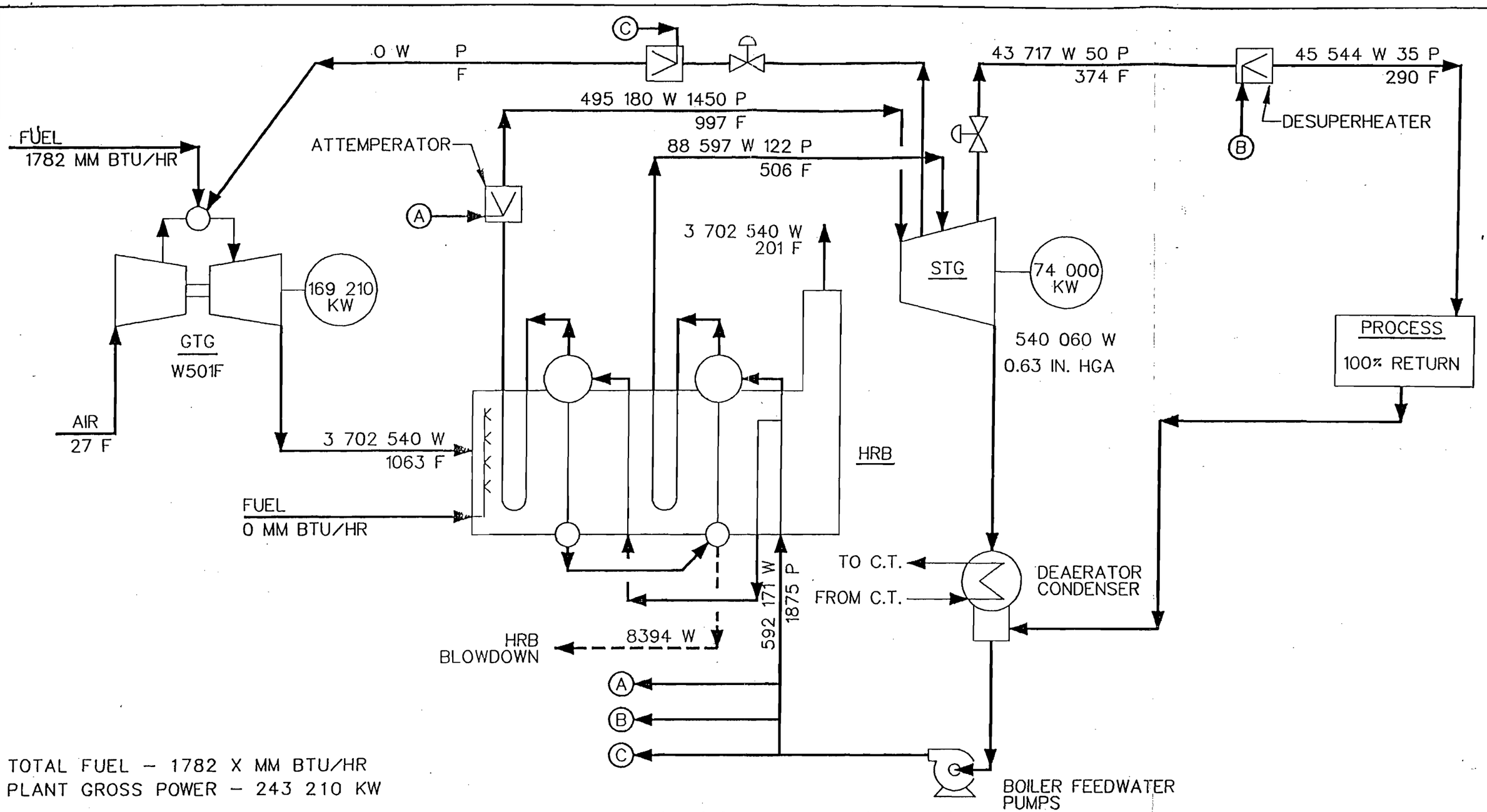
SCALE :	NONE	
CALC. TCE	DATE 8-25-92	
DWN. RDP	DATE 8-25-92	
CHK.	DATE	
APPV.	DATE	

DESTEC ENGINEERING

W501F
FLOW DIAGRAM
CASE: WINTER DES OIL UNFIRED

PROJECT NO.: 1253
CLIENT: TIGER BAY COGEN
DWG. NO.: 1253-M-017.02
REV.: 0

DWG NO.
RDP
082592



TOTAL FUEL – 1782 X MM BTU/HR
PLANT GROSS POWER – 243 210 KW

LEGEND
P = PSIG
H = BTU/LB
F = °F
KW = KILOWATTS
W = LB/HR

NO.	DATE	REVISION	BY	APPV.

SCALE : NONE

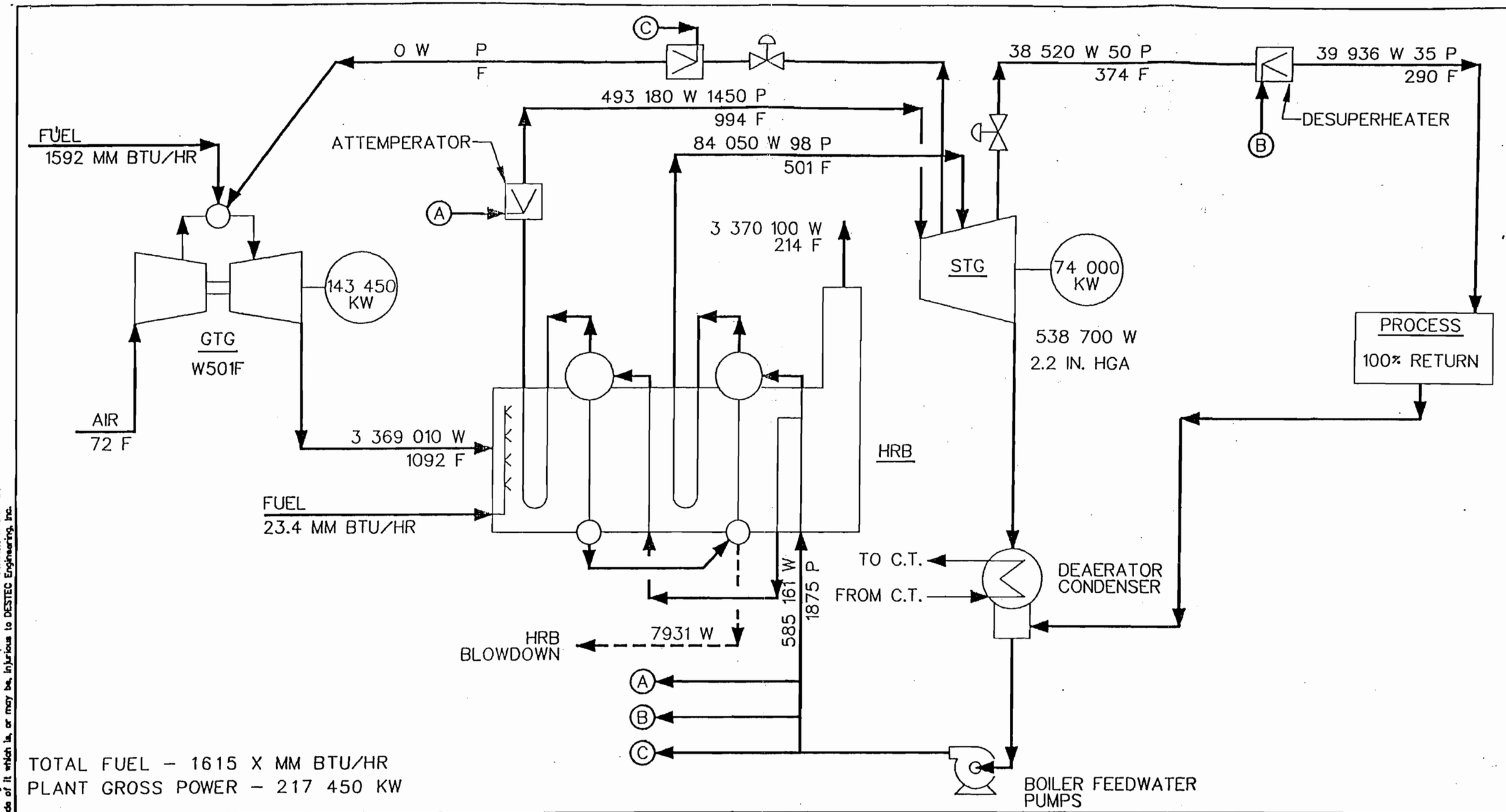
CALC. TCE	DATE 8-25-92
DWN. RDP	DATE 8-25-92
CHK.	DATE
APPV.	DATE

DESTEC ENGINEERING

W501F
FLOW DIAGRAM
CASE: WINTER DES GAS UNFIRED

PROJECT NO.: 1253
CLIENT: TIGER BAY COGEN
DWG. NO.: 1253-M-017.03
REV.: 0

DWG NO. RDP 082592



TOTAL FUEL – 1615 X MM BTU/HR
PLANT GROSS POWER – 217 450 KW

LEGEND
P = PSIG
H = BTU/LB
F = °F
KW = KILOWATTS
W = LB/HR

NO.	DATE	REVISION	BY	APPV.

SCALE : NONE

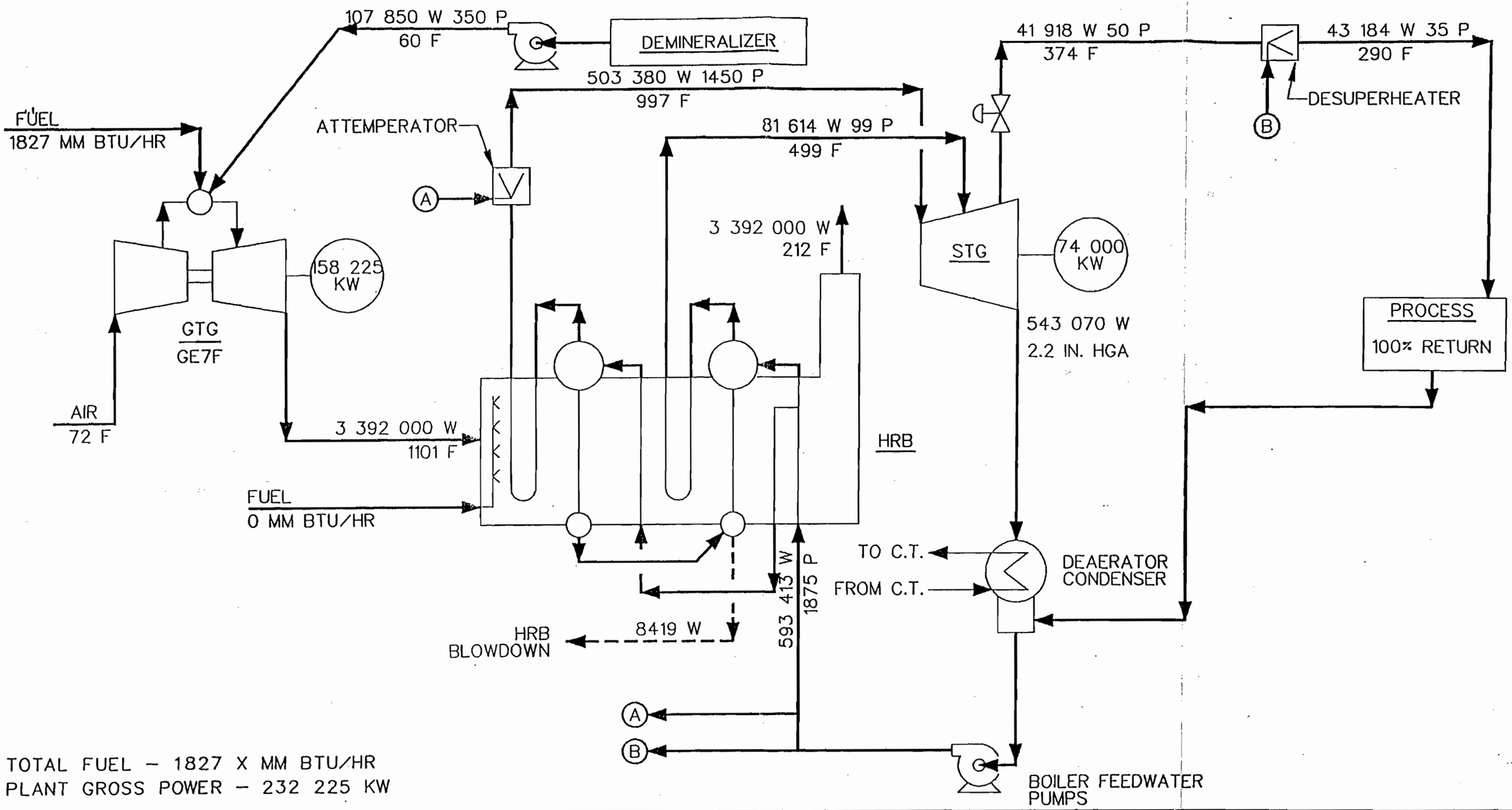
CALC. TCE	DATE 8-25-92
DWN. RDP	DATE 8-25-92
CHK.	DATE
APPV.	DATE

DESTEC ENGINEERING

W501F
FLOW DIAGRAM
CASE: AVG AMB GAS UNFIRED

PROJECT NO.: 1253
CLIENT: TIGER BAY COGEN
DWG. NO.: 1253-M-017.04
REV.: 0

DWG NO.
RDP
082592



TOTAL FUEL – 1827 X MM BTU/HR
PLANT GROSS POWER – 232 225 KW

LEGEND
P = PSIG
H = BTU/LB
F = °F
KW = KILOWATTS
W = LB/HR

NO.	DATE	REVISION	BY	APPV.

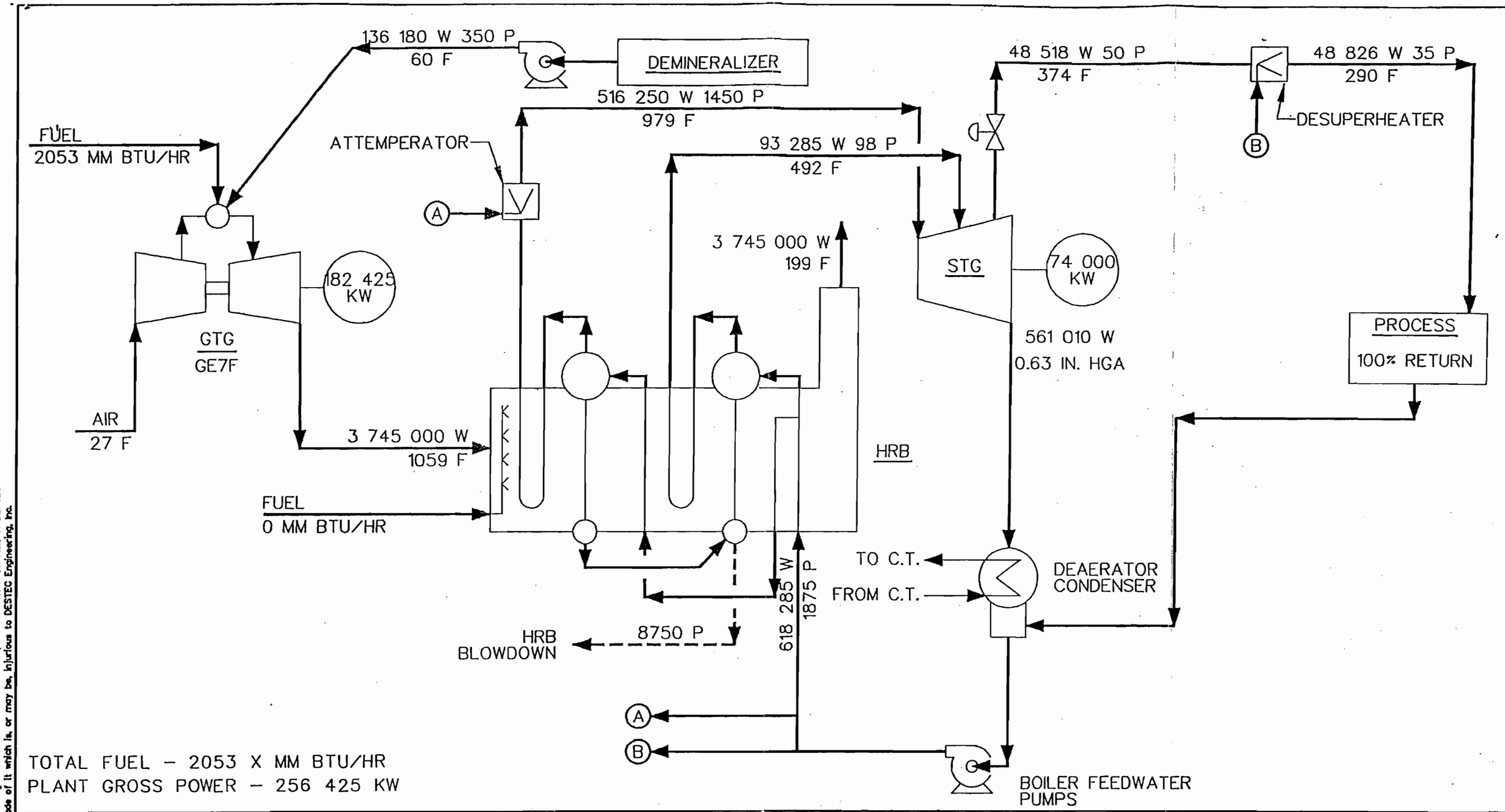
SCALE : NONE		
CALC. TCE	DATE 8-25-92	
DWN. BHG	DATE 8-25-92	
CHK.	DATE	
APPV.	DATE	

DESTEC ENGINEERING

GE PG72221 (FA)
FLOW DIAGRAM
CASE: AVG. AMB. OIL UNFIRED

PROJECT NO.: -1253
CLIENT: TIGER BAY COGEN
DWG. NO.: 1253-M-017.05
REV.: 0

DWG NO.
BHG
082592



TOTAL FUEL – 2053 X MM BTU/HR
PLANT GROSS POWER – 256 425 KW

LEGEND
P = PSIG
H = BTU/LB
F = °F
KW = KILOWATTS
W = LB/HR

NO.	DATE	REVISION	BY	APPV.

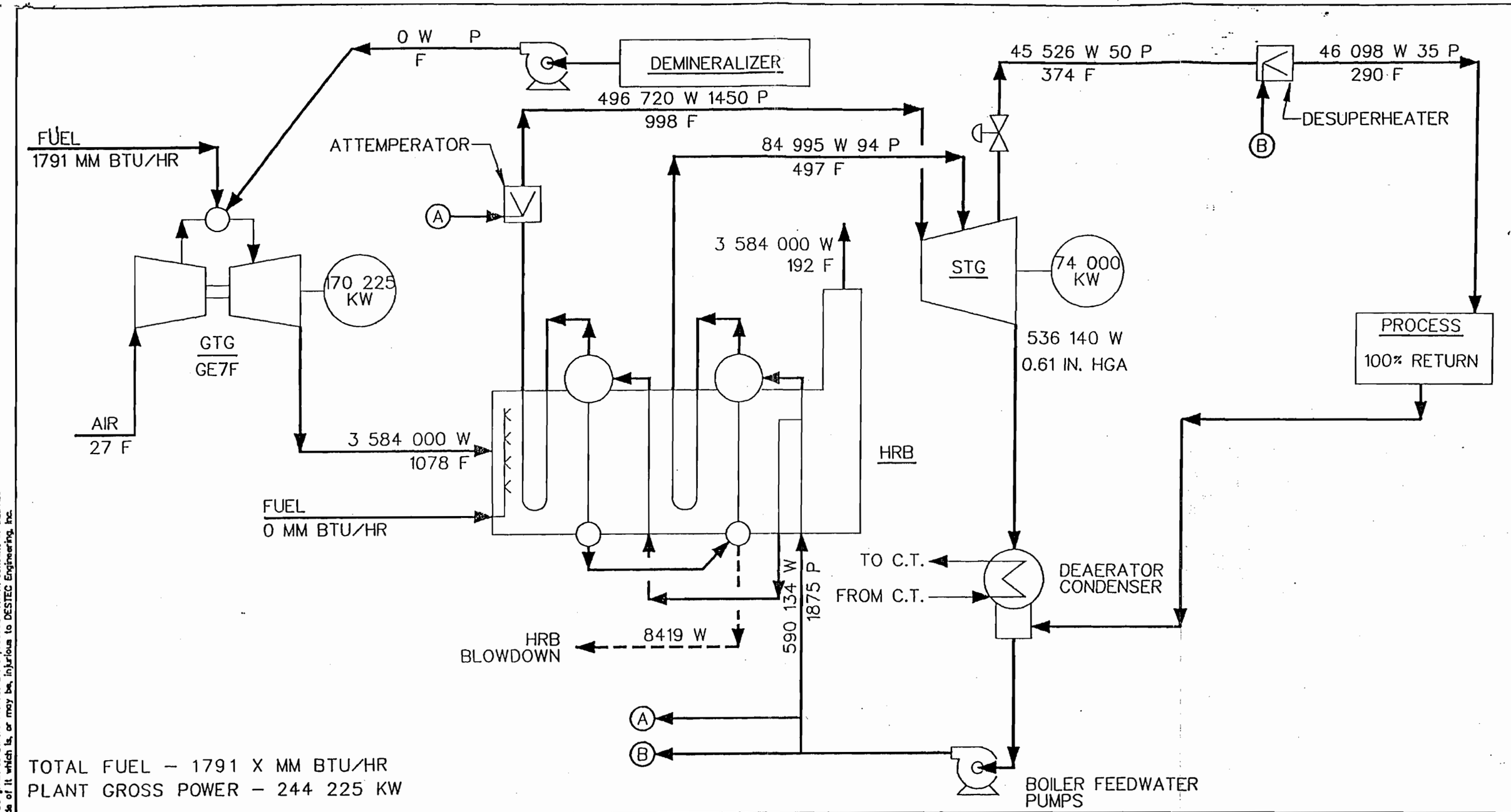
SCALE :	NONE	
CALC. TCE	DATE 8-25-92	
DWN. BHG	DATE 8-25-92	
CHK.	DATE	
APPV.	DATE	

DESTEC ENGINEERING

GE PG7221 (FA)
FLOW DIAGRAM
CASE: WINTER DES. OIL UNFIRED

PROJECT NO: 1253
CLIENT: TIGER BAY COGEN
DWG. NO.: 1253-M-017.06
REV.: 0

DWG NO.
BHG
082592



TOTAL FUEL – 1791 X MM BTU/HR
PLANT GROSS POWER – 244 225 KW

LEGEND
P = PSIG
H = BTU/LB
F = °F
KW = KILOWATTS
W = LB/HR

NO.	DATE	REVISION	BY	APPV.

SCALE : NONE

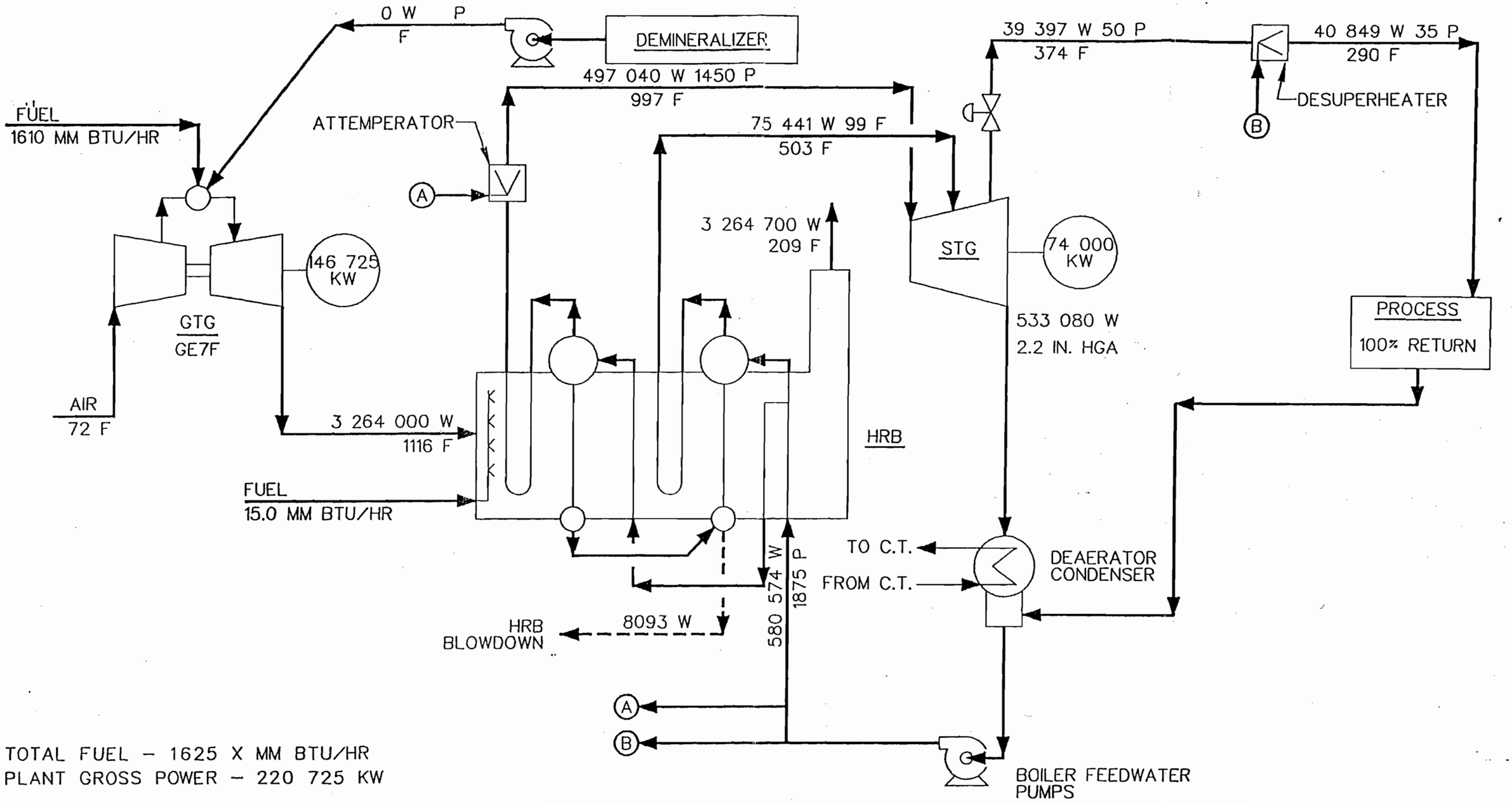
CALC. TCE	DATE 8-25-92
DWN. BHG	DATE 8-25-92
CHK.	DATE
APPV.	DATE

DESTEC ENGINEERING

GE PG7221 (FA)
FLOW DIAGRAM
CASE: WINTER DES GAS UNFIRED

PROJECT NO: 1253
CLIENT: TIGER BAY COGEN
DWG. NO: 1253-M-017.07
REV. 0

DWG NO. 1253-M-017.07
BHG
082592



TOTAL FUEL – 1625 X MM BTU/HR
PLANT GROSS POWER – 220 725 KW

LEGEND
P = PSIG
H = BTU/LB
F = °F
KW = KILOWATTS
W = LB/HR

NO.	DATE	REVISION	BY	APPV.

SCALE : NONE

CALC. TCE	DATE 8-25-92
DWN. BHG	DATE 8-25-92
CHK.	DATE
APPV.	DATE

DESTEC ENGINEERING

GE PG7221 (FA) FLOW DIAGRAM CASE: AVG. AMB. GAS FIRED

PROJECT NO.: 1253
CLIENT: TIGER BAY COGEN
DWG. NO.: 1253-M-017.08
REV.: 0

DWG NO. 082592 BHG

P 710 058 545

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

UNITED STATES POSTAL SERVICE

Sent to Mr. Robert I. Taylor, Centra	
Street & No. FL Power, L.P. 2500 City West Blvd.	
P.O., State & ZIP Code Houston, TX 77042	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date Mailed: 7-14-92 Permit: AC 53-214903 PSD-FL-190	

PS Form **3800**, June 1990

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

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. Robert I. Taylor
Project Manager
Central Florida Power, L.P.
2500 City West Blvd., Sutie 150
Houston, TX 77042

4a. Article Number
P 710 058 545

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

7. Date of Delivery
7-22-92

5. Signature (Addressee)

6. Signature (Agent)

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

PS Form **3811**, October 1990 ☆U S GPO 1990—273-861 **DOMESTIC RETURN RECEIPT**

United States Postal Service

Official Business

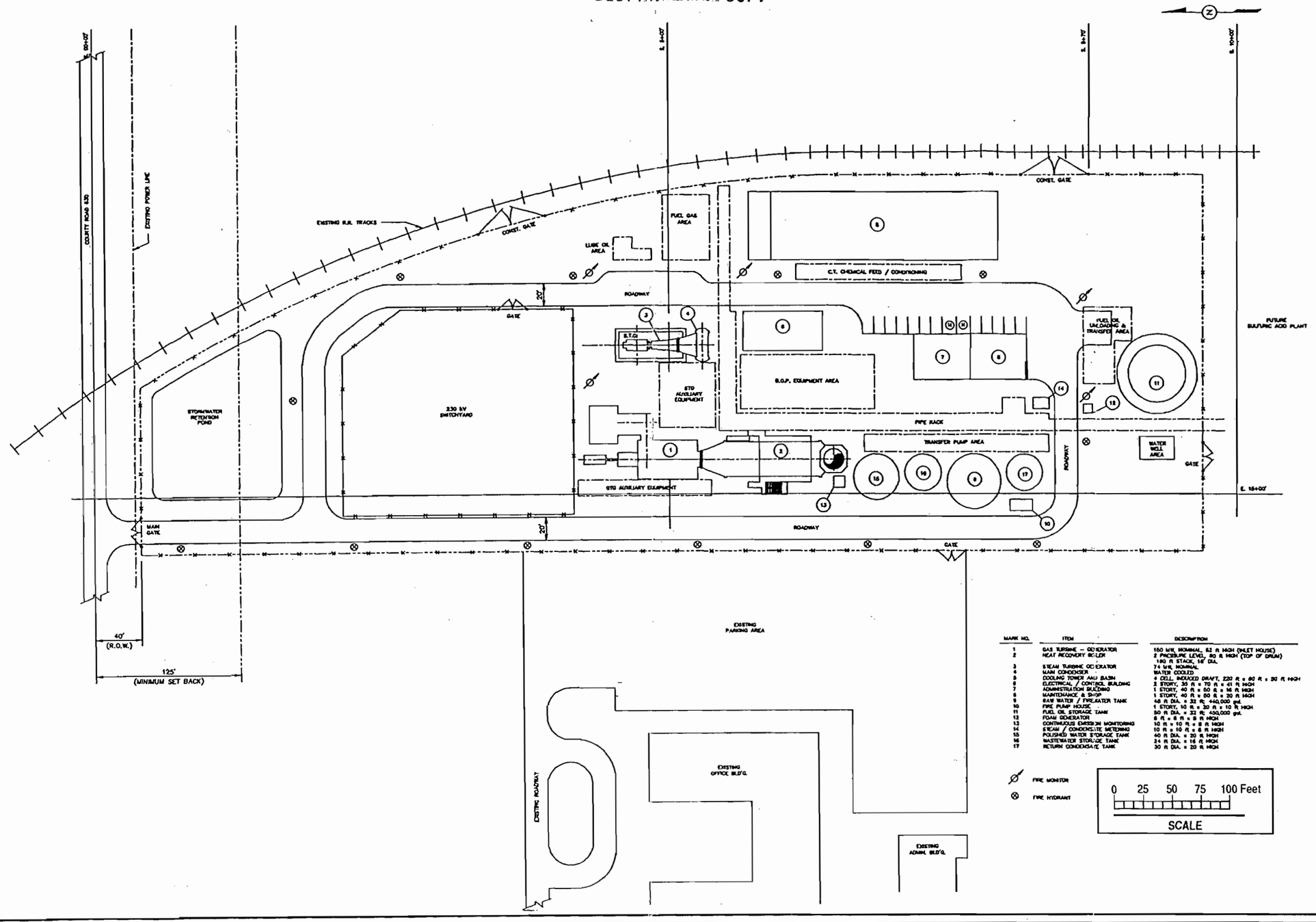
RECEIVED
JUL 24 1992
Division of Air
Resources Management

U.S. MAIL

PENALTY FOR PRIVATE
USE, $300

Print your name, address and ZIP Code here

Patty Adams
Dept. of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400



MARK NO.	ITEM	DESCRIPTION
1	GAS TURBINE – GENERATOR	150 MW, NOMINAL, 63 ft HIGH (INLET HOUSE)
2	HEAT RECOVERY BOILER	3 PRESSURE LEVEL, 80 ft HIGH (TOP OF DRUM) 180 ft STACK, 18' DIA.
3	STEAM TURBINE GENERATOR	74 MW, NOMINAL
4	MAIN CONDENSER	WATER COOLED
5	COOLING TOWER AND BASIN	4 CELL, INDUCED DRAFT, 220 ft x 80 ft x 30 ft HIGH
6	ELECTRICAL / CONTROL BUILDING	2 STORY, 35 ft x 70 ft x 41 ft HIGH
7	ADMINISTRATION BUILDING	1 STORY, 40 ft x 60 ft x 16 ft HIGH
8	MAINTENANCE & SHOP	1 STORY, 40 ft x 80 ft x 20 ft HIGH
9	RAW WATER / FIRE WATER TANK	48 ft DIA. x 32 ft, 440,000 gal.
10	FIRE PUMP HOUSE	1 STORY, 10 ft x 30 ft x 10 ft HIGH
11	FUEL OIL STORAGE TANK	80 ft DIA. x 32 ft, 450,000 gal.
12	FOAM GENERATOR	8 ft x 8 ft x 8 ft HIGH
13	CONTINUOUS EMISSION MONITORING	10 ft x 10 ft x 8 ft HIGH
14	STEAM / CONDENSATE METERING	10 ft x 10 ft x 6 ft HIGH
15	POLISHED WATER STORAGE TANK	40 ft DIA. x 20 ft HIGH
16	WASTEWATER STORAGE TANK	24 ft DIA. x 16 ft HIGH
17	RETURN CONDENSATE TANK	30 ft DIA. x 20 ft HIGH

Figure 2-2 PLOT PLAN

KBN

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. Jeffrey Pardue
Fla. Power Corp.
3201 34th St. South
St. Petersburg, Fl
33733

4a. Article Number
Z 333 612 572

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

7. Date of Delivery
12/21/98

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X Kathy DeLong (for AD)

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 333 612 572

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

Sent to Jeffrey Pardue	
Street & Number FPC	
Post Office, State, & ZIP Code St. Pete, 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 PSD-FI-AOD 12-17-98	

PS Form **3800**, April 1995

Best Available Copy

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete ite...
- Complete ite...
- Print your name ... ...rn this card to you.
- Attach this form to the fron... ...ack 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.

... the following services (for an extra fee):

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

Consult postmaster for fee.

3. Article Addressed to: W. Jeffrey Pardue, CEP Director FPC PO Box 14042 St. Pete, Fl 33733

4a. Article Number: P 265 659 299

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

7. Date of Delivery: FEB 2 3 1998

5. Received By: *(Print Name)*

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

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

PS Form **3811**, December 1994 — Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 299

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

Sent to	W Jeffrey Pardue
Street & Number	FPC
Post Office, State, & ZIP Code	St. Pete, 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	2-19-98

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

February 18, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. W. Jeffrey Pardue, C.E.P.
Director
Florida Power Corporation
Post Office Box 14042
St. Petersburg, Florida 33733

Dear Mr. Pardue:

RE: Tiger Bay Cogen Facility

The Bureau of Air Regulation received your February 16, letter concerning the above referenced faciltiy. Since this request is being reviewed under site certification, no further processing fee is required to amend the BACT determination. Enclosed is your check number 1953206 for $250 which was submitted with your request.

If you have any questions, please call Teresa Heron at (850)921-9529.

Sincerely,

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

AAL/kt

cc: T. Heron, BAR

Accounts Payable Department C2N
P.O. Box 14042
St. Petersburg, Fl 33733-4042

Florida Power
CORPORATION

63-115
631

DATE 02/09/98 CHECK NO. 1953206

Refunded 2/19

PAY: $250*DOLLARS AND 00 CENTS

$*******250.00

SunTrust / Mid-Florida

TO THE ORDER OF

FLA DEPT OF ENVIRONMENTAL PROTECTION
2600 BLAIR STONE RD
TALLAHASSEE FL 32399-2400

Void after 60 days

J. V. Smallwood

Treasurer

[redacted]

Florida Power
CORPORATION

RECEIVED
FEB 18 1998
BUREAU OF
AIR REGULATION

February 16, 1998

Mr. Al Linero, P.E.
Administrator, New Source Review Section
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

Dear Mr. Linero:

Re: Tiger Bay Cogen Facility

As you know, the Tiger Bay Cogeneration Facility was purchased by Florida Power Corporation (FPC) from DESTEC in 1997. FPC is in the process of obtaining a site certification for an additional 10.5 megawatts (MW) of steam electric capacity. This reflects the actual steam capacity of the unit, which is a nominal 85.5 MW.

This change necessitates a corresponding amendment language contained in the BACT determination in order to reflect the unit's actual capacity. References to the steam turbine capacity in the final BACT determination should be changed to reflect the nominal 85.5 MW capacity. The combustion turbine has a nominal capacity of 184 MW, which combined with the nominal 85.5 MW capacity of the steam turbine, results in a total plant capacity of 269.5 MW. Attachment 1 contains a P.E.-certified certification of the capacity of the steam turbine. A check in the amount of $250 is enclosed for the processing of this amendment.

Thank you for your processing of this request. Please contact Mr. Mike Kennedy at (813) 866-4344 if you have any questions or comments.

Sincerely,

cc: J. Heron, BAR
B. Owen, PPS

W. Jeffrey Pardue, C.E.P.
Director

Attachments

Attachment 1

Florida Power
CORPORATION

INTEROFFICE CORRESPONDENCE

Performance Services	MAC	231-5292
OFFICE	MAC	TELEPHONE

SUBJECT: **Tiger Bay Steam Turbine Capabilities**

TO: **Michael J. Kennedy** DATE: **November 20, 1997**

Performance Services has reviewed the design specifications for the steam turbine at Tiger Bay and concluded that the steam turbine is capable of operating continuously at 105 percent of initial pressure (1537.5 psia) with control valves wide open. We expect to generate 87.4 gross megawatts at the following steam inlet conditions:

- steam flow of 549,675 lbs/hr
- Throttle steam pressure of 1537.5 psia
- Throttle steam temperature of 1000 deg F
- Exhausting to 1.62 psia

If you have any further questions concerning Tiger Bay, please call me at Ext. 231-5292.

David Zuloaga

Dario B. Zuloaga, P.E.
License # 0032729 (FL)
Lead Principal Engineer
Performance Services

cc: Bob Anderson