State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To:	Location:
To:	Location:
To:	Location:
From:	Date:

Interoffice Memorandum

TO: Carol Browner

FROM: Steve Smallwood

DATE: October 16, 1991

SUBJ: Permit and BACT determination for Florida Power Corporation

Attached for your approval and signature is a Permit and Best Available Control Technology determination for Florida Power Corporation's, Debary Facility in DeBary, Florida. The permit will allow the subject facility to construct and operate six simple-cycle combustion peaking units rated 92.2 MW each.

The determination is not controversial.

I recommend your approval and signature.

SS/MH/mh

Attachment

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

In the matter of an
Application for Permit by:

Mr. W. W. Vierday
Environmental Programs & Licensing
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33733

DER File No. AC 64-191015
PSD-FL-167
Volusia County

Enclosed is Permit Number AC 64-191015 to construct and operate six simple cycle combustion peaking units rated 92.9 MW each at the Florida Power Corporation, DeBary facility in DeBary, Volusia County, Florida, issued pursuant to Section(s) 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on 10-18-91 to the listed persons.

Clerk Stamp

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

Martha Jane Wise (Clerk) 10-18-91 (Date)

Copies furnished to:
Alan Zahm, DER
Kenneth Kosky, P.E., KBN
Jewell Harper, EPA
Julia Thomas, Fish & Wildlife
Chris Hauer, NPS

Final Determination

Florida Power Corporation
DeBary Facility
Debary, Volusia County, Florida

Six 92.9 MW Simple Cycle Combustion Turbines
for Peaking Service

Permit Number: AC 64-191015
PSD-FL-167

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

October 16, 1991

FINAL DETERMINATION

Florida Power Corporation (FPC) submitted an application for an air pollution source construction permit authorizing construction of six simple-cycle combustion turbine peaking units at their DeBary Electric Generating Station. Each unit is rated at 92.9 MW and will fire #2 distillate fuel oil. The DeBary facility has six existing simple-cycle combustion turbines with a generating capability of 330 MW. The Florida Department of Environmental Regulation (FDER) reviewed the application and issued a Preliminary Determination and Technical Evaluation, along with its Notice of Intent to Issue a permit for the six proposed combustion turbines on August 2, 1991.

The U.S. Environmental Protection Agency (EPA) submitted a letter commenting on the Preliminary Determination on September 10, 1991. EPA submitted one comment concerning the emission limit regarding opacity. As a result, the words, "at peak load" were removed from specific condition 2 of the permit.

On September 9, 1991, the U.S. Fish and Wildlife Service (FWS) submitted a letter commenting on the Preliminary Determination. With regard to the air quality modeling analysis, FWS indicated that neither the FDER nor FPC calculated the impact of the proposed project on the Class I sulfur dioxide (SO_2) increment at the Chassahowitzka Wilderness Area because this area is located more than 100 km away from the project. The FWS took exception to this, stating that the EPA recognizes the possible impacts of sources located more than 100 km from a class I area. To asses the proposed project's impact at the Chassahowitzka Wilderness Area, the FWS used the ISCST model, stack parameters included in the FPC permit application, and one year of meteorological data (Tampa 1986). The results of this analysis showed the highest second highest (HSH) 24-hour SO_2 concentration to be 5.20 micrograms per cubic meter (ug/m^3). Thus, there appeared to be a potential to violate the allowable Prevention of Significant Deterioration (PSD) Class I increment of 5 ug/m3 for a 24-hour averaging time.

In response to the analysis done by the FWS, on September 24, 1991, FPC submitted a letter to FDER detailing air quality modeling using the ISCST model and five years of meteorological data (Orlando/Ruskin 1982-86). Three cases for the proposed project were analyzed. The first case represents the six proposed turbines using worst-case emissions (at 20°F) and operating conditions of minimum flow (at 90°F). The second case represents the six proposed turbines using emissions and flowrates at 20°F. The last case represents emissions and flowrates at 90°F. Each of the above cases includes all other significant increment consuming sources which may interact with the FPC facility at the Class I area The HSH 24-hour predicted impacts are 4.98, 4.89, and 4.76 ug/m^3 for cases 1, 2, and 3 respectively. Both the annual and 3-hour averaging time results also meet the allowable PSD Class I

increments. The modeling done by FPC can be considered conservative for three reasons. The first reason is that the modeling analysis assumes that the maximum fuel sulfur content will occur continuously. While a maximum sulfur content of 0.5 percent has been approved, the average sulfur content for any 12 month rolling period must not be more than 0.30 percent. The second reason is that the hours of operation for the six combustion turbines are limited by permit. The maximum annual hours of operation at 0.30 percent average fuel sulfur is 2,890. This corresponds to a 33 percent capacity factor. The capacity factor could increase to as much as 38.7 percent if the average fuel sulfur content drops to 0.26 percent or less. This permit condition significantly limits the hours of operation which reduces the probability that the six turbines would operate during "worst case" meteorological conditions. The last reason is the maximum impacts predicted are due to the most stable conditions which occur at night. However, the turbines are peaking units which will be operated during peak load periods which occur during the morning to evening hours.

The modeling results from FPC have been made available to FDER, and FWS. All parties have reviewed this modeling and have determined that the proposed project including all other PSD sources will meet all allowable PSD Class I increments.

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

PERMITTEE:
Florida Power Corporation
DeBary Facility
3201 34th Street South
St. Petersburg, FL 33733

Permit Number: AC 64-191015
PSD-FL-167
Expiration Date: January 31, 1993
County: Volusia
Latitude/Longitude: 28°54'14"N
81°19'59"W
Project: Six 92.9 MW Simple Cycle Gas Turbines

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

For six 92.9 MW simple cycle combustion turbines (CT's) with maximum heat input of 1,144 MMBtu/hr/unit at 59°F (oil) to be located at the DeBary facility in DeBary, Florida. The turbines are to be GE PG7111EA equipped with wet injection. The UTM coordinates are Zone 17, 467.5 km East and 3197.2 km North.

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

Attachments are listed below:

1. Florida Power Corp.'s application received December 31, 1990.
2. Department's letter dated January 30, 1991.
3. Florida Power Corp.'s letter received February 18, 1991.
4. Florida Power Corp.'s letter dated July 8, 1991.
5. Florida Power Corp.'s letter dated July 12, 1991.
6. Florida Power Corp.'s letter dated July 18, 1991.
7. KBN's faxed letter dated July 24, 1991.
8. U.S. Fish and Wildlife Service's letter dated September 9, 1991.
9. U.S. Environmental Protection Agency's letter dated September 10, 1991.
10. Florida Power Corp.'s letter dated September 24, 1991.

GENERAL CONDITIONS:

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

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

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

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

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

GENERAL CONDITIONS:

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

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

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

a. a description of and cause of non-compliance; and

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

GENERAL CONDITIONS:

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

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

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

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

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

13. This permit also constitutes:

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

14. The permittee shall comply with the following:

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

GENERAL CONDITIONS:

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

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

Emission Limits

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

2. Visible emissions shall not exceed 20% opacity except at full load in which case visible emissions shall not exceed 10% opacity.

Operating Rates

3. These sources are allowed to use only No. 2 fuel oil with a 0.30% average and 0.5% sulfur content maximum, by weight. The sulfur content is based upon a weighted 12 month rolling average of fuel oil analysis from delivery receipts.

SPECIFIC CONDITIONS:

4. The permitted materials and utilization rates for the combined cycle gas turbines shall not exceed: (a) the maximum heat input of 1,144 MMBtu/hr/unit at 20°F. (b) maximum No. 2 fuel oil consumption shall not exceed 7,826 (at 59°F) gal/hr/unit or 159,200,000 gal/yr for 6 CT's. (c) SO_2 emissions for the six combustion turbines not exceed 2,888 tons/year. (d) the maximum capacity factor shall be limited to 38.7%.

5. The capacity factor shall be limited to 33% based on a weighted 12 month rolling average sulfur content of 0.30%. However, if the weighted rolling average sulfur content of the fuel oil is less than 0.30%, the capacity factor may be adjusted using the following table:

Percent Average Sulfur Content	% Capacity Factor
0.30 - 0.295	33
0.29 - 0.285	34.4
0.28 - 0.275	35.8
0.27 - 0.265	37.2
0.26 - or less	38.7

6. Any change in the method of operation, equipment or operating hours shall be submitted to DER's Bureau of Air Regulation.

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 (on each unit within 10% maximum heat rate input) within 180 days of initial operation and annually thereafter, by the following reference methods as described in 40 CFR 60, Appendix A (July, 1990 version) and adopted by reference in F.A.C. Rule 17-2.700.

- Method 1. Sample and Velocity Traverses
- Method 2. Volumetric Flow Rate
- Method 3. Gas Analysis
- Method 5. Determination of Particulate Matter Emissions from Stationary Sources
- Method 9. Determination of the Opacity of the Emissions from
- Method 8. Determination of the Sulfuric Acid of the Emissions from Stationary Sources

- Method 10. Determination of the Carbon Monoxide Emission from Stationary Sources
- Method 20. Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines.
- Method 25A Determination of the Volatile Organic Compounds Emissions from Stationary Sources.

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

9. Method 5 must be performed on one combustion turbine to determine the initial compliance status of this type unit. Thereafter, the opacity emissions test may be used unless 10% opacity is exceeded at peak load.

10. Compliance with the SO_2 emission limit can also be determined by calculations based on fuel analysis using ASTM D4292 for the sulfur content of liquid fuels.

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 proposed 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:

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.

SPECIFIC CONTIDIONS:

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 Central District office will be notified at least 15 days in writing in advance of the compliance test(s). The sources shall operate between 90% and 100% of permitted capacity during the compliance test(s) as adjusted for ambient temperature. Compliance test results shall be submitted to the Central District office no later than 45 days after completion.

15. A continuous monitoring system shall be installed to monitor and record the fuel consumption on each unit. Water injection shall be utilized for NOx control. The water to fuel ratio at which compliance is achieved shall be incorporated into the permit and shall be continuously monitored. The system shall meet the requirements of 40 CFR Part 60, Subpart GG.

16. Sulfur, nitrogen content and lower heating value of the fuel being fired in the combustion turbines shall be based on a weighted 12 month rolling average from fuel delivery receipts. The records of fuel oil usage shall be kept by the company for a two-year period for regulatory agency inspection purposes.

Rule Requirements

17. This source shall comply with all applicable provisions of Chapter 403, Florida Statutes, Chapters 17-2 and 17-4, Florida Administrative Code and 40 CFR (July, 1990 version).

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

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

20. The sources shall comply with F.A.C. Rule 17-2.700, Stationary Point Source Emission Test Procedures.

SPECIFIC CONDITIONS:

21. If construction does not commence within 18 months of issuance of this certification/permit, then the permittee shall obtain from DER 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)).

22. Quarterly excess emission reports, in accordance with the July 1, 1988 version of 40 CFR 60.7 and 60.334 shall be submitted to DER's Central District office.

23. Literature on equipment selected shall be submitted as it becomes available. A CT-specific graph of the relationship between NOx emissions and steam injection and also another of ambient temperature and heat inputs to the CT shall be submitted to DER's Central District office and the Bureau of Air Regulation.

24. Stack sampling facilities shall be provided for each of the stacks.

25. Construction period fugitive dust emissions shall be minimized by covering or watering dust generation areas.

26. Pursuant to F.A.C. Rule 17-2.210(2), Air Operating Permits, the permittee is required to submit annual reports on the actual operating rates and emissions from this facility. These reports shall include, but are not limited to the following: sulfur nitrogen contents 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 Central 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 Central 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).

PERMITTEE:
Florida Power Corp.

Permit Number: AC 64-191015
PSD-FL-167
Expiration Date: Jan. 31, 1993

Issued this 18 day
of October, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner
Secretary

Best Available Control Technology (BACT) Determination
Florida Power Corporation
DeBary Facility
Volusia County

The applicant proposes to operate six No. 2 fuel oil fired 92.9 MW peaking cycle combustion turbine systems to be used for peaking power at their DeBary facility on Highlands Road, DeBary, Volusia County, Florida.

The applicant states that the maximum heat input will be 1,144 MMBtu/hr per turbine. The applicant has indicated the maximum annual tonnage of regulated air pollutants emitted from the six turbines based on sea level conditions at 59°F and 100 percent capacity (8760 hours/year) to be as follows:

Pollutant	Potential Emissions (tons/yr)	PSD Significant Emission Rate (tons/yr)
NOx	4794	40
SO_2	14581	40
PM	394	25
PM_{10}	394	15
CO	1411	100
VOC	131	40

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

Date of Receipt of a BACT Application

December 31, 1990

BACT Determination Requested by the Applicant

Pollutant	Determination
NOx	42 ppmvd @ 15% O_2
SO2 and H_2SO_4	Max 0.5% Sulfur No. 2 fuel oil
PM/PM_{10}	Combustion Controls
CO	Combustion Controls

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and

economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

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

The applicant has stated that BACT for nitrogen oxides will be met by using wet injection necessary to limit emissions to 42 ppmvd at 15% oxygen for No. 2 fuel oil firing.

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

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

The applicant has rejected using SCR because of technical infeasibility. The applicant was unable to find similar combustion turbines firing fuel oil and equipped with SCR. The applicant states several supporting reasons for the decision in Table 4-3 of the application.

Although the Department agrees that there was a time when SCR was not feasible for oil firing, the latest information available now indicates that SCR can be used for oil firing provided that adjustments are made in the ammonia to NOx injection ratio. By lowering the injection ratio below 1 to 1, testing has indicated that NOx can be controlled with efficiencies ranging from 60 to 75 percent. When the injection ratio is lowered, there is not a problem with ammonium bisulfate formation since essentially all of the ammonia is able to react with the nitrogen oxides present in the combustion gases.

The Department recently reviewed an application for a similar combustion turbine, which included levelized cost for SCR of $2,190,000. Assuming that the lowered ammonia injection ratio strategy was used to control NOx emissions by 65%, the SCR would control 201 tons (65% x 309 tons/year) of NOx annually. The 309 tons/year assumes an operating rate of 3400 hours/year/unit. When this reduction of NOx is taken into consideration with the total annual cost of $2,190,000, the cost per ton of controlling NOx is $10,896. This calculated cost is higher than has previously been approved as BACT and if the capacity factor were limited to 33% (2,891 hrs), the cost per ton would be even higher.

The applicant has stated that sulfur dioxide (SO_2) and sulfuric acid mist (H_2SO_4) emissions when firing fuel oil will be controlled by lowering the operating hours to 3400/year per unit and the fuel oil sulfur content to a maximum of 0.5% by weight, and an average of 0.3%. This would result in a SO_2 reduction of 377 tons/year/unit (0.3/0.5 x 3400/8760 hrs x 14,581 TPY 6 units). Also, H_2SO_4 mist would be reduced by 46 tons/year/unit.

With regard to the operation of turbines on oil, several BACT determinations have established a 25% capacity factor as an operating limit. This is due to the increase in nitrogen oxides emissions that results from the burning of oil as compared to natural gas. In some cases, turbines have been allowed to operate above the 25% capacity factor limitation on oil (generally 33%), provided that they use low NOx combustors (42 ppm on oil firing) and limit the sulfur content of oil. Those facilities that have been permitted to operate above the 25% capacity factor limitation had a maximum sulfur content ranging from 0.20 to 0.25 percent. However, their primary fuel was natural gas. Since the DeBary facility is capable of limiting NOx emissions to 42 ppm and can only use oil, it is reasonable to allow the capacity factor to range from 33 to 38.7% provided that the <u>average</u> sulfur content is at or below 0.30%. The Department accepts the applicants proposal to control CO and PM/PM_{10} by combustion design and the use of clean fuels (No. 2 distillate). The Department also agrees with the

applicant that there are no feasible methods to control beryllium and aresenic 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 would be affected by the emissions of these pollutants.

Potentially Sensitive Concerns

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

- Reduced power output, ammonia slip and disposal of hazardous waste generated (spent catalyst)

BACT Determination by DER

Based on the information presented by the applicant and the studies conducted, the Department believes that the use of SCR for NOx control is not justifiable as BACT. Since these units are intended for peaking service and have operating hours limited to 3,390 hrs/yr/unit, wet injection for NOx emission control is justifiable as BACT for this facility. Should the weighted rolling average sulfur content for the fuel oil be greater than 0.30% the operating hours will be reduced or prorated.

As this is the case, the BACT emission limitations are established as follows:

Pollutant	Emission Limit	Method of Control
NOx	42 ppmvd @ 15% O_2	Wet Injection
SO_2	555 lbs/hr/unit	Avg. 0.30% and max. 5% sulfur content, by weight, No. 2 fuel oil
PM and PM_{10}	15 lbs/hr/unit	Combustion
CO	54 lbs/hr/unit	Combustion
VOC	5 lbs/hr/unit	Combustion
Arsenic	7.1×10^{-3} lbs/hr/unit	Fuel Quality
Beryllium	1.3×10^{-6} lbs/hr/unit	Fuel Quality
H_2SO_4	76 lbs/hr/unit	Avg. 0.30% and max. 0.5% sulfur content, by weight, No. 2 fuel oil

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

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

October 17, 1991
Date

Approved by:

Carol M. Browner, Secretary
Dept. of Environmental Regulation

October 18, 1991
Date

TABLE 1
ALLOWABLE EMISSION LIMITS
Simple Cycle Combustion Turbine

Pollutant	Standard Oil Firing	Each Unit lb/hr[a]	Total 6 Units T/yr	Basis
NOx	42 ppm at 15% oxygen-dry basis	182	1851[b]	BACT
SO_2	No. 2 fuel oil with 0.3% avg. and 0.5% max. sulfur	555	2888[c]	BACT
PM/PM_{10}	0.025 lb/MMBtu	15	153[b]	BACT
VOC	-	5	51[b]	BACT
CO	-	54	547[b]	BACT
Sulfuric Acid Mist	No. 2 fuel oil with 0.3% avg. and 0.5% max. sulfur	76	773[b]	BACT
Fluorides (FR)	-	1.67×10^{-5}	0.34	Application
Mercury (Hg)	3.0×10^{-6} lbs/MMBtu	1.54×10^{-6}	0.031[b]	Application
Lead (Pb)	2.8×10^{-5} lbs/MMBtu	4.6×10^{-6}	0.093[b]	Application
Inorganic Arsenic	-	2.1×10^{-6}	0.4[b]	BACT
Beryllium (be)	2.5×10^{-3} lbs/MMBtu	1.3×10^{-6}	0.026[b]	BACT

(a) Emission rates based on 59°F and 15% O_2.

(b) Equivalent to 3390 hours per year at peak load and 38.7% capacity factor. If less than 6 units are constructed annual emissions prorated for actual number units constructed (i.e., if 4 units constructed, the annual NOx emission limit is 1851 TPY * (4/6) = 1234 TPY).

(c) Total TPY CAP for SO_2 assumes 33% capacity factor and fuel sulfur content of 0.30% avg. If less than 6 units constructed annual emission limit prorated for actual number units (4/6) = 1925 TPY).

P 832 538 736

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

UNITED STATES POSTAL SERVICE

Sent to: Mr. W. W. Vierday, FPC	
Street & No.: 3201 34th St. South	
P.O., 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, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date: Mailed: 10-18-91 Permit: AC 64-191015 PSD-FL-167	

PS Form 3800, June 1990

Preston:
Please get me a cy for
the trip to EPA on 6/23.
JM
John returns from
Hold till
Atlanta

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. W. W. Vierday
Environmental Programs & Licen.
Florida Power Corp.
3201 34th Street South
St. Petersburg, FL 33733

4a. Article Number
P 832 538 736

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

7. Date of Delivery
OCT 21 1991

5. Signature (Addressee)

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

6. Signature (Agent)
Walter Kirk

PS Form 3811, October 1990 ☆U.S. GPO: 1990—273-861 **DOMESTIC RETURN RECEIPT**