STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

In the matter of an
Application for Permit by:

Mr. R. W. Neiser
Florida Power Corporation
3201-34th Street North
St. Petersburg, FL 33733

DER File No. AC 49-203114
PSD-FL-181
Osceola County

_____/

Enclosed is Permit Number AC 49-203114 to construct six simple cycle combustion turbines at Florida Power Corporation's Intercession City Electric Generating Station in Osceola County, Florida. This permit is 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 August 17, 1992 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 (Clerk) 8/17/92 (Date)

Copies furnished to:

Kennard Kosky, P.E.
Charles Collins, Central District
Jewell Harper, EPA
Chris Shaver, NPS

P 062 921 989

Receipt for Certified Mail

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

Sent to Mr. R. W. Neiser, FPC	
Street and No. 3201-34th Street South	
P.O., State and 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, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Mailed: 8-17-92 Permit: AC 49-203114 PSD-FL-181	

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. R. W. Neiser
Florida Power Corporation
3201-34th Street South
St. Petersburg, FL 33733

4a. Article Number
P 062 921 989

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

7. Date of Delivery
AUG 20 1992

5. Signature (Addressee)

6. Signature (Agent)

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

PS Form **3811**, November 1990 ☆U.S. GPO: 1991—287-066 **DOMESTIC RETURN RECEIPT**

Final Determination

Florida Power Corporation
Intercession City Facility
Intercession City, Osceola County, Florida

Six Simple Cycle Combustion Turbines
(Four 92.9 MW & Two 185.5 MW)

Permit Number: AC 49-203114
PSD-FL-180

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

August 17, 1992

FINAL DETERMINATION

The Technical Evaluation and Preliminary Determination for the permit to construct six simple cycle combustion peaking units at Florida Power Corporation's (FPC) Intercession City Electric Generating Station in Intercession City, Osceola County, Florida, was distributed on May 22, 1992. The Notice of Intent to Issue was published in the Orlando Sentinel on June 17, 1992. Copies of the evaluation were available for public inspection at the Department's offices in Orlando and Tallahassee.

FPC's applications for permits to construct six simple cycle combustion peaking units (with a combined capacity of 371 MW) at their Intercession City Electric Generating Station have 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 June 16, 1992.

Comments were received from Mr. Scott H. Osbourn , Senior Environmental Engineer for FPC, and Mr. John R. Eadie, Acting Regional Director of the U. S. Fish and Wildlife Service.

The Bureau has considered Mr. Osbourn's and Mr. Eadie's comments and has addressed them as follows:

Florida Power Corporation 's letter dated July 16, 1992.

COMMENT:

Mr. Osbourn's concerns are regarding the economics (cost differentials per gallon for various grades) of using No. 2 fuel oil with a maximum of 0.2% sulfur by weight vs No. 2 fuel oil with a 0.3% sulfur average and a maximum of 0.5% sulfur on an annual basis. Initially, Mr. Osbourn requested that Specific Condition No.5 be deleted, the expiration date of the permit changed, and Specific Condition No. 16 be modified. However, on July 24, 1992, Mr. Osbourn withdrew his requests for changes to Specific Conditions Nos. 5 and 16, via a telephone conversation with Mr. Preston Lewis, Permitting Supervisor.

RESPONSE:

The Department has evaluated Mr. Osbourn's comments and concluded that the BACT determination for this project is justifiable and should not be changed. The limitations for sulfur content and SO2 emissions will remain as specified in the permit: Distillate fuel oil with a maximum of 0.2% sulfur by weight and 2459 TPY SO2. However, as requested, the economics (cost differentials per gallon for various grades) of this project will be revisited before startup, and if warranted, the BACT determination and permit conditions will be revised.

As requested, the expiration date of this permit will be changed to December 31, 1994.

U.S. Fish and Wildlife Service's letter dated July 16, 1992.

COMMENTS:

Mr. Eadie's comments are regarding the sulfur content in the oil and the air quality analyses. He recommended to lower the sulfur content of the No. 2 fuel oil to 0.05% S (by weight) maximum.

RESPONSE:

Mr. Eadie's concerns regarding the sulfur content in the oil are valid. We also believe that new sources should minimize SO2 emissions when feasible. It is true that recent permit applications (Kissimmee Utilities Authority, Auburndale Power Partners, and Central Florida Power) have proposed to fire oil with a maximum sulfur content of 0.05%, but it should be pointed out that they are using fuel oil as a supplementary fuel. However, in this case, it is not economically feasible to require fuel oil with a 0.05 % maximum sulfur content since fuel oil is the primary and only fuel at the site. Section 211(i)(1) of the Clean Air Act, Sulfur Content Requirements For Diesel Fuel, states: "Effective October 1, 1993, no person shall manufacture, sell, supply, offer for sale or supply, dispense, transport, or introduce into commerce motor vehicle diesel fuel which contains a concentration of sulfur in excess of 0.05% (by weight) or which fails to meet a cetane index minimum of 40..". Although this regulation is not applicable to stationary sources, and we will continue evaluating sources in a BACT case-by-case basis, it will have an impact on the availability and economics of requiring fuel oil with a lower sulfur content for future projects.

COMMENT:

Mr. Eadie's comments on the potential impacts to the Chassahowitxka Wilderness Area.

RESPONSE:

When the Department released its Intent to Issue this permit, we believed the applicant had sufficiently addressed all of the potential impacts to the air quality related values (AQRVs) (such as vegetation, soils, terrestrial wildlife and visibility) in the Chassahowitzka Wilderness Area. The Fish and Wildlife Service (FWS) identified potential effects on fresh water creeks and

related wildlife in the wilderness area as an AQVR after the Intent wsa released. However, the Department agrees with the FWS that, based on modeling results, we do not anticipate that these resources will be adversely affected by emissions from the proposed project. In addition, the Department will require future applicants to address impacts to these aquatic resources.

The final action of the Department will be to issue construction permit, No. AC 49-203114 (PSD-FL-180), as proposed in the Technical Evaluation and Preliminary Determination, with the above changes incorporated.

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
Intercession City Facility
3201 34th Street South
St. Petersburg, Florida 33733

Permit Number: AC 49-203114
PSD-FL-180
Expiration Date: Dec. 31, 1994
County: Osceola
Latitude/Longitude: 28°15'37"N
81°32'47.6"W
Project: Four 92.9 MW and Two 185.5 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 four 92.9 MW and two 185.5 MW simple cycle combustion turbines (CTs) with maximum heat input of 1,029 MMBtu/hr/unit and 1,886.3 MMBtu/hr/unit, respectively, at 59°F (oil) to be located at the Intercession facility in Intercession City, Florida. The turbines are to be GE PG7111FA and GE PG7111EA equipped with wet injection. The UTM coordinates are Zone 17, 446.3 km East and 3126 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. Florida Power Corporation (FPC) application received October 3, 1992.
2. Department's letter dated October 31, 1991.
3. FPC's letter received December 16, 1991.
4. FPC's letter received January 23, 1992.
5. FPC's letter received February 10, 1992.
6. Department's letter dated February 21, 1992.
7. FPC's letter dated March 5, 1992.
8. Department's letter dated March 9, 1992.
9. FPC's letter dated March 25, 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 these sources shall not exceed the emission rates listed in Table 1 (92.9 MW combustion turbines) and Table 2 (185.5 MW combustion turbines).

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 0.2% sulfur content maximum, by weight.

4. The permitted materials and utilization rates for the simple cycle gas turbines shall not exceed:

(A) The average maximum capacity factor shall be limited to 38.7% (3,390 hours per year operating time).

(B) Total hours of operation for the six turbines shall not exceed 20,340 unit hours per year. Unit hour per year shall be determined by adding the hrs/yr operation of each of the six units.

(C) GE FRAME 7FA
a) The maximum heat input of 2,032 MMBtu/hr/unit at 20°F (peak load).

SPECIFIC CONDITIONS:

b) The maximum heat input of 1,886 MMBtu/hr/unit at 59°F (peak load).
c) The maximum heat input of 1,708 MMBtu/hr/unit at 90°F (peak load).
d) Maximum No. 2 fuel oil consumption shall not exceed 14,342 gal/hr/unit (at 59°F) or 97,238,760 gal/yr based on 59°F or the prorated consumption based on the tables in the application to construct these units.

(D) GE FRAME 7EA
a) The maximum heat input of 1,144 MMBtu/hr/unit at 20°F (peak load).
b) The maximum heat input of 1,029 MMBtu/hr/unit at 59°F (peak load).
c) The maximum heat input of 932 MMBtu/hr/unit at 90°F (peak load).
d) Maximum No. 2 fuel oil consumption shall not exceed 7,826 gal/hr/unit or 106,120,560 gal/yr based on 59°F or the prorated consumption based on the tables in the application to construct these units.

5. The capacity factor for these turbines shall be limited to 33% based on a weighted 12 month rolling maximum sulfur content of 0.2%. However, if the weighted rolling average sulfur content of the fuel oil is less than 0.2%, the capacity factor may be adjusted using the following table:

Percent Average Sulfur Content	% Capacity Factor
0.2 - 0.195	33.0
0.19 - 0.185	34.4
0.18 - 0.175	35.8
0.17 - 0.165	37.2
0.16 - 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 may be included in the operating permit.

SPECIFIC CONDITIONS:

Compliance Determination

8. Compliance with the NO_x, SO_2, CO, PM, PM_{10}, and VOC standards shall be determined (on each unit while operating within 10% of the permitted 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, 1991 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 Stationary Sources
- 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 (each type) to determine the initial compliance status of the 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.

SPECIFIC CONDITIONS:

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:

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

where:

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

NO_X obs = Measured NO_X emission at 15 percent oxygen, ppmv.

P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals (1 atmosphere) ambient pressure.

P_{obs} = Measured combustor inlet absolute pressure at test ambient pressure.

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718).

T_{AMB} = Temperature of ambient air at test.

14. Test results will be the average of 3 valid runs. The Central District office will be notified at least 30 days in writing in advance of the compliance test(s) pursuant to 40 CFR 60.8. 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 pursuant to F.A.C. Rule 17-2.700(8).

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 operation permit and shall be continuously monitored. The system shall meet the requirements of 40 CFR Part 60, Subpart GG.

SPECIFIC CONDITIONS:

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. For sulfur dioxide, periods of excess emissions shall be reported if the fuel being fired in the gas turbine exceeds 0.2 percent.

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.

21. If construction does not commence within 18 months of issuance of this 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, 1991 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.

SPECIFIC CONDITIONS:

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 and 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).

Issued this 17th day
of August, 1992

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner
Secretary

Best Available Control Technology (BACT) Determination
Florida Power Corporation
Intercession City Facility
Osceola County

The applicant proposes to operate six No. 2 fuel oil fired simple cycle combustion turbines with an output power of 92.9 MW (4 turbines) and 185.5 MW (2 turbines) to be used for peaking power at their facility in Osceola County, Florida.

The applicant states that the maximum heat input will be 1,029 MMBtu/hr and 1,886 MMBtu/hr for each turbine type (Frame EA and Frame FA, respectively). The applicant has indicated the maximum annual tonnage of regulated pollutants based on sea level conditions at 59°F and 38.7% capacity (3,390 hours/year) to be as follows:

Pollutant	Potential Emissions (tons/yr)	PSD Significant Emission Rate (tons/yr)
NO_x	2369	40
SO_2	4326	40
H_2SO_4 Mist	626	7
PM	159	25
PM_{10}	159	15
CO	633	100
VOC	65	40
Be	0.034	0.0004
Hg	0.04	0.1
Pb	0.12	0.6
As	0.054	0

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

October 3, 1991

BACT Determination Requested by the Applicant

Pollutant	Determination
NO_x	42 ppmvd @ 15% O_2
SO_2 and H_2SO_4	Max 0.5% Sulfur No. 2 fuel oil
PM/PM_{10}	Combustion Controls
CO	Combustion Controls
VOC	Combustion Controls
As, Be	Fuel Quality

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.

BACT Pollutants Analysis

Nitrogen Oxides (NO_x)

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

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% 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 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.

The exhaust temperatures of the proposed CTs for the Intercession City site are expected to be in excess of 1,000°F. At temperatures of 1,000°F and above, the zeolite catalyst (reported to operate within 600°F to 950°F) will be irreparably damaged. Therefore, application of an SCR system using a zeolite catalyst on a simple-cycle operation is technically infeasible without exhaust gas cooling. Attemperation systems are neither commercially available nor have they been applied, even at a pilot stage, to SCR systems associated with simple-cycle CTs.

Consequently, the applicant has rejected using SCR because of technical infeasibility, economic and environmental impact. In addition, controlling NO_X emissions with SCR, the applicant has identified the following limitations: (a) reduced power output, (b) ammonia slip, and (c) disposal of hazardous waste generated (spent catalyst). The applicant was unable to find similar combustion turbines firing fuel oil and equipped with SCR, and states several supporting reasons for their decision in Table 4-3 of the application.

Economic analysis review of an application for a similar combustion turbine, included levelized cost for SCR of $2,190,000. Assuming that the lowered ammonia injection ratio strategy was used to control NO_X emissions by 65%, the SCR would control 201 tons (.65 x 308 tons/year) for the 92.9 MW turbine and 367 tons (.65 x 566 tons/year). This reduction (201 and 367 tons/year) assumes an operating rate of 3,390 hours/year/unit. When this

reduction of NO_X is taken into consideration with the total annual cost of $2,190,000, the cost per ton of controlling NO_X is $10,890 and $5,967 for the 92.9 MW and 185.5 MW units, respectively.

Several BACT determinations have established a 25% capacity factor as an operating limit due to the increase in nitrogen oxides emissions that results from the burning of oil as compared to natural gas. In some cases, turbines (using natural gas as a primary fuel) have been allowed to operate above the 25% capacity factor limitation on oil (generally 33%) provided that they use low NO_X combustors (42 ppmv on oil firing). Since the Intercession City facility is capable of limiting NO_X emissions to 42ppmv using wet injection and can only use oil, it is reasonable to allow the capacity factor to range from 33 to 38.7%. Hence, the technology proposed, wet injection, with a maximum capacity factor of 38.7% is accepted by the Department as BACT for NO_X.

Sulfur Dioxide(SO_2) and Sulfuric Acid Mist (H_2SO_4)

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 time to 3390 hour/year per unit and the fuel oil sulfur content to a maximum of 0.5 % by weight, and an average of 0.3%. This will result in an annual emission rate of 4,326 tons SO_2/year and 626 tons H_2SO_4 mist per year.

In accordance with the "top down" BACT review approach, only two alternatives exist that would result in more stringent SO_2 emissions. These include the use of a lower sulfur content fuel oil or the use of wet lime or limestone-based scrubbers, otherwise known as flue gas desulfurization (FGD).

In developing the NSPS for stationary gas turbines, EPA recognized that FGD technology was inappropriate to apply to these combustion units. EPA acknowledged in the preamble of the proposed NSPS that "Due to the high volumes of exhaust gases, the cost of flue gas desulfurization (FGD) to control SO_2 emissions from stationary gas turbines is considered unreasonable."(23). EPA reinforced this point when, later on in the preamble, they stated that "FGD... would cost about two to three times as much as the gas turbine."(23). The economic impact of applying FGD today would be no different.

Furthermore, the application of FGD would have negative environmental and energy impacts. Sludge would be generated that would have to be disposed of properly, and there would be increased utility (electricity and water) costs associated with the operation of a FGD system. The capital cost alone of a system designed for 90% removal would require debt services cost of $30,000+/tons SO_2 removed. Finally, there is no information in the open literature to indicate that FGD has ever been applied to stationary gas turbines burning distillate oil.

The elimination of flue gas controls as a BACT option then leaves the use of low sulfur fuel oils as the next option to be investigated. Area available distillate fuel oil has a sulfur content in the range of 0.1% - 0.5% by weight. As already mentioned, several BACT determinations nationwide have established a 25% capacity factor as an operating time limit for turbines using gas as a primary fuel and oil as a supplemental fuel. 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.

The Intercession City facility's proposed simple cycle turbines will be allowed to operate from 33 to 37.8% capacity factor provided that the maximum sulfur content will not exceed 0.2%. This would result in a SO_2 and H_2SO_4 mist reduction of 1867 tons/year [4326 (proposed) - 2459 (allowable)] and 439 tons/yr [626 (proposed) - 187 (allowable)] while operating at a 33% capacity factor.

The applicant's cost analysis presented showed that the cost effectiveness of using 0.2% sulfur maximum in the oil instead of 0.5% sulfur maximum is $1,995/ton SO_2 removed. The Department believes that this cost of $1,995/ton removed is reasonable as BACT for this proposed project.

Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

Combustion design is proposed as BACT as a result of the technical infeasibility and economic impact of using catalytic oxidation on fuel-oil fired CTs. Catalytic oxidation has not been demonstrated on a continuous basis when using fuel oil and a cost effectiveness of $7,099/ton removed will have an economic impact on this facility. The Department is in agreement with the applicant's proposal, therefore, BACT for this facility's gas turbines is combustion design as proposed.

Particulate Matter (PM/PM_{10})

The design of the CTs ensures that particulate emissions will be minimized by combustion control and the use of clean fuels. The maximum particulate emissions from the CTs when burning fuel oil will be lower concentration than that normally specified for fabric filter designs (0.01 grains/scf). The Department accepts the applicant's proposed control for particulate matter.

Toxic Pollutants (As, Be)

The Department agrees with the applicant's rationale that there are no feasible methods to control beryllium and arsenic 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.

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 NO_x 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 NO_x emission control is justifiable as BACT for this facility. BACT for SO_2 and sulfuric acid mist is the burning of fuel oil with a maximum sulfur content of 0.2%. The economics of the 0.2% maximum sulfur limit will be revised at the time of startup (or actual fuel oil contract negotiation) and if warranted, a BACT determination revision.

As this is the case, the BACT emission limitations are established as follows for the **92.9 MW combustion turbines.**

Pollutant	Emission Limit	Method of Control
NO_x	42 ppmvd @ 15% O_2	Wet Injection
SO_2	222 lbs/hr/unit	Max. 0.2% 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	4.32×10^{-3} lbs/hr/unit	Fuel Quality
Beryllium	2.57×10^{-3} lbs/hr/unit	Fuel Quality
H_2SO_4	18 lbs/hr/unit	Max. 0.2% sulfur content, by weight, No. 2 fuel oil

and as follows for the **185.5 MW combustion turbines:**

Pollutant	Emission Limit	Method of Control
NO_x	42 ppmvd @ 15% O_2	Wet Injection
SO_2	407 lbs/hr/unit	Max. 0.2% sulfur content, by weight, No. 2 fuel oil

PM and PM_{10}	17 lbs/hr/unit	Combustion
CO	79 lbs/hr/unit	Combustion
VOC	9 lbs/hr/unit	Combustion
Arsenic	7.9×10^{-3} lbs/hr/unit	Fuel Quality
Beryllium	4.7×10^{-3} lbs/hr/unit	Fuel Quality
H_2SO_4	28 lbs/hr/unit	Max 0.2% sulfur content, by weight, No. 2 fuel oil

Details of the Analysis May be Obtained by Contacting:

Preston Lewis, P.E., Permit Supervisor
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

August 17 1992
Date

Approved by:

Carol M. Browner, Secretary
Dept. of Environmental Regulation

August 17 1992
Date

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 M. Browner

FROM: Howard L. Rhodes

DATE: August 17, 1992

SUBJ: Approval of Construction Permit AC 49-203114 (PSD-FL-180)
Florida Power Corporation - Intercession City

Attached for your approval and signature is a permit prepared by the Bureau of Air Regulation for the above mentioned company to construct six simple cycle combustion peaking units.

Florida Power Corporation proposes to increase their energy capability at the Intercession City site by operating six new simple cycle combustion turbines (CTs) for a generating capability of 712.6 megawatts (MW). The six combustion turbines will fire No. 2 fuel oil with a maximum of 0.2% sulfur by weight and will operate for a maximum of 3390 hours per year. These CTs are equipped with water injection for nitrogen oxides (NO_X) control. The Intercession City facility has six existing simple cycle combustion turbines with a generating capability of 306 MW.

Comments were received from Mr. Scott H. Osbourn, Senior Environmental Engineer for FPC and Mr. John R. Eadie, Acting Regional Director of the U.S. Fish and Wildlife Service.

I recommend your approval and signature.

HLR/TH/plm

Attachments