STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT MODIFICATION

In the Matter of an
Application for Permit Modification

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

Permit: PSD-FL-195A / PA-92-33

Hines

Enclosed is the Final Permit Modification which reflects the use of SCR and the technical specifications of the new Westinghouse combined cycle combustion turbines. This permit is issued pursuant to Chapter 403, Florida Statutes and 62-4 through 297 F.A.C and 40 CFR 52.21-Prevention of Significant Deterioration (PSD).

Any party to this order (permit) 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.

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 NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 9-29-98 to the person(s) listed:

Mr. W Jeffrey Pardue *
Mr. Doug Neeley, EPA
Mr. John Bunyak, NPS
Mr. Bill Thomas, SWD
Mr. Hamilton Oven, OSC

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) 9-29-98 (Date)

FINAL DETERMINATION

Florida Power Corporation

Permit Modification for Westinghouse CTs with SCR and Other Changes
Hines Energy Complex
Combined Cycle Project
Power Block 1

Polk County

Construction Permit No. PSD-FL-195A / PA-92-33

Florida Power Corporation submitted an application to modify permit No. PSD-FL-195 to install a Selective Catalytic Reduction (SCR) system and to reflect the technical specifications of the combustion turbines installed at its Combined Cycle Facility located near Fort Meade, Polk County.

No comments were received during the public notice period. With this action the Department modifies the construction permit in accordance with the Intent To Issue PSD Permit Modification with the following minor changes:

1. The custom fuel monitoring schedule has been revised to reflect recent guidance from EPA.
2. Minor clarifications were made to certain Specific Conditions regarding testing.

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
2. ☐ Res

Consult

3. Article Addressed to:

Mr. Jeffrey Pardue
Fla. Power Corp.
3201 34th Street So.
St. Petersburg, F

4a. Article Number

Z 333 612 520

5. Received By: *(Print*

6. Signature: *(Ad*

OCT 0 1 1998

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PS Form 38

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PS Form 3800, April 1995

PSD-FI-195A
PA 92-33

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

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

Permit Number: PSD-FL-195A/PA-92-33
Issued: 3/1/94 **Revised:** 9/28/98
Expiration Date: November 1, 2000
County: Polk
Latitude/Longitude: 27°47'19"N/81°52'10"W
Project: 485 MW Combined Cycle

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-212 and 62-4. 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 specifically described as follows:

For two combined cycle combustion turbines (CTs) with maximum allowable heat input based on the higher heating value (HHV) at 59°F of 1,757 MMBtu/hr/unit (natural gas) and 1,846 MMBtu/hr/unit (oil) to be located at the Hines Energy Complex near Fort Meade, Florida. Power Block 1 consists of two combined cycle combustion turbines for a total of 485 MW, a 99 MMBtu/hr auxiliary boiler(Subpart Dc), a 1,300 KW diesel generator and a 97,570 barrel fuel oil storage tank(Subpart Kb). The combustion turbines are Westinghouse Model 501FC or equivalent and rated at approximately 165 MW in simple cycle and equipped with dry low NO_X combustors and/or Selective Catalytic Reduction (SCR) for natural gas firing and wet injection for fuel oil firing. Each combustion turbine will incorporate an unfired heat recovery steam generator.

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.

Howard L. Rhodes, Director
Division of Air Resources
Management

Relevant documents are listed below:

1. Florida Power Corporation (FPC) application received August 4, 1992.
2. The Department's letters dated August 31 and November 13, 1992.
3. FPC's letters dated October 13 and November 30, 1992; June 27 and September 9, 1996; February 18 and June 30, 1998; and the SCR Technical Specification received August 3, 1998.

4. Westinghouse 501FC tables or curves showing Heat Input vs. Compressor Inlet Temperature and Nitrogen Oxide Emissions vs Compressor Inlet Temperature shall be attachments to and are part of this permit.

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 acknowledgment 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.

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.

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 62-4.120 and 62-730.300, 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;
       - 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.

16. Circumvention. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly pursuant to Rule 62-210.650 F.A.C.

SPECIFIC CONDITIONS:

The construction and operation of the Hines Energy Complex (Project) shall be in accordance with all applicable provisions of Chapters 62-210 to 297, F.A.C. and NSPS Subparts GG, Dc, and Kb. The following emission limitations and conditions reflect BACT determinations for the Power Block 1- 485 MW (two combined cycle combustion turbines and auxiliary equipment) of generating capacity for which the need has been determined. BACT determinations for the remaining phases will be made upon review of supplemental applications. In addition to the foregoing, the Project shall comply with the following conditions of certification as indicated.

A. General Requirements

1. The maximum heat input (HHV) to each combustion turbine (CT) at an ambient temperature of 59° F shall neither exceed 1,757 MMBtu/hr while firing natural gas, nor 1,846 MMBtu/hr while firing fuel oil. Heat input may vary depending on ambient conditions and the CT characteristics. Manufacturer's curves or equations for correction to other temperatures shall be provided to DEP for review 90 days after selection of the CT. Subject to approval by the Department for technical validity applying sound engineering principles, the manufacturer's curves shall be used to establish heat input rates over a range of temperatures for the purpose of compliance determination.

2. Each of the two CTs in Power Block 1 may operate continuously, i.e., 8,760 hrs/year.

3. Only natural gas (NG) or low sulfur fuel oil shall be fired in each combustion turbine. Only low sulfur fuel oil shall be fired in the diesel generator. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent, by weight. Only natural gas shall be fired in the auxiliary boiler.

4. The maximum heat input to the auxiliary boiler shall not exceed 99 MMBtu/hr. Fuel consumption shall be measured and recorded for the auxiliary boiler.

5. The maximum allowable fuel oil consumption for the two turbines is 13,762,806 gallons per year, which is equivalent to an aggregate of 1,000 hours per year of operation at full load.

6. The permittee shall have the option of installing duct module(s) suitable for possible future installation of an oxidation catalyst and/or SCR equipment on each combined cycle generating unit. In the event that the module(s) are not installed in the Heat Recovery Steam Generator (HRSG), the retrofit costs

associated with not making provisions for such technology (initially) shall not be considered in any future economic evaluation to justify not installing SCR or an oxidation catalyst.

7. Fugitive dust emissions during the construction period shall be minimized by covering or watering dust generation areas.

8. If site construction does not commence on Power Block 1 (485 MW)within 18 months of issuance of this permit, then FPC may request an extension of the 18-month period, provided that such request is received by the Department's Bureau of Air Regulation at least 90 days prior to the expiration date. Such a request shall identify the progress made toward commencement of the construction of the site and the expected time required to start and complete construction of the initial phase. The Department may grant the extension upon a satisfactory showing that the extension is justified. Units to be constructed or modified in later phases of the project will be reviewed under the supplementary review process of the Power Plant Siting Act. If site construction has not commenced within 18 months of issuance of this certification, then FPC shall obtain from DEP a review and, if necessary, a modification of the BACT determination and allowable emissions for the unit(s) on which construction has not commenced [40 CFR 52.21(r)(2)].

B. Emission Limits

1. The maximum allowable emissions from each of the two CTs, when firing natural gas or low sulfur fuel oil, in accordance with the BACT determination and subsequent data from Westinghouse, shall not exceed the following(at 59° F reference temperature for NOx emissions) (except during periods of start up, shutdown, malfunction):

EMISSIONS LIMITATIONS

POLLUTANT	FUEL	BASIS(g)	LB/HR/CT	TPY(b)
NO_X(a)	Gas	12 ppmvd (h)	73(i)	639
	Oil	42 ppmvd (c) (h)	305	153
VOC (d)	Gas	7 ppmvw	10.4	91
	Oil	10 ppmvw	19.0	5.6
CO	Gas	25 ppmvd	77	675
	Oil	30 ppmvd	93	47
PM/PM_{10}	Gas		15.6	79
	Oil(e)		44.8	21
SO_2	Gas(f)		4.7	44
	Oil(f)		94	47
Visible Emissions	Gas	10 percent opacity		
	Oil	20 percent opacity		

a. Pollutant emission rates may vary depending on ambient conditions (compressor inlet temperatures)and the CT characteristics. Manufacturer's curves for the NO_X emission rate correction to other temperatures at different loads shall be provided to DEP for review 90 days

after selection of the CT. Subject to approval by the Department for technical validity applying sound engineering principles, the manufacturer's curves shall be used to establish pollutant emission rates over a range of temperatures for the purpose of compliance determination. Emission limitations in LB/HR/CT of NO_X are blocked 24-hour averages (midnight to midnight) and are calculated as follows:

NO_X emissions shall be determined continuously by a Continuous Emissions Monitoring System (CEMS). A CEMS operated and maintained in accordance with 40 CFR 75 shall be used. Compliance with the NO_X emissions standards in the above table shall be demonstrated with this CEMS system based on a 24-hour block average. Based on CEMS data at the end of each operating day, new 24-hour average emission rates, both actual and allowable (based on compressor inlet temperatures) are calculated from the arithmetic average of all valid hourly emission rates during the previous 24 operating hours. Valid hourly emission rates shall not include periods of startup (including fuel switching), shutdown, or malfunction as defined in Rule 62-210.200 where emissions exceed the NO_X standard. These excess emission periods shall be reported as required in Specific Condition E.2.f. A valid hourly emission rate shall be calculated for each hour in which two NO_X and carbon dioxide (or oxygen) concentrations are obtained at least 15 minutes apart. When monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate the 24-hour block average.

b. Annual emission limits (TPY) for natural gas are based on a total of two CTs operating at full load 8,760 hours per year (i.e., NO_X - 73 lbs/hr X 2 CTs X 8,760 hrs/yr X 1 ton/2,000 lbs = 639 TPY). Annual emission limits (TPY) for fuel oil are based on full load operation for a total of 1,000 hours per year for the two CTs (i.e., NO_X - 305 lbs/hr X 1,000 hrs/yr X 1 ton/2,000 lbs = 153 TPY).

c. Fuel oil NO_X emissions are based on full load operation and 15 percent oxygen. For fuel oil firing, NO_X levels of 42 ppmvd @ 15 percent O_2 are based on a fuel bound nitrogen content of 0.015 percent or less. The emission limit for NO_X is adjusted as follows for higher fuel nitrogen contents up to a maximum of 0.030 percent by weight:

FUEL BOUND NITROGEN (% BY WEIGHT)	NO_X LEVELS (PPMVD @ 15%O_2)	NO_X EMISSIONS LB/HR/CT	NO_X EMISSIONS TPY
0.015 or less	42	305	153
0.020	44	320	160
0.025	46	334	167
0.030	48	349	175

using the formula STD = 0.0042 + F where:

STD = allowable NO_X emissions (percent by volume at 15 percent O_2 and on a dry basis).

F = NO_X emission allowance for fuel-bound nitrogen defined by the following table:

FUEL-BOUND NITROGEN (% BY WEIGHT)	F (NO_X % BY VOLUME)
$0 < N < 0.015$	0
$0.015 < N < 0.03$	0.04(N-0.015)

where: N = the nitrogen content of the fuel (% by weight).

NO_X emissions limits are preliminary for the fuel oil specified in Specific Condition No. A.3. FPC shall maintain fuel bound nitrogen content data for the low sulfur fuel oil prior to commercial

operation. Adjustments of the NO_X standard (up and down) shall be calculated and recorded based upon a volume weighted average of the nitrogen content of each bulk fuel oil shipment and the nitrogen content of the existing fuel in the storage tank. The NO_X emission allowance (F) for fuel oil shall not be adjusted between fuel oil shipments. Records for these adjusted standards shall be kept on site for a minimum of 5 years.

d. Exclusive of background concentrations.

e. PM/PM_{10} emission limitations include sulfuric acid mist.

f. SO_2 emissions are based on a maximum of 1 grain of S/100cf of natural gas and 0.05 percent sulfur in the fuel oil.

g. The values are the computational basis for the lb/hr numbers, which are the actual emission limitations. Once a combustion turbine manufacturer has been selected, it may be necessary to modify this basis. If this basis is to be modified, a professional engineer-certified equivalency analysis by the manufacturer must be submitted to the Department. The equivalency analysis will recommend an emissions normalizing basis (i.e., lb/hr, lb/MMBtu, lb/MWh, or ppmvd) and associated emissions appropriate for the specific manufacturer's equipment. If the equivalency analysis demonstrates an impact equal to or less than the current lb/hr limit, the Department shall amend the conditions to reflect the alternate basis. The characteristics and parameters of the CT selected will be reflected in other permit conditions, where appropriate.

h. At 15 percent O_2, not ISO corrected.

i. Control of nitrogen oxides from each CT while firing natural gas shall be accomplished using dry low NO_X burners (DLN) and SCR. Ammonia slip shall not exceed 10 ppm. If the Westinghouse Piloted Ring Combustor(PRC) or a more advanced DLN burner is developed which is able to comply with the emission limits (listed in the above table) and is installed by November 1, 2000 the SCR system may be removed and replaced with these new burners upon 30 days prior notice to DEP. This action would implement the original BACT for NO_X and would not be subject to PSD review. This notice shall include information on the new burners which provides reasonable assurance and PE certification that these DLN burners can consistently meet the BACT emission limits. In this case the new dry low NO_X burners shall be tested in accordance with the initial performance test as described in Section C.1 within 180 days of startup with the new burners.

The following CT emissions, determined by BACT, are tabulated for PSD purposes:

ESTIMATED EMISSIONS

POLLUTANT	METHOD OF CONTROL	Basis(b)
Benzene	Natural Gas	BACT
Inorganic Arsenic	No. 2 Fuel Oil(a)	BACT
Beryllium	No. 2 Fuel Oil (a)	BACT
Mercury	No. 2 Fuel Oil(a)	(c)
Pb	No. 2 Fuel Oil (a)	(c)

a. The No. 2 fuel oil shall have a maximum sulfur content of 0.05 percent.

b. Since these pollutants are inherent constituents in the fuel, the basis for control will be by specifying that only natural gas and No. 2 fuel oil can be fired at the facility.

c. Below PSD significant emission levels.

3. Excess emissions from a turbine resulting from start up, shutdown, malfunction, or load change shall be acceptable providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for a longer duration. The permittee shall provide a general description of the procedures to be followed during periods of start up, shutdown, malfunction, or load change to ensure that the best operational practices to minimize emissions will be adhered to and the duration of any excess emissions will be minimized. The description should be submitted to the Department along with the initial compliance test data. The description may be updated as needed by submitting such update to the Department within thirty (30) days of implementation.

4. Operation of the auxiliary steam boiler shall be limited to a maximum of 1000 hours per year and only during periods of cold CT startup or quick startup out of a short-term shutdown mode, when no other source of steam is available or during periodic testing. The following emission limitations shall apply:

   a. NO_X emissions shall not exceed 0.1 lb/MMBtu for natural gas firing based on vendor-certified stack test data for the model of auxiliary boiler purchased.
   b. Sulfur dioxide emissions shall be limited by firing natural gas.
   c. Visible emissions shall not exceed 10 percent opacity while burning natural gas.

5. Operation of the emergency diesel generator shall be limited to a maximum of 100 hours per year and only during periods of on site emergency power needs (when no other power source is available) or during periodic testing. The following emission limitations shall apply:
   a. The manufacturers design NO_X emission rate shall not exceed 9.82 grams/hp-hr based on vendor-certified stack test data (or equivalent) on the model of generator purchased. This test data shall be provided to the Department with the initial combustion turbine performance test report.
   b. Sulfur dioxide emissions shall be limited by firing only low sulfur fuel oil with maximum sulfur content of 0.05 percent by weight.
   c. Visible emissions shall not exceed 20 percent opacity.

C. Performance Testing

1. An initial (I) performance test shall be performed on each CT for each fuel. Testing of emissions shall be conducted with the source operating at capacity (maximum heat input rate for the tested operating temperature). Capacity is defined as 90 - 100 percent of permitted capacity. If it is impracticable to test at capacity, then sources may be tested at less than capacity; in this case subsequent source operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen consecutive days for purposes of additional compliance testing to regain the rated capacity in the permit, with prior notification to the Department. Annual (A) compliance tests shall be performed on each CT with the fuel(s) indicated below. Tests shall be conducted using EPA reference methods in accordance with 40 CFR 60, Appendix A, as adopted by reference in Rule 62-297, F.A.C.:
   a. Reference Method 5 or 17 for PM (I, A- only for oil and only if fuel oil is fired more than 400 hours for the CT in the previous federal fiscal year).
   b. Reference Method 9 for VE (I, A- only for oil and only if fuel oil is fired more than 400 hours for the CT in the previous federal fiscal year).

c. Reference Method 10 for CO (I, A- for gas and annually for oil if fuel oil is fired more than 400 hours for the CT in the previous federal fiscal year).
d. Reference Method 20 for NO_X (I- only for compliance with 40 CFR 60.332 and 40 CFR 60.335).
e. Reference Method 18 or Method 25A for VOC (I).
f. ASTM D4294 (or equivalent) for sulfur content of distillate oil (I,A), which can be used for determining SO_2 emissions annually.
g. ASTM D1072-80, D3031-81, D4084-82, or D3246-81 (or equivalent) for sulfur content of natural gas (I).
h. Ammonia (I) by EPA Conditional Test Method CTM-027 or a test method approved by DEP prior to the initial performance test.
i. Other DEP approved methods may be used for compliance testing after prior Departmental approval.

2. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent by weight. Compliance shall be demonstrated in accordance with the requirements of 40 CFR 60.334 testing for sulfur content of the fuel oil in the storage tanks on each occasion that fuel is transferred to the storage tanks from any other source. Testing for fuel bound nitrogen content by ASTM D3431 or D4629 or other equivalent ASTM method, and for fuel oil higher heating value, shall also be conducted on the same schedule.

D. Monitoring Requirements

For each combined cycle unit, the permittee shall install, operate, and maintain a continuous emission monitoring system (CEMS) (in accordance with 40 CFR 60, Appendix F or 40 CFR 75) or use other DEP approved alternate methods to monitor nitrogen oxides and, if necessary, a diluent gas (CO_2 or O_2). The Federal Acid Rain Program requirements of 40 CFR 75 shall apply when those requirements become effective for the CTs.

1. Each CEMS shall meet performance specifications of 40 CFR 60, Appendix B or 40 CFR 75.

2. CEMS data shall be recorded and reported in accordance with Chapter 40 CFR 60 Appendix A and Subpart GG and 40 CFR 75. The record shall include periods of start up, shutdown, and malfunction. Compliance with condition B.1. for NO_X shall be determined by CEMS on a mass emission rate basis (LB/HR) using EPA Method 19 and hourly averaged heat inputs (MMBtu/hr).

3. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.

4. The procedures under 40 CFR 60.13 and 40 CFR 75 shall be followed for installation, evaluation, and operation of all CEMS.

5. For purposes of the reports required under this permit, excess emissions are defined as any calculated average emission rate, as determined pursuant to Condition B.3 herein, which exceeds the applicable emission limits in Condition B.1.

E. Notification, Reporting and Recordkeeping

1. To determine compliance with the natural gas and fuel oil firing heat input limitation, the permittee shall maintain daily records of natural gas and fuel oil consumption for each turbine and the heating value for each fuel. All records shall be maintained for a minimum of two years after the date of each record and shall be made available to representatives of the Department upon request.
2. The project shall comply with all the applicable requirements of Chapter 62, F.A.C., and 40 CFR 60 Subparts A, GG, Dc, and Kb. The requirements shall include:

   a. CFR 60.7(a)(1) - By postmarking or delivering notification of the start of construction no more than 30 days after such date.

   b. CFR 60.7(a)(2) - By postmarking or delivering notification of the anticipated date of the initial startup of each CT and the auxiliary steam boiler not less than 30 days prior to such date.

   c. CFR 60.7(a)(3) - By postmarking or delivering notification of the actual start up of each turbine and the auxiliary steam boiler within 15 days after such date.

   d. CFR 60.7(a)(5) - By postmarking or delivering notification of the date for demonstrating the CEMS performance, no less than 30 days prior to such date.

   e. CFR 60.7(a)(6) - By postmarking or delivering notification of the anticipated date for conducting the opacity observations no less than 30 days prior to such date.

   f. CFR 60.7(b) - By initiating a recordkeeping system to record the occurrence and duration of any start up, shutdown or malfunction of a turbine and the auxiliary steam boiler, of any malfunction of the air pollution control equipment, and the periods when the CEMS is inoperable.

   g. CFR 60.7(c) - By postmarking or delivering a quarterly excess emissions and monitoring system performance report within 30 days after the end of each calendar quarter. This report shall contain the information specified in 40 CFR 60.7(c) and (d). When firing natural gas or fuel oil in the combustion turbines, the NO_X CEMS shall be used in lieu of the water/fuel monitoring system and fuel bound nitrogen (FBN) monitoring required for reporting excess emissions in 40 CFR 60.334(c)(1) (1997 version). The calibration of the water/fuel monitoring device required in 40 CFR 60.335 (c)(2) (1997 version) will be replaced by the 40 CFR 75 certification tests of the NO_X CEMS. Upon request from DEP, the CEMS emission rates for NO_X shall be corrected to ISO conditions to demonstrate compliance with the NO_X standard established in 40 CFR 60.332.

   h. A custom fuel monitoring schedule pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2) provided the following requirements are met:

      1. The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.
      2. The permittee shall submit a monitoring plan, certified by signature of the Designated Representative (DR), that commits to using a primary fuel of pipeline supplied natural gas (sulfur content less than or equal to 20 gr/100 scf pursuant to 40 CFR 75.11(d)(2)).
      3. Each unit shall be monitored for SO_2 emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

      This custom fuel monitoring schedule will only be valid when pipeline natural gas is used as a primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO_2 emissions must be accounted for as required pursuant to 40 CFR 75.11(d).

   i. CFR 60.8(a) - By conducting all performance tests within 60 days after achieving the maximum turbine and boiler firing rates, but not more than 180 days after the initial start up of each CT and the auxiliary boiler.

j. CFR 60.8(d) - By postmarking or delivering notification of the date of each performance test required by this permit at least 30 days prior to the test date; and,

k. Rule 62-297.345, F.A.C. - By providing stack sampling facilities where necessary .

All notifications and reports required by this specific condition shall be submitted to the Department's Air Program, within the Southwest District office. Performance test results shall be submitted within 45 days of completion of such test.

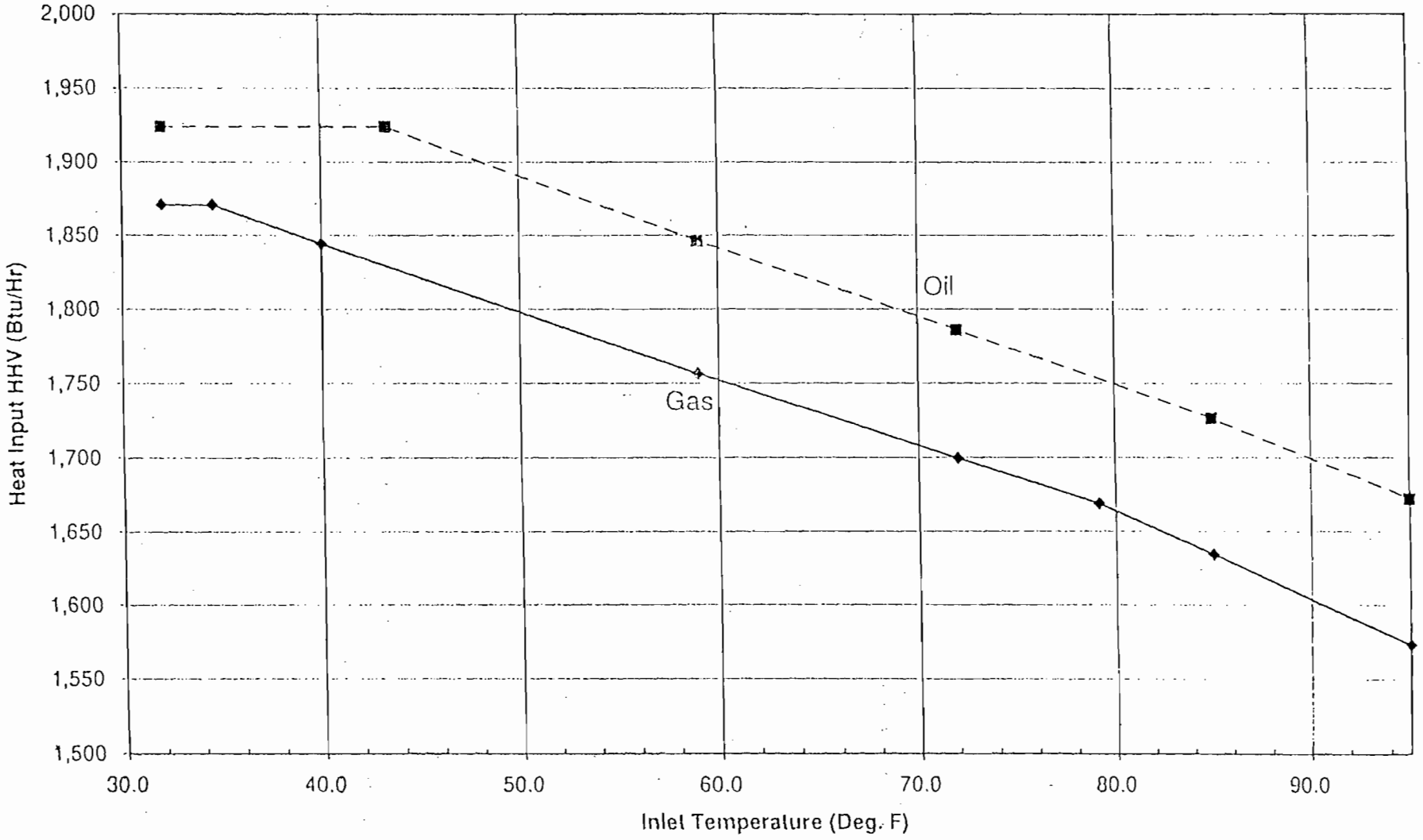
3. The following information shall be submitted to the Department's Bureau of Air Regulation within 90 days after selection of each, respectively:
   a. Description of the final selection of the turbines, the auxiliary steam boiler and diesel generator for installation at the facility. Descriptions shall include the specific make and model numbers, any changes in the proposed method of operation, fuels, emissions or equipment.
   b. Description of the CEMS selected. Description shall include the type of sensors, the manufacturer and model number of the equipment.

4. The following protocols shall be submitted to the Department's Air Program, within the Southwest District office for approval;
   a. CEMS Protocol - Within 60 days after selection of the CEMS, but prior to the initial startup, a CEMS protocol describing the system, its installation, operating and maintenance characteristics and requirements. The protocol shall meet the requirements of 40 CFR 60.13, 40 CFR 60 Appendix B and Appendix F or 40 CFR 75. The Federal Acid Rain Program requirements of 40 CFR 75 shall apply when those requirements become effective within the state.
   b. Performance Test Protocol - At least 30 days prior to conducting the initial performance tests required by this permit, the permittee shall submit to the Department's Air Program, within the Southwest District office, a protocol outlining the procedures to be followed, the test methods and any differences between the reference methods and the test methods proposed to be used to verify compliance with the conditions of this permit. The Department shall approve the testing protocol provided that it meets the requirements of this permit.

F. Modifications

The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change.

Heat Input (HHV) vs. Inlet Temperature



Florida Power Corporation - Hines Energy Project
NOx Emission Rates

Gas Fuel		Oil Fuel	
Temp, °F	NOx, lb/hr	Temp, °F	NOx, lb/hr
20	78.00	20	316.00
21	78.00	21	316.08
22	78.00	22	316.17
23	78.00	23	316.25
24	78.00	24	316.33
25	78.00	25	316.42
26	78.00	26	316.50
27	78.00	27	316.58
28	78.00	28	316.67
29	78.00	29	316.75
30	78.00	30	316.83
31	78.00	31	316.92
32	78.00	32	317.00
33	78.00	33	317.00
34	78.00	34	317.00
35	78.00	35	317.00
36	77.80	36	317.00
37	77.60	37	317.00
38	77.40	38	317.00
39	77.20	39	317.00
40	77.00	40	317.00
41	76.79	41	317.00
42	76.58	42	317.00
43	76.37	43	317.00
44	76.16	44	316.25
45	75.95	45	315.50
46	75.74	46	314.75
47	75.53	47	314.00
48	75.32	48	313.25
49	75.11	49	312.50
50	74.89	50	311.75
51	74.68	51	311.00
52	74.47	52	310.25
53	74.26	53	309.50
54	74.05	54	308.75
55	73.84	55	308.00
56	73.63	56	307.25
57	73.42	57	306.50
58	73.21	58	305.75
59	73.00	59	305.00
60	72.85	60	304.46
61	72.69	61	303.92
62	72.54	62	303.38
63	72.38	63	302.85
64	72.23	64	302.31
65	72.08	65	301.77
66	71.92	66	301.23
67	71.77	67	300.69

Florida Power Corporation - Hines Energy Project
NOx Emission Rates

68	71.62	68	300.15
69	71.46	69	299.62
70	71.31	70	299.08
71	71.15	71	298.54
72	71.00	72	298.00
73	70.86	73	297.23
74	70.71	74	296.46
75	70.57	75	295.69
76	70.43	76	294.92
77	70.29	77	294.15
78	70.14	78	293.38
79	70.00	79	292.62
80	69.83	80	291.85
81	69.67	81	291.08
82	69.50	82	290.31
83	69.33	83	289.54
84	69.17	84	288.77
85	69.00	85	288.00
86	68.80	86	287.30
87	68.60	87	286.60
88	68.40	88	285.90
89	68.20	89	285.20
90	68.00	90	284.50
91	67.80	91	283.80
92	67.60	92	283.10
93	67.40	93	282.40
94	67.20	94	281.70
95	67.00	95	281.00

Memorandum

Florida Department of
Environmental Protection

BAR

TO: Howard Rhodes

FROM: Clair Fancy

DATE: September 28, 1998

SUBJECT: Florida Power Corporation Hines Energy Complex
PSD-FL-195A Combined Cycle Facility
Final Amendment

Attached is the final amendment for the above referenced permit.

No comments have been received since the public notice on August 13, 1998.

I recommend your approval and signature.

MC/t

Attachments

Florida Power
CORPORATION

August 24, 1998

Mr. Al Linero, P.E.
Division of Air Resource Management
Florida Department of Environmental Protection
2600 Blair Stone Rd.
Tallahassee, Florida 32399-2400

Dear Mr. Linero:

Re: FPC Hines Energy Complex
Site Certification No. PA-92-33; PSD Permit No. FL-195

Enclosed please find the notarized proof of publication received from the Lakeland Ledger for the Florida Department of Environmental Protection *Notice of Intent to Issue PSD Permit Modification* referenced to the above request. The notice was published on August 13, 1998.

It is our understanding that a final permit could be issued by the Department as early as September 14, 1998, assuming no adverse comments were received.

If you should have any questions concerning this correspondence, please do not hesitate to contact me at (727) 826-4258.

Sincerely,

Scott H. Osbourn
Senior Environmental Engineer

cc: Bill Thomas, DEP SW District (w/attach)

Attachment
cc: M. Costello

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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 .....

DEP File PSD-FL-195A/PA-92-33

in the .....

Court, was published in said newspaper in the issues of .....

August 13;

1998

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

By Nelson Kirkland who is personally known to me

Sworn to and subscribed before me this 13TH

day of AUGUST A.D. 19 98

(Seal) Donald Ray Jenkins
Notary Public

DONALD RAY JENKINS
MY COMMISSION # CC 586345
EXPIRES: September 18, 2000
Bonded Thru Notary Public Underwriters

My Commission Expires .....

Order#113205
Florida Power Corp

Attach Notice Here

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION
STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP File PSD-FL-195A/PA-92-33
Hines Energy Complex Combined Cycle Project
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a PSD Permit Modification to Florida Power Corporation (FPC) to install a Selective Catalytic Reduction (SCR) system and reflect the technical specifications of the combustion turbines actually installed at its Combined Cycle Facility located near Fort Meade, Polk County. A Best Available Control Technology determination was not required pursuant to Rule 62-212.400, F.A.C. or 40CFR52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Power Corporation, 3201 34th Street South, St. Petersburg, Florida 33733.

The facility was originally permitted in 1994 as a 470 megawatt power plant consisting of two General Electric 7FA (or equivalent) gas or oil-fired combustion turbines and a heat recovery steam generator. The actual equipment installed this summer has a power capability of 485 MW and is powered by two Westinghouse 501FC combustion turbines. The current permit requires that nitrogen oxides (NO_x) emissions be controlled through Dry Low NO_x (DLN) combustion technology. The DLN combustors installed will not be able to achieve the permit limit of 75 pounds per hour per turbine at 59° F. Westinghouse and FPC have decided to install Selective Catalytic Reduction (SCR) in addition to Westinghouse's present generation of DLN combustors in order to comply with the permitted limit. If Westinghouse's Piloted Ring Combustor or a more advanced DLN technology is developed and can be installed by November 1, 2000 to meet the original BACT for NO_x, the SCR may be replaced with this new DLN control system.

The specifications to be included or adjusted to reflect the capabilities of the Westinghouse 501FC turbines include the heat input rate curves, particulate and volatile organic compound emissions and the sulfur dioxide (SO_2) emissions while burning natural gas. Adjustments to emission limits due to the change in turbine vendors have been less than PSD significant amounts. These changes will not cause or contribute to a violation of the National Ambient Air quality Standards or Allowable Increments under the requirements for Prevention of Significant Deterioration of air Quality.

The Department will accept written comments concerning the proposed permit modification issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit Modification." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station 5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit 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., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

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

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

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

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

Pursuant to Condition of Certification XI.B of the separate Power Plant Site (PPSA) Certification Order, PA 92-33, for the FPC Hines Energy Complex, the PPSA certification will be automatically modified to conform to amendments to the facility's PSD permit. Upon issuance of any amended PSD permit, the Department will also modify the parallel PPSA conditions of certification to conform to the amended conditions of the PSD permit.

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:

Polk County Public Works Department	Dept. of Environmental Protection	Dept. of Environmental Protection
Air Program	Bureau of Air Regulation	Southwest District
4189 Ben Durrance Road	111 S. Magnolia Drive, Suite 4	3804 Coconut Palm Drive
Bartow, Florida 33830	Tallahassee, Florida 32301	Tampa, Florida 33619-8218
Telephone: 941/534-7377	Telephone: 850/488-0114	Telephone: 813/744-6100
Fax: 941/534-7374	Fax: 850/922-6979	Fax: 813/744-6084

The complete project file includes the Draft permit Modification, the application, and the information submitted by the applicant or responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Bureau of Air Regulation at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114 for additional information.
B-794 - 8-13; 1998

B794

Florida Power
CORPORATION

August 4, 1998

Howard Rhodes, Director
Florida Department of Environmental Protection
Division of Air Resources Management
2600 Blair Stone Rd.
Tallahassee, Florida 32399-2400

Dear Mr. Rhodes:

Re: Hines Energy Complex
Permit PSD-FL-195 and Site Certification PA-92-33

Florida Power Corporation (FPC) notified the Department by letter, dated June 30, 1998, that a selective catalytic reduction (SCR) system would be installed at the above-referenced facility to control NO_x to the level required in our original PSD permit. Accompanying our letter was SCR design information, as requested by the Department. Subsequently, FPC received an incompleteness letter from the Department, dated July 10, 1998, indicating that the SCR design document would need to be signed and sealed by a Florida Professional Engineer and resubmitted by FPC. Further, the Bureau of Air Regulation requested responses to the following issues to expedite the issuance of the amended permit.

Comment - The present permit requires that the "Permittee install a Dry Low NO_x combustion turbine (and) make every practicable effort to achieve with that CT the lowest possible NO_x emissions rate but must not exceed 73 lb/hr (based on 12 ppm)... on a continuous basis when firing natural gas. According to the technical specification submitted by Westinghouse for the SCR system, it is being designed to achieve 12 ppm. Dry low NOx systems are typically designed to achieve BACT requirements of 9-15 ppm, whereas SCR systems are typically designed to meet BACT requirements of 4.5 -9 ppm. If Westinghouse designs the SCR system accordingly, then it will be possible to make "every practicable effort to achieve the lowest possible NO_x emission rate." Specific Condition 3, PSD-FL-195.

Response – The history of the above-quoted language relates to FPC's belief and the Department's belief in the ability of any vendor to achieve the NO_x limit that would ultimately be designated as BACT. As indicated in the Department's BACT determination for NO_x, this language was placed in the permit because vendor guarantees for dry low NO_x combustion

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technology at levels as low as 9 ppm may have been available, and DEP thought that it may have been possible for the Hines units to achieve NO_x emissions at that level. Because operational units had not yet achieved those emission levels and because FPC did not have an emission guarantee that low, DEP decided that an emission limit based on 12 ppm was appropriate. The intent of the language was to consider lower emission levels achievable using dry low NO_x combustion technology once the units became operational. Clearly, time has proven that not only is 9 ppm not achievable for this class of machine with a dual fuel combustor, but 12 ppm cannot be achieved at this time. Therefore, FPC is meeting its obligation to insure compliance at the site by the installation of an alternative technology to meet the original BACT limit. FPC has provided the Department with notification of the change and, by this letter transmits signed and sealed SCR design specifications.

Comment - The Westinghouse specifications require achievement of 73 lb/hr (about 25 ppm NOx) at 50 percent capacity. In contrast with Westinghouse's DLN technology, lower NOx emission rates and concentrations are typically realized with SCR at lower operating rates. A properly designed and operated SCR system should achieve proportionately lower emissions at lower operating rates. Consistent with the requirements of Specific Condition 3, practicable efforts to achieve the lowest possible NOx rate should yield emissions substantially less than 73 lb/hr or 25 ppm at 50 percent of capacity.

Response – The signed and sealed SCR design document indicates Westinghouse's commitment to operate the combustion turbines in accordance with the original BACT determination issued by the Department.

Comment - Based on FPC's original application, the Department's determination of BACT, SCR was rejected for technical, economic, and environmental reasons. Now that SCR is being reconsidered by FPC, the Technical Specification (or a supplementary document) prepared by Westinghouse should be certified by a Professional Engineer (P.E.) registered in the State of Florida and knowledgeable in the field of combustion and/or air pollution control. This is a typical requirement of engineering plans prepared in the State of Florida. The P.E. seal is also required for permit applications and will "affirmatively provide the Department with reasonable assurance based on plans, test results, installation of control equipment, or other information, that the construction, expansion, modification, operation, or activity of the installation will not discharge, emit, or cause pollution in contravention of Department standards or rules." Rules 62-4.050(2) and 62-4.070(1), F.A.C.

Response – As previously stated above, this letter serves to transmit the SCR design document, certified by a Westinghouse Professional Engineer registered in the State of Florida.

Comment - Please compare the original permit with the latest proposed draft permit and indicate the changes needed to accommodate the SCR system.

Response - A marked up version of the permit, including considerations for the incorporation of an SCR system, has been transmitted between FPC and the Department by E-mail. A final version is attached.

If you should have any questions concerning the above, please do not hesitate to contact me at (727) 826-4258.

Sincerely,

Scott H. Osbourn
Senior Environmental Engineer

Enclosure

cc: Clair Fancy, DEP
Al Linero, DEP
Martin Costello, DEP
Buck Oven, DEP
Bill Thomas, SWD
DanBarpal,P.E.,WEC

Florida Power Corporation - Hines Energy Complex
501FC Combustion Turbine Emissions

Fuel Type	Ambient Temp. (°F)	Heat Input mmBTU/hr (HHV)	NOx Emissions lb/hr
Natural Gas	32	1,869	78
	40	1,844	77
	59	1,757	73
	72	1,699	71
	79.2	1,669	70
	85	1,634	69
	95	1,573	67
No. 2 Fuel Oil*	32	1,918	317
	43.3	1,924	317
	59	1,846	305
	72	1,786	298
	85	1,727	288
	95	1,672	281

*NOx emissions based on a fuel bound nitrogen (FBN) content of 0.015% by weight or less.

68	71.62	68	300.15
69	71.46	69	299.62
70	71.31	70	299.08
71	71.15	71	298.54
72	71.00	72	298.00
73	70.86	73	297.23
74	70.71	74	296.46
75	70.57	75	295.69
76	70.43	76	294.92
77	70.29	77	294.15
78	70.14	78	293.38
79	70.00	79	292.62
80	69.83	80	291.85
81	69.67	81	291.08
82	69.50	82	290.31
83	69.33	83	289.54
84	69.17	84	288.77
85	69.00	85	288.00
86	68.80	86	287.30
87	68.60	87	286.60
88	68.40	88	285.90
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93	67.40	93	282.40
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95	67.00	95	281.00

Florida Power Corporation - Hines Energy Project
NOx Emission Rates

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Temp, °F	NOx, lb/hr	Temp, °F	NOx, lb/hr
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24	78.00	24	316.33
25	78.00	25	316.42
26	78.00	26	316.50
27	78.00	27	316.58
28	78.00	28	316.67
29	78.00	29	316.75
30	78.00	30	316.83
31	78.00	31	316.92
32	78.00	32	317.00
33	78.00	33	317.00
34	78.00	34	317.00
35	78.00	35	317.00
36	77.80	36	317.00
37	77.60	37	317.00
38	77.40	38	317.00
39	77.20	39	317.00
40	77.00	40	317.00
41	76.79	41	317.00
42	76.58	42	317.00
43	76.37	43	317.00
44	76.16	44	316.25
45	75.95	45	315.50
46	75.74	46	314.75
47	75.53	47	314.00
48	75.32	48	313.25
49	75.11	49	312.50
50	74.89	50	311.75
51	74.68	51	311.00
52	74.47	52	310.25
53	74.26	53	309.50
54	74.05	54	308.75
55	73.84	55	308.00
56	73.63	56	307.25
57	73.42	57	306.50
58	73.21	58	305.75
59	73.00	59	305.00
60	72.85	60	304.46
61	72.69	61	303.92
62	72.54	62	303.38
63	72.38	63	302.85
64	72.23	64	302.31
65	72.08	65	301.77
66	71.92	66	301.23
67	71.77	67	300.69

Attached To Aug. 4th Letter from Scott Osbourn

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

Permit Number: PSD-FL-195/PA-92-33
Issued: 3/1/94 Revised: 8/xx/98
Expiration Date: November 1, 2000
County: Polk
Latitude/Longitude: 27°47'19"N
81°52'10"W
Project: 485~~70~~ MW Combined Cycle Combustion Turbines

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62~~17~~-212 and 62~~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 specifically described as follows:

For two ~~235 MW~~ combined cycle combustion turbines (CTs) with maximum heat input based on the higher heating value (HHV) at 59°F of ~~1,510~~1,757 MMBtu/hr/unit (natural gas) and ~~1,730~~1,846 MMBtu/hr/unit (oil) to be located at the Hines Energy Complex~~Polk County site~~ near Fort Meade, Florida. ~~Phase IA would consist~~ower Block 1 consists of two combined cycle combustion turbines for a total of ~~470~~485 MW, a 99 MMBtu/hr auxiliary boiler(Subpart Dc), a 1,300 KW diesel generator and a 97,570 barrel fuel oil storage tank(Subpart Kb). The combustion turbines are ~~to be GE PG7111FA~~Westinghouse Model 501FC or equivalent and rated at approximately 165 MW in simple cycle and equipped with dry low NO_x combustors and/or Selective Catalytic Reduction (SCR) for natural gas firing and wet injection for fuel oil firing. Each combustion turbine will incorporate an unfired heat recovery steam generator.

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.

Howard L. Rhodes, Director
Division of Air Resources Management

Relevant documents ~~Attachments~~ are listed below:
1. Florida Power Corporation (FPC) application received August 4, 1992.
2. Department's letters dated August 31 and November 13, 1992.
3. FPC's letters dated October 13, 1992 and November 30, 1992, and June 27, 1996 and September 9, 1996 ~~1996~~ and February 18, 1998 and June 30, 1998. August xx, 1998.~~.~~
4. Westinghouse 501FC tables or curves showing Heat Input vs. Compressor Inlet Temperature and Nitrogen Oxide Emissions vs Compressor Inlet Temperature shall be attachments to and are part of this permit.

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 acknowledgment~~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.

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.

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 62~~17~~-4.120 and 62~~17~~-730.300, 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;
- 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.

16. Circumvention. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly pursuant to Rule 62-210.650 F.A.C.

SPECIFIC CONDITIONS:

The construction and operation of the Hines Energy Complex (Project) shall be in accordance with all applicable provisions of Chapters 62~~17--~~210 to 297, F.A.C. and NSPS Subparts GG, Dc, and Kb. The following emission limitations and conditions reflect BACT determinations for the ~~Phase IA 470~~Power Block 1- 485 MW (two combined cycle combustion turbines and auxiliary equipment) of generating capacity for which the need has been determined. BACT determinations for the remaining phases will be made upon review of supplemental applications. In addition to the foregoing, the Project shall comply with the following conditions of certification as indicated.

A. General Requirements

1. The maximum heat input (HHV) to each combustion turbine (CT) at an ambient temperature of 59° F shall neither exceed ~~1,510~~ 1,757 MMBtu/hr while firing natural gas, nor ~~1,730~~ 1,846 MMBtu/hr while firing fuel oil. Heat input may vary depending on ambient conditions and the CT characteristics. Manufacturer's curves or equations for correction to other temperatures shall be provided to DEP for review 90 days after selection of the CT. Subject to approval by the Department for technical validity applying sound engineering principles, the manufacturer's curves shall be used to establish heat input rates over a range of temperatures for the purpose of compliance determination.

2. Each of the two CTs in ~~Phase IA~~ Power Block 1 may operate continuously, i.e., 8,760 hrs/year.

3. Only natural gas (NG) or low sulfur fuel oil shall be fired in each combustion turbine~~ and the auxiliary boiler~~. Only low sulfur fuel oil shall be fired in the diesel generator. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent, by weight. Only natural gas shall be fired in the auxiliary boiler.

4. The maximum heat input to the auxiliary boiler shall not exceed 99 MMBtu/hr ~~when firing NG or No. 2 fuel oil with 0.05 percent maximum sulfur content (by weight).~~ All fuel consumption must be continuously measured and recorded for the auxiliary boiler.

5. The maximum allowable fuel oil consumption for the two turbines is 13,762,806 gallons per year, which is equivalent to an aggregate of 1,000 hours per year of operation at full load.

6. The permittee shall have the option of installing duct module(s) suitable for possible future installation of an oxidation catalyst and/or SCR equipment on each combined cycle generating unit. In the event that the module(s) are not installed in the Heat Recovery Steam Generator (HRSG), the retrofit costs associated with not making provisions for such technology (initially) shall not be considered in any future economic evaluation to justify not installing SCR or an oxidation catalyst.

7. Fugitive dust emissions during the construction period shall be minimized by covering or watering dust generation areas.

8. If site construction does not commence on ~~Phase IA (470 MW)~~ Power Block 1 (485 MW) within 18 months of issuance of this permit, then FPC may request an extension of the 18-month period, provided that such request is received by the Department's Bureau of Air Regulation at least 90 days prior to the expiration date. Such a request shall identify the progress made toward commencement of the construction of the site and the expected time required to start and complete construction of the initial phase. The Department may grant the extension upon a satisfactory showing that the extension is justified.

Units to be constructed or modified in later phases of the project will be reviewed under the supplementary review process of the Power Plant Siting Act. If site construction has not commenced within 18 months of issuance of this certification, then FPC shall obtain from DEP a review and, if necessary, a modification of the BACT determination and allowable emissions for the unit(s) on which construction has not commenced [40 CFR 52.21(r)(2)].

SPECIFIC CONDITIONS:

B. Emission Limits

1. The maximum allowable emissions from each of the two CTs, when firing natural gas or low sulfur fuel oil, in accordance with the BACT determination and subsequent data from Westinghouse, shall not exceed the following~~,~~ (at 59° F reference temperature for NOx emissions) (except during periods of start up, shutdown, malfunction ~~and load change~~):

EMISSIONS LIMITATIONS

POLLUTANT	FUEL	BASIS(g)	LB/HR/CT	TPY(b)
NO_x (a)	Gas	12 ppmvd(h)	73(i)	639
	~~Gas~~	~~25 ppmvd(h)(i)~~	~~173~~	~~1,515~~
	Oil	42 ppmvd(c)(h)	305	153
VOC (d)	Gas	7 ppmvw	10.4	91
	Oil	10~~7~~ ppmvw	19.0~~11.2~~	5.6
CO	Gas	25 ppmvd	77	675
	Oil	30 ppmvd	93	47
PM/PM_{10}	Gas		15.6~~9~~	79
	Oil(e)		44.8~~40.917~~	21~~8.5~~
SO_2	Gas (f)		4.7~~0.99~~	44~~8.7~~
	Oil (f)		94	47
Visible Emissions	Gas	10 percent opacity		
	Oil	20 percent opacity		

a. Pollutant emission rates may vary depending on ambient conditions (compressor inlet temperatures) and the CT characteristics. Manufacturer's curves for the NOx emission rate correction to other temperatures at different loads shall be provided to DEP for review 90 days after selection of the CT. Subject to approval by the Department for technical validity applying sound engineering principles, the manufacturer's curves shall be used to establish pollutant emission rates over a range of temperatures for the purpose of compliance determination ~~(except~~

~~that the NOx limit shall be 73 lb/hr for all compressor inlet temperatures when SCR is used).~~ Emission limitations in LB/HR/CT of NOx are blocked 24-hour averages (midnight to midnight) and are calculated as follows:

NO_x emissions shall be determined continuously by a Continuous Emissions Monitoring System (CEMS). A CEMS operated and maintained in accordance with 40 CFR 75 shall be used. Compliance with the NO_x emissions standards in the above table shall be demonstrated with this CEMS system based on a 24-hour block average. Based on CEMS data at the end of each operating day, ~~a~~ new 24-hour average emission rates, both actual and allowable (based on compressor inlet temperatures) are ~~is~~ calculated from the arithmetic average of all valid hourly emission rates during the previous 24 operating hours. Valid hourly emission rates shall not include periods of startup (including fuel switching), shutdown, or malfunction as defined in Rule 62-210.200 where emissions exceed the NO_x standard. These excess emission periods shall be reported as required in Specific Condition E.2.f. A valid hourly emission rate shall be calculated for each hour in which two NO_x and oxygen concentrations are obtained at least 15 minutes apart. When monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate the 24-hour block average.

b. Annual emission limits (TPY) for natural gas are based on a total of two CTs operating at full load 8,760 hours per year (i.e., NO_x - 73 lbs/hr X 2 CTs X 8,760 hrs/yr X 1 ton/2,000 lbs = 639 TPY). Annual emission limits (TPY) for fuel oil are based on full load operation for a total of 1,000 hours per year for the two CTs (i.e., NO_x - 305 lbs/hr X 1,000 hrs/yr X 1 ton/2,000 lbs = 153 TPY).

c. Fuel oil NO_x emissions are based on full load operation ~~at ISO conditions~~ and 15 percent oxygen. For fuel oil firing, NO_x levels of 42 ppmvd @ 15 percent 0_2 are based on a fuel bound nitrogen content of 0.015 percent or less. The emission limit for NO_x is adjusted as follows for higher fuel nitrogen contents up to a maximum of 0.030 percent by weight:

FUEL BOUND NITROGEN (% BY WEIGHT)	NO_X LEVELS (PPMVD @ 15%0_2)	NO_X EMISSIONS LB/HR/CT	NO_X EMISSIONS TPY
0.015 or less	42	305	153
0.020	44	320	160
0.025	46	334	167
0.030	48	349	175

using the formula STD = 0.0042 + F where:

STD = allowable NO_X emissions (percent by volume at 15 percent O_2 and on a dry basis).

F = NO_X emission allowance for fuel-bound nitrogen defined by the following table:

FUEL-BOUND NITROGEN (% BY WEIGHT)	F (NO_X % BY VOLUME)
0 < N < 0.015	0
0.015< N < 0.03	0.04(N-0.015)

where: N = the nitrogen content of the fuel (% by weight).

NO_X emissions limits are preliminary for the fuel oil specified in Specific Condition No. A.3. FPC shall maintain ~~submit~~ fuel bound nitrogen content data for the low sulfur fuel oil prior to commercial operation. Adjustments of the NO_X standard (up and down) shall be calculated and recorded based upon a volume weighted average of the nitrogen content of each bulk fuel oil shipment and the nitrogen content of the existing fuel in the storage tank. The NO_X standard for fuel oil shall not be adjusted between fuel oil shipments. Records for these adjusted standards shall be kept on site for a minimum of 3 years.

d. Exclusive of background concentrations.

e. PM/PM_{10} emission limitations ~~are exclusive of~~ include sulfuric acid mist.

f. SO_2 emissions are based on a maximum of 1 grain of S/100cf of natural gas and 0.05 percent sulfur in the fuel oil.

g. The values are the computational basis for the lb/hr numbers, which are the actual emission limitations. Once a combustion turbine manufacturer has been selected, it may be necessary to modify this basis. If this basis is to be modified, a professional engineer-certified equivalency analysis by the manufacturer must be submitted to the Department. The equivalency analysis will recommend an emissions normalizing basis (i.e., lb/hr, lb/MMBtu, lb/MWh, or ppmvd) and associated emissions appropriate for the specific manufacturer's equipment. If the equivalency analysis demonstrates an impact equal to or less than the current lb/hr limit, the Department shall amend the conditions to reflect the alternate basis. The characteristics and parameters of the CT selected will be reflected in other permit conditions, where appropriate.

h. ~~12 ppmvd a~~At 15 percent O_2, not ISO corrected. ~~The ISO corrected value is 15 ppmvd at 15 percent O_2. Compliance will be determined through the initial and annual compliance tests required in Condition C.1.~~

i. ~~The Westinghouse CTs shall operate at NO_x levels of no greater than 173 lb/hr (24 hour block average, based on 25 ppmvd at 15% O_2 and 59°F) for an interim period of no later than April 1, 2000. longer than one year from the date of commercial operation. During this interim period, all reasonable efforts shall be made to achieve a NO_x level of 73 lb/hr (24 hour block average, based on 12 ppmvd at 15% O_2 and 59°F) using dry low NOx combustion technology. In the event that this is not achieved, provisions shall be made for SCR technology. Such technology is to be in operation and shall comply with a limit of capable of achieving the equivalent of 55 73 lb/hr NO_x, (24 hr block average, based on 9 ppm @ 15% O2 and 59° F) no later than April 1, 2000. six months after the end of the interim period, unless compliance with Condition B.3 is demonstrated using the piloted ring combustor during this 6 month period.~~ Control of nitrogen oxides from each CT while firing natural gas may be accomplished using dry low NOx burners and/or SCR. ~~When NOx emissions are controlled with SCR, NOx emissions shall not exceed 73 lb/hr for all compressor inlet temperatures~~. If the Westinghouse Piloted Ring Combustor, or a more advanced dry low NOx burner is developed which is able to comply with the emission limits (listed in the above table) after the installation of the SCR system, the SCR system may be removed and replaced with these new burners. In this case the new dry low NOx burners shall be

tested in accordance with the initial performance test as described in Section C.1 within 180 days of startup with the new burners.

2. The following CT emissions, determined by BACT, are tabulated for PSD purposes:

ESTIMATED EMISSIONS

POLLUTANT	METHOD OF CONTROL	Basis(b)
Benzene	Natural Gas	BACT
Inorganic Arsenic	No. 2 Fuel Oil(a)	BACT
Beryllium	No. 2 Fuel Oil(a)	BACT
Mercury	No. 2 Fuel Oil(a)	(c)
Pb	No. 2 Fuel Oil(a)	(c)

a. The No. 2 fuel oil shall have a maximum sulfur content of 0.05 percent.

b. Since these pollutants are inherent constituents in the fuel, the basis for control will be by specifying that only natural gas and No. 2 fuel oil can be fired at the facility.

c. Below PSD significant emission levels.

~~3. The permittee shall~~will ~~install a~~ the ~~Westinghouse~~GE ~~piloted ring combustor~~ dry low NO_x ~~burners~~combustion turbine (CT). ~~Permittee shall make every practicable effort to achieve with that CT the lowest possible NO_x emission rate but must not exceed 73 lbs/hr (based on 12 ppmvd at 15 percent O_2 and 59° F) per CT (24 hour average, not including down-time) on a continuous basis when firing natural gas~~ following the ~~1.5 year interim period~~ referenced in Condition B.1.i. ~~This schedule shall not provide FPC relief from the implementation of combustor technology required to meet the 73 lbs/hr emission level at the earliest possible opportunity (i.e., once such emission levels are demonstrated by Westinghouse in a similar unit in commercial operation).~~

~~4. After the initial compliance tests on the CTs (estimated to be in January, 1999), the permittee shall operate a certified continuous emissions monitor for NO_x emissions, and collect 12 months of monitoring data. The monitor will at a minimum meet the requirements of 40 CFR 60 Appendix F~~ or 40 CFR 75 quality assurance ~~procedures. Within 17 months after the initial compliance test FPC shall prepare and submit for the Department's review an engineering report regarding the collection and the analysis of the data gathered from the monitor. In addition, this report shall include a conclusion regarding the lowest NO_x emission rate which can be consistently achieved with a reasonable operating margin taking into account long term performance expectations and assuming good operating and maintenance practices. The report shall also include results of the testing requirements of 40 CFR 60 Appendix F or 40 CFR 75 procedures and the actual CEM data for the period of the study in an acceptable format.~~

~~5. One month after submittal of the engineering report (estimated to be by June 2000), the Department will make a determination based on the engineering report submitted by FPC on the revised NO_x emission limits. If the data demonstrate that a NO_x emission rate of less than 73 lb/hr (based on 12 ppmvd at 15 percent O_2 and 59°F) is consistently achievable, the NO_x emission limits may be adjusted accordingly, but not lower than 55 lb/hr (based on 9 ppmvd at 15 percent O_2 and 59°F).~~

~~3~~4~~6~~. Excess emissions from a turbine resulting from start up, shutdown, malfunction, or load change shall be acceptable providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed three ~~two~~ hours in any 24 hour period unless specifically authorized by the Department for a longer duration. The permittee shall provide a general description of the procedures to be followed during periods of start up, shutdown, malfunction, or load change to ensure that the best operational practices to minimize emissions will be adhered to and the duration of any excess emissions will be minimized. The description should be submitted to the Department along with the initial compliance test data. The description may be updated as needed by submitting such update to the Department within thirty (30) days of implementation.

4~~5~~7. Operation of the auxiliary steam boiler shall be limited to a maximum of 1000 hours per year and only during periods

of cold CT startup or quick startup out of a short-term shutdown mode, when no other source of steam is available or during periodic testing. The following emission limitations shall apply:

a. NO_x emissions shall not exceed 0.1 lb/MMBtu for natural gas firing based on vendor-certified stack test data for the model of auxiliary boiler purchased.

b. Sulfur dioxide emissions shall be limited by firing natural gas.

c. Visible emissions shall not exceed 10 percent opacity while burning natural gas.

5~~6~~8. Operation of the emergency diesel generator shall be limited to a maximum of 100 hours per year and only during periods of on site emergency power needs (when no other power source is available) or during periodic testing. The following emission limitations shall apply:

a. The manufacturers design NO_x emission rate shall not exceed 9.82 grams/hp-hr based on vendor-certified stack test data (or equivalent) on the model of generator purchased. This test data shall be provided to the Department with the initial combustion turbine performance test report.

b. Sulfur dioxide emissions shall be limited by firing only low sulfur fuel oil with maximum sulfur content of 0.05 percent by weight.

c. Visible emissions shall not exceed 20 percent opacity.

C. Performance Testing

1. An ~~I~~initial (I) performance ~~compliance~~ test~~s~~ shall be performed on each CT for each~~using both~~ fuel~~s~~. ~~A compliance test for CO and PM on both fuels shall be performed after the NOx control system is fully optimized but no later than 60 days after the conclusion of the interim period reference in Condition B.1(i) (i.e. April 1, 2000) is required unless FPC obtains the Department's written concurrence that the NOx control equipment or combustors have not been changed significantly since the initial performance test~~. Testing of emissions shall be conducted with the

source operating at capacity (maximum heat input rate for the tested operating temperature). Capacity is defined as 90 - 100 percent of permitted capacity. If it is impracticable to test at capacity, then sources may be tested at less than capacity; in this case subsequent source operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen consecutive days for purposes of additional compliance testing to regain the rated capacity in the permit, with prior notification to the Department. Annual (A) compliance tests shall be performed on each CT with ~~the~~the fuel(s) indicated below ~~used for more than 400 hours in the preceding 12 month period~~. Tests shall be conducted using EPA reference methods in accordance with 40 CFR 60, Appendix A, as adopted by reference in Rule 62~~17~~-297, F.A.C.:

a. Reference Method 5 for PM (I, A~~,~~ only for oil and only if fuel oil is fired more than 400 hours per CT in the previous federal fiscal year).

b. Reference Method 9 for VE (I, A only for oil and only if fuel oil is fired more than 400 hours per CT in the previous federal fiscal year).

c. Reference Method 10 for CO (I, A for gas and annually for oil if fuel oil is fired more than 400 hours per CT in the previous federal fiscal year).

d. Reference Method 20 for NOx (I~~,~~ ~~A~~only, for compliance with 40 CFR 60.332 and 40 CFR 60.335).

and/or 25A

e. Reference Method 18 for VOC (I~~, A~~).

~~f. Trace elements of Beryllium (Be) and Arsenic (As) shall be tested (I, for oil only) using EMTIC Interim Test Methods. As an alternative, Method 104 for Beryllium (Be) may be used; or Be and Arsenic may be determined from fuel analysis using either Method 7090 or 7091, and sample extraction using Method 3040 as described in the EPA solid waste regulations SW-846.~~

f~~g~~.ASTM D4294 (or equivalent) for sulfur content of distillate oil (I,A), which can be used for determining SO_2 emissions annually.

~~g~~h.ASTM D1072-80, D3031-81, D4084-82, or D3246-81 (or equivalent) for sulfur content of natural gas (I, and A if deemed necessary by DEP).

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

2. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent by weight. Compliance shall be demonstrated in accordance with the requirements of 40 CFR 60.334 testing for sulfur content of the fuel oil in the storage tanks on each occasion that fuel is transferred to the storage tanks from any other source. Testing for fuel bound nitrogen content by ASTM D3431 or other ASTM method, and for fuel oil ~~lower~~ higher heating value, shall also be conducted on the same schedule.

D. Monitoring Requirements

For each combined cycle unit, the permittee shall install, operate, and maintain a continuous emission monitoring system (CEMS) (in accordance with 40 CFR 60, Appendix F or 40 CFR 75) or use other DEP approved alternate methods to monitor nitrogen oxides and, if necessary, a diluent gas (CO_2 or O_2). The Federal Acid Rain Program requirements of 40 CFR 75 shall apply when those requirements become effective for the CTs. ~~within the state~~.

1. Each CEMS shall meet performance specifications of 40 CFR 60, Appendix B or 40 CFR 75.

2. CEMS data shall be recorded and reported in accordance with Chapter ~~62~~17-297.500, F.A.C., ~~-~~40 CFR 60 Appendix A and Subpart GG and 40 CFR 75. The record shall include periods of start up, shutdown, and malfunction. Compliance with condition B.1. for NO_x shall be determined by CEMS on a mass emission rate basis (LB/HR) using EPA Method 19 and hourly averaged heat inputs (MMBtu/hr).

3. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation or any other preventable upset condition or preventable equipment breakdown shall not be considered
malfunctions.

4. The procedures under 40 CFR 60.13 and 40 CFR 75 shall be followed for installation, evaluation, and operation of all CEMS.

5. For purposes of the reports required under this permit, excess emissions are defined as any calculated average emission rate, as determined pursuant to Condition B.3~~4~~6 herein, which exceeds the applicable emission limits in Condition B.1.

E. Notification, Reporting and Recordkeeping

1. To determine compliance with the natural gas and fuel oil firing heat input limitation, the permittee shall maintain daily records of natural gas and fuel oil consumption for each turbine and the heating value for each fuel. All records shall be maintained for a minimum of two years after the date of each record and shall be made available to representatives of the Department upon request.

2. The project shall comply with all the applicable requirements of Chapter 62~~17~~, F.A.C., and 40 CFR 60 Subparts A, ~~and~~ GG, Dc, and Kb. The requirements shall include:

a. 40 CFR 60.7(a)(1) - By postmarking or delivering notification of the start of construction no more than 30 days after such date.

b. 40 CFR 60.7(a)(2) - By postmarking or delivering notification of the anticipated date of the initial start up of each CT and the auxiliary steam boiler not less than 30 days prior to such date.

c. 40 CFR 60.7(a)(3) - By postmarking or delivering notification of the actual start up of each turbine and the auxiliary steam boiler within 15 days after such date.

d. 40 CFR 60.7(a)(5) - By postmarking or delivering notification of the date for demonstrating the CEMS performance, no less than 30 days prior to such date.

e. 40 CFR 60.7(a)(6) - By postmarking or delivering notification of the anticipated date for conducting the opacity observations no less than 30 days prior to such date.

f. 40 CFR 60.7(b) - By initiating a recordkeeping system to record the occurrence and duration of any start up, shutdown or malfunction of a turbine and the auxiliary steam boiler, of any malfunction of the air pollution control equipment, and the periods when the CEMS is inoperable.

g. 40 CFR 60.7(c) - By postmarking or delivering a quarterly excess emissions and monitoring system performance report within 30 days after the end of each calendar quarter. This report shall contain the information specified in 40 CFR 60.7(c) and (d). (Pending EPA approval) When firing natural gas or fuel oil in the combustion turbines, the NO_x CEMS shall be used in lieu of the water/fuel monitoring system and fuel bound nitrogen (FBN) monitoring required for reporting excess emissions in 40 CFR 60.334(c)(1) (1997 version). The calibration of the water/fuel monitoring device required in 40 CFR 60.335 (c)(2) (1997 version) will be replaced by the 40 CFR 75 certification tests of the NO_x CEMS. Upon request from DEP, the CEMS emission rates for NO_x shall be corrected to ISO conditions to demonstrate compliance with the NO_x standard established in 40 CFR 60.332.

(Pending EPA approval)The following custom monitoring schedule for natural gas is approved in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2):

1. Monitoring of natural gas nitrogen content shall not be required.
2. Analysis of the sulfur content of natural gas shall be conducted using one of the EPA-approved ASTM reference methods in Condition C.1.g for the measurement of sulfur in gaseous fuels, or ~~an~~ DEP approved alternative method. Monitoring of the sulfur content of the natural gas 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 fuel sulfur monitoring shall be conducted once per quarter for six quarters and after that, semiannually.
3. Should any sulfur analysis indicate noncompliance with 40 CFR 60.333, the Permittee shall notify DEP of such excess emissions and the customized fuel monitoring schedule shall be reexamined. The sulfur content of the natural gas will be monitored weekly during the interim period while the monitoring schedule is reexamined.
4. The permittee shall notify DEP of any change in natural gas supply for reexamination of this monitoring schedule. A

substantial change in natural gas quality (i.e., sulfur content variation of greater than 1 grain per 100 cubic foot of natural gas) shall be considered as a change in the natural gas supply. Sulfur content of the natural gas will be monitored weekly by the natural gas supplier or other qualified parties during the interim period when this monitoring schedule is being reexamined.

5. Records of sampling analysis and natural gas supply pertinent to this monitoring schedule shall be retained by the Permittee for a period of five years, and shall be made available for inspection by the appropriate regulatory personnel(DEP).

6. The Permittee may obtain the sulfur content of the natural gas from the fuel supplier or other qualified parties provided the test methods listed in Specific Condition C.1.g are used.

h. 40 CFR 60.8(a) - By conducting all performance tests within 60 days after achieving the maximum turbine and boiler firing rates, but not more than 180 days after the initial start up of each CT and the auxiliary boiler.

i. 40 CFR 60.8(d) - By postmarking or delivering notification of the date of each performance test required by this permit at least 30 days prior to the test date; and,

j. 62~~17~~-297.345 - By providing stack sampling facilities where necessary ~~for each turbine and the auxiliary steam boiler~~.

All notifications and reports required by this specific condition shall be submitted to the Department's Air Program, within the Southwest District office. Performance test results shall be submitted within 45 days of completion of such test.

3. The following information shall be submitted to the Department's Bureau of Air Regulation within 90 days after selection of each, respectively:

a. Description of the final selection of the turbines, the auxiliary steam boiler and diesel generator for installation at the facility. Descriptions shall include the specific make and model numbers, any changes in the proposed method of operation, fuels, emissions or equipment.

b. Description of the CEMS selected. Description shall include the type of sensors, the manufacturer and model number of the equipment.

4. The following protocols shall be submitted to the Department's Air Program, within the Southwest District office for approval;

a. CEMS Protocol - Within 60 days after selection of the CEMS, but prior to the initial startup, a CEMS protocol describing the system, its installation, operating and maintenance characteristics and requirements. The protocol shall meet the requirements of 40 CFR 60.13, 40 CFR 60 Appendix B and Appendix F or 40 CFR 75. The Federal Acid Rain Program requirements of 40 CFR 75 shall apply when those requirements become effective within the state.

b. Performance Test Protocol - At least 30~~90~~ days prior to conducting the initial performance tests required by this permit, the permittee shall submit to the Department's Air Program, within the Southwest District office, a protocol outlining the procedures to be followed, the test methods and any differences between the reference methods and the test methods proposed to be used to verify compliance with the conditions of this permit. The Department shall approve the testing protocol provided that it meets the requirements of this permit.

F. Modifications

The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change.

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

August 4, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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

Re: DEP File PSD-FL-195A
Hines Energy Complex

Dear Mr. Pardue:

Enclosed is one copy of the Draft PSD Permit Modification for the Hines Energy Complex Combined Cycle facility located near Fort Meade, Polk County. The Department's Intent to Issue PSD Permit Modification and the "PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION" must be published in a newspaper of general circulation in Polk County. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Bureau of Air Regulation at the above letterhead address. If you have any other questions, please call Mr. Marty Costello at 850/921-9511.

Sincerely,

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

CHF/mc

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

DEP File PSD-FL-195A
Hines Energy Complex
Polk County

_____/

INTENT TO ISSUE PSD PERMIT MODIFICATION

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

The applicant, Florida Power Corporation, applied on July 6, 1998 to the Department for a permit modification to install a Selective Catalytic Reduction System and to reflect the technical specifications of the combustion turbines actually installed this summer at the Hines Energy Complex Combined Cycle Facility located near Fort Meade, Polk County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212, and 40CFR52.21(u). The above actions are not exempt from permitting procedures. The Department has determined that a modification of the permit issued pursuant to the Prevention of Significant Deterioration (PSD Permit) is required to modify the permit as requested.

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

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

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

The Department will accept written comments concerning the proposed permit modification issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit Modification." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit 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., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department

on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

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

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 PSD 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 8-6-98 to the person(s) listed:

Mr. W. Jeffrey Pardue, CEP, Director*
Mr. Doug Neely, EPA
Mr. John Bunyak, NPS
Mr. Bill Thomas, DEP SWD
Mr. Buck Oven, DEP PPS
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.

Paul Doyer 8-6-98
(Clerk) (Date)

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
Env. Services Dept.
Fla. Power Corp.
3201 34th St. South
St. Petersburg, Fl 33733

4a. Article Number
P 265 659 404

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

7. Date of Delivery
AUG 10 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 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 404

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

Sent to W. Jeff. Pardue
Street & Number Fla. Power Corp
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-Fl-195A 3-6-95	

PS Form **3800**, April 1995

NOTICE TO BE PUBLISHED

IN THE NEWSPAPER

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File PSD-FL-195A/ PA-92-33

Hines Energy Complex Combined Cycle Project
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a PSD Permit Modification to Florida Power Corporation (FPC) to install a Selective Catalytic Reduction (SCR) system and reflect the technical specifications of the combustion turbines actually installed at its Combined Cycle Facility located near Fort Meade, Polk County. A Best Available Control Technology determination was not required pursuant to Rule 62-212.400, F.A.C. or 40CFR52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Power Corporation, 3201 34th Street South, St. Petersburg, Florida 33733.

The facility was originally permitted in 1994 as a 470 megawatt power plant consisting of two General Electric 7FA (or equivalent) gas or oil-fired combustion turbines and a heat recovery steam generator. The actual equipment installed this summer has a power capability of 485 MW and is powered by two Westinghouse 501FC combustion turbines. The current permit requires that nitrogen oxides (NO_X) emissions be controlled through Dry Low NO_X (DLN) combustion technology. The DLN combustors installed will not be able to achieve the permit limit of 73 pounds per hour per turbine at 59° F. Westinghouse and FPC have decided to install Selective Catalytic Reduction (SCR) in addition to Westinghouse's present generation of DLN combustors in order to comply with the permitted limit. If Westinghouse's Piloted Ring Combustor or a more advanced DLN technology is developed and can be installed by November 1, 2000 to meet the original BACT for NOx, the SCR may be replaced with this new DLN control system.

The specifications to be included or adjusted to reflect the capabilities of the Westinghouse 501FC turbines include the heat input rate curves, particulate and volatile organic compound emissions and the sulfur dioxide (SO_2) emissions while burning natural gas. Adjustments to emission limits due to the change in turbine vendors have been less than PSD significant amounts. These changes will not cause or contribute to a violation of the National Ambient Air quality Standards or Allowable Increments under the requirements for Prevention of Significant Deterioration of air Quality.

The Department will accept written comments concerning the proposed permit modification issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit Modification." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station 5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit 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., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

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

fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under Section120.60(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 Section120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

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

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

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

Pursuant to Condition of Certification XI.B of the separate Power Plant Site (PPSA) Certification Order, PA 92-33, for the FPC Hines Energy Complex, the PPSA certification will be automatically modified to conform to amendments to the facility's PSD permit. Upon issuance of any amended PSD permit, the Department will also modify the parallel PPSA conditions of certification to conform to the amended conditions of the PSD permit.

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:

Polk County Public Works Department - Air Program 4189 Ben Durrance Road Bartow, Florida 33830 Telephone: 941/534-7377 Fax: 941/534-7374	Dept. of Environmental Protection Bureau of Air Regulation 111 S. Magnolia Drive, Suite 4 Tallahassee, Florida 32301 Telephone: 850/488-0114 Fax: 850/922-6979	Dept. of Environmental Protection Southwest District 3804 Coconut Palm Drive Tampa, Florida 33619-8218 Telephone: 813/744-6100 Fax: 813/744-6084

The complete project file includes the Draft Permit Modification, the application, and the information submitted by the applicant or responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Bureau of Air Regulation at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114 for additional information.

TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

Florida Power Corporation

Hines Energy Complex
Combined Cycle Project
Power Block 1
Polk County

Construction Permit No. PSD-FL-195 / PA-92-33

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

August 4, 1998

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

Florida Power Corporation submitted an application to modify permit No. PSD-FL-195 to install a Selective Catalytic Reduction (SCR) system and to reflect the technical specifications of the combustion turbines actually installed at its Combined Cycle Facility located near Fort Meade, Polk County.

The facility was originally permitted in 1994 as a 470 megawatt power plant consisting of two General Electric 7FA (or equivalent) gas or oil-fired combustion turbines and a heat recovery steam generator. The actual equipment installed this summer has a power capability of 485 MW and is powered by two Westinghouse 501FC combustion turbines. The permit requires that nitrogen oxides (NO_X) emissions be controlled through Dry Low NO_X (DLN) combustion technology. The DLN combustors installed will not be able to achieve the permit limit of 73 pounds per hour per turbine at 59° F. Westinghouse and FPC have decided to install Selective Catalytic Reduction (SCR) in addition to Westinghouse's present generation of DLN combustors in order to comply with the permitted limit. If Westinghouse's Piloted Ring Combustor or a more advanced DLN technology is developed and can be installed by November 1, 2000 to meet the original BACT for NOx, the SCR may be replaced with this new DLN control system.

The specifications to be included or adjusted to reflect the capabilities of the Westinghouse 501FC turbines include the heat input rate curves, particulate and volatile organic compound emissions and the sulfur dioxide (SO_2) emissions while burning natural gas. Adjustments to emission limits due to the change in turbine vendors have been less than PSD significant amounts. These changes will not cause or contribute to a violation of the National Ambient Air quality Standards or Allowable Increments under the requirements for Prevention of Significant Deterioration of air Quality.

Based on the foregoing technical evaluation of the application and additional information submitted by the applicant, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations provided that vendor guarantees for emissions rates are verified and certain conditions are met. The proposed revisions to the original construction permit conditions are attached.

Engineer: Martin Costello, P.E.

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

Permit Number: PSD-FL-195/PA-92-33
Issued: 3/1/94 Revised: 8/xx/98
Expiration Date: November 1, 2000
County: Polk
Latitude/Longitude: 27°47'19"N
81°52'10"W
Project: 485~~70~~ MW Combined Cycle Combustion Turbines

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62~~17~~-212 and 62~~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 specifically described as follows:

For two ~~235 MW~~ combined cycle combustion turbines (CTs) with maximum heat input based on the higher heating value (HHV) at 59°F of ~~1,510~~1,757 MMBtu/hr/unit (natural gas) and ~~1,730~~1,846 MMBtu/hr/unit (oil) to be located at the Hines Energy Complex~~Polk County site~~ near Fort Meade, Florida. ~~Phase IA would consist~~ Power Block 1 consists of two combined cycle combustion turbines for a total of ~~470~~485 MW, a 99 MMBtu/hr auxiliary boiler (Subpart Dc), a 1,300 KW diesel generator and a 97,570 barrel fuel oil storage tank (Subpart Kb). The combustion turbines are ~~to be GE PG7111FA~~ Westinghouse Model 501FC or equivalent and rated at approximately 165 MW in simple cycle and equipped with dry low NO_x combustors and/or Selective Catalytic Reduction (SCR) for natural gas firing and wet injection for fuel oil firing. Each combustion turbine will incorporate an unfired heat recovery steam generator.

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.

Howard L. Rhodes, Director
Division of Air Resources
Management

Relevant documents ~~Attachments~~ are listed below:
1. Florida Power Corporation (FPC) application received August 4, 1992.
2. Department's letters dated August 31 and November 13, 1992.
3. FPC's letters dated October 13, 1992 and November 30, 1992, and June 27, 1996 and September 9, 1996 and February 18, 1998 and June 30, 1998 and the SCR Technical Specification received August 3, 1998.~~.~~
4. Westinghouse 501FC tables or curves showing Heat Input vs. Compressor Inlet Temperature and Nitrogen Oxide Emissions vs Compressor Inlet Temperature shall be attachments to and are part of this permit.

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 acknowledgment~~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.

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.

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 62~~17~~-4.120 and 62~~17~~-730.300, 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;
- 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.

16. Circumvention. No person shall circumvent any air pollution control device, or allow the emission of air pollutants without the applicable air pollution control device operating properly pursuant to Rule 62-210.650 F.A.C.

SPECIFIC CONDITIONS:

The construction and operation of the Hines Energy Complex (Project) shall be in accordance with all applicable provisions of Chapters 62~~17--~~210 to 297, F.A.C. and NSPS Subparts GG, Dc, and Kb. The following emission limitations and conditions reflect BACT determinations for the ~~Phase IA 470~~Power Block 1- 485 MW (two combined cycle combustion turbines and auxiliary equipment) of generating capacity for which the need has been determined. BACT determinations for the remaining phases will be made upon review of supplemental applications. In addition to the foregoing, the Project shall comply with the following conditions of certification as indicated.

A. General Requirements

1. The maximum heat input (HHV) to each combustion turbine (CT) at an ambient temperature of 59° F shall neither exceed ~~1,510~~ 1,757 MMBtu/hr while firing natural gas, nor ~~1,730~~ 1,846 MMBtu/hr while firing fuel oil. Heat input may vary depending on ambient conditions and the CT characteristics. Manufacturer's curves or equations for correction to other temperatures shall be provided to DEP for review 90 days after selection of the CT. Subject to approval by the Department for technical validity applying sound engineering principles, the manufacturer's curves shall be used to establish heat input rates over a range of temperatures for the purpose of compliance determination.

2. Each of the two CTs in Power Block 1 ~~Phase IA~~ may operate continuously, i.e., 8,760 hrs/year.

3. Only natural gas (NG) or low sulfur fuel oil shall be fired in each combustion turbine ~~and the auxiliary boiler~~. Only low sulfur fuel oil shall be fired in the diesel generator. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent, by weight. Only natural gas shall be fired in the auxiliary boiler.

4. The maximum heat input to the auxiliary boiler shall not exceed 99 MMBtu/hr ~~when firing NG or No. 2 fuel oil with 0.05 percent maximum sulfur content (by weight).~~ All fuel consumption must be continuously measured and recorded for the auxiliary boiler.

5. The maximum allowable fuel oil consumption for the two turbines is 13,762,806 gallons per year, which is equivalent to an aggregate of 1,000 hours per year of operation at full load.

6. The permittee shall have the option of installing duct module(s) suitable for possible future installation of an oxidation catalyst and/or SCR equipment on each combined cycle generating unit. In the event that the module(s) are not installed in the Heat Recovery Steam Generator (HRSG), the retrofit costs associated with not making provisions for such technology (initially) shall not be considered in any future economic evaluation to justify not installing SCR or an oxidation catalyst.

7. Fugitive dust emissions during the construction period shall be minimized by covering or watering dust generation areas.

8. If site construction does not commence on ~~Phase IA (470 MW)~~ Power Block 1 (485 MW) within 18 months of issuance of this permit, then FPC may request an extension of the 18-month period, provided that such request is received by the Department's Bureau of Air Regulation at least 90 days prior to the expiration date. Such a request shall identify the progress made toward commencement of the construction of the site and the expected time required to start and complete construction of the initial phase. The Department may grant the extension upon a satisfactory showing that the extension is justified.

Units to be constructed or modified in later phases of the project will be reviewed under the supplementary review process of the Power Plant Siting Act. If site construction has not commenced within 18 months of issuance of this certification, then FPC shall obtain from DEP a review and, if necessary, a modification of the BACT determination and allowable emissions for the unit(s) on which construction has not commenced [40 CFR 52.21(r)(2)].

SPECIFIC CONDITIONS:

B. Emission Limits

1. The maximum allowable emissions from each of the two CTs, when firing natural gas or low sulfur fuel oil, in accordance with the BACT determination and subsequent data from Westinghouse, shall not exceed the following~~,~~ (at 59° F reference temperature for NOx emissions) (except during periods of start up, shutdown, malfunction ~~and load change~~):

EMISSIONS LIMITATIONS

POLLUTANT	FUEL	BASIS(g)	LB/HR/CT	TPY(b)
NO_x (a)	Gas	12 ppmvd(h)	73(i)	639
	Oil	42 ppmvd(c)(h)	305	153
VOC (d)	Gas	7 ppmvw	10.4	91
	Oil	10 ~~7~~ ppmvw	19.0 ~~11.2~~	-5.6
CO	Gas	25 ppmvd	77	675
	Oil	30 ppmvd	93	47
PM/PM_{10}	Gas		15.6 ~~9~~	79
	Oil(e)		44.8 ~~17~~	21 ~~8.5~~
SO_2	Gas (f)		4.7 ~~0.99~~	44 ~~8.7~~
	Oil (f)		94	47
Visible Emissions	Gas	10 percent opacity		
	Oil	20 percent opacity		

a. Pollutant emission rates may vary depending on ambient conditions (compressor inlet temperatures) and the CT characteristics. Manufacturer's curves for the NOx emission rate correction to other temperatures at different loads shall be provided to DEP for review 90 days after selection of the CT. Subject to approval by the Department for technical validity applying sound engineering principles, the manufacturer's curves shall be used to establish pollutant emission rates over a range of temperatures for the purpose of compliance determination. Emission limitations in LB/HR/CT of NOx are blocked 24-hour averages (midnight to midnight) and are calculated as follows:

NO_x emissions shall be determined continuously by a Continuous Emissions Monitoring System (CEMS). A CEMS operated and maintained in accordance with 40 CFR 75 shall be used. Compliance with the NO_x emissions standards in the above table shall be demonstrated with this CEMS system based on a 24-hour block average. Based on CEMS data at the end of each operating day, ~~a~~ new 24-hour average emission rates, both actual and allowable (based on compressor inlet temperatures) are ~~is~~ calculated from the arithmetic average of all valid hourly emission rates during the previous 24 operating hours. Valid hourly emission rates shall not include periods of startup (including fuel switching), shutdown, or malfunction as defined in Rule 62-210.200 where emissions exceed the NO_x standard. These excess emission periods shall be reported as required in Specific Condition E.2.f. A valid hourly emission rate shall be calculated for each hour in which two NO_x and oxygen concentrations are obtained at least 15 minutes apart. When monitoring data is not available, substitution for missing data shall be handled as required by Title IV (40 CFR 75) to calculate the 24-hour block average.

b. Annual emission limits (TPY) for natural gas are based on a total of two CTs operating at full load 8,760 hours per year (i.e., NO_x - 73 lbs/hr X 2 CTs X 8,760 hrs/yr X 1 ton/2,000 lbs = 639 TPY). Annual emission limits (TPY) for fuel oil are based on full load operation for a total of 1,000 hours per year for the two CTs (i.e., NO_x - 305 lbs/hr X 1,000 hrs/yr X 1 ton/2,000 lbs = 153 TPY).

c. Fuel oil NO_x emissions are based on full load operation ~~at ISO conditions~~ and 15 percent oxygen. For fuel oil firing, NO_x levels of 42 ppmvd @ 15 percent O_2 are based on a fuel bound nitrogen content of 0.015 percent or less. The emission limit for NO_x is adjusted as follows for higher fuel nitrogen contents up to a maximum of 0.030 percent by weight:

FUEL BOUND NITROGEN (% BY WEIGHT)	NO_X LEVELS (PPMVD @ 15%O_2)	NO_X EMISSIONS LB/HR/CT	NO_X EMISSIONS TPY
0.015 or less	42	305	153
0.020	44	320	160
0.025	46	334	167
0.030	48	349	175

using the formula STD = 0.0042 + F where:

STD = allowable NO_X emissions (percent by volume at 15 percent O_2 and on a dry basis).

F = NO_X emission allowance for fuel-bound nitrogen defined by the following table:

FUEL-BOUND NITROGEN (% BY WEIGHT)	F (NO_X % BY VOLUME)
0 < N < 0.015	0
0.015< N < 0.03	0.04(N-0.015)

where: N = the nitrogen content of the fuel (% by weight).

NO_X emissions limits are preliminary for the fuel oil specified in Specific Condition No. A.3. FPC shall maintain ~~submit~~ fuel bound nitrogen content data for the low sulfur fuel oil prior to commercial operation. Adjustments of the NO_X standard (up and down) shall be calculated and recorded based upon a volume weighted average of the nitrogen content of each bulk fuel oil shipment and the nitrogen content of the existing fuel in the storage tank. The NO_X standard for fuel oil shall not be adjusted between fuel oil shipments. Records for these adjusted standards shall be kept on site for a minimum of 5 years.

d. Exclusive of background concentrations.

e. PM/PM_{10} emission limitations ~~are exclusive of~~ include sulfuric acid mist.

f. SO_2 emissions are based on a maximum of 1 grain of S/100cf of natural gas and 0.05 percent sulfur in the fuel oil.

g. The values are the computational basis for the lb/hr numbers, which are the actual emission limitations. Once a combustion turbine manufacturer has been selected, it may be necessary to modify this basis. If this basis is to be modified, a professional engineer-certified equivalency analysis by the manufacturer must be submitted to the Department. The equivalency analysis will recommend an emissions normalizing basis (i.e., lb/hr, lb/MMBtu, lb/MWh, or ppmvd) and associated emissions appropriate for the specific manufacturer's equipment. If the equivalency analysis demonstrates an impact equal to or less than the current lb/hr limit, the Department shall amend the conditions to reflect the alternate basis. The characteristics and parameters of the CT selected will be reflected in other permit conditions, where appropriate.

h. ~~12 ppmvd a~~At 15 percent O_2, not ISO corrected. ~~The ISO corrected value is 15 ppmvd at 15 percent O_2. Compliance will be determined through the initial and annual compliance tests required in Condition C.1.~~

i. ~~—~~Control of nitrogen oxides from each CT while firing natural gas shall be accomplished using dry low NOx burners (DLN) and SCR. Ammonia slip shall not exceed 10 ppm. ~~—~~If the Westinghouse Piloted Ring Combustor(PRC) or a more advanced DLN burner is developed which is able to comply with the emission limits (listed in the above table) and is installed by November 1, 2000 the SCR system may be removed and replaced with these new burners upon 30 days prior notice to DEP. This action would implement the original BACT for NOx and would not be subject to PSD review. This notice shall include information on the new burners which provides reasonable assurance and PE certification that these DLN burners can consistently meet the NOx emission limits. In this case the new dry low NOx burners shall be tested in accordance with the initial performance test as described in Section C.1 within 180 days of startup with the new burners.

2. The following CT emissions, determined by BACT, are tabulated for PSD purposes:

ESTIMATED EMISSIONS

POLLUTANT	METHOD OF CONTROL	Basis(b)
Benzene	Natural Gas	BACT
Inorganic Arsenic	No. 2 Fuel Oil(a)	BACT
Beryllium	No. 2 Fuel Oil(a)	BACT
Mercury	No. 2 Fuel Oil(a)	(c)
Pb	No. 2 Fuel Oil(a)	(c)

a. The No. 2 fuel oil shall have a maximum sulfur content of 0.05 percent.

b. Since these pollutants are inherent constituents in the fuel, the basis for control will be by specifying that only natural gas and No. 2 fuel oil can be fired at the facility.

c. Below PSD significant emission levels.

~~4. After the initial compliance tests on the CTs (estimated to be in January, 1999), the permittee shall operate a certified continuous emissions monitor for NO_x emissions, and collect 12 months of monitoring data. The monitor will at a minimum meet the requirements of 40 CFR 60 Appendix F or 40 CFR 75 quality assurance procedures. Within 17 months after the initial compliance test FPC shall prepare and submit for the Department's review an engineering report regarding the collection and the analysis of the data gathered from the monitor. In addition, this report shall include a conclusion regarding the lowest NO_x emission rate which can be consistently achieved with a reasonable operating margin taking into account long term performance expectations and assuming good operating and maintenance practices. The report shall also include results of the testing requirements of Appendix F procedures and the actual CEM data for the period of the study in an acceptable format.~~

~~5. One month after submittal of the engineering report (estimated to be by June 2000), the Department will make a determination based on the engineering report submitted by FPC on the revised NO_x emission limits. If the data demonstrate that a~~

~~NO_x emission rate of less than 73 lb/hr (based on 12 ppmvd at 15 percent O_2 and 59°F) is consistently achievable, the NO_x emission limits may be adjusted accordingly, but not lower than 55 lb/hr (based on 9 ppmvd at 15 percent O_2 and 59°F).~~

~~3~~4~~6~~. Excess emissions from a turbine resulting from start up, shutdown, malfunction, or load change shall be acceptable providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for a longer duration. The permittee shall provide a general description of the procedures to be followed during periods of start up, shutdown, malfunction, or load change to ensure that the best operational practices to minimize emissions will be adhered to and the duration of any excess emissions will be minimized. The description should be submitted to the Department along with the initial compliance test data. The description may be updated as needed by submitting such update to the Department within thirty (30) days of implementation.

4~~5~~7~~.~~ Operation of the auxiliary steam boiler shall be limited to a maximum of 1000 hours per year and only during periods of cold CT startup or quick startup out of a short-term shutdown mode, when no other source of steam is available or during periodic testing. The following emission limitations shall apply:

a. NO_x emissions shall not exceed 0.1 lb/MMBtu for natural gas firing based on vendor-certified stack test data for the model of auxiliary boiler purchased.

b. Sulfur dioxide emissions shall be limited by firing natural gas.

c. Visible emissions shall not exceed 10 percent opacity while burning natural gas.

5~~6~~8~~.~~ Operation of the emergency diesel generator shall be limited to a maximum of 100 hours per year and only during periods of on site emergency power needs (when no other power source is available) or during periodic testing. The following emission limitations shall apply:

a. The manufacturers design NO_x emission rate shall not exceed 9.82 grams/hp-hr based on vendor-certified stack test data (or equivalent) on the model of generator purchased. This test data shall be provided to the Department with the initial combustion turbine performance test report.

b. Sulfur dioxide emissions shall be limited by firing only low sulfur fuel oil with maximum sulfur content of 0.05 percent by weight.

c. Visible emissions shall not exceed 20 percent opacity.

C. Performance Testing

1. An ~~I~~initial (I) performance ~~compliance~~ test~~s~~ shall be performed on each CT for each ~~using both~~ fuel~~s~~. Testing of emissions shall be conducted with the source operating at capacity (maximum heat input rate for the tested operating temperature). Capacity is defined as 90 - 100 percent of permitted capacity. If it is impracticable to test at capacity, then sources may be tested at less than capacity; in this case subsequent source operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen consecutive days for purposes of additional compliance testing to regain the rated capacity in the permit, with prior notification to the Department. Annual (A) compliance tests shall be performed on each CT with ~~the~~the fuel(s) indicated below ~~used for more than 400 hours in the preceding 12 month period~~. Tests shall be conducted using EPA reference methods in accordance with 40 CFR 60, Appendix A, as adopted by reference in Rule 62~~17~~-297, F.A.C.:

a. Reference Method 5 for PM (I, A~~,~~ only for oil and only if fuel oil is fired more than 400 hours per CT in the previous federal fiscal year).

b. Reference Method 9 for VE (I, A- only for oil and only if fuel oil is fired more than 400 hours per CT in the previous federal fiscal year).

c. Reference Method 10 for CO (I, A- for gas and annually for oil if fuel oil is fired more than 400 hours per CT in the previous federal fiscal year).

d. Reference Method 20 for NOx (I~~,~~ ~~A~~only, for compliance with 40 CFR 60.332 and 40 CFR 60.335).

e. Reference Method 18 or Method 25A for VOC (I~~, A~~).

~~f. Trace elements of Beryllium (Be) and Arsenic (As) shall be tested (I, for oil only) using EMTIC Interim Test Methods. As an alternative, Method 104 for Beryllium (Be) may be used; or Be and Arsenic may be determined from fuel analysis using either Method 7090 or 7091, and sample extraction using Method 3040 as described in the EPA solid waste regulations SW-846.~~

f~~g~~.ASTM D4294 (or equivalent) for sulfur content of distillate oil (I,A), which can be used for determining SO_2 emissions annually.

g~~h~~.ASTM D1072-80, D3031-81, D4084-82, or D3246-81 (or equivalent) for sulfur content of natural gas (I, and A if deemed necessary by DEP).

h. Ammonia (I) by EPA Method 26A and Ion Chromatography analysis or a test method approved by DEP prior to the initial performance test.

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

2. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent by weight. Compliance shall be demonstrated in accordance with the requirements of 40 CFR 60.334 testing for sulfur content of the fuel oil in the storage tanks on each occasion that fuel is transferred to the storage tanks from any other source. Testing for fuel bound nitrogen content by ASTM D3431 or other ASTM method, and for fuel oil ~~lower~~ higher heating value, shall also be conducted on the same schedule.

D. Monitoring Requirements

For each combined cycle unit, the permittee shall install, operate, and maintain a continuous emission monitoring system (CEMS) (in accordance with 40 CFR 60, Appendix F or 40 CFR 75) or use other DEP approved alternate methods to monitor nitrogen oxides and, if necessary, a diluent gas (CO_2 or O_2). The Federal Acid

Rain Program requirements of 40 CFR 75 shall apply when those requirements become effective for the CTs. ~~within the state~~.

1. Each CEMS shall meet performance specifications of 40 CFR 60, Appendix B or 40 CFR 75.

2. CEMS data shall be recorded and reported in accordance with Chapter ~~62~~-297.500, F.A.C., ~~-~~40 CFR 60 Appendix A and Subpart GG and 40 CFR 75. The record shall include periods of start up, shutdown, and malfunction. Compliance with condition B.1. for NO_x shall be determined by CEMS on a mass emission rate basis (LB/HR) using EPA Method 19 and hourly averaged heat inputs (MMBtu/hr).

3. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.

4. The procedures under 40 CFR 60.13 and 40 CFR 75 shall be followed for installation, evaluation, and operation of all CEMS.

5. For purposes of the reports required under this permit, excess emissions are defined as any calculated average emission rate, as determined pursuant to Condition B.3~~4~~6 herein, which exceeds the applicable emission limits in Condition B.1.

E. Notification, Reporting and Recordkeeping

1. To determine compliance with the natural gas and fuel oil firing heat input limitation, the permittee shall maintain daily records of natural gas and fuel oil consumption for each turbine and the heating value for each fuel. All records shall be maintained for a minimum of two years after the date of each record and shall be made available to representatives of the Department upon request.

2. The project shall comply with all the applicable requirements of Chapter 62~~1~~7, F.A.C., and 40 CFR 60 Subparts A, ~~and~~ GG, Dc, and Kb. The requirements shall include:

a. 40 CFR 60.7(a)(1) - By postmarking or delivering

notification of the start of construction no more than 30 days after such date.

b. 40 CFR 60.7(a)(2) - By postmarking or delivering notification of the anticipated date of the initial start up of each CT and the auxiliary steam boiler not less than 30 days prior to such date.

c. 40 CFR 60.7(a)(3) - By postmarking or delivering notification of the actual start up of each turbine and the auxiliary steam boiler within 15 days after such date.

d. 40 CFR 60.7(a)(5) - By postmarking or delivering notification of the date for demonstrating the CEMS performance, no less than 30 days prior to such date.

e. 40 CFR 60.7(a)(6) - By postmarking or delivering notification of the anticipated date for conducting the opacity observations no less than 30 days prior to such date.

f. 40 CFR 60.7(b) - By initiating a recordkeeping system to record the occurrence and duration of any start up, shutdown or malfunction of a turbine and the auxiliary steam boiler, of any malfunction of the air pollution control equipment, and the periods when the CEMS is inoperable.

g. 40 CFR 60.7(c) - By postmarking or delivering a quarterly excess emissions and monitoring system performance report within 30 days after the end of each calendar quarter. This report shall contain the information specified in 40 CFR 60.7(c) and (d). (Pending EPA approval) When firing natural gas or fuel oil in the combustion turbines, the NO_x CEMS shall be used in lieu of the water/fuel monitoring system and fuel bound nitrogen (FBN) monitoring required for reporting excess emissions in 40 CFR 60.334(c)(1) (1997 version). The calibration of the water/fuel monitoring device required in 40 CFR 60.335 (c)(2) (1997 version) will be replaced by the 40 CFR 75 certification tests of the NO_x CEMS. Upon request from DEP, the CEMS emission rates for NO_x shall be corrected to ISO conditions to demonstrate compliance with the NO_x standard established in 40 CFR 60.332.

(Pending EPA approval)The following custom monitoring schedule for natural gas is approved in lieu of the daily sampling requirements of 40 CFR 60.334 (b)(2):

1. Monitoring of natural gas nitrogen content shall not be required.

2. Analysis of the sulfur content of natural gas shall be conducted using one of the EPA-approved ASTM reference methods in Condition C.1.g for the measurement of sulfur in gaseous fuels, or ~~an~~ DEP approved alternative method. Monitoring of the sulfur content of the natural gas 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 fuel sulfur monitoring shall be conducted once per quarter for six quarters and after that, semiannually.

3. Should any sulfur analysis indicate noncompliance with 40 CFR 60.333, the Permittee shall notify DEP of such excess emissions and the customized fuel monitoring schedule shall be reexamined. The sulfur content of the natural gas will be monitored weekly during the interim period while the monitoring schedule is reexamined.

4. The permittee shall notify DEP of any change in natural gas supply for reexamination of this monitoring schedule. A substantial change in natural gas quality (i.e., sulfur content variation of greater than 1 grain per 100 cubic foot of natural gas) shall be considered as a change in the natural gas supply. Sulfur content of the natural gas will be monitored weekly by the natural gas supplier or other qualified parties during the interim period when this monitoring schedule is being reexamined.

5. Records of sampling analysis and natural gas supply pertinent to this monitoring schedule shall be retained by the Permittee for a period of five years, and shall be made available for inspection by the appropriate regulatory personnel(DEP).

6. The Permittee may obtain the sulfur content of the natural gas from the fuel supplier or other qualified parties provided the test methods listed in Specific Condition C.1.g are used.

h. 40 CFR 60.8(a) - By conducting all performance tests within 60 days after achieving the maximum turbine and boiler firing rates, but not more than 180 days after the initial start up of each CT and the auxiliary boiler.

i. 40 CFR 60.8(d) - By postmarking or delivering notification of the date of each performance test required by this permit at least 30 days prior to the test date; and,

j. 62~~17~~-297.345 - By providing stack sampling facilities where necessary ~~for each turbine and the auxiliary steam boiler~~.

All notifications and reports required by this specific condition shall be submitted to the Department's Air Program, within the Southwest District office. Performance test results shall be submitted within 45 days of completion of such test.

3. The following information shall be submitted to the Department's Bureau of Air Regulation within 90 days after selection of each, respectively:

a. Description of the final selection of the turbines, the auxiliary steam boiler and diesel generator for installation at the facility. Descriptions shall include the specific make and model numbers, any changes in the proposed method of operation, fuels, emissions or equipment.

b. Description of the CEMS selected. Description shall include the type of sensors, the manufacturer and model number of the equipment.

4. The following protocols shall be submitted to the Department's Air Program, within the Southwest District office for approval;

a. CEMS Protocol - Within 60 days after selection of the CEMS, but prior to the initial startup, a CEMS protocol describing the system, its installation, operating and maintenance characteristics and requirements. The protocol shall meet the requirements of 40 CFR 60.13, 40 CFR 60 Appendix B and Appendix F or 40 CFR 75. The Federal Acid Rain Program requirements of 40 CFR 75 shall apply when those requirements become effective within the state.

b. Performance Test Protocol - At least 30~~90~~ days prior to conducting the initial performance tests required by this permit, the permittee shall submit to the Department's Air Program, within the Southwest District office, a protocol outlining the procedures to be followed, the test methods and any differences between the

reference methods and the test methods proposed to be used to verify compliance with the conditions of this permit. The Department shall approve the testing protocol provided that it meets the requirements of this permit.

F. Modifications

The permittee shall give written notification to the Department when there is any modification to this facility. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and the anticipated completion date of the change.

Memorandum

Florida Department of
Environmental Protection

TO: Clair Fancy

FROM: Martin Costello MC 8/4/98

DATE: August 4, 1998

SUBJECT: Florida Power Corporation Hines Energy Complex
PSD-FL-195A Combined Cycle Facility

Attached is the Public Notice and draft permit modification to install a Selective Catalytic Reduction (SCR) system and to reflect the specifications of the actual (Westinghouse 501FC) combustion turbines installed at the Hines Energy Complex.

The changes will allow FPC to meet its original NO_X commitment with SCR.

Other changes in the permit reflect the technical specifications of the Westinghouse 501 FC versus the General Electric 7FA units originally proposed at the site. These include a higher heat input rate and total power generation capability of 485 megawatts (MW) versus 470 MW. Other changes include higher particulate matter, VOC and SO_2 emission limits which are less than significant for purposes of PSD.

I recommend your approval and signature.

MC/t

Attachments

TECHNICAL SPECIFICATION FOR AN SCR SYSTEM FOR THE FPC HINES ENERGY PROJECT

Written by: J. M. Prescott for RDP — 7/31/98
R. D. Prescott, Engineer — Date
Thermal Cycle & BOP System Design

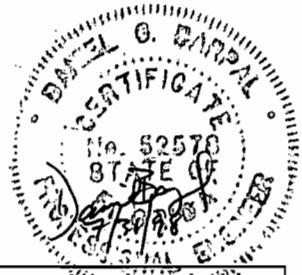
Reviewed by: J. M. Prescott for G.P. — 7/31/98
G. Pyros, Engineer — Date
Thermal Cycle & BOP System Design

Reviewed by: Bruce Rising — 31 Jul 98
B. Rising, Engineer — Date
Environmental Engineering

Approved by: F. W. Shoemaker — 7/31/98
F. Shoemaker, Technical Group Leader — Date
Thermal Cycle & BOP System Design

Approved by: M. S. Briesch — 7/31/98
M. S. Briesch, Manager — Date
Thermal Cycle & BOP System Design

Reference: _____
WBS: 255
Review Level: 5



DOCUMENT NO. 21T8900	DISTRIBUTION CODE: 273-000-604	
TITLE: SCR SYSTEM FOR THE FPC-HINES ENERGY PROJECT	TYPE ESP	REV 003
WESTINGHOUSE POWER GENERATION POWER GENERATION BUSINESS UNIT - ORLANDO, FL	Issue Date:	Page: 1 of 38

REVISION SHEET

REVISION	REISSUE DATE	SECTION	DESCRIPTION OF CHANGE
001	12/3/97	All	Original Issue
002	7/20/98	3.1	Removed second paragraph, as it is the Buyer's option to validate emission guarantees.
		7.1.3	Removed statement as nitrogen purge is not required.
		7.2.2	Revised second sentence to incorporate as built design.
		8.2.1	Changed reference section number.
		10.2.13	Changed reference section number.
		Scope of Supply Datasheet, p. 2	Revised flue gas analyzer scope of supply to incorporate as built design.
		Performance Information Datasheets, pages 1 - 8	Revised combustion turbine emissions. Filled in Seller supplied information for upstream temperature entering catalyst and downstream emissions.
		Design Specification Datasheet	Revised dilution medium to incorporate as built design.
003		Performance Information Datasheets, pages 1, 3, 4	Revised ambient conditions, CT exhaust and emissions conditions. Revised downstream emissions.
		Performance Information Datasheets, pages 6, 8	Revised downstream emissions.

TABLE OF CONTENTS

1.0 DOCUMENT SCOPE

1.1 This specification, together with the contract document and all documents referenced herein, covers the scope of supply and technical design requirements for a Selective Catalytic Reduction (SCR) system to reduce Nitrogen Oxide (NOx) emissions for the 2x1 501F FPC-Hines Energy Combined Cycle Project.

1.2 All conflicts between the requirements of this specification, design specification data sheets, related specifications, and standard codes shall be brought to the attention of the Buyer for clarification before proceeding with the design or manufacture of the affected parts.

1.3 Reference Documents

The design, fabrication, testing, and inspection of the SCR system shall be in accordance with this document and the documents referenced herein.

1.3.1 Westinghouse Specifications and Documents (latest revisions)

21T5673 Supplier Data Requirements for Software Deliverables

21T5802 Supplier Quality Requirements

21T7360 Paint Specification for FPC-Polk County, Florida

21T7397 Specification for a Heat Recovery Steam Generator for FPC-Hines Energy Project

21T7525 Acoustical Requirements for FPC-Polk County Project

1.3.2 Codes and Standards (latest editions apply)

1.3.2.1 American Institute of Steel Construction (AISC)

a. "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings."

1.3.2.2 American National Standard Institute (ANSI)

a. ANSI B16.5, "Steel Pipe Flanges and Flanged Fittings."

b. ANSI B16.11 for Threaded and Socket Welding Fittings.

c. ANSI B16.9 for Butt Welding Fittings.

d. ANSI B31.1, "Power Piping."

1.3.2.3 American Society of Mechanical Engineers (ASME)

a. ASME Section II, "Material Specifications."

b. ASME Section VIII, Division 1, "Rules for the Construction of Pressure Vessels," plus addenda (if applicable to ammonia injection system).

c. ASME Section IX, "Welding and Brazing Qualifications."

1.3.2.4 American Society for Testing and Materials (ASTM)

In general, all materials of construction not required to be covered by the ASME code shall conform to the latest edition of the applicable ASTM Standard. Other materials may be used provided that they are of a "recognizable quality" as determined by Buyer. Materials conforming to foreign standards (BS, DIM, JIS, etc.) may be used provided that "material equivalency" is proven by the manufacturer to the satisfaction of the Buyer.

1.3.2.5 American Welding Society (AWS)

a. AWS D1.1, "Structural Welding Code."

b. Structural welds shall be done in accordance with AWS welding procedures. ASME Code Certified Welders may be used instead of AWS certified welders.

1.3.2.6 Federal Occupational Safety and Health Act (OSHA)

a. OSHA 2206, "OSHA Safety and Health Standards (29 CFR 1910)."

1.3.2.7 Building Codes

The catalyst and housing shall be designed and constructed in accordance with the building codes indicated in Westinghouse Specification 21T7397, "Heat Recovery Steam Generator (HRSG) for the FPC-Hines Energy Project."

1.3.2.8 Electrical Codes

Electrical equipment supplied shall comply with the latest applicable codes and standards of the NFPA National Electrical Code, the Institute of Electrical and Electronic Engineers (IEEE), the National Electrical Manufacturers Association (NEMA), and the National Electrical Code (NEC). Requirements

for electrical equipment certification shall be in accordance with local building codes.

1.3.2.10 American Standards Association (ASA).

1.3.2.11 American Iron and Steel Institute (AISI).

1.3.2.12 Underwriters Laboratories

All applicable instruments shall be supplied with a UL label.

1.3.2.13 U.S. Environmental Protection Agency (EPA) as applicable to emissions testing.

1.3.3 Other Codes or Standards

The Seller shall list in his proposal any additional codes or standards that he intends to use in the design and manufacture of his equipment. Additional codes or standards are subject to approval by the Buyer.

2.0 SYSTEM APPLICATION AND SCOPE OF SUPPLY

2.1 The SCR catalyst shall reduce NOx from the exhaust of a combustion turbine. The system application and design requirements are indicated in Sections 4.0 through 7.0 and the DESIGN SPECIFICATION data sheets. The performance guarantees that shall be met are indicated in Section 3.0 and on the SELLER GUARANTEE data sheet.

2.2 The Seller shall supply two (2) complete SCR systems, one for each Heat Recovery Steam Generator (HRSG). The SCR systems shall be opposite hand (skid and piping on outboard side of HRSG), but otherwise identical in design. See Figure 1 at the end of this specification.

2.3 The Seller's scope of supply shall be as indicated on the Seller SCOPE OF SUPPLY data sheets.

2.4 The following items are specifically excluded from the Seller's scope of supply unless indicated otherwise on the Seller SCOPE OF SUPPLY data sheets:

2.4.1 Foundations, anchor bolts, and other embedments required for support of the reactor housing, ammonia injection header, and ammonia injection skid.

2.4.2 Heat tracing and/or insulation of hot air piping, miscellaneous drain lines, instrumentation lines, etc. required for freeze or personnel protection which are not on the ammonia injection skid.

2.4.3 Nitrogen supply for nitrogen purge of ammonia injection system.

2.4.4 All motor starting equipment and control centers (MCC's) for fan drives, pump drives, or motor operated valves.

2.4.5 All control and electrical wiring and conduit external to the ammonia injection skid.

2.4.6 Final painting of the reactor housing.

2.4.7 Erection and installation of the catalyst reactor, catalyst modules, and ammonia injection skid.

2.4.8 Materials for field welding (electrodes, etc.).

3.0 PERFORMANCE AND EQUIPMENT GUARANTEES

The Seller shall meet the following guarantees for each SCR System.. These guarantees shall also be contained in the special Terms and Conditions of the SCR System Contract between Buyer and Seller.

3.1 Emission Guarantees

Emission guarantees shall be made for all operating conditions indicated on the PERFORMANCE INFORMATION and SELLER GUARANTEE data sheets.

3.2 Pressure Drop Guarantee

The maximum pressure drop measured from immediately downstream of the inlet interface with the HRSG to immediately upstream of the outlet interface with the HRSG, shall be guaranteed based on the value indicated in the SELLER GUARANTEE data sheet.

3.3 Catalyst Life Guarantee

3.3.1 The catalyst life guarantee shall be indicated on the SELLER GUARANTEE data sheet.

3.3.2 The "life" is defined as the period of time in which each catalyst can meet all the guarantees stated in paragraphs 3.1 through 3.2, including the operational requirements indicated on the DESIGN SPECIFICATION data sheet.

3.4 Used Catalyst Disposal Guarantee

3.4.1 The Seller shall provide and guarantee disposal of the used catalyst at no additional cost except shipping charges provided that:

3.4.1.1 The used catalyst is not damaged or contaminated in any way with elements/compounds that would substantially alter the disposability of the catalyst.

3.4.1.2. The laws and regulations regarding the handling, transportation, storage, disposal, and/or treatment of the used catalyst are substantially unchanged from those in effect on the date of the sales contract.

3.4.2 It is the responsibility of the Seller to indicate to the Buyer before the sales contract any elements/compounds which could alter the disposability of the catalyst. Also, the Seller shall inform the Buyer of any pending legislation regarding the handling, transportation, storage, disposal, and/or treatment of the used catalyst.

3.5 Acoustical Guarantee

The Seller shall comply with and guarantee the sound level requirements as specified in Westinghouse Specification 21T7525 - "Acoustical Requirements for the FPC-Polk County Project."

4.0 DESIGN REQUIREMENTS - GENERAL

4.1 Codes

4.1.1 In addition to those specifications, codes, and standards referenced in Section 1.0 of this document, each SCR system shall comply with all state and local codes applicable for the location at which the equipment is to be installed. The responsibility for compliance with these codes rests solely with the Seller.

4.1.2 All equipment furnished under this specification shall allow each SCR system to be operated and maintained in accordance with the Federal Occupational Safety and Health Act.

4.2 Catalyst Bed Location

Each catalyst shall be located in the project specific Heat Recovery Steam Generator (HRSG) at the location described on the DESIGN SPECIFICATION data sheets, with the expected temperature range at this location.

4.3 Flow and Temperature Maldistribution

Each catalyst shall be designed for gas flow and temperature maldistribution entering the catalyst as specified on the DESIGN SPECIFICATION data sheets.

4.4 Catalyst Operating Requirements

4.4.1 Each catalyst shall be capable of operating in the cyclic duty mode. Start up and shutdown can be on a daily basis.

4.4.2 Each catalyst shall be designed to withstand the number of starts indicated on the DESIGN SPECIFICATION data sheets.

4.4.3 Each catalyst shall be capable of being operated within specification limits within one hour from a cold HRSG start, provided inlet concentrations are within design values.

4.4.4 Start up of each catalyst shall be automatic and initiated from the plant's central control room.

4.5 Catalyst Sampling

4.5.1 Two samples of each catalyst shall be retained before shipping the catalyst to the job site. One shall be forwarded to Buyer for storage. The other sample shall be tested by the Seller to ensure the catalyst meets specifications. The results of this test shall be presented to Buyer before shipment of the catalyst.

4.5.2 Each catalyst bed shall be equipped with provisions for periodic catalyst sampling. If removable catalyst sections are used to meet sampling requirements, one complete set of spare catalyst sample blocks shall be provided.

4.6 Manufacturing Requirements

4.6.1 All equipment supplied by the Seller shall be manufactured in one complete assembly or in sub-assemblies. All assemblies shall be designed and manufactured to enable the largest pieces possible to be shipped to the plant site.

4.6.2 All equipment shall be designed and constructed to minimize field welding. Where field welding is required, all joints shall be prepared for welding before shipment.

4.7 Welding

4.7.1 All structural welds shall be in accordance with Section 1W of Appendix B of 21T7397.

4.7.2 All external welds shall be continuous, full seam welds to prevent rust streaking.

4.8 Surface Preparation

4.8.1 Seller's standard practice for surface preparations of interior surfaces shall be used. For exterior surfaces, the Seller shall conduct surface preparation in accordance with Westinghouse Specification 21T7360, "Paint Specification for FPC Polk County, Florida."

4.8.2 The pipes for the ammonia injection system shall be internally cleaned to remove metal shavings and rust before installation.

4.8.3 All materials shall be cleaned of foreign matter, scale, flux, and weld splatter prior to painting.

5.0 DESIGN REQUIREMENTS - CATALYST

5.1 The design point to be used by the Seller for the design of each catalyst shall be selected from the operating conditions presented in the PERFORMANCE INFORMATION data sheets. The Seller shall design each catalyst to meet all guarantees under the worst case conditions from the data sheets. The design conditions used shall be clearly stated by Seller.

5.2 Each catalyst shall maintain the design removal efficiencies as stated on the PERFORMANCE INFORMATION data sheets as long as the inlet NOx concentrations (ppmvd basis) remain at or below the design values, and that the catalyst operating temperature is maintained within the range given in the SELLER GUARANTEE data sheet.

6.0 DESIGN REQUIREMENTS - CATALYST BED AND HOUSING; MECHANICAL

6.1 Housing Mechanical Design

Each catalyst housing shall be complete with catalyst support structure, inner liner, insulation, and outer casing. Materials of construction for the catalyst housing shall be compatible with the materials used for the HRSG. Seller shall clearly communicate and coordinate with HRSG Seller at interface points.

6.1.1 Outer Casing

6.1.1.1 The outer casing shall be gas tight and shall be a "cold wall" design.

6.1.1.2 The casing shall be manufactured from carbon steel plate, ¼ inch minimum thickness, and reinforced with stiffeners.

6.1.1.3 The internal design pressure of the catalyst housing shall be a minimum of 20 inches of water.

6.1.2 Inner Casing

6.1.2.1 The inner liner shall be constructed of type 409 or 304 stainless steel. Any Type 304 stainless steel exposed to the exhaust gases and which is welded upon, shall be of the low carbon type.

6.1.2.2 Due to the large thermal transients to which the ductwork shall be subjected, the Seller's design shall include adequate provisions for thermal expansion on the inner casing.

6.1.3 Insulation

6.1.3.1 Sufficient insulation shall be installed between the outer and inner casings so that at design conditions the outer casing cold face temperature at any point does not exceed 140 °F with an 80 °F ambient in still air.

6.1.3.2 10 gauge insulation studs and retaining clips shall be installed between liner anchors as required to prevent sagging of the insulation on the ceiling walls.

6.1.3.3 Insulation shall be fire proof and asbestos free.

6.1.4 Catalyst Housing Doors

6.1.4.1 One access opening shall be provided on the HRSG roof with handrail and ladder access.

6.1.4.2 Access doors shall also be provided upstream and downstream of each catalyst bed.

6.1.4.3 All doors shall be hinged and insulated, and shall be a minimum of 18 in. by 24 in.

6.1.5 Interface with HRSG

6.1.5.1 The HRSG interface dimensions for each catalyst are to be worked out between the catalyst Seller and the HRSG Seller. Transitions from the catalyst housing to the HRSG duct may be used to interface the two systems and allow a larger section for each catalyst.

6.1.5.2 The catalyst housing interface, supports, and piping shall be designed so that expansion joints are not required.

6.1.5.3 The scope of supply for the interfacing between the catalyst Seller and HRSG Seller shall be as indicated on the SCOPE OF SUPPLY data sheets.

6.1.6 Housing Drains

Each catalyst housing shall be equipped with drains located at the lowest point of the housing. The drains shall be sized based on the washing requirements of the catalyst if washing is part of the potential maintenance. If washing is not necessary or is performed outside the housing, drains shall be sized based on HRSG draining requirements.

6.2 Catalyst Support Structure

6.2.1 Each catalyst module shall be supported with minimum clearance, and seals should be made to prevent gas by-pass.

6.2.2 In some housing designs it may be required to provide space for additional catalyst or provide additional support structure for addition of catalyst after plant has been in operation. These requirements shall be indicated on the Seller SCOPE OF SUPPLY data sheets.

6.3 Catalyst Housing Structural Loads

6.3.1 Live loads shall be taken as 100 lbs/ft^2.

6.3.2 Wind loading and seismic loading shall be as defined by the applicable building code referenced in Specification 21T7397.

6.3.3 Thermal loadings shall be calculated by the Seller for submission to the HRSG Seller.

6.3.4 Each catalyst housing shall accept all loads imposed on it by the HRSG.

6.4 Catalyst Housing Sampling Ports

6.4.1 All sampling ports and monitoring equipment shall be in compliance with EPA requirements.

6.4.2 Seller shall supply a minimum of 7 equally spaced ports along the vertical dimension of the housing for the measurement of temperature and flow distributions, inlet NOx, and ammonia injection distributions. Sampling ports shall be provided upstream and downstream of each catalyst bed. The ports upstream of the catalyst shall be downstream of the ammonia injection grid.

6.4.3 A permanent gas side thermocouple shall be installed upstream of each catalyst bed to monitor inlet temperature.

7.0 DESIGN REQUIREMENTS - AMMONIA INJECTION SYSTEM

An aqueous ammonia injection system shall be supplied by the Seller that will take aqueous ammonia forwarded from a storage vessel (by others), vaporize the ammonia, mix it with a dilution medium, and inject it into the exhaust gas stream at the proper location and in the proper proportions. Scope of supply requirements for the injection system are given in the Seller SCOPE OF SUPPLY data sheets. Detailed design requirements are given in this section.

7.1 Ammonia Injection System - General

7.1.1 All ammonia injection system components supplied by the Seller shall be free of ammonia leaks. The detectable limit shall be determined by odor such that no ammonia shall be detectable by sense of smell in any area.

7.1.2 A solenoid operated emergency shut-off valve shall be provided for any ammonia supply line or steam supply line to the injection system.

7.1.3 Steel pipe and malleable iron pipe fittings shall be used. Galvanized pipe or fittings and unions with brass seats are not acceptable. Trim containing tungsten carbide shall also not be used. All ammonia injection piping shall also be in accordance with the specifications given in Section 1.3.

7.1.4 The ammonia injection skid shall be pre-piped and pre-wired. All equipment supplied by the Seller shall be mounted on the skid except for the ammonia injection header which should be designed to be accessible from grade and mounted adjacent to the HRSG to minimize the length of the ammonia injection lines. Wiring on the skid shall terminate at a junction box mounted at the edge of the skid.

7.1.5 The ammonia injection skid shall be supplied finish painted.

7.2 Ammonia Injection Skid

7.2.1 Vaporization Method

The aqueous ammonia shall be vaporized before being mixed with a dilution medium and injected into the gas stream in an ammonia vaporizer. The vaporizer shall use high pressure hot air or steam to vaporize all of the water/ammonia mixture before mixing with the dilution medium. The properties of the steam or air used and the piping design requirements shall be indicated on the DESIGN SPECIFICATION data sheets. The vaporizer shall be supplied with steam or air atomizing nozzles and any instrumentation necessary for proper control of the vaporizer.

7.2.2 Dilution Medium

To preclude condensation of the ammonia mixture the temperature of the dilution medium shall be above the vapor point of the mixture used. The dilution medium shall be as indicated on the DESIGN SPECIFICATION data sheets.

7.2.3 Dilution Air Blowers

Two x 100% dilution air fans or blowers shall be provided, one for normal use and one for stand-by. Blowers shall be equipped with an inlet air filter to prevent clogging of injection nozzles.

7.2.4 Ammonia/Dilution Medium Mixer

Ammonia/dilution medium mixer shall be provided to obtain proper dilute concentrations of ammonia. The Seller shall measure both dilution medium and ammonia flow rates such that dilute concentrations can be continuously monitored. The ammonia concentration after mixing with the dilution medium shall be a maximum of 5% by volume.

7.3 Ammonia Injection Grid (AIG)

7.3.1 Because temperature and flow maldistribution are more likely to occur vertically in the HRSG, the AIG shall be designed with horizontal injection pipes to allow for adjusting ammonia flow along the entire height of the catalyst bed. Also, provisions shall be provided for vertical injection pipes at areas where flow maldistribution is expected side to side (i.e., against wall where bypassing is possible between tubes and inner liner).

7.3.2 The ammonia injection header, adjustable trim valves, and flow indicators shall be shop assembled and shall be accessible from grade.

7.3.3 The AIG shall be located upstream of the catalyst in a location which shall prevent the possibility of conversion of NH3 to NO.

7.4 Ammonia Injection System Control

7.4.1 The start-up and control of the ammonia injection system shall be accomplished in the plant distributed control system. The injection system shall also have the capability to be controlled manually.

7.4.2 The control system shall ensure that if the ammonia injection is shut down for any reason while the combustion turbine is in operation, the dilution air is continuously injected into the injection nozzles to prevent back flow of the flue gas into the ammonia injection line.

7.4.3 The control system shall also monitor inlet temperature to the catalyst so that ammonia is not injected into the gas stream at any time when the temperature is below the formation temperatures for ammonia salts.

7.5 Instrumentation and Valve Requirements

7.5.1 Design requirements for all instrumentation and valves shall be in accordance with Section 5.2 of Specification 21T7397 (including referenced subsections).

7.5.2 The scope of supply for specific SCR instrumentation is indicated in the Seller SCOPE OF SUPPLY data sheets.

7.5.3 The pressure drop across each catalyst shall be measured. Local differential pressure measurement devices shall be provided by the catalyst Seller.

7.5.4 All valve limit switches and position transmitters shall be rigidly mounted on the valve, and they shall have water tight enclosures. The position switch shall be an integral part of the valve and actuator design (not an "add-on").

7.5.5 To the extent that it is economically feasible, remotely operated ON-OFF valves shall be pneumatically actuated.

7.5.6 All Seller supplied equipment shall be supplied with provisions for freeze protection.

8.0 QUALITY, SHOP TEST AND SHIPPING REQUIREMENTS

8.1 Quality Assurance Requirements

8.1.1 Suppliers of Materials, Equipment and Services in support of this specification shall meet the requirements of the Westinghouse Supplier Quality Program as described in Westinghouse Document 21T5802, "Supplier Quality Requirements". This document shall be reviewed concurrently with this specification.

8.1.2 It is the Seller's responsibility to obtain copies of all documents referenced in this specification. Unless specific exception is requested formally by the Seller, and formally granted by the Buyer, these referenced documents shall be binding.

8.2 Shop Test Requirements

8.2.1 Catalyst testing shall be as indicated in paragraph 4.5.1.

8.2.2 The Seller shall leak test all ammonia injection piping assemblies before shipment to the site.

8.2.3 The Seller shall perform a functional test of the ammonia injection system including sequencing of all valves.

8.3 Preparation for Shipment

8.3.1 During in-transit time and while pending assembly, the catalyst components will be subject to outdoor exposure in a wide range of ambient conditions. All items shall be preserved, sealed, and packed adequately to keep moisture, dirt and other contaminants out for a minimum of 6 months of field storage and with a preservation durability of one year preferred.

8.3.2 For shipment and storage any flanged connections shall be suitably protected with steel plate, gaskets, and bolts.

8.3.3 A permanently attached corrosion resistant nameplate shall be affixed at a prominent location on the catalyst housing and shall include the following information as a minimum:

8.3.3.1 Name of Manufacturer.

8.3.3.2 Equipment Type (Name).

8.3.3.3 Manufacturer's Model No.

8.3.3.4 Buyer Purchase order No.

8.3.3.5 Design Removal Efficiency.

8.3.4 The Seller shall be responsible for any damage to equipment resulting from improper shipment or storage instructions.

9.0 FIELD ERECTION AND START UP ASSISTANCE

9.1 Field Erection

The Seller's proposal shall include sufficient information to allow evaluation of the erection requirements (see Section 10.1).

9.2 Field Supervision

9.2.1 The Seller shall make available a competent engineer to supervise erection and start up of all equipment in his scope.

9.2.2 The requirements shall be indicated on the SELLER SCOPE OF SUPPLY data sheets. The Seller should recommend the number of hours required for erection and start-up separately.

9.2.3 The Seller shall supply, at no cost to the Buyer, personnel to witness the performance testing of the catalyst, if desired by the Buyer.

9.3 Erection Equipment

9.3.1 The Seller shall supply special tools, fixtures, wrenches, or other equipment required for erection and list additional equipment which may be required but is not furnished.

9.3.2 The Seller shall supply all lifting beams, spreader bars, and other devices required for unloading and installation purposes. Any special slings or cables required shall be provided.

9.4 Erection Instructions

9.4.1 The Seller shall furnish a complete written description of the erection and start up procedure to supplement his erection drawings.

9.4.2 The Seller shall furnish instructions for the preservation and storage of equipment in his scope at the job site during construction.

10.0 DOCUMENTATION AND INFORMATION REQUIREMENTS

The following drawings and information shall be furnished by the Seller in accordance with Westinghouse Document 21T5673, "Supplier Data Requirements for Software Deliverables." More specific information required is given in this section to be used in conjunction with 21T5673. All documents shall contain the following information as a minimum:

Customer:	Westinghouse Electric Corporation
Project Name:	Hines Energy Complex PB1
P.A. No.:	
Service:	Selective Catalytic Reduction
Tag No.:	
Specification :	21T8900
Sequence No.:	
WBS No.:	255

10.1 Proposal Information Requirements

The Seller shall submit three (3) copies of a technical proposal containing the following requirements, at a minimum. Drawings and details of the proposed system shall give enough detail for evaluation of the system with regard to performance, structural integrity, installation labor and conformance with all major requirements of this specification.

10.1.1 General arrangement drawings showing outline dimensions, foundation requirements and accessories.

10.1.2 Preliminary foundation footprint, including estimated plot space and flooded weights and foundation loadings.

10.1.3 Ammonia injection system piping and instrumentation diagram.

10.1.4 Expected performance curves for NOx conversion versus temperature, and ammonia slip versus temperature.

10.1.5 All filled-in data sheets in this specification

10.1.6 Clearly identified design conditions used for the design point.

10.1.7 List of any specific contaminants which could alter the catalyst performance (e.g. air, fuel, water, steam, lubricating oil contaminants).

10.1.8 Expected gas side pressure drop.

10.1.9 Buyer and HRSG Seller Interface List:

The Seller shall furnish a list of all major interface points where the Seller terminates their supply with the Buyer and with the HRSG Seller. Seller shall provide information as necessary to properly interface the catalyst housing with the HRSG and the housing foundation.

10.1.10 Catalyst disposal/replacement information.

10.1.11 List of shipping components including dimensions and weights.

10.1.12 Any special storage requirements for equipment supplied.

10.1.13 Field Erection Information

A typical erection procedure shall be submitted for equipment substantially similar to the equipment being proposed by the Seller, including typical erection drawings of how the unit is to be erected. The Seller shall also provide lifting requirements for the specific catalyst components being proposed including required lifting capacity and length of time that each crane is required. A detailed erection schedule shall also be supplied specific to the proposed equipment, which includes craft man-hour estimates for each major step in the erection procedure.

10.1.14 Proposed engineering, purchasing and fabrication schedule.

10.1.15 List of exceptions (with reasoning) to all requirements of referenced specifications.

10.2 Buyer Approval Drawings and Information

The following certified drawings and information shall be furnished by the Seller in accordance with Westinghouse Document 21T5673.

10.2.1 General Arrangement Drawing

This shall show the arrangement and location of all major components within the Seller's scope, and shall feature side elevations, plan, and frontal views.

10.2.2 Ammonia Injection P&I Diagram

This shall show all components of ammonia injection system including control valves and flow meters.

10.2.3 Catalyst Housing Layout Drawings

This shall show all layout and interface details with the HRSG duct. The layout shall show the location of all Buyer interface points including piping connections, structural supports to grade, and other structural supports which interface with the HRSG duct. This shall also show layout of loading and access doors.

10.2.4 Catalyst Housing Foundation Loading Diagram

This shall show locations of baseplates, plate and anchor bolt details, and list the dead, wind, thermal, and seismic forces transmitted to the foundations for the catalyst support duct.

10.2.5 Ammonia Injection Control System Drawings

The following control system drawings shall be supplied by the Seller:

10.2.5.1 Control Logic drawings.

10.2.5.2 Instrumentation Input and Output List.

10.2.5.3 Instrument Specification Data Sheets.

10.2.5.4 Instrument Installation Details.

10.2.5.5 Instrument Control Setting List.

10.2.5.6 All Control Valve Data Sheets.

10.2.6 Maintenance Layout Drawing

This shall show the location of all stairs, ladders, and platforms as well as the location of all instruments, valves, and other equipment that requires access for maintenance.

10.2.7 Detail Drawings

Details of the following components shall be provided for Buyer approval:

(a) Module sealing details
(b) Ammonia injection skid details

(c) Ammonia injection grid/piping details
(d) All equipment on ammonia injection skid

10.2.8 Performance Curves

(a) NOx conversion versus temperature.
(b) Ammonia slip versus temperature.
(c) Ammonia slip as a function of inlet NOx and NH3 injection rate.
(d) SO2 to SO3 conversion versus temperature.
(e) Formation of ammonia sulfur compounds versus SO3 concentration upstream of AIG and temperature assuming constant NH3 slip.
(f) Estimated removal efficiencies for Non-Methane and Non-Ethane Hydrocarbons versus temperature.
(g) NOx conversion versus hours of operation.

10.2.9 Catalyst Replacement Details

10.2.9.1 A detailed cost analysis should be submitted regarding the replacement of each used catalyst, including cost of new catalyst, installation cost, and reclaim value of used catalyst.

10.2.9.2 A detailed description of removal and disposal procedures should be submitted.

10.2.10 Piping Layout Drawings

This shall show the layout and routing of all piping within the Seller's scope.

10.2.11 Erection Drawings

Drawings and instructions shall be furnished sufficient to allow erection of the equipment in the field by others (See Section 9.0).

10.2.12 Design, Engineering, and Manufacturing Schedule

The Seller shall submit a schedule showing specific milestones for all design, engineering, drafting, purchasing, and manufacturing functions. This schedule shall include specific shipping dates.

10.2.13 Catalyst Testing Results

A sample of each catalyst shall be tested as explained in paragraph 4.5.1. The results of this test shall be presented to the Buyer before shipment of each catalyst.

10.2.14 Recommended long term storage procedure for items prior to construction.

10.2.15 Shipping Details

The Seller shall submit drawings and other documentation as required to give complete shipping details for major equipment. The drawings/documents shall show the proposed method of shipment, the weight, center of gravity, shipping dimensions for each piece, the tie down and bracing methods used for each package (lifting instructions), and instructions for proper storage at the plant site.

10.2.16 Spare Parts List

The Seller shall furnish a priced list of the recommended spare parts for one, three, and five years of inventory.

10.3 Instruction Books

The Seller shall submit 10 copies of bound instruction manuals for the unloading, storage, installation, operation and maintenance of all equipment in the Seller's scope of supply.

LIST OF ATTACHMENTS DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

THE SCR CATALYST SYSTEM SHALL BE DESIGNED IN COMPLIANCE WITH THE ATTACHMENTS LISTED BELOW ACCORDING TO THE FOLLOWING KEY **(THIS KEY SHALL APPLY TO ALL DATA SHEETS)**:

X= SCR SELLER, H = HRSG SELLER, W = OTHERS, NR = NOT REQUIRED, OPT = OPTION

SPECIFICATIONS (LATEST REVISIONS):

X	SPECIFICATION 21T7397, SPECIFICATION FOR A HEAT RECOVERY STEAM GENERATOR (HRSG) FOR THE FPC-HINES ENERGY PROJECT
X	SPECIFICATION 21T8900, SPECIFICATION FOR AN SCR CATALYST FOR THE FPC-HINES ENERGY PROJECT
X	SPECIFICATION 21T7525, ACOUSTICAL REQUIREMENTS FOR THE FPC-POLK COUNTY PROJECT
X	SPECIFICATION 21T7360, PAINT SPECIFICATION FOR FPC POLK COUNTY, FLORIDA
X	SPECIFICATION 21T5802, SUPPLIER QUALITY REQUIREMENTS
X	SPECIFICATION 21T5673, SUPPLIER DATA REQUIREMENTS FOR SOFTWARE DELIVERABLES

DATASHEETS:

X	SELLER SCOPE OF SUPPLY DATASHEET - GENERAL (1 PAGE)
X	SELLER SCOPE OF SUPPLY DATASHEET - SCR AQUEOUS AMMONIA (2 PAGES)
NR	SELLER SCOPE OF SUPPLY DATASHEET - SCR/ANHYDROUS AMMONIA (2 PAGES)
NR	SELLER SCOPE OF SUPPLY DATASHEET - CO INSTRUMENTATION (1 PAGE)
X	PERFORMANCE INFORMATION DATASHEET (8 PAGES)
X	DESIGN SPECIFICATION DATASHEET - GENERAL(1 PAGE)
X	DESIGN SPECIFICATION DATASHEET - AMMONIA INJECTION SYSTEM (1 PAGE)
X	SELLER GUARANTEE DATASHEET (1 PAGE)

THE SELLER SHALL REVIEW THE ABOVE LIST TO ENSURE THAT ALL ATTACHMENTS INDICATED HAVE BEEN INCLUDED WITH THE TRANSMITTAL. SELLER SHALL NOTIFY BUYER IF ANY DOCUMENTS ARE MISSING.

SELLER SCOPE OF SUPPLY DATASHEET - GENERAL

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

THE ITEMS LISTED BELOW SHALL INDICATE THE SELLER'S SCOPE OF SUPPLY:

X	SCR CATALYST IN MODULES
NR	CO CATALYST IN MODULES
X	AQUEOUS AMMONIA INJECTION SYSTEM
NR	ANHYDROUS AMMONIA INJECTION SYSTEM

CATALYST REACTOR HOUSING:

X	CATALYST HOUSING WITH INTERNAL INSULATION AND LINER
X	CATALYST MODULE SUPPORT STRUCTURE
NR	SPACE IN REACTOR FOR ADDITION OF CATALYST AT LATER DATE (TO ACHIEVE 90% REDUCTION IN NOx)
NR	CATALYST SUPPORT STRUCTURE FOR ADDITION OF CATALYST AT LATER DATE (TO ACHIEVE 90% REDUCTION IN NOx)

CATALYST HANDLING/MAINTENANCE FACILITIES:

X	CATALYST LOADING DOORS
X	ACCESS DOORS (UPSTREAM AND DOWNSTREAM OF CATALYST BED)
NR	MONORAIL AND HOIST WITH SUPPORT STEEL FOR CATALYST LOADING
H	PLATFORMS, LADDERS, AND STAIRWAYS

ACCESSORIES AND FIELD WORK:

X	HOUSING SAMPLING PORTS (7 UPSTREAM AND DOWNSTREAM OF EACH CATALYST BED)
NR	CATALYST FOR SAMPLING CELLS
X	SAMPLE EXTRACTION TOOLS
W	FOUNDATIONS
W	SLIDE PLATES FOR FOUNDATIONS (EMBEDDED)
W	FOUNDATION BOLTS
X	STRUCTURAL STEEL FOR SUPPORT OF ALL ITEMS WITHIN SELLERS SCOPE OF SUPPLY
X	SURFACE PREPARATION PER THE SPECIFICATION
X	SHIPMENT OF ALL EQUIPMENT TO SITE
W	ERECTION OF CATALYST HOUSING
W	INSTALLATION OF CATALYST MODULES
W	INSTALLATION OF AMMONIA INJECTION SKID
X	ALL CONSTRUCTION, START-UP, AND COMMISSIONING SPARES

TECHNICAL FIELD ASSISTANCE:

X	TFA FOR ERECTION AND INSTALLATION
NR	TFA FOR START-UP OF CATALYST
NR	TFA FOR PERFORMANCE TESTS

SELLER SCOPE OF SUPPLY DATASHEET - AQUEOUS AMMONIA INJECTION SYSTEM

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

THE ITEMS LISTED BELOW SHALL INDICATE THE SELLER'S SCOPE OF SUPPLY:

AMMONIA INJECTION HEADER ASSEMBLY (MOUNTED AT GRADE):

X	AMMONIA INJECTION HEADER WITH CONNECTING PIPES
X	MANUAL TRIM VALVES
X	FLOW INDICATORS
X	MANUAL SHUT-OFF VALVES
W	SUPPORT OF INJECTION HEADER, IF REQUIRED (FOUNDATIONS)

AQUEOUS AMMONIA EVAPORATION AND FLOW CONTROL SKID:

X	DILUTION AIR FANS WITH MOTOR (QTY. 2)
X	PROVISIONS FOR RECIRCULATING HOT GAS FROM HRSG
NR	ELECTRIC AIR HEATERS
X	AMMONIA VAPORIZER WITH AIR OR STEAM ATOMIZING NOZZLE
X	AMMONIA/AIR MIXER
X	ALL AMMONIA/STEAM AIR PIPING AND VALVES ON SKID
X	ALL CONTROL INSTRUMENTATION (SEE CONTROL AND INSTRUMENTATION DATASHEET)
X	TUBING AND WIRING ON SKID
X	INSULATION ON SKID
X	PROVISIONS FOR NITROGEN PURGE OF AMMONIA INJECTION SYSTEM

AQUEOUS AMMONIA STORAGE AND FORWARDING EQUIPMENT:

W	AQUEOUS AMMONIA STORAGE TANK
W	AQUEOUS AMMONIA FORWARDING PUMPS
W	AQUEOUS AMMONIA STRAINER

EXTERNAL PIPING:

W	PIPING FROM FORWARDING SYSTEM TO AMMONIA INJECTION SKID
X/H*	PIPING FROM AMMONIA INJECTION SKID TO AMMONIA INJECTION HEADER
X/H*	PIPING FROM HRSG DUCT TO INLET OF DILUTION AIR FANS
X/H*	PIPING FROM AMMONIA INJECTION HEADER TO HRSG DUCT (INJECTION GRID)
X	AMMONIA FLOW CONTROL VALVE
X	AMMONIA SHUT-OFF VALVE (SOLENOID OPERATED)
X	AMMONIA FLOW TRANSMITTER
X	DILUTION AIR FLOW TRANSMITTER
X	ATOMIZING STEAM/AIR FLOW CONTROL VALVE
X	ATOMIZING STEAM/AIR PRESSURE REGULATING VALVE
X	ATOMIZING STEAM/AIR SHUT-OFF VALVE (SOLENOID OPERATED)

* TO BE WORKED OUT BETWEEN HRSG SELLER AND CATALYST SELLER

SELLER SCOPE OF SUPPLY DATASHEET - AQUEOUS AMMONIA INJECTION SYSTEM

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

EXTERNAL PIPING:

X	PRESSURE/TEMPERATURE TRANSMITTERS FOR CONTROL
X	LOCAL PRESSURE/TEMPERATURE INDICATORS
X	ALL INSTRUMENTATION AND VALVES FOR CONTROL OF EQUIPMENT ON INJECTION SKID
X	FLUE GAS INLET TEMPERATURE TRANSMITTER - CONNECTION ONLY
NR	CATALYST PRESSURE DROP TRANSMITTER
X	LOCAL CATALYST PRESSURE DROP INDICATOR
X	CONTROL LOGIC
W	CONTROL SYSTEM HARDWARE

FLUE GAS ANALYZERS:

N/A	SCR INLET $NOx/0_2$ ANALYZER WITH PROBE AND SAMPLING LINE
W	SCR OUTLET $NOx/0_2$ ANALYZER WITH PROBE AND SAMPLING LINE
N/A	SCR OUTLET NH3 ANALYZER WITH PROBE AND SAMPLING LINE

GAS SAMPLING PORTS:

H	INLET $NOx/0_2$ PORT
H	STACK SAMPLING PORTS

PERFORMANCE INFORMATION DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #1, 32°F AMB, N.G., BASE LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	3,612,690		
EXHAUST TEMPERATURE	DEG. F	1112		
TEMP. ENTERING SCR CATALYST	DEG. F	655*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL. %	12.43		
CARBON DIOXIDE	VOL.%	3.90		
WATER	VOL.%	7.89		
NITROGEN	VOL. %	74.82		
ARGON	VOL.%	0.94		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.45		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		12
NOx	(lbs/hour)	316				78
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	25				25
CO	(lbs/hour)	85				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				1
S02	(lbs/hour)	2				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	3				3
VOC	(lbs/hour)	6				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	16.2				16.2
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

PERFORMANCE INFORMATION DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #2, 59°F AMB, N.G., BASE LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	3,519,210		
EXHAUST TEMPERATURE	DEG. F	1140		
TEMP. ENTERING SCR CATALYST	DEG. F	653*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL. %	12.60		
CARBON DIOXIDE	VOL.%	3.76		
WATER	VOL.%	8.31		
NITROGEN	VOL.%	74.38		
ARGON	VOL.%	0.93		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.39		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		12
NOx	(lbs/hour)	298				73
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	25				25
CO	(lbs/hour)	77				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				1
S02	(lbs/hour)	2				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	3				3
VOC	(lbs/hour)	6				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	15.6				15.6
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #3, 95°F AMB, N.G., BASE LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	3,228,150		
EXHAUST TEMPERATURE	DEG. F	1160		
TEMP. ENTERING SCR CATALYST	DEG. F	642*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL. %	12.13		
CARBON DIOXIDE	VOL.%	3.65		
WATER	VOL.%	11.49		
NITROGEN	VOL.%	71.82		
ARGON	VOL.%	0.90		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.04		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		12
NOx	(lbs/hour)	268				67
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	25				25
CO	(lbs/hour)	71				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				1
S02	(lbs/hour)	1				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	3				3
VOC	(lbs/hour)	5				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	13.6				13.6
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

PERFORMANCE INFORMATION DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #4, 95°F AMB, N.G., 57% LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	2,410,190		
EXHAUST TEMPERATURE	DEG. F	1160		
TEMP. ENTERING SCR CATALYST	DEG. F	605*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL. %	12.66		
CARBON DIOXIDE	VOL. %	3.40		
WATER	VOL.%	11.02		
NITROGEN	VOL.%	72.00		
ARGON	VOL.%	0.90		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.07		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		12
NOx	(lbs/hour)	179				67
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	78				78
CO	(lbs/hour)	165				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				1
S02	(lbs/hour)	1				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	8				8
VOC	(lbs/hour)	10				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	10.3				10.3
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #5, 59°F AMB, N.G., 50% LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	2,552,500		
EXHAUST TEMPERATURE	DEG. F	1043		
TEMP. ENTERING SCR CATALYST	DEG. F	605*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL.%	14.09		
CARBON DIOXIDE	VOL.%	3.08		
WATER	VOL.%	6.99		
NITROGEN	VOL.%	74.90		
ARGON	VOL.%	0.94		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.48		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		12
NOx	(lbs/hour)	179				73
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	200				200
CO	(lbs/hour)	474				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				1
S02	(lbs/hour)	1				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	20				20
VOC	(lbs/hour)	27				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	11.4				11.4
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #6, AMMONIA SIZING CASE 1, 40°F AMB, BASE LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	3,813,140		
EXHAUST TEMPERATURE	DEG. F	1087		
TEMP. ENTERING SCR CATALYST	DEG. F	655*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL.%	11.60		
CARBON DIOXIDE	VOL.%	5.47		
WATER	VOL.%	9.83		
NITROGEN	VOL.%	72.18		
ARGON	VOL.%	0.91		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.48		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	75	N/A	75		42
NOx	(lbs/hour)	568				317
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	30				30
CO	(lbs/hour)	93				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	14				14
S02	(lbs/hour)	101				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	10				10
VOC	(lbs/hour)	20				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	95.3				95.3
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

PERFORMANCE INFORMATION DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #7, AMMONIA SIZING CASE 2, 59°F AMB, BASE LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	3,642,480		
EXHAUST TEMPERATURE	DEG. F	1102		
TEMP. ENTERING SCR CATALYST	DEG. F	651*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL.%	11.69		
CARBON DIOXIDE	VOL.%	5.36		
WATER	VOL.%	10.06		
NITROGEN	VOL.%	71.97		
ARGON	VOL.%	0.90		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.44		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	75	N/A	75		42
NOx	(lbs/hour)	547				305
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	30				30
CO	(lbs/hour)	93				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	14				14
S02	(lbs/hour)	97				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	10				10
VOC	(lbs/hour)	19				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	92.1				92.1
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

PERFORMANCE INFORMATION DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #8, AMMONIA SIZING CASE 3, 59°F AMB, 50% LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	2,560,680		
EXHAUST TEMPERATURE	DEG. F	1076		
TEMP. ENTERING SCR CATALYST	DEG. F	605*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL.%	14.18		
CARBON DIOXIDE	VOL.%	4.34		
WATER	VOL.%	4.72		
NITROGEN	VOL.%	75.79		
ARGON	VOL.%	0.95		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.91		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	75	N/A	75		42
NOx	(lbs/hour)	325				305
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	300				300
CO	(lbs/hour)	720				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	11				11
S02	(lbs/hour)	58				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	100				100
VOC	(lbs/hour)	137				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	109				109
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

DESIGN SPECIFICATION DATASHEET - GENERAL

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

SCR/CO CATALYST OPERATION

_____	CONTINUOUS DUTY	X	CYCLIC DUTY	30 YRS	DESIGN LIFE
7500	EST. HOURS PER YEAR	120	HOT STARTS PER YEAR	30	COLD STARTS PER YEAR

COMBUSTION TURBINE OPERATION

X	NATURAL GAS	X	NO. 2 FUEL OIL	OTHER:	
7350	HOURS OPER. PER YEAR	150	HOURS OPER. PER YEAR	_____	HOURS OPER./YR
X	UNFIRED DESIGN	_____	FIRED DESIGN		

SCR CATALYST BED LOCATION

_____	SPLIT HP EVAP	_____	DESIGN FLOW MALDSTRIB	_____	DESIGN TEMP MALDSTRIB
X	DOWNSTREAM OF HP EVAP	H	DESIGN FLOW MALDSTRIB	H	DESIGN TEMP MALDSTRIB
_____	DOWNSTREAM OF HP ECON	_____	DESIGN FLOW MALDSTRIB	_____	DESIGN TEMP MALDSTRIB

CO CATALYST BED LOCATION

N/A	UPSTREAM OF HP SUPHTR	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB
N/A	DWNSTRM OF HP SUPHTR	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB
N/A	SPLIT HP EVAP	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB
N/A	DWNSTRM OF HP SUPHTR	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB
N/A	DWNSTRM OF HP SUPHTR	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB

CATALYST DESIGN

H	APPROX. HRSG DIM.	H	MAX INNER LINER DIMENSIONS

SPECIAL DESIGN CONSIDERATIONS:

HRSG SELLER TO COORDINATE WITH CATALYST SELLER CATALYST DESIGN LOCATION AND DIMENSIONS, AND MALDISTRIBUTIONS.

DESIGN SPECIFICATION DATASHEET - AMMONIA INJECTION SYSTEM

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

AMMONIA INJECTION SYSTEM

DILUTION MEDIUM (ANHYDROUS AMMONIA INJECTION SYSTEM): **N/A**

_____ STEAM _____ AMBIENT AIR _____ HEATED AIR

DILUTION MEDIUM (AQUEOUS AMMONIA INJECTION SYSTEM):

_____ STEAM _____ RECIRCULATED HRSG GAS X HEATED AIR

VAPORIZATION MEDIUM (AQUEOUS AMMONIA INJECTION SYSTEM):

H STEAM H HOT AIR (HIGH PRESSURE)

AVAILABLE STEAM PROPS:	H	PRESSURE (PSIG)	H	TEMPERATURE (DEG. F)
STEAM PIPING DESIGN:	H	PRESSURE (PSIG)	H	TEMPERATURE (DEG. F)
AVAILABLE AIR PROPS:	H	PRESSURE (PSIG)	H	TEMPERATURE (DEG. F)
AIR PIPING DESIGN:	H	PRESSURE (PSIG)	H	TEMPERATURE (DEG. F)

SELLER TO FILL IN FOLLOWING DATA:

_____	AQUEOUS AMMONIA WT %	_____	DISTANCE BETWEEN NOZZLES/ORIFICES ON INJECTION GRID
_____	AQUEOUS NH3 CONSP. RATE	_____	DESIGN PRESSURE DROP ACROSS NOZZLES/ORIFICES
N/A	ANHYDROUS NH3 CONSP. RATE	_____	DIRECTION OF NH3 INJECTION (UPSTREAM OR DOWNSTREAM)
_____	# AIG HORIZONTAL RUNNERS	_____	DIRECTION BETWEEN AIG AND SCR CATALYST
_____	# AIG VERTICAL RUNNERS		

SPECIAL DESIGN CONSIDERATIONS:

SELLER TO SPECIFY ANY SPECIAL DESIGN CONSIDERATIONS IN THE PROPOSAL.
HRSG SELLER TO DETERMINE VAPORIZATION MEDIUM.

SELLER GUARANTEE DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

THE SCR CATALYST SHALL MEET THE GUARANTEES LISTED BELOW AND AS EXPLAINED IN SECTION 3.0 OF SPEC 21T8900

REFERENCE CATALYST INLET CONDITIONS*

	UNITS:	
EXHAUST GAS FLOW	LB/HR	SEE PERFORMANCE DATA SHEETS
TEMPERATURE RANGE ENTERING SCR CATALYST**	DEG. F	H
TEMPERATURE RANGE ENTERING CO CATALYST**	DEG. F	N/A
TOTAL EMISSIONS: (WORST CASE FROM PERFORMANCE DATASHEETS)		SEE PERFORMANCE DATA SHEETS

SCR CONVERSION GUARANTEES:

	UNITS:	
NOx REDUCTION	(%)	WORST CASE FROM PERF. DATA SHTS
AMMONIA SLIP	(ppmvd @ 15% 02)	10 MAX
S02-S03 CONVERSION	(%)	3 MAX

OTHER GUARANTEES

	UNITS	
CATALYST LIFE GUARANTEE		
FROM DELIVERY	MONTHS	N/A
FROM FIRST EXHAUST GAS IN	MONTHS	36
EQUIPMENT GUARANTEE		
FROM DELIVERY	MONTHS	NA
FROM PLANT ACCEPTANCE	MONTHS	24
GAS SIDE PRESSURE DROP		
SCR CATALYST	INCHES H20	3.0 MAX
CO CATALYST	INCHES H20	N/A
TOTAL	INCHES H20	N/A
DISPOSAL GUARANTEE	NONE	YES
ACOUSTICAL GUARANTEE		
3 FEET FROM SOURCE, ALL EQUIPMENT	dB(A)	SEE 21T7525

*ALL GUARANTEES SHOULD BE MADE AT THESE CONDITIONS UNLESS NOTED OTHERWISE
** TEMPERATURE RANGE DENOTES AVERAGE TEMPERATURES
H-HRSG SELLER TO DETERMINE FROM PERFORMANCE INFORMATION DATA SHEETS

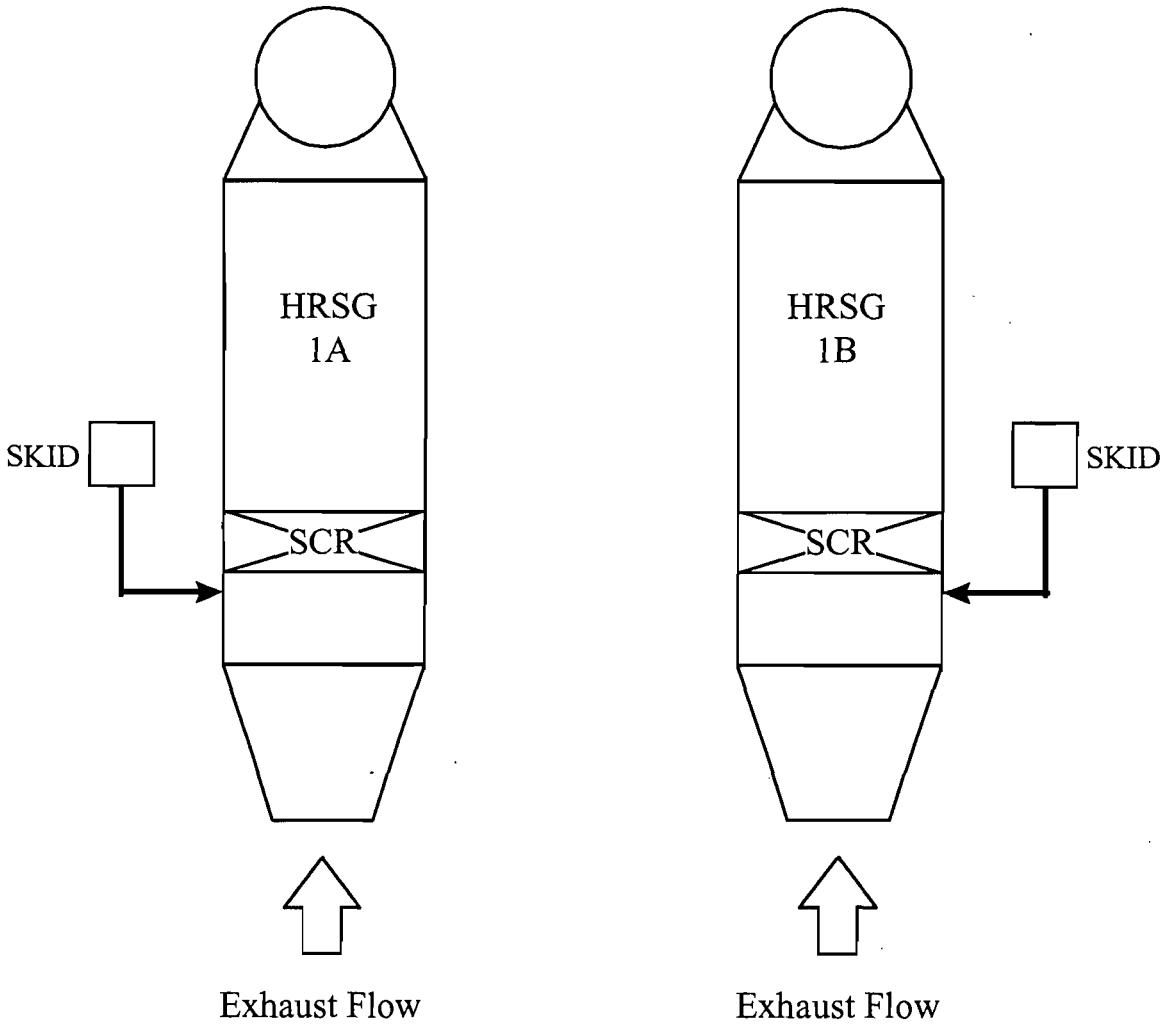


FIGURE 1 - SCR SYSTEM LAYOUT : PLAN VIEW

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Jennifer L. Gilman 7/27/98
Signature No. 52125 Date

(seal)

* Attach any exception to certification statement.

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AUG 03 1998
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AIR REGULATION

Exceptions to PE Certification Statement

This certification is for the content of the attached supplemental design document. The certification is to provide the Department "reasonable assurance based on plans, test results, installation of control equipment, or other information, that the construction, expansion, modification, operation, or activity of the installation will not discharge, emit, or cause pollution in contravention of Department standards or rules" to the best of my knowledge in conformity with sound engineering principles.

This certification statement is not intended to certify the specific design criteria of the attached selective catalytic reduction (SCR) system design document. Mr. Daniel Barpal, Project Engineer of Westinghouse, who was primarily responsible for the design specification, is certifying this criterion. Mr. Barpal is a registered Florida Professional Engineer, license number 52578.

AL

Florida Power
CORPORATION

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AUG 06 1998
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AIR REGULATION

August 2, 1998

Mr. Hamilton S. Oven, Jr.
Florida Department of Environmental Protection
Douglas Bldg, Room 953AA
3900 Commonwealth Blvd., MS48
Tallahassee, Florida 32399-3000

Dear Mr. Oven:

Re: Florida Power Corporation
Hines Energy Complex
Site Certification No. PA-92-33; Condition No. XIII.E.2.c.
PSD Permit No. FL-195; Specific Condition E.2.c.

In fulfillment of the above-referenced condition of Florida Power Corporation's Site Certification and Prevention of Significant Deterioration (PSD) permit, this letter serves to notify the Department that one of the two combustion turbines (CT1B) conducted first fire on July 17, 1998. It is anticipated that the other combustion turbine will be fired during the week of August 3, 1998.

If you should have any questions concerning this submittal, please do not hesitate to contact me at (727) 826-4258.

Sincerely,

for

Scott H. Osbourn
Senior Environmental Engineer

cc: Clair Fancy, DEP

ONE POWER PLAZA, 263 - 13th Avenue South, BB1A, St. Petersburg, FL 33701-5511
P.O. Box 14042, BB1A • St. Petersburg • Florida 33733-4042 • (727) 866-5151
A Florida Progress Company

FAX COVER SHEET

ENGELHARD

ENGELHARD CORPORATION
2205 CHEQUERS COURT
BEL AIR, MD 21015
PHONE 410-569-0297
FAX 410-569-1841
E-Mail Fred_Booth@ENGELHARD.COM

DATE:	July 8, 1998	NO. PAGES	5	(INCLUDING COVER)
TO:	Florida DEP ATTN: Syed Arif	FAX 850-922-6979		
FROM:	Fred Booth	Ph 410-569-0297 // FAX 410-569-1841		

RE: SCR System Components
Engelhard Budgetary Proposal EPB98205

ENGELHARD

ENGELHARD CORPORATION
2205 CHEQUERS COURT
BEL AIR, MD 21015
PHONE 410-569-0297
FAX 410-569-1841
E-Mail Fred_Booth@ENGELHARD.COM

July 8, 1998

Florida DEP

ATTN: **Syed Arif**

RE: **SCR System Components**
Engelhard Budgetary Proposal EPB98205

Dear Mr. Arif,

We enclose Engelhard Budgetary Proposal EPB98205 for Engelhard **NOxCAT™ VNX™** Vanadia-Titania SCR Catalyst System Components.

This Proposal Includes:

- Engelhard **NOxCAT™ VNX™** SCR Catalyst modules with internal support frame to fit inside HRSG casing;
- Catalysts are sized for NOx reductions as noted with ammonia slip of 10 ppmvd @ 15%O_2;
- Aqueous Ammonia (28% Solution to skid) Delivery System components;
- Dimensions illustrated are assumed HRSG duct - inside liner dimensions.

Sincerely yours,

ENGELHARD CORPORATION

Frederick A. Booth
Sales Engineer

cc: Lorraine Pierson - Proposal Administrator

ENGELHARD CORPORATION
NOxCAT™ VNX™ SCR NOx ABATEMENT CATALYST SYSTEM

Engelhard Corporation ("Engelhard") offers to supply the **NOxCAT™ VNX™** Vanadia-Titania Ceramic Substrate SCR systems herein.

Scope of Supply

1. Engelhard **NOxCAT™ VNX™** SCR catalyst modules;
2. Internal support structures for catalyst modules; includes all hardware and gaskets for catalyst module installation;
3. Ammonia Injection Grid (AIG);
4. External AIG manifold with flow control valves;
5. NH_3 Vaporization / Air dilution skid; 28% Aqueous Ammonia to skid

BUDGET PRICE: FOB, shipping point

Per Unit	NOx Out-12 ppmvd@ 15% O_2	NOx Out-9 ppmvd@ 15% O_2
SCR Catalyst System Components	**$1,150,000**	**$1,250,000**
Replacement SCR Catalyst	**$ 750,000**	**$ 850,000**

WARRANTY AND GUARANTEE:

Mechanical Warranty: One year of operation* or 18 months after delivery, whichever occurs first.

Performance Guarantee: Three (3) years of operation* or thirty-six (36)) months after catalyst delivery, whichever occurs first. Catalyst warranty is prorated over the guaranteed life.

**Operation is considered to start when exhaust gas is first passed through the catalyst.*

Typical, useful catalyst life is 5 - 7 years.

DOCUMENT / MATERIAL DELIVERY SCHEDULE

Drawings / Documentation - 10 weeks after notice to proceed and receipt of engineering specifications and details

Material Delivery 24 - 30 weeks after approval and release for fabrication

QUALITY ASSURANCE and SAFETY

Engelhard's manufacturing is carried out under strict adherence to published quality control and statistical process control programs, and strict adherence to Corporate safety practices and procedures.

SCR SYSTEM DESIGN BASIS:

Gas Flow from:	Combustion Turbine
Gas Flow:	Assumed Horizontal through HRSG
Fuel:	Natural Gas
Gas Flow Rate (At catalyst face):	See Performance Data
Temperature (At catalyst face):	See Performance Data
NOx Concentration (At catalyst face):	45 ppmvd @ 15% O_2
NH_3 Slip	10 ppmvd @ 15% O_2
HRSG Cross section	57 ft. H x 32 ft. W - inside liner sheets

ENGELHARD

Florida DEP
NOxCAT™ VNX™ SCR Catalyst Systems
Engelhard Budgetary Proposal EPB98205
July 8, 1998

Performance Data

GIVEN // CALC. DATA		
CASE	NOx Out-12 ppmvd@ 15% O_2	NOx Out-12 ppmvd@ 15% O_2
FUEL	NG	NG
TURBINE EXHAUST FLOW, lb/hr	3,554,960	3,554,960
TURBINE EXHAUST GAS ANALYSIS, % VOL.		
N_2	74.84	74.84
O_2	12.43	12.43
CO_2	3.90	3.90
H_2O	7.89	7.89
Ar	0.94	0.94
CALCULATED GAS MOL. WT.	28.46	28.46
GIVEN: TURBINE NOx, ppmvd @ 15%O_2	45	45
CALC.: TURBINE NOx, lb/hr	298.9	298.9
ASSUMED GAS TEMP. @ SCR CATALYST, F	650	650
DESIGN REQUIREMENTS		
NOx OUT, ppmvd@15%O_2	12	9
NH_3 SLIP, ppmvd@15%O_2	10	10
SCR PRESSURE DROP, "WG - Max.		
GUARANTEED PERFORMANCE DATA		
NOx CONVERSION, % - Min.	73.3%	80.0%
NOx OUT, ppmvd@15%O_2 - Max.	12	9
NOx OUT, lb/hr - Max.	79.7	59.8
EXPECTED 28% AQUEOUS NH_3 FLOW, lb/hr	377	403
NH_3 SLIP, ppmvd@15%O_2 - Max.	10	10
SCR PRESSURE DROP, "WG - Max.	2.0	2.3

ENGELHARD

Florida DEP
NOxCAT™ VNX™ SCR Catalyst Systems
Engelhard Budgetary Proposal EPB98205
July 8, 1998

Scope of Supply: The equipment supplied is installed by others in accordance with the Engelhard design and installation instructions.

- **Engelhard NOxCAT™ VNX™ SCR catalyst modules;**
- **Internal support structures for catalyst modules; includes all hardware and gaskets for catalyst module installation;**
- **Ammonia injection Grid (AIG);**
- **External AIG manifold with flow control valves;**
- **NH_3/Air dilution skid: Pre-piped & wired (including all valves and fittings)**
  - **Two (2) dilution air fans, one for back-up purposes**
  - **Panel mounted system controls for:**
    - **Fans (on/off/flow indicators)**
    - **Air/ammonia flow indicator and controller**
    - **System pressure indicators**
    - **Main power disconnect switch**

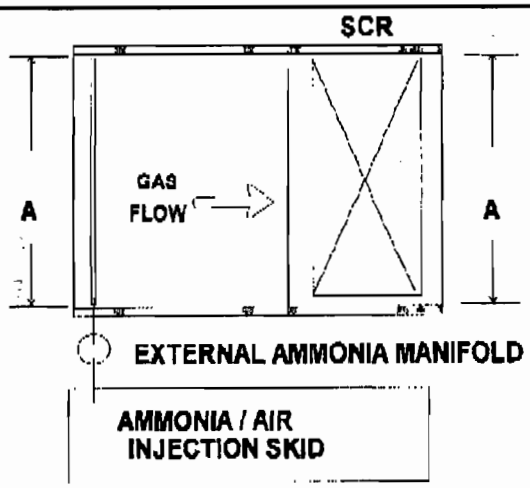
Excluded from Scope of Supply:

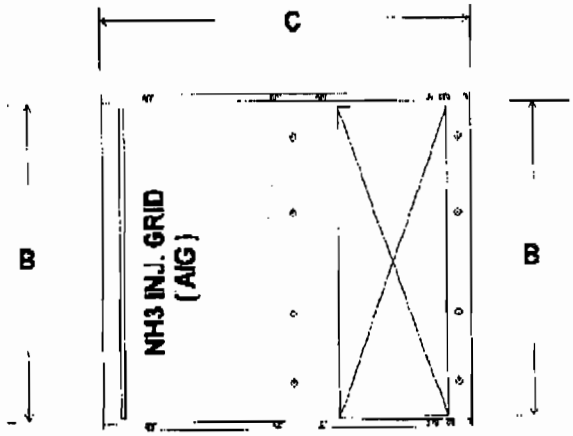
Ammonia storage and pumping
HRSG Casing - internally insulated
Electrical grounding equipment
Foundations
All other items not specifically listed in Scope of Supply
Interconnecting field piping or wiring
Utilities
All Monitors

Dimensions: Estimated

HRSG Inside Liner Width	(A) 32'-0"
HRSG Inside Liner Height	(B) 57'-0"
Reactor Depth - Total	(C) 12'-0" **

**Assumes no heat transfer surface between AIG and SCR Catalyst





Department of Environmental Protection

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

July 10, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. W. Jeffrey Pardue, C.E.P.
Director, Environmental Service Department
Florida Power Corporation
3201 34th Street South
St. Petersburg, Florida 33711

Re: Hines Energy Complex
Permit PSD-FL-195 and Site Certification PA-92-33

Dear Mr. Pardue:

The Department has received the letter with an attachment on July 1, 1998 advising of FPC and Westinghouse's decision to install a Selective Catalytic Reduction (SCR) system to achieve the NO_x levels required in the original above-referenced PSD permit. The Bureau of Air Regulation requests responses to the following items to expedite the issuance of the amended permit:

1. The present permit requires that the "Permittee install a Dry Low NO_X combustion turbine (and) make *every practicable effort* to achieve with that CT the *lowest* possible NO_X emission rate but must not exceed 73 lbs/hr (based on 12 ppm) .... on a continuous basis when firing natural gas. According to the Technical Specification submitted by Westinghouse for the SCR system, it is being designed to achieve 12 ppm. Dry Low NO_X systems are typically designed to achieve BACT requirements of 9-15 ppm, whereas SCR systems are typically designed to meet BACT requirements of 4.5 to 9 ppm. If Westinghouse designs the SCR system accordingly, then it will be possible to make "every practicable effort to achieve the lowest possible NO_X emission rate." **Specific Condition 3, PSD-FL-195.**

2. The Westinghouse specifications require achievement of 73 lb/hr (about 25 ppm NO_X) at 50 percent capacity. In contrast with Westinghouse's DLN technology, lower NO_X emissions rates and concentrations are typically realized with SCR at lower operating rates. A properly designed and operated SCR system should achieve proportionately lower emissions at lower operating rates. Consistent with the requirements of Specific Condition 3, practicable efforts to achieve the lowest possible NO_X rate should yield emissions *substantially* less than 73 lb/hr or 25 ppm at 50 percent of capacity.

3. Based on FPC's original application, the Department's determination of Best Available Control Technology (BACT), SCR was rejected for technical, economic, and *environmental reasons*. Now that SCR is being reconsidered by FPC, the Technical Specification (or a supplementary document) prepared by Westinghouse should be certified by a Professional Engineer (P.E.) registered in the State of Florida and knowledgeable in the field of combustion and/or air pollution control. This is a typical requirement of engineering plans prepared in the State of Florida. The P.E. seal is also required for permit applications and will "affirmatively provide the Department with reasonable assurance based on plans, test results, installation of control equipment, or other information, that the construction, expansion, modification, operation, or activity of the installation will not discharge, emit, or cause pollution in contravention of Department standards or rules." **Rules 62-4.050(2) and 62-4.070(1), F.A.C.**

4. Please compare the original permit with the latest proposed draft permit and indicate the changes needed to accommodate the SCR system.

We will be contacting SCR manufacturers to get estimated cost data for an SCR system that will achieve the requirements of the original PSD permit. The original BACT negated the use of SCR system due to excessive cost of $10,000/ton of NO_x removed. We would appreciate receiving any cost information already developed by FPC and Westinghouse for the planned SCR system.

In the meantime, we will be working on the technical write-up to amend your original permit. If you have any questions regarding this matter, please call Syed Arif, P.E., at (850)921-9528.

Sincerely,

A A Linero 7/10

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

AAL/sa

cc: Brian Beals, EPA
John Bunyak, NPS
Buck Oven, DEP
Bill Thomas, SWD
M.S. Briesch, Westinghouse

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. W. Jeffrey Pardue
Director, Env. Service Dept.
Fla. Power Corp
3201 34th St. South
St. Petersburg, FL
33711

4a. Article Number
P 265 659 387

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

7. Date of Delivery
7/20/98

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 W Pardue

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

Thank you for using Return Receipt Service.

P 265 659 387

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

Sent to	Jeff. Pardue
Street & Number	3201 FPC
Post Office, State, & ZIP Code	Power Energy
Postage	St. Pete, FL
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	7-14-98

PS Form **3800**, April 1995

PSD-FL-195
PA 92-33

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

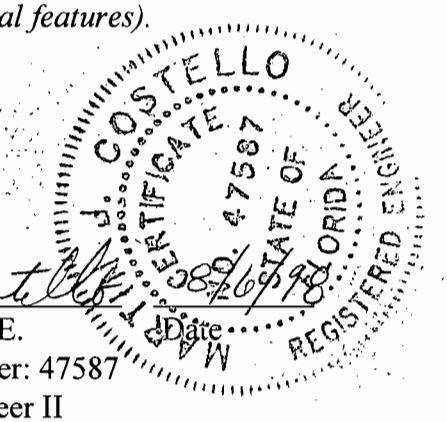
P.E. Certification Statement

Permittee:
Florida Power Corporation
Hines Energy Complex

DRAFT Permit No. PSD-FL-195A / PA92-33
Facility ID No.: 1050234

Project type: Construction of New Combustion Turbines and
Heat Recovery Steam Generators
Hines Energy Complex
Permit Modification to Authorize SCR and Other Changes

I HEREBY CERTIFY *that the engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).*



Martin Costello 6/29/98
Martin Costello, P.E. Date
Registration Number: 47587
Professional Engineer II

Department of Environmental Protection
Bureau of Air Regulation
New Source Review Section
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Phone (904) 488-1344
Fax (904) 922-6979

Florida Power
CORPORATION

June 30, 1998

Mr. Clair Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Protection
111 S. Magnolia, Suite 4
Tallahassee, Florida 32301

Dear Mr. Fancy:

Re: Hines Energy Complex Air Permit
PSD-FL-195 and Site Certification PA-92-33

Construction on the Hines Energy Complex is nearing completion and startup of the combined cycle units is anticipated in early July 1998. For several months now, I have been working with Mr. Martin Costello, of your staff, on revisions to the above-referenced PSD permit. The revisions were necessary in order to make the permit conditions compatible with the Westinghouse equipment that was ultimately installed, rather than the General Electric equipment that was the basis for our original permit. Our permitting efforts have also been influenced by the development schedule of the dry low NO_x (DLN) combustors proposed for this project and their ability to meet the limits required by the original PSD permit that was issued on February 25, 1994.

Florida Power Corporation (FPC), as recently as April 1998, was pursuing permit revisions that would have allowed the combined cycle units at our Hines Energy Complex to operate at NO_x levels as high as 173 lb/hr (based on 25 ppmvd at 59°F) until the proposed combustors could be developed to the point that they could achieve the original BACT limit of 73 lb/hr (based on 12 ppmvd at 59°F). Draft final permit language was negotiated that would have allowed FPC to operate at these higher NO_x levels until as long as April 1, 2000. At that time, if the original BACT limit could still not be met with DLN technology, the draft negotiated language called for the installation of an SCR system designed to meet a NO_x level of 9 ppmvd. In order to finalize the agreement, the Department requested a firm commitment from FPC management (in a letter to FPC dated April 21, 1998) that the Hines' units would be available to Westinghouse to the extent necessary to achieve the goals of their development schedule.

Subsequent discussions between FPC and Westinghouse have now led to a decision that the prudent course of action is to proceed with the installation of an SCR system designed to control NO_x to the level required in our original PSD permit. Therefore, FPC will not be asking

for relief to emit at higher levels while combustor development occurs, or for any additional time in which to achieve compliance. We will meet our original NO_x commitment with SCR while combustor development concurrently takes place. When the originally proposed DLN combustors are available to meet the current permit limits, FPC will then consider installation of those combustors and the removal of the SCR as an option.

In light of these developments, FPC does not believe that the issues raised in the Department's letter of April 21, 1998 need to be further addressed. Mr. Al Linero, Chief of New Source Review, has informed me that Mr. Costello has taken on a new assignment and that this permitting effort has now been assigned to Mr. Syed Arif. Mr. Arif has indicated that an FPC response to the Department's last correspondence (i.e., the April 21, 1998 letter) was necessary in order for further permit processing to occur. Further, it was requested that FPC submit information pertinent to the SCR system. The requested information is included as an attachment to this letter. Finally, Mr. Arif has indicated that upon receipt of this information, FPC could meet with him and Mr. Linero to finalize revised permit language. A tentative meeting date of June 30, 1998 has been set.

As mentioned earlier, startup at the site is anticipated within several weeks. FPC requests that the revised permit be finalized in a timely manner; to that end I will personally be available to your staff to expedite the permitting process. If you should have any questions, please do not hesitate to contact me at (813) 866-5158.

Sincerely.

Scott H. Osbourn
Senior Environmental Engineer

Attachment

cc: Al Linero, DEP
Syed Arif, DEP

TECHNICAL SPECIFICATION FOR AN SCR SYSTEM FOR THE FPC HINES ENERGY PROJECT

Written by:	*Russel D. Prescott* R. D. Prescott, Engineer Thermal Cycle & BOP System Design	12/2/97 Date
Reviewed by:	*G. Pyros* G. Pyros, Engineer Thermal Cycle & BOP System Design	12/2/97 Date
Reviewed by:	*Bruce Rising* B. Rising, Engineer Environmental Engineering	12/2/97 Date
Approved by:	*Steven J. Knott* S. J. Knott, Technical Group Leader Thermal Cycle & BOP System Design	12/2/97 Date
Approved by:	*M. S. Briesch* M. S. Briesch, Manager Thermal Cycle & BOP System Design	12/3/97 Date

FLORIDA POWER CORPORATION
HINES ENERGY COMPLEX PBI
FPC CONTRACT: G6001079
B & V FILE: 18875.62.1003 GES

ISSUED FOR CONSTRUCTION

Reference: _____
WBS: 255
Review Level: 5

STEAM TURBINE & AUXILIARIES

WGSD

DOCUMENT NO. 21T8900	DISTRIBUTION CODE: 273-000-604		
TITLE: SCR SYSTEM FOR THE FPC-HINES ENERGY PROJECT		TYPE ESP	REV 001
WESTINGHOUSE POWER GENERATION POWER GENERATION BUSINESS UNIT - ORLANDO, FL	Issue Date: 12/3/97	Page: 1 of 38	

Quadrangle - MC 504

4900 MC 504

TABLE OF CONTENTS

1.0 DOCUMENT SCOPE

1.1 This specification, together with the contract document and all documents referenced herein, covers the scope of supply and technical design requirements for a Selective Catalytic Reduction (SCR) system to reduce Nitrogen Oxide (NOx) emissions for the 2x1 501F FPC-Hines Energy Combined Cycle Project.

1.2 All conflicts between the requirements of this specification, design specification data sheets, related specifications, and standard codes shall be brought to the attention of the Buyer for clarification before proceeding with the design or manufacture of the affected parts.

1.3 Reference Documents

The design, fabrication, testing, and inspection of the SCR system shall be in accordance with this document and the documents referenced herein.

1.3.1 Westinghouse Specifications and Documents (latest revisions)

21T5673 Supplier Data Requirements for Software Deliverables

21T5802 Supplier Quality Requirements

21T7360 Paint Specification for FPC-Polk County, Florida

21T7397 Specification for a Heat Recovery Steam Generator for FPC-Hines Energy Project

21T7525 Acoustical Requirements for FPC-Polk County Project

1.3.2 Codes and Standards (latest editions apply)

1.3.2.1 American Institute of Steel Construction (AISC)

a. "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings."

1.3.2.2 American National Standard Institute (ANSI)

a. ANSI B16.5, "Steel Pipe Flanges and Flanged Fittings."

b. ANSI B16.11 for Threaded and Socket Welding Fittings.

c. ANSI B16.9 for Butt Welding Fittings.

d. ANSI B31.1, "Power Piping."

1.3.2.3 American Society of Mechanical Engineers (ASME)

a. ASME Section II, "Material Specifications."

b. ASME Section VIII, Division 1, "Rules for the Construction of Pressure Vessels," plus addenda (if applicable to ammonia injection system).

c. ASME Section IX, "Welding and Brazing Qualifications."

1.3.2.4 American Society for Testing and Materials (ASTM)

In general, all materials of construction not required to be covered by the ASME code shall conform to the latest edition of the applicable ASTM Standard. Other materials may be used provided that they are of a "recognizable quality" as determined by Buyer. Materials conforming to foreign standards (BS, DIM, JIS, etc.) may be used provided that "material equivalency" is proven by the manufacturer to the satisfaction of the Buyer.

1.3.2.5 American Welding Society (AWS)

a. AWS D1.1, "Structural Welding Code."

b. Structural welds shall be done in accordance with AWS welding procedures. ASME Code Certified Welders may be used instead of AWS certified welders.

1.3.2.6 Federal Occupational Safety and Health Act (OSHA)

a. OSHA 2206, "OSHA Safety and Health Standards (29 CFR 1910)."

1.3.2.7 Building Codes

The catalyst and housing shall be designed and constructed in accordance with the building codes indicated in Westinghouse Specification 21T7397, "Heat Recovery Steam Generator (HRSG) for the FPC-Hines Energy Project."

1.3.2.8 Electrical Codes

Electrical equipment supplied shall comply with the latest applicable codes and standards of the NFPA National Electrical Code, the Institute of Electrical and Electronic Engineers (IEEE), the National Electrical Manufacturers Association (NEMA), and the National Electrical Code (NEC). Requirements for electrical equipment certification shall be in accordance with local building codes.

1.3.2.10 American Standards Association (ASA).

1.3.2.11 American Iron and Steel Institute (AISI).

1.3.2.12 Underwriters Laboratories

All applicable instruments shall be supplied with a UL label.

1.3.2.13 U.S. Environmental Protection Agency (EPA) as applicable to emissions testing.

1.3.3 Other Codes or Standards

The Seller shall list in his proposal any additional codes or standards that he intends to use in the design and manufacture of his equipment. Additional codes or standards are subject to approval by the Buyer.

2.0 SYSTEM APPLICATION AND SCOPE OF SUPPLY

2.1 The SCR catalyst shall reduce NOx from the exhaust of a combustion turbine. The system application and design requirements are indicated in Sections 4.0 through 7.0 and the DESIGN SPECIFICATION data sheets. The performance guarantees that shall be met are indicated in Section 3.0 and on the SELLER GUARANTEE data sheet.

2.2 The Seller shall supply two (2) complete SCR systems, one for each Heat Recovery Steam Generator (HRSG). The SCR systems shall be opposite hand (skid and piping on outboard side of HRSG), but otherwise identical in design. See Figure 1 at the end of this specification.

2.3 The Seller's scope of supply shall be as indicated on the Seller SCOPE OF SUPPLY data sheets.

2.4 The following items are specifically excluded from the Seller's scope of supply unless indicated otherwise on the Seller SCOPE OF SUPPLY data sheets:

2.4.1 Foundations, anchor bolts, and other embedments required for support of the reactor housing, ammonia injection header, and ammonia injection skid.

2.4.2 Heat tracing and/or insulation of hot air piping, miscellaneous drain lines, instrumentation lines, etc. required for freeze or personnel protection which are not on the ammonia injection skid.

2.4.3 Nitrogen supply for nitrogen purge of ammonia injection system.

2.4.4 All motor starting equipmcnt and control centers (MCC's) for fan drives, pump drives, or motor operated valves.

2.4.5 All control and electrical wiring and conduit external to the ammonia injection skid.

2.4.6 Final painting of the reactor housing.

2.4.7 Erection and installation of the catalyst reactor, catalyst modules, and ammonia injection skid.

2.4.8 Materials for field welding (electrodes, etc.).

3.0 PERFORMANCE AND EQUIPMENT GUARANTEES

The Seller shall meet the following guarantees for each SCR System.. These guarantees shall also be contained in the special Terms and Conditions of the SCR System Contract between Buyer and Seller.

3.1 Emission Guarantees

Emission guarantees shall bc madc for all operating conditions indicated on the PERFORMANCE INFORMATION and SELLER GUARANTEE data sheets.

The NOx and SO3 concentrations for the guarantees will bc measured using EPA Reference Test Methods (40 CFR Part 60, Appendix A). (SO3 emissions will be measured as H2SO4). The inlet concentrations shall bc measured using the sampling ports discussed in this specification, upstream of the catalyst bed. The outlet concentrations shall bc measured using the stack sampling ports. To preclude the formation of ammonia-sulfur compounds from SO3, the ammonia injection into the gas stream will be interrupted for this test. For the ammonia slip guarantee the outlet concentrations will bc measured at the stack sampling ports using an EPA approved method.

3.2 Pressure Drop Guarantee

The maximum pressure drop measured from immediately downstream of the inlet interface with the HRSG to immediately upstream of the outlet interface with the HRSG, shall bc guaranteed based on the value indicated in the SELLER GUARANTEE data sheet.

3.3 Catalyst Life Guarantee

3.3.1 The catalyst life guarantee shall be indicated on the SELLER GUARANTEE data sheet.

3.3.2 The "life" is defined as the period of time in which each catalyst can meet all the guarantees stated in paragraphs 3.1 through 3.2, including the operational requirements indicated on the DESIGN SPECIFICATION data sheet.

3.4 Used Catalyst Disposal Guarantee

3.4.1 The Seller shall provide and guarantee disposal of the used catalyst at no additional cost except shipping charges provided that:

a. The used catalyst is not damaged or contaminated in any way with elements/compounds that would substantially alter the disposability of the catalyst.

b. The laws and regulations regarding the handling, transportation, storage, disposal, and/or treatment of the used catalyst are substantially unchanged from those in effect on the date of the sales contract.

3.4.2 It is the responsibility of the Seller to indicate to the Buyer before the sales contract any elements/compounds which could alter the disposability of the catalyst. Also, the Seller shall inform the Buyer of any pending legislation regarding the handling, transportation, storage, disposal, and/or treatment of the used catalyst.

3.5 Acoustical Guarantee

The Seller shall comply with and guarantee the sound level requirements as specified in Westinghouse Specification 21T7525 - "Acoustical Requirements for the FPC-Polk County Project."

4.0 DESIGN REQUIREMENTS - GENERAL

4.1 Codes

4.1.1 In addition to those specifications, codes, and standards referenced in Section 1.0 of this document, each SCR system shall comply with all state and local codes applicable for the location at which the equipment is to be installed. The responsibility for compliance with these codes rests solely with the Seller.

4.1.2 All equipment furnished under this specification shall allow each SCR system to be operated and maintained in accordance with the Federal Occupational Safety and Health Act.

4.2 Catalyst Bed Location

Each catalyst shall be located in the project specific Heat Recovery Steam Generator (HRSG) at the location described on the DESIGN SPECIFICATION data sheets, with the expected temperature range at this location.

4.3 Flow and Temperature Maldistribution

Each catalyst shall be designed for gas flow and temperature maldistribution entering the catalyst as specified on the DESIGN SPECIFICATION data sheets.

4.4 Catalyst Operating Requirements

4.4.1 Each catalyst shall be capable of operating in the cyclic duty mode. Start up and shutdown can be on a daily basis.

4.4.2 Each catalyst shall be designed to withstand the number of starts indicated on the DESIGN SPECIFICATION data sheets.

4.4.3 Each catalyst shall be capable of being operated within specification limits within one hour from a cold HRSG start, provided inlet concentrations are within design values.

4.4.4 Start up of each catalyst shall be automatic and initiated from the plant's central control room.

4.5 Catalyst Sampling

4.5.1 Two samples of each catalyst shall be retained before shipping the catalyst to the job site. One shall be forwarded to Buyer for storage. The other sample shall be tested by the Seller to ensure the catalyst meets specifications. The results of this test shall be presented to Buyer before shipment of the catalyst.

4.5.2 Each catalyst bed shall be equipped with provisions for periodic catalyst sampling. If removable catalyst sections are used to meet sampling requirements, one complete set of spare catalyst sample blocks shall be provided.

4.6 Manufacturing Requirements

4.6.1 All equipment supplied by the Seller shall be manufactured in one complete assembly or in sub-assemblies. All assemblies shall be designed and manufactured to enable the largest pieces possible to be shipped to the plant site.

4.6.2 All equipment shall be designed and constructed to minimize field welding. Where field welding is required, all joints shall be prepared for welding before shipment.

4.7 Welding

4.7.1 All structural welds shall be in accordance with Section 1W of Appendix B of 21T7397.

4.7.2 All external welds shall be continuous, full seam welds to prevent rust streaking.

4.8 Surface Preparation

4.8.1 Seller's standard practice for surface preparations of interior surfaces shall be used. For exterior surfaces, the Seller shall conduct surface preparation in accordance with Westinghouse Specification 21T7360, "Paint Specification for FPC Polk County, Florida."

4.8.2 The pipes for the ammonia injection system shall be internally cleaned to remove metal shavings and rust before installation.

4.8.3 All materials shall be cleaned of foreign matter, scale, flux, and weld splatter prior to painting.

5.0 DESIGN REQUIREMENTS - CATALYST

5.1 The design point to be used by the Seller for the design of each catalyst shall be selected from the operating conditions presented in the PERFORMANCE INFORMATION data sheets. The Seller shall design each catalyst to meet all guarantees under the worst case conditions from the data sheets. The design conditions used shall be clearly stated by Seller.

5.2 Each catalyst shall maintain the design removal efficiencies as stated on the PERFORMANCE INFORMATION data sheets as long as the inlet NOx concentrations (ppmvd basis) remain at or below the design values, and that the catalyst operating temperature is maintained within the range given in the SELLER GUARANTEE data sheet.

6.0 DESIGN REQUIREMENTS - CATALYST BED AND HOUSING; MECHANICAL

6.1 Housing Mechanical Design

Each catalyst housing shall be complete with catalyst support structure, inner liner, insulation, and outer casing. Materials of construction for the catalyst housing shall be compatible with the materials used for the HRSG. Seller shall clearly communicate and coordinate with HRSG Seller at interface points.

6.1.1 Outer Casing

6.1.1.1 The outer casing shall be gas tight and shall be a "cold wall" design.

6.1.1.2 The casing shall be manufactured from carbon steel plate, ¼ inch minimum thickness, and reinforced with stiffeners.

6.1.1.3 The internal design pressure of the catalyst housing shall be a minimum of 20 inches of water.

6.1.2 Inner Casing

6.1.2.1 The inner liner shall be constructed of type 409 or 304 stainless steel. Any Type 304 stainless steel exposed to the exhaust gases and which is welded upon, shall be of the low carbon type.

6.1.2.2 Due to the large thermal transients to which the ductwork shall be subjected, the Seller's design shall include adequate provisions for thermal expansion on the inner casing.

6.1.3 Insulation

6.1.3.1 Sufficient insulation shall be installed between the outer and inner casings so that at design conditions the outer casing cold face temperature at any point does not exceed 140 °F with an 80 °F ambient in still air.

6.1.3.2 10 gauge insulation studs and retaining clips shall be installed between liner anchors as required to prevent sagging of the insulation on the ceiling walls.

6.1.3.3 Insulation shall be fire proof and asbestos free.

6.1.4 Catalyst Housing Doors

6.1.4.1 One access opening shall be provided on the HRSG roof with handrail and ladder access.

6.1.4.2 Access doors shall also be provided upstream and downstream of each catalyst bed.

6.1.4.3 All doors shall be hinged and insulated, and shall be a minimum of 18 in. by 24 in.

6.1.5 Interface with HRSG

6.1.5.1 The HRSG interface dimensions for each catalyst are to be worked out between the catalyst Seller and the HRSG Seller. Transitions from the catalyst housing to the HRSG duct may be used to interface the two systems and allow a larger section for each catalyst.

6.1.5.2 The catalyst housing interface, supports, and piping shall be designed so that expansion joints are not required.

6.1.5.3 The scope of supply for the interfacing between the catalyst Seller and HRSG Seller shall be as indicated on the SCOPE OF SUPPLY data sheets.

6.1.6 Housing Drains

Each catalyst housing shall be equipped with drains located at the lowest point of the housing. The drains shall be sized based on the washing requirements of the catalyst if washing is part of the potential maintenance. If washing is not necessary or is performed outside the housing, drains shall be sized based on HRSG draining requirements.

6.2 Catalyst Support Structure

6.2.1 Each catalyst module shall be supported with minimum clearance, and seals should be made to prevent gas by-pass.

6.2.2 In some housing designs it may be required to provide space for additional catalyst or provide additional support structure for addition of catalyst after plant has been in operation. These requirements shall be indicated on the Seller SCOPE OF SUPPLY data sheets.

6.3 Catalyst Housing Structural Loads

6.3.1 Live loads shall be taken as 100 lbs/ft^2.

6.3.2 Wind loading and seismic loading shall be as defined by the applicable building code referenced in Specification 21T7397.

6.3.3 Thermal loadings shall be calculated by the Seller for submission to the HRSG Seller.

6.3.4 Each catalyst housing shall accept all loads imposed on it by the HRSG.

6.4 Catalyst Housing Sampling Ports

6.4.1 All sampling ports and monitoring equipment shall be in compliance with EPA requirements.

6.4.2 Seller shall supply a minimum of 7 equally spaced ports along the vertical dimension of the housing for the measurement of temperature and flow distributions, inlet NOx, and ammonia injection distributions. Sampling ports shall be provided upstream and downstream of each catalyst bed. The ports upstream of the catalyst shall be downstream of the ammonia injection grid.

6.4.3 A permanent gas side thermocouple shall be installed upstream of each catalyst bed to monitor inlet temperature.

7.0 DESIGN REQUIREMENTS - AMMONIA INJECTION SYSTEM

An aqueous ammonia injection system shall be supplied by the Seller that will take aqueous ammonia forwarded from a storage vessel (by others), vaporize the ammonia, mix it with a dilution medium, and inject it into the exhaust gas stream at the proper location and in the proper proportions. Scope of supply requirements for the injection system are given in the Seller SCOPE OF SUPPLY data sheets. Detailed design requirements are given in this section.

7.1 Ammonia Injection System - General

7.1.1 All ammonia injection system components supplied by the Seller shall be free of ammonia leaks. The detectable limit shall be determined by odor such that no ammonia shall be detectable by sense of smell in any area.

7.1.2 A solenoid operated emergency shut-off valve shall be provided for any ammonia supply line or steam supply line to the injection system.

Ammonia/dilution medium mixer shall be provided to obtain proper dilute concentrations of ammonia. The Seller shall measure both dilution medium and ammonia flow rates such that dilute concentrations can be continuously monitored. The ammonia concentration after mixing with the dilution medium shall be a maximum of 5% by volume.

7.3 Ammonia Injection Grid (AIG)

7.3.1 Because temperature and flow maldistribution are more likely to occur vertically in the HRSG, the AIG shall be designed with horizontal injection pipes to allow for adjusting ammonia flow along the entire height of the catalyst bed. Also, provisions shall be provided for vertical injection pipes at areas where flow maldistribution is expected side to side (i.e., against wall where bypassing is possible between tubes and inner liner).

7.3.2 The ammonia injection header, adjustable trim valves, and flow indicators shall be shop assembled and shall be accessible from grade.

7.3.3 The AIG shall be located upstream of the catalyst in a location which shall prevent the possibility of conversion of NH3 to NO.

7.4 Ammonia Injection System Control

7.4.1 The start-up and control of the ammonia injection system shall be accomplished in the plant distributed control system. The injection system shall also have the capability to be controlled manually.

7.4.2 The control system shall ensure that if the ammonia injection is shut down for any reason while the combustion turbine is in operation, the dilution air is continuously injected into the injection nozzles to prevent back flow of the flue gas into the ammonia injection line.

7.4.3 The control system shall also monitor inlet temperature to the catalyst so that ammonia is not injected into the gas stream at any time when the temperature is below the formation temperatures for ammonia salts.

7.5 Instrumentation and Valve Requirements

7.5.1 Design requirements for all instrumentation and valves shall be in accordance with Section 5.2 of Specification 21T7397 (including referenced subsections).

7.5.2 The scope of supply for specific SCR instrumentation is indicated in the Seller SCOPE OF SUPPLY data sheets.

7.5.3 The pressure drop across each catalyst shall be measured. Local differential pressure measurement devices shall be provided by the catalyst Seller.

7.5.4 All valve limit switches and position transmitters shall be rigidly mounted on the valve, and they shall have water tight enclosures. The position switch shall be an integral part of the valve and actuator design (not an "add-on").

7.5.5 To the extent that it is economically feasible, remotely operated ON-OFF valves shall be pneumatically actuated.

7.5.6 All Seller supplied equipment shall be supplied with provisions for freeze protection.

8.0 QUALITY, SHOP TEST AND SHIPPING REQUIREMENTS

8.1 Quality Assurance Requirements

8.1.1 Suppliers of Materials, Equipment and Services in support of this specification shall meet the requirements of the Westinghouse Supplier Quality Program as described in Westinghouse Document 21T5802, "Supplier Quality Requirements". This document shall be reviewed concurrently with this specification.

8.1.2 It is the Seller's responsibility to obtain copies of all documents referenced in this specification. Unless specific exception is requested formally by the Seller, and formally granted by the Buyer, these referenced documents shall be binding.

8.2 Shop Test Requirements

8.2.1 Catalyst testing shall be as indicated in paragraph 4.6.1.

8.2.2 The Seller shall leak test all ammonia injection piping assemblies before shipment to the site.

8.2.3 The Seller shall perform a functional test of the ammonia injection system including sequencing of all valves.

8.3 Preparation for Shipment

8.3.1 During in-transit time and while pending assembly, the catalyst components will be subject to outdoor exposure in a wide range of ambient conditions. All items shall be preserved, sealed, and packed adequately to keep moisture, dirt and other contaminants out for a minimum of 6 months of field storage and with a preservation durability of one year preferred.

8.3.2 For shipment and storage any flanged connections shall be suitably protected with steel plate, gaskets, and bolts.

8.3.3 A permanently attached corrosion resistant nameplate shall be affixed at a prominent location on the catalyst housing and shall include the following information as a minimum:

8.3.3.1 Name of Manufacturer.

8.3.3.2 Equipment Type (Name).

8.3.3.3 Manufacturer's Model No.

8.3.3.4 Buyer Purchase order No.

8.3.3.5 Design Removal Efficiency.

8.3.4 The Seller shall be responsible for any damage to equipment resulting from improper shipment or storage instructions.

9.0 FIELD ERECTION AND START UP ASSISTANCE

9.1 Field Erection

The Seller's proposal shall include sufficient information to allow evaluation of the erection requirements (see Section 10.1).

9.2 Field Supervision

9.2.1 The Seller shall make available a competent engineer to supervise erection and start up of all equipment in his scope.

9.2.2 The requirements shall be indicated on the SELLER SCOPE OF SUPPLY data sheets. The Seller should recommend the number of hours required for erection and start-up separately.

9.2.3 The Seller shall supply, at no cost to the Buyer, personnel to witness the performance testing of the catalyst, if desired by the Buyer.

9.3 Erection Equipment

9.3.1 The Seller shall supply special tools, fixtures, wrenches, or other equipment required for erection and list additional equipment which may be required but is not furnished.

9.3.2 The Seller shall supply all lifting beams, spreader bars, and other devices required for unloading and installation purposes. Any special slings or cables required shall be provided.

9.4 Erection Instructions

9.4.1 The Seller shall furnish a complete written description of the erection and start up procedure to supplement his erection drawings.

9.4.2 The Seller shall furnish instructions for the preservation and storage of equipment in his scope at the job site during construction.

10.0 DOCUMENTATION AND INFORMATION REQUIREMENTS

The following drawings and information shall be furnished by the Seller in accordance with Westinghouse Document 21T5673, "Supplier Data Requirements for Software Deliverables." More specific information required is given in this section to be used in conjunction with 21T5673. All documents shall contain the following information as a minimum:

Customer:	Westinghouse Electric Corporation
Project Name:	Hines Energy Complex PB1
P.A. No.:	
Service:	Selective Catalytic Reduction
Tag No.:	
Specification :	21T8900
Sequence No.:	
WBS No.:	255

10.1 Proposal Information Requirements

The Seller shall submit three (3) copies of a technical proposal containing the following requirements, at a minimum. Drawings and details of the proposed system shall give enough detail for evaluation of the system with regard to performance, structural integrity, installation labor and conformance with all major requirements of this specification.

10.1.1 General arrangement drawings showing outline dimensions, foundation requirements and accessories.

10.1.2 Preliminary foundation footprint, including estimated plot space and flooded weights and foundation loadings.

10.1.3 Ammonia injection system piping and instrumentation diagram.

10.1.4 Expected performance curves for NOx conversion versus temperature, and ammonia slip versus temperature.

10.1.5 All filled-in data sheets in this specification

10.1.6 Clearly identified design conditions used for the design point.

10.1.7 List of any specific contaminants which could alter the catalyst performance (e.g. air, fuel, water, steam, lubricating oil contaminants).

10.1.8 Expected gas side pressure drop.

10.1.9 Buyer and HRSG Seller Interface List:

The Seller shall furnish a list of all major interface points where the Seller terminates their supply with the Buyer and with the HRSG Seller. Seller shall provide information as necessary to properly interface the catalyst housing with the HRSG and the housing foundation.

10.1.10 Catalyst disposal/replacement information.

10.1.11 List of shipping components including dimensions and weights.

10.1.12 Any special storage requirements for equipment supplied.

10.1.13 Field Erection Information

A typical erection procedure shall be submitted for equipment substantially similar to the equipment being proposed by the Seller, including typical erection drawings of how the unit is to be erected. The Seller shall also provide lifting requirements for the specific catalyst components being proposed including required lifting capacity and length of time that each crane is required. A detailed erection schedule shall also be supplied specific to the proposed equipment, which includes craft man-hour estimates for each major step in the erection procedure.

10.1.14 Proposed engineering, purchasing and fabrication schedule.

10.1.15 List of exceptions (with reasoning) to all requirements of referenced specifications.

10.2 Buyer Approval Drawings and Information

The following certified drawings and information shall be furnished by the Seller in accordance with Westinghouse Document 21T5673.

10.2.1 General Arrangement Drawing

This shall show the arrangement and location of all major components within the Seller's scope, and shall feature side elevations, plan, and frontal views.

10.2.2 Ammonia Injection P&I Diagram

This shall show all components of ammonia injection system including control valves and flow meters.

10.2.3 Catalyst Housing Layout Drawings

This shall show all layout and interface details with the HRSG duct. The layout shall show the location of all Buyer interface points including piping connections, structural supports to grade, and other structural supports which interface with the HRSG duct. This shall also show layout of loading and access doors.

10.2.4 Catalyst Housing Foundation Loading Diagram

This shall show locations of baseplates, plate and anchor bolt details, and list the dead, wind, thermal, and seismic forces transmitted to the foundations for the catalyst support duct.

10.2.5 Ammonia Injection Control System Drawings

The following control system drawings shall be supplied by the Seller:

10.2.5.1 Control Logic drawings.

10.2.5.2 Instrumentation Input and Output List.

10.2.5.3 Instrument Specification Data Sheets.

10.2.5.4 Instrument Installation Details.

10.2.5.5 Instrument Control Setting List.

10.2.5.6 All Control Valve Data Sheets.

10.2.6 Maintenance Layout Drawing

This shall show the location of all stairs, ladders, and platforms as well as the location of all instruments, valves, and other equipment that requires access for maintenance.

10.2.7 Detail Drawings

Details of the following components shall be provided for Buyer approval:

(a) Module sealing details
(b) Ammonia injection skid details
(c) Ammonia injection grid/piping details
(d) All equipment on ammonia injection skid

10.2.8 Performance Curves

(a) NOx conversion versus temperature.
(b) Ammonia slip versus temperature.
(c) Ammonia slip as a function of inlet NOx and NH3 injection rate.
(d) SO2 to SO3 conversion versus temperature.
(e) Formation of ammonia sulfur compounds versus SO3 concentration upstream of AIG and temperature assuming constant NH3 slip.
(f) Estimated removal efficiencies for Non-Methane and Non-Ethane Hydrocarbons versus temperature.
(g) NOx conversion versus hours of operation.

10.2.9 Catalyst Replacement Details

10.2.9.1 A detailed cost analysis should be submitted regarding the replacement of each used catalyst, including cost of new catalyst, installation cost, and reclaim value of used catalyst.

10.2.9.2 A detailed description of removal and disposal procedures should be submitted.

10.2.10 Piping Layout Drawings

This shall show the layout and routing of all piping within the Seller's scope.

10.2.11 Erection Drawings

Drawings and instructions shall be furnished sufficient to allow erection of the equipment in the field by others (See Section 9.0).

10.2.12 Design, Engineering, and Manufacturing Schedule

The Seller shall submit a schedule showing specific milestones for all design, engineering, drafting, purchasing, and manufacturing functions. This schedule shall include specific shipping dates.

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

THE SCR CATALYST SYSTEM SHALL BE DESIGNED IN COMPLIANCE WITH THE ATTACHMENTS LISTED BELOW ACCORDING TO THE FOLLOWING KEY (**THIS KEY SHALL APPLY TO ALL DATA SHEETS**):

X= SCR SELLER, H = HRSG SELLER, W = OTHERS, NR = NOT REQUIRED, OPT = OPTION

SPECIFICATIONS (LATEST REVISIONS):

X	SPECIFICATION 21T7397, SPECIFICATION FOR A HEAT RECOVERY STEAM GENERATOR (HRSG) FOR THE FPC-HINES ENERGY PROJECT
X	SPECIFICATION 21T8900, SPECIFICATION FOR AN SCR CATALYST FOR THE FPC-HINES ENERGY PROJECT
X	SPECIFICATION 21T7525, ACOUSTICAL REQUIREMENTS FOR THE FPC-POLK COUNTY PROJECT
X	SPECIFICATION 21T7360, PAINT SPECIFICATION FOR FPC POLK COUNTY, FLORIDA
X	SPECIFICATION 21T5802, SUPPLIER QUALITY REQUIREMENTS
X	SPECIFICATION 21T5673, SUPPLIER DATA REQUIREMENTS FOR SOFTWARE DELIVERABLES

DATASHEETS:

X	SELLER SCOPE OF SUPPLY DATASHEET - GENERAL (1 PAGE)
X	SELLER SCOPE OF SUPPLY DATASHEET - SCR AQUEOUS AMMONIA (2 PAGES)
NR	SELLER SCOPE OF SUPPLY DATASHEET - SCR/ANHYDROUS AMMONIA (2 PAGES)
NR	SELLER SCOPE OF SUPPLY DATASHEET - CO INSTRUMENTATION (1 PAGE)
X	PERFORMANCE INFORMATION DATASHEET (8 PAGES)
X	DESIGN SPECIFICATION DATASHEET - GENERAL(1 PAGE)
X	DESIGN SPECIFICATION DATASHEET - AMMONIA INJECTION SYSTEM (1 PAGE)
X	SELLER GUARANTEE DATASHEET (1 PAGE)

THE SELLER SHALL REVIEW THE ABOVE LIST TO ENSURE THAT ALL ATTACHMENTS INDICATED HAVE BEEN INCLUDED WITH THE TRANSMITTAL. SELLER SHALL NOTIFY BUYER IF ANY DOCUMENTS ARE MISSING.

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JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

THE ITEMS LISTED BELOW SHALL INDICATE THE SELLER'S SCOPE OF SUPPLY:

X	SCR CATALYST IN MODULES
NR	CO CATALYST IN MODULES
X	AQUEOUS AMMONIA INJECTION SYSTEM
NR	ANHYDROUS AMMONIA INJECTION SYSTEM

CATALYST REACTOR HOUSING:

X	CATALYST HOUSING WITH INTERNAL INSULATION AND LINER
X	CATALYST MODULE SUPPORT STRUCTURE
NR	SPACE IN REACTOR FOR ADDITION OF CATALYST AT LATER DATE (TO ACHIEVE 90% REDUCTION IN NOx)
NR	CATALYST SUPPORT STRUCTURE FOR ADDITION OF CATALYST AT LATER DATE (TO ACHIEVE 90% REDUCTION IN NOx)

CATALYST HANDLING/MAINTENANCE FACILITIES:

X	CATALYST LOADING DOORS
X	ACCESS DOORS (UPSTREAM AND DOWNSTREAM OF CATALYST BED)
NR	MONORAIL AND HOIST WITH SUPPORT STEEL FOR CATALYST LOADING
H	PLATFORMS, LADDERS, AND STAIRWAYS

ACCESSORIES AND FIELD WORK:

X	HOUSING SAMPLING PORTS (7 UPSTREAM AND DOWNSTREAM OF EACH CATALYST BED)
NR	CATALYST FOR SAMPLING CELLS
X	SAMPLE EXTRACTION TOOLS
W	FOUNDATIONS
W	SLIDE PLATES FOR FOUNDATIONS (EMBEDDED)
W	FOUNDATION BOLTS
X	STRUCTURAL STEEL FOR SUPPORT OF ALL ITEMS WITHIN SELLERS SCOPE OF SUPPLY
X	SURFACE PREPARATION PER THE SPECIFICATION
X	SHIPMENT OF ALL EQUIPMENT TO SITE
W	ERECTION OF CATALYST HOUSING
W	INSTALLATION OF CATALYST MODULES
W	INSTALLATION OF AMMONIA INJECTION SKID
X	ALL CONSTRUCTION, START-UP, AND COMMISSIONING SPARES

TECHNICAL FIELD ASSISTANCE:

X	TFA FOR ERECTION AND INSTALLATION
NR	TFA FOR START-UP OF CATALYST
NR	TFA FOR PERFORMANCE TESTS

SELLER SCOPE OF SUPPLY DATASHEET - AQUEOUS AMMONIA INJECTION SYSTEM

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

THE ITEMS LISTED BELOW SHALL INDICATE THE SELLER'S SCOPE OF SUPPLY:

AMMONIA INJECTION HEADER ASSEMBLY (MOUNTED AT GRADE):

X	AMMONIA INJECTION HEADER WITH CONNECTING PIPES
X	MANUAL TRIM VALVES
X	FLOW INDICATORS
X	MANUAL SHUT-OFF VALVES
W	SUPPORT OF INJECTION HEADER, IF REQUIRED (FOUNDATIONS)

AQUEOUS AMMONIA EVAPORATION AND FLOW CONTROL SKID:

X	DILUTION AIR FANS WITH MOTOR (QTY. 2)
X	PROVISIONS FOR RECIRCULATING HOT GAS FROM HRSG
NR	ELECTRIC AIR HEATERS
X	AMMONIA VAPORIZER WITH AIR OR STEAM ATOMIZING NOZZLE
X	AMMONIA/AIR MIXER
X	ALL AMMONIA/STEAM AIR PIPING AND VALVES ON SKID
X	ALL CONTROL INSTRUMENTATION (SEE CONTROL AND INSTRUMENTATION DATASHEET)
X	TUBING AND WIRING ON SKID
X	INSULATION ON SKID
X	PROVISIONS FOR NITROGEN PURGE OF AMMONIA INJECTION SYSTEM

AQUEOUS AMMONIA STORAGE AND FORWARDING EQUIPMENT:

W	AQUEOUS AMMONIA STORAGE TANK
W	AQUEOUS AMMONIA FORWARDING PUMPS
W	AQUEOUS AMMONIA STRAINER

EXTERNAL PIPING:

W	PIPING FROM FORWARDING SYSTEM TO AMMONIA INJECTION SKID
X/H*	PIPING FROM AMMONIA INJECTION SKID TO AMMONIA INJECTION HEADER
X/H*	PIPING FROM HRSG DUCT TO INLET OF DILUTION AIR FANS
X/H*	PIPING FROM AMMONIA INJECTION HEADER TO HRSG DUCT (INJECTION GRID)
X	AMMONIA FLOW CONTROL VALVE
X	AMMONIA SHUT-OFF VALVE (SOLENOID OPERATED)
X	AMMONIA FLOW TRANSMITTER
X	DILUTION AIR FLOW TRANSMITTER
X	ATOMIZING STEAM/AIR FLOW CONTROL VALVE
X	ATOMIZING STEAM/AIR PRESSURE REGULATING VALVE
X	ATOMIZING STEAM/AIR SHUT-OFF VALVE (SOLENOID OPERATED)

* TO BE WORKED OUT BETWEEN HRSG SELLER AND CATALYST SELLER

SELLER SCOPE OF SUPPLY DATASHEET - AQUEOUS AMMONIA INJECTION SYSTEM

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

EXTERNAL PIPING:

X	PRESSURE/TEMPERATURE TRANSMITTERS FOR CONTROL
X	LOCAL PRESSURE/TEMPERATURE INDICATORS
X	ALL INSTRUMENTATION AND VALVES FOR CONTROL OF EQUIPMENT ON INJECTION SKID
X	FLUE GAS INLET TEMPERATURE TRANSMITTER - CONNECTION ONLY
NR	CATALYST PRESSURE DROP TRANSMITTER
X	LOCAL CATALYST PRESSURE DROP INDICATOR
X	CONTROL LOGIC
W	CONTROL SYSTEM HARDWARE

FLUE GAS ANALYZERS:

W	SCR INLET NO_x/O_2 ANALYZER WITH PROBE AND SAMPLING LINE
W	SCR OUTLET NO_x/O_2 ANALYZER WITH PROBE AND SAMPLING LINE
W	SCR OUTLET NH3 ANALYZER WITH PROBE AND SAMPLING LINE

GAS SAMPLING PORTS:

H	INLET NO_x/O_2 PORT
H	STACK SAMPLING PORTS

PERFORMANCE INFORMATION DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #1, 20°F AMB, N.G., BASE LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	3554,960		
EXHAUST TEMPERATURE	DEG. F	1112		
TEMP. ENTERING SCR CATALYST	DEG. F	*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL. %	12.43		
CARBON DIOXIDE	VOL.%	3.90		
WATER	VOL.%	7.89		
NITROGEN	VOL. %	74.82		
ARGON	VOL.%	0.94		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.45		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		12
NOx	(lbs/hour)	311				73
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	25				**
CO	(lbs/hour)	85				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				**
S02	(lbs/hour)	2				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	3				**
VOC	(lbs/hour)	6				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	16.2				**
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO CALCULATE AND USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
**CATALYST SELLER TO DETERMINE
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #2, 59°F AMB, N.G., BASE LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	3,519,210		
EXHAUST TEMPERATURE	DEG. F	1140		
TEMP. ENTERING SCR CATALYST	DEG. F	*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL. %	12.60		
CARBON DIOXIDE	VOL.%	3.76		
WATER	VOL.%	8.31		
NITROGEN	VOL.%	74.38		
ARGON	VOL.%	0.93		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.39		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		12
NOx	(lbs/hour)	298				73
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	25				**
CO	(lbs/hour)	81				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				**
S02	(lbs/hour)	2				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	3				**
VOC	(lbs/hour)	6				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	15.6				**
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO CALCULATE AND USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
**CATALYST SELLER TO DETERMINE
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

PERFORMANCE INFORMATION DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #4, 105°F AMB, N.G., 57% LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	2,335,500		
EXHAUST TEMPERATURE	DEG. F	1160		
TEMP. ENTERING SCR CATALYST	DEG. F	*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL. %	12.66		
CARBON DIOXIDE	VOL. %	3.40		
WATER	VOL.%	11.02		
NITROGEN	VOL.%	72.00		
ARGON	VOL.%	0.90		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.07		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		**
NOx	(lbs/hour)	179				70
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	78				**
CO	(lbs/hour)	165				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				**
S02	(lbs/hour)	1				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	8				**
VOC	(lbs/hour)	10				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	10.3				**
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO CALCULATE AND USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
**CATALYST SELLER TO DETERMINE
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

PERFORMANCE INFORMATION DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

PERFORMANCE CASE DESCRIPTION: CASE #5, 59°F AMB, N.G., 50% LOAD

	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL
FUEL	NONE	N.G.		
DUCT BURNER HEAT INPUT (HHV)	MMBTU/HR	N/A		
EXHAUST FLOW	LB/HR	2,552,500		
EXHAUST TEMPERATURE	DEG. F	1043		
TEMP. ENTERING SCR CATALYST	DEG. F	*		
TEMP. ENTERING CO CATALYST	DEG. F	NR		
EXHAUST COMPOSITION:				
OXYGEN	VOL.%	14.09		
CARBON DIOXIDE	VOL.%	3.08		
WATER	VOL.%	6.99		
NITROGEN	VOL.%	74.90		
ARGON	VOL.%	0.94		
EXHAUST MOLECULAR WEIGHT	LBS/LBMOLE	28.48		

EXHAUST EMISSIONS	UNITS	COMBUSTION TURBINE	DUCT BURNER	TOTAL	DOWNSTREAM CO	DOWNSTREAM SCR
NOx	(ppmvd @ 15% 02)	45	N/A	45		**
NOx	(lbs/hour)	179				70
NOx	(lbs/MMBtu), HHV					
CO	(ppmvd)	200				**
CO	(lbs/hour)	474				
CO	(lbs/MMBtu), HHV					
S02	(ppmvd)	1				**
S02	(lbs/hour)	1				
S02	(lbs/MMBtu), HHV					
VOC***	(ppmvd)	20				**
VOC	(lbs/hour)	27				
VOC	(lbs/MMBtu), HHV					
Particulates	(lbs/hour)	11.4				**
Particulates	(lbs/MMBtu), HHV					

*HRSG SELLER TO CALCULATE AND USE ± 20°F MARGIN FOR SCR DESIGN (AVERAGE TEMP.)
**CATALYST SELLER TO DETERMINE
***VOC DEFINED AS NON-METHANE AND NON-ETHANE HC'S

DESIGN SPECIFICATION DATASHEET - GENERAL

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

SCR/CO CATALYST OPERATION

_____	CONTINUOUS DUTY	X	CYCLIC DUTY	30 YRS	DESIGN LIFE
7500	EST. HOURS PER YEAR	120	HOT STARTS PER YEAR	30	COLD STARTS PER YEAR

COMBUSTION TURBINE OPERATION

X	NATURAL GAS	X	NO. 2 FUEL OIL	OTHER:	
7350	HOURS OPER. PER YEAR	150	HOURS OPER. PER YEAR	_____	HOURS OPER./YR
X	UNFIRED DESIGN	_____	FIRED DESIGN		

SCR CATALYST BED LOCATION

_____	SPLIT HP EVAP	_____	DESIGN FLOW MALDSTRIB	_____	DESIGN TEMP MALDSTRIB
X	DOWNSTREAM OF HP EVAP	H	DESIGN FLOW MALDSTRIB	H	DESIGN TEMP MALDSTRIB
_____	DOWNSTREAM OF HP ECON	_____	DESIGN FLOW MALDSTRIB	_____	DESIGN TEMP MALDSTRIB

CO CATALYST BED LOCATION

N/A	UPSTREAM OF HP SUPHTR	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB
N/A	DWNSTRM OF HP SUPHTR	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB
N/A	SPLIT HP EVAP	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB
N/A	DWNSTRM OF HP SUPHTR	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB
N/A	DWNSTRM OF HP SUPHTR	N/A	DESIGN FLOW MALDSTRIB	N/A	DESIGN TEMP MALDSTRIB

CATALYST DESIGN

H	APPROX. HRSG DIM.	H	MAX INNER LINER DIMENSIONS

SPECIAL DESIGN CONSIDERATIONS:

HRSG SELLER TO COORDINATE WITH CATALYST SELLER CATALYST DESIGN LOCATION AND DIMENSIONS, AND MALDISTRIBUTIONS.

DESIGN SPECIFICATION DATASHEET - AMMONIA INJECTION SYSTEM

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

AMMONIA INJECTION SYSTEM

DILUTION MEDIUM (ANHYDROUS AMMONIA INJECTION SYSTEM): N/A

_____ STEAM _____ AMBIENT AIR _____ HEATED AIR

DILUTION MEDIUM (AQUEOUS AMMONIA INJECTION SYSTEM):

_____ STEAM X RECIRCULATED HRSG GAS _____ HEATED AIR

VAPORIZATION MEDIUM (AQUEOUS AMMONIA INJECTION SYSTEM):

H STEAM H HOT AIR (HIGH PRESSURE)

AVAILABLE STEAM PROPS:	H	PRESSURE (PSIG)	H	TEMPERATURE (DEG. F)
STEAM PIPING DESIGN:	H	PRESSURE (PSIG)	H	TEMPERATURE (DEG. F)
AVAILABLE AIR PROPS:	H	PRESSURE (PSIG)	H	TEMPERATURE (DEG. F)
AIR PIPING DESIGN:	H	PRESSURE (PSIG)	H	TEMPERATURE (DEG. F)

SELLER TO FILL IN FOLLOWING DATA:

_____	AQUEOUS AMMONIA WT %	_____	DISTANCE BETWEEN NOZZLES/ORIFICES ON INJECTION GRID
_____	AQUEOUS NH3 CONSP. RATE	_____	DESIGN PRESSURE DROP ACROSS NOZZLES/ORIFICES
N/A	ANHYDROUS NH3 CONSP. RATE	_____	DIRECTION OF NH3 INJECTION (UPSTREAM OR DOWNSTREAM)
_____	# AIG HORIZONTAL RUNNERS	_____	DIRECTION BETWEEN AIG AND SCR CATALYST
_____	# AIG VERTICAL RUNNERS		

SPECIAL DESIGN CONSIDERATIONS:

SELLER TO SPECIFY ANY SPECIAL DESIGN CONSIDERATIONS IN THE PROPOSAL.
HRSG SELLER TO DETERMINE VAPORIZATION MEDIUM.

SELLER GUARANTEE DATASHEET

JOB NO./SHOP NO. _____ RFQ NO. _____
JOB TITLE FPC-HINES ENERGY PROJECT SPECIFICATION NO. 21T8900

THE SCR CATALYST SHALL MEET THE GUARANTEES LISTED BELOW AND AS EXPLAINED IN SECTION 3.0 OF SPEC 21T8900

REFERENCE CATALYST INLET CONDITIONS*

	UNITS:	
EXHAUST GAS FLOW	LB/HR	SEE PERFORMANCE DATA SHEETS
TEMPERATURE RANGE ENTERING SCR CATALYST**	DEG. F	H
TEMPERATURE RANGE ENTERING CO CATALYST**	DEG. F	N/A
TOTAL EMISSIONS: (WORST CASE FROM PERFORMANCE DATASHEETS)		SEE PERFORMANCE DATA SHEETS

SCR CONVERSION GUARANTEES:

	UNITS:	
NOx REDUCTION	(%)	WORST CASE FROM PERF. DATA SHTS
AMMONIA SLIP	(ppmvd @ 15% 02)	10 MAX
S02-S03 CONVERSION	(%)	3 MAX

OTHER GUARANTEES

	UNITS	
CATALYST LIFE GUARANTEE		
FROM DELIVERY	MONTHS	N/A
FROM FIRST EXHAUST GAS IN	MONTHS	36
EQUIPMENT GUARANTEE		
FROM DELIVERY	MONTHS	NA
FROM PLANT ACCEPTANCE	MONTHS	24
GAS SIDE PRESSURE DROP		
SCR CATALYST	INCHES H20	3.0 MAX
CO CATALYST	INCHES H20	N/A
TOTAL	INCHES H20	N/A
DISPOSAL GUARANTEE	NONE	YES
ACOUSTICAL GUARANTEE		
3 FEET FROM SOURCE, ALL EQUIPMENT	dB(A)	SEE 21T7525

*ALL GUARANTEES SHOULD BE MADE AT THESE CONDITIONS UNLESS NOTED OTHERWISE
** TEMPERATURE RANGE DENOTES AVERAGE TEMPERATURES
H-HRSG SELLER TO DETERMINE FROM PERFORMANCE INFORMATION DATA SHEETS

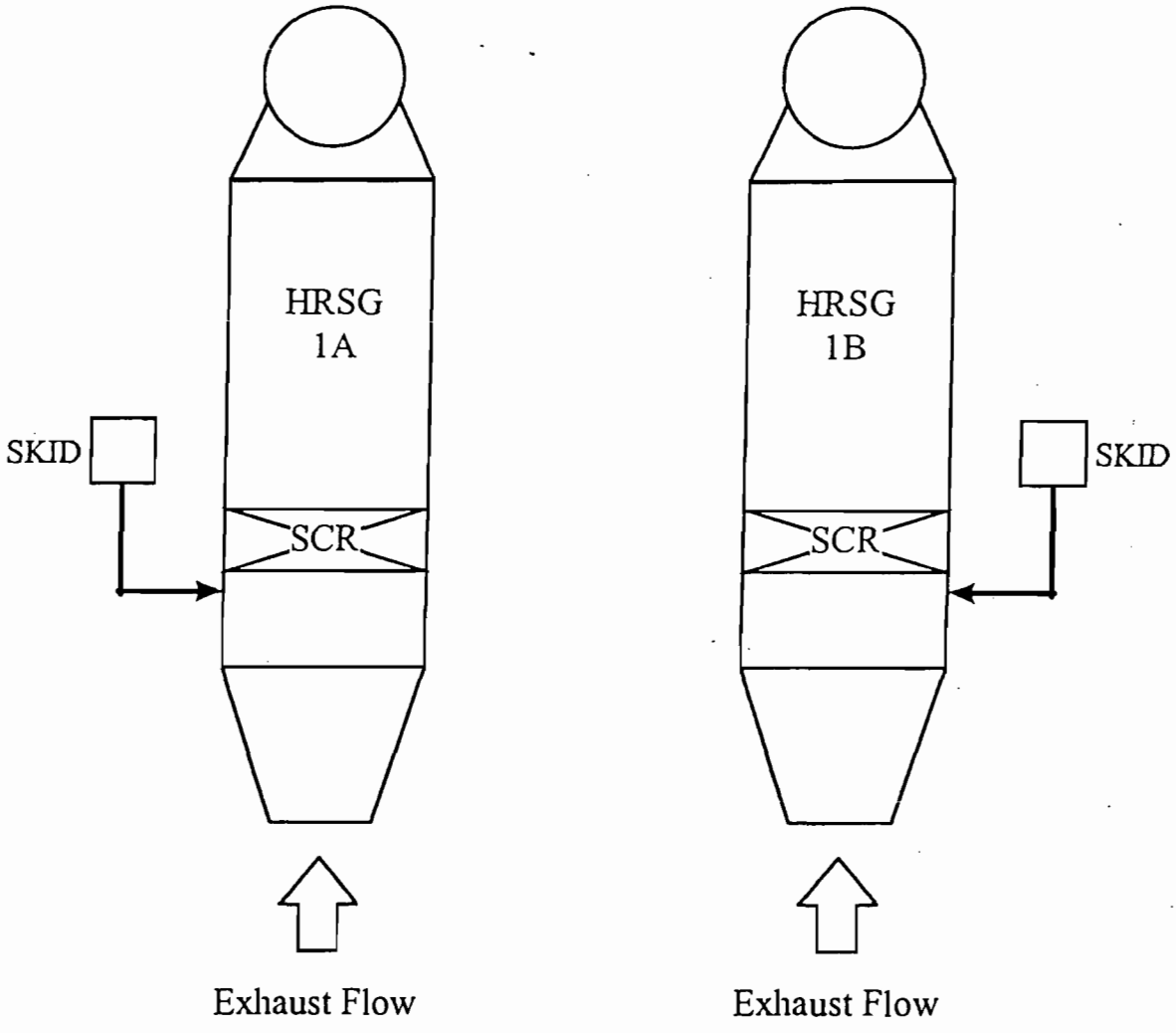

FIGURE 1 - SCR SYSTEM LAYOUT : PLAN VIEW

Florida Power
CORPORATION

August 2, 1995

Mr. William C. Thomas
District Air Program Administrator
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Dr.
Tampa, Florida 33619

Dear Mr. Thomas:

Re: Notification of the Commencement of Construction of FPC's Polk County Project
Permit Nos. PA-92-33 and PSD-FL-195

As required by 40 CFR 60.7(a)(1), Florida Power Corporation (FPC) is providing the Florida Department of Environmental Protection (DEP) notification of commencement of construction at FPC's above-referenced facility.

If you should have any questions or concerns, please do not hesitate to contact me at (813) 866-4387.

Sincerely,

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

cc: John Brown, DEP- Tallahassee
Jewell Harper, EPA Reg. IV

ENVIRONMENTAL SERVICES DEPARTMENT
H2G • 3201 Thirty-fourth Street South • P.O. Box 14042 • St. Petersburg, Florida 33733 • (813) 866-5151
A Florida Progress Company

Florida Power
CORPORATION

RECEIVED
MAY 0 1998
BUREAU OF
AIR REGULATION

May 5, 1998

Mr. Hamilton S. Oven, Jr.
Florida Department of Environmental Protection
Douglas Bldg., Room 953AA
3900 Commonwealth Blvd., MS48
Tallahassee, FL 32399-3000

Dear Mr. Oven:

Re: Florida Power Corporation
Hines Energy Complex (formerly the Polk County Site)
Site Certification No. PA-92-33; Condition No. XIII.E.3.a.
PSD Permit No. FL-195; Specific Condition E.3.a.

In fulfillment of the above-referenced conditions of Florida Power Corporation's (FPC) Site Certification and Prevention of Significant Deterioration (PSD) permit, this letter serves to notify the Department that the auxiliary boiler to be used in support of Power Block 1 has been selected. The boiler is a Universal Energy Corporation (UEC) Model BF 500C-PF-V-G-I.

If you should have any questions concerning this submittal, please do not hesitate to contact me at (813) 866-5158 or Randall Melton at (813) 866-4290.

Sincerely,

Scott H. Osbourn
Senior Environmental Engineer

cc: Clair Fancy, DEP Tallahassee

cc: M. Costello

PSD-FL-195 PERMITTING HISTORY

Florida Power Corporation
Hines Energy Complex

Facility ID No.: 1050234

PSD Permit History (for tracking purposes):

	Issue	**PERMITTING ACTION DESCRIPTION**
Permit No.	Date	
PSD-FL-195	3/01/94	PPSC No. PA-92-33. PSD permit issued for the construction of two 235 MW combined cycle combustion units using GE technology and with NO_X limits of 12 ppmvd.
PSD-Fl-195A	9/29/98	Permit modification to install SCR system and to reflect the specifications of the actual (Westinghouse 501FC) combustion turbines installed. Other changes included higher input & power rates and emissions increases.
PSD-FL-195B 1050234-002AC	5/27/99	Modification to allow the facility to utilize the fully installed capacity of the combined cycle units by modifying the maximum heat input and megawatts rating. Additional time for warm and cold start. Refer to changes in specific conditions.

Detail | Events | Facility | perMitted EU | Help | eXit

Permitting Application

Permit #:	PATS:	Issue:	Expire:

Project #/Name	Owner/Company	Type/Sub	Receive
001/FPC HINES ENERGY COMPLEX	**FLORIDA POWER CORPORATION**	**AV /00**	**20-JAN-1999**
002/FPC HINES PSD-FL195A, PA9	FLORIDA POWER CORPORATION	AC /M1	04-MAY-1999
/		/	
/		/	
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Your query has retrieved 2 records.

Count: *2

<Replace>

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in one of the file drawers labeled Supplementary Documents Drawer. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: Florida Power Corporation

Permit(s) Numbered:

AC	53	-	217434
PSD	FL	-	195
PA	92	-	33

Period during which document was received:		Detailed Description
APPLICATION 14 OCT 1992	1.	PAMPHLET DESCRIBING A NEBRASKA BOILER
	2.	PAMPHLET DESCRIBING VOGT HEAT RECOVERY STEAM GENERATORS

Check Sheet

Company Name: FLORIDA POWER CORPORATION/ Hinds Energy Complex
Permit Number: AC 53-217434
PSD Number: 195
Permit Engineer:

Application:

- [x] Initial Application
  - [x] Incompleteness Letters
  - [x] Responses
  - [ ] Waiver of Department Action
  - [ ] Department Response
  - [ ] Other

Cross References:

- [ ]
- [ ]
- [ ]

Intent:

- [x] Intent to Issue
- [x] Notice of Intent to Issue
- [x] Technical Evaluation
- [x] BACT Determination
- [x] Unsigned Permit
- Correspondence with:
  - [ ] EPA
  - [ ] Park Services
  - [ ] Other
- [x] Proof of Publication
  - [ ] Petitions - (Related to extensions, hearings, etc.)
  - [ ] Waiver of Department Action
  - [ ] Other

Final Determination:

- [x] Final Determination
- [x] Signed Permit
- [x] BACT Determination
  - [ ] Other

Post Permit Correspondence:

- [ ] Extensions/Amendments/Modifications
- [x] Other

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. W. Jeffrey Pardue Dept.
Director, Env. Service
Fla. Power Corp
3201 34th St. South
St. Petersburg, Fl
33711

4a. Article Number
P 265 659 387

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

7. Date of Delivery
7/20/98

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 W Pardue

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

Thank you for using Return Receipt Service.

P 265 659 387

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

Sent to	Jeff. Pardue
Street & Number	FPC
Post Office, State, & ZIP Code	Fla. Power Energy
Postage	St. Pete, Fl
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	7-14-98

PS Form **3800**, April 1995

PSD-FL-195
PA 92-33

Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

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
Env. Services Dept.
Fla. Power Corp.
3201 34th St. South
St. Petersburg, Fl 33733

4a. Article Number
P 265 659 404

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

7. Date of Delivery
AUG 10 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 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 404

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

Sent to W. Jeff. Pardue
Street & Number Fla. Power Corp
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 PSDFl-195A 8-6-98	

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

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

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 .....

DEP File PSD-FL-195A/PA-92-33

in the .....

Court, was published in said newspaper in the issues of .....

August 13;

1998

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

By Nelson Kirkland who is personally known to me

Sworn to and subscribed before me this 13TH

day of AUGUST A.D. 19 98

(Seal)
Notary Public

DONALD RAY JENKINS
MY COMMISSION # CC 586345
EXPIRES: September 18, 2000
Bonded Thru Notary Public Underwriters

My Commission Expires .....

Order#113205
Florida Power Corp

Attach Notice Here

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION
STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP File PSD-FL-195A/PA-92-33
Hines Energy Complex Combined Cycle Project
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a PSD Permit Modification to Florida Power Corporation (FPC) to install a Selective Catalytic Reduction (SCR) system and reflect the technical specifications of the combustion turbines actually installed at its Combined Cycle Facility located near Fort Meade, Polk County. A Best Available Control Technology determination was not required pursuant to Rule 62-212.400, F.A.C. or 40CFR52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Power Corporation, 3201 34th Street South, St. Petersburg, Florida 33733.

The facility was originally permitted in 1994 as a 470 megawatt power plant consisting of two General Electric 7FA (or equivalent) gas or oil-fired combustion turbines and a heat recovery steam generator. The actual equipment installed this summer has a power capability of 485 MW and is powered by two Westinghouse 501FC combustion turbines. The current permit requires that nitrogen oxides (NO_x) emissions be controlled through Dry Low NO_x (DLN) combustion technology. The DLN combustors installed will not be able to achieve the permit limit of 73 pounds per hour per turbine at 59° F. Westinghouse and FPC have decided to install Selective Catalytic Reduction (SCR) in addition to Westinghouse's present generation of DLN combustors in order to comply with the permitted limit. If Westinghouse's Piloted Ring Combustor or a more advanced DLN technology is developed and can be installed by November 1, 2000 to meet the original BACT for NO_x, the SCR may be replaced with this new DLN control system.

The specifications to be included or adjusted to reflect the capabilities of the Westinghouse 501FC turbines include the heat input rate curves, particulate and volatile organic compound emissions and the sulfur dioxide (SO_2) emissions while burning natural gas. Adjustments to emission limits due to the change in turbine vendors have been less than PSD significant amounts. These changes will not cause or contribute to a violation of the National Ambient Air quality Standards or Allowable Increments under the requirements for Prevention of Significant Deterioration of air Quality.

The Department will accept written comments concerning the proposed permit modification issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit Modification." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station 5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit 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., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Mediation is not available in this proceeding.

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

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

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

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

Pursuant to Condition of Certification XI.B of the separate Power Plant Site (PPSA) Certification Order, PA 92-33, for the FPC Hines Energy Complex, the PPSA certification will be automatically modified to conform to amendments to the facility's PSD permit. Upon issuance of any amended PSD permit, the Department will also modify the parallel PPSA conditions of certification to conform to the amended conditions of the PSD permit.

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:

Polk County Public Works Department Air Program 4189 Ben Durrance Road Bartow, Florida 33830 Telephone: 941/534-7377 Fax: 941/534-7374	Dept. of Environmental Protection Bureau of Air Regulation 111 S. Magnolia Drive, Suite 4 Tallahassee, Florida 32301 Telephone: 850/488-0114 Fax: 850/922-6979	Dept. of Environmental Protection Southwest District 3804 Coconut Palm Drive Tampa, Florida 33619-8218 Telephone: 813/744-6100 Fax: 813/744-6084

The complete project file includes the Draft permit Modification, the application, and the information submitted by the applicant or responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Bureau of Air Regulation at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114 for additional information.
B-794 - 8-13; 1998

B794

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
2. ☐ Res

Consult

Is your RETURN ADDRESS completed on the reverse side?

3. Article Addressed to:
Mr. Jeffrey Pardue
Fla. Powel Corp.
3201 34th Street So.
St. Petersburg, F

4a. Article Num
Z 333 612 520

5. Received By: (Print

6. Signature: (Ad

OCT 0 1 1998

PS Form 38

Z 333 612 520

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

Sent to Jeff. 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 9-29-98	

PS Form 3800, April 1995

PSD-FI-195A
PA 92-33

Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Memorandum

Florida Department of
Environmental Protection

TO: Howard Rhodes

FROM: Clair Fancy

DATE: January 16, 2001

SUBJECT: Florida Power Corporation - Hines Energy Complex Power Block 1
DEP File No. 1050234-005-AC

Attached for approval and signature is the Notice of Permit Denial for this project. This project is for the modification of FPC's Hines Energy Complex Power Block 1 located in Polk County. On October 26, 2000, the Department received an application to modify the permit PSD-FL-195B, by extending the date by which SCR could be removed and replaced with dry low NO_x (DLN) technology, from November 1, 2000 to November 1, 2002. Currently, Hines employs SCR on its two combined cycle Siemens-Westinghouse combustion turbines.

These units were originally required to meet the pound per hour equivalent of 12 ppmvd of NO_x by DLN after start-up in 1998. Thereafter, the lowest possible emission concentration value between 9 and 12 ppmvd was to be achieved by tuning, etc. The Department set a requirement to achieve the full load pound per hour equivalent of 12 ppmvd when the SCR unit was installed. This is the equivalent to roughly 12 - 30 ppm across the typical operating range for these units.

We provided until November 1, 2000, for replacement of the SCR system by DLN. The purpose was to insure that additional PSD/BACT review would not be required by the equipment modification. This was reasonable because the units had not achieved full production and annual emissions could not be estimated. In any case, it was assumed that the potential emissions could be considered as past actual emissions to compare with future potential emissions. Since these would be the same, PSD would not be triggered.

By now, the units have achieved normal operation and annual emissions can be estimated. An extension of two more years would be in effect a waiver of rule applicability.

FPC and Siemens-Westinghouse have not provided reasonable assurances on whether higher emissions of certain pollutants would result from replacing the SCR system. According to compliance test results, the units at Hines Energy Power Block 1, have achieved about 2 ppmvd of CO at full load, versus a permitted value of 25 ppmvd on gas. The DLN technology will very likely increase emissions of CO in the attempt to achieve full lean pre-mix combustion.

I recommend that you deny this application. I do not think that extending this date would yield any appreciable benefits.

Attachments

/raw

cc: Al Linero, P.E.
Scott Sheplak, P.E.

In the Matter of an
Application for Permit by:

Mr. Paul Crimi
Florida Power Corporation
263 13th Avenue South
St. Petersburg, Florida 33701

DEP File No. 1050234-005-AC, PSD-FL-195B
Hines Energy Complex Power Block 1
Polk County

NOTICE OF PERMIT DENIAL

The applicant, Florida Power Corporation, applied on October 26, 2000, to the Department of Environmental Protection for a permit to extend the date by which dry low-NO_x (DLN) technology may be installed in place of Selective Catalytic Reduction (SCR) system on the two Siemens-Westinghouse combined cycle units (Units 1A and 1B) at its Hines Energy Complex. FPC has requested that this time be extended from the November 1, 2000 deadline to November 1, 2002.

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 hereby denies the permit for the following reasons:

The Department believes that replacement of the SCR unit with DLN combustors will lead to significant emissions increases of at least carbon monoxide. This would trigger a requirement for a review under the Rules for the Prevention of Significant Deterioration of Air Quality at 40 CFR 52.21 and Rule 62-212.400, F.A.C.

The Department does not have reasonable assurance that Siemens-Westinghouse will by October 2002 actually install a non-SCR technology and achieve the present NO_x limitations in a dual-fuel unit.

The Department notes that the units were originally permitted to achieve 9-12 ppmvd of NO_x by DLN technology at start-up in 1998. The technology was not installed at the time and the Department already allowed installation of DLN until October 2000 without necessarily triggering PSD.

A person whose substantial interests are affected by the Department's permit denial may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at Mail Station #35, 3900 Commonwealth Boulevard, 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 Permit Denial. 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 receipt of this Notice of Permit Denial. 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 Notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. 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.

This Notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition which conforms to Rule 62-110.106, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department.

If either a petition for administrative hearing or a request for extension of time is not timely filed with the Department, then this Notice shall constitute final agency action. Any party to this order would then have the right to seek judicial review pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice of appeal must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Permit Denial and all copies were sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 1/22/01 to the person(s) listed:

Mr. Paul Crimi, Florida Power Corporation *
Ms. Jennifer Stenger, P.E., Florida Power Corporation *
Mr. Bill Thomas, P.E., DEP-SWD
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS

1/22/01 cc: Reading File
Russell Wieder
Al Linero

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.

Barbara J. Friday 1/22/01
(Clerk) (Date)

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Jennifer Stenger, P.E.
Florida Power Corporation
263 13th Avenue South
St. Petersburg, Florida
33701

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* Milton Mohead — B. Date of Delivery 01/24/01

C. Signature
X [signature] ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
7000 0600 0021 2825 2326

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

Article Sent To: Ms. Jennifer Stenger

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

7000 0600 0021 2825 2326

Name (Please Print Clearly) (to be completed by mailer)
Ms. Jennifer Stenger
Street, Apt. No., or PO Box No.
263 13th Avenue South
City, State, ZIP+4
St. Petersburg, FL 33701

PS Form 3800, July 1999 See Reverse for Instructions

7000 0600 0021 2825 2319

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

Article Sent To:
Mr. Paul Crimi

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

Name (Please Print Clearly) (to be completed by mailer)
Mr. Paul Crimi
Street, Apt. No.; or PO Box No.
263 13th Avenue South
City, State, ZIP+4
St. Petersburg, FL 33701

PS Form 3800, July 1999 — See Reverse for Instructions

SENDER: *COMPLETE THIS SECTION*

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Paul Crimi
Florida Power Corporation
263 13th Avenue South
St. Petersburg, Florida
33701

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* Milton Mohead — B. Date of Delivery 10/24/00

C. Signature — X — ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
7000 0600 0021 2825 2319

PS Form 3811, July 1999 — Domestic Return Receipt — 102595-99-M-1789