STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION NOTICE OF FINAL PERMIT

In the Matter of an Application for Permit

Ms. Deborah Shaw Florida Keys Electric Cooperative Association, Inc. 91605 Overseas Highway P.O. Box 700377 Tavernier, Florida 33070-0377 DEP File No. 0870004-002-AC

PSD-FL-237

Enclosed is the FINAL Permit Number PSD-FL-237 for the construction of a 3.58 megawatt diesel generator (Unit 8) at the Florida Keys Electric Cooperative, Marathon Generating Plant, Monroe County. This permit is issued pursuant to Chapter 403, Florida Statutes and in accorance with Rule 62-212.400., F.A.C. - 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 \cdot (including the FINAL permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 9 - 12 - 97 to the person(s) listed:

Ms. Deborah Shaw, FKEC *

Mr. Brian Beals, EPA

Mr. John Bunyak, NPS

Mr. David Knowles, DEP

Clerk Stamp

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

(Clerk)

Date)

FINAL DETERMINATION

Florida Keys Electric Cooperative Association, Incorporated

Permit No. 0870004-002-AC, PSD-FL-237

Marathon Generation Plant

An Intent to Issue an air construction permit for Unit 8 at Florida Keys Electric Cooperative Association's, Marathon Generation Plant's, Monroe County, was distributed on August 11, 1997. The Notice of Intent was published in the Miami Herald on August 13, 1997. Copies of the draft construction permit were available for public inspection at the Department offices in Ft. Myers and Tallahassee.

No comments were submitted by the National Park Service, the U.S. Environmental Protection Agency or the public. No comments were received from the applicant other than inquiries regarding the earliest possible issue date of the final permit.

The final action of the Department is to issue the permit as proposed.

P 265 659 454

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

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Domestic Return Receipt

Is your RETURN ADDRESS completed on the reverse side?

6. Signature

PS Form **3811**, December 1994



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 Keys Electric Cooperative Association, Inc.

91605 Overseas Highway Tavernier, Florida 33070

Authorized Representative:

Charles A. Russell

Chief Executive Officer General Manager

FID No. 0870004

PSD No. PSD-FL-237

SIC No. 4911

Project: Unit 8

Permit No. 0870004-002-AC Expires: January 31, 1999

PROJECT AND LOCATION:

Permit for the construction of a 3.58 megawatt diesel electric generator at the Marathon Generation Power Plant, 3421 Overseas Highway, Marathon, Monroe County. UTM coordinates are Zone 17; 490.7 km E; 2732.7 km N.

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297. The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Attached appendices are made a part of this permit:

Appendix BD BACT Determination

Appendix GC Construction Permit General Conditions

Appendix CSC Emission Unit(s) Common Specific Conditions

Howard L. Rhodes, Director Division of Air Resources

Management

SECTION I. FACILITY INFORMATION

SUBSECTION A. FACILITY DESCRIPTION

The Florida Keys Electric Cooperative Association (FKEC) Marathon Generating Plant presently consists of two nominal 2.0 Megawatt (MW) diesel generators designated as Units 1 and 2, three nominal 3.0 MW diesel generators (Units 3, 4 and 5), and two 2.5 MW diesel generators (Units 6 & 7). This permit is to construct a 3.58 MW diesel generator designated as Unit 8 and to limit the potential-to-emit of the other units.

SUBSECTION B. REGULATORY CLASSIFICATION

The Marathon Generation Power Plant is classified as a Major Source of Air Pollution or Title V Source because it emits or has the potential to emit at least 100 tons per year of nitrogen oxides (NO_X) and carbon monoxide (CO). It is also a Major Facility with respect to preconstruction review because it emits or has the potential to emit at least 250 tons per year of NO_X and CO.

SUBSECTION C. PERMIT SCHEDULE:

- 01-27-97: Date of Receipt of Application
- 07-10-97: Application deemed complete
- 08-11-97: Intent issued
- 08-13-97: Notice published in the Miami Herald

SUBSECTION D. RELEVANT DOCUMENTS:

The documents listed form the basis of the permit. They are specifically related to this permitting action. These documents are on file with the Department.

- Application received 1-27-97
- Department's letter dated 2-13-97
- Company letters dated 4-7-97, 5-19-97, 5-27-97, 6-19-97, and 7-10-97
- Technical Evaluation and Preliminary Determination dated 8-11-97
- Best Available Control Technology determination (issued concurrently with permit)

SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

SUBSECTION A. ADMINISTRATIVE

- A.1 Regulating Agencies: All documents related to applications for permits to operate, reports, tests, minor modifications and notifications shall be submitted to the Department of Environmental Protection, South District Office located at 2295 Victoria Avenue, Suite 364, Ft. Myers, Florida 33901, and phone number (941) 332-6975. All applications for permits to construct or modify an emission unit(s) subject to the Prevention of Significant Deterioration (PSD) should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP) located at 2600 Blairstone Road, Tallahassee, Florida 32399-2400 and phone number (850)488-1344.
- A.2 <u>General Conditions</u>: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in *Appendix GC* of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
- A.3 Emission Unit(s) Common Specific Conditions: The owner and operator is subject to and shall operate under the attached Emission Unit(s) Common Specific Conditions listed in *Appendix CSC* of this permit. The Emission Unit(s) Common Specific Conditions are binding and enforceable pursuant to Chapters 62-204 through 62-297 of the Florida Administrative Code.
- A.4 <u>Terminology</u>: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
- A.5 <u>Forms and Application Procedures</u>: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
- A.6 Expiration: This air construction permit shall expire on January 31, 1999. [Rule 62-210.300(1), F.A.C.]. The permittee may, for good cause, request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. However, the permittee shall promptly notify the permitting authority office of any delays in completion of the project which would affect the startup day by more than 90 days. [Rule 62-4.090, F.A.C]
- A.7 <u>Applicable Regulations</u>: The facility is subject to the following regulations: Florida Administrative Code Chapters 62-4; 62-103; 62-204; 62-210; 62-212, 62-296, and 62-297. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

SUBSECTION A. LISTING OF EMISSIONS UNITS

This permit addresses the following emission units.

EMISSIONS UNIT NO.	System	EMISSIONS UNITS DESCRIPTION
001#	Power	2.0 MW Diesel Electric Generator
002#	Power	2.0 MW Diesel Electric Generator
003#	Power	3.0 MW Diesel Electric Generator
004#	Power	3.0 MW Diesel Electric Generator
005#	Power	3.0 MW Diesel Electric Generator
0.06#	Power	2.5 MW Diesel Electric Generator
007#	Power	2.5 MW Diesel Electric Generator
008*	Power	3.58 MW Diesel Electric Generator

- # Existing Emission units
- * New Emission unit

SUBSECTION B. SPECIFIC CONDITIONS (UNIT 008):

The following Specific Conditions apply to the following emission unit:

EMISSION	,	·
Unit No.	System	EMISSION UNIT DESCRIPTION
008	Power	3.58 MW Diesel Electric Generator

EMISSION LIMITATIONS

- B.1 The maximum allowable emission rates for NO_X for Unit No. 008 shall not exceed 62 pounds per hour (lb/hr) and 271 tons per year (TPY) pursuant to the Best Available Control Technology (BACT) Determination. [Rule 62-212.410, F.A.C.]
- B.2 Visible emissions shall not exceed 20% opacity. [Rule 62-296.310, F.A.C.]
- B.3 In order to minimize excess emissions during startup/shutdown/malfunction this emission unit shall adhere to best operational practices. [Rule 62-210.700, F.A.C.]

OPERATIONAL LIMITATIONS

- B.4 The emission unit is allowed to operate continuously (8760 hours/year) [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].
- B.5 Only No. 2 fuel oil can be fired in the diesel generator. The maximum sulfur content of the No. 2 fuel oil shall not exceed 0.05 percent, by weight. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

- B.6 The maximum heat input rate to Unit No. 008 shall not exceed 30.2 million Btu per hour (MMBtu/hr) [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].
- B.7 The maximum No. 2 fuel oil consumption allowed to be burned in Unit No. 008 is 2,015,000 gallons per year, which is equivalent to 8760 hours per year of operation at full load. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]

TEST METHODS AND PROCEDURES

- B.8 Compliance with the allowable emission limiting standards for NO_X in B.1 shall be determined by using EPA Reference Method 7E (or equivalent) as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. An annual compliance test shall be performed on the unit if operated for more than 400 hours in the preceding 12-month period. [Rule 62-297.310, F.A.C.]
- B.9 An initial compliance test shall be conducted for CO emissions using EPA Reference Method 10 as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. If the test indicates emissions to be less than 23 lb/hr, then no further testing will be required. If CO emissions exceed 23 lb/hr, the permittee will have to submit a BACT determination for CO. [Rules 62-297.310, F.A.C.]
- B.10 The fuel shall be monitored initially and annually for the sulfur content using ASTM D4294 Method (or equivalent). [Rule 62-297.440, F.A.C.]
- B.11 The permittee shall maintain daily records of fuel oil consumption for the emission unit. [Rule 62-210.200, F.A.C.]
- B.12 Compliance with the visible emission standard shall be demonstrated with EPA Reference Method 9 as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-297.401, F.A.C.]

RECORDKEEPING AND REPORTING REQUIREMENTS

- B.13 All measurements, records, and other data required to be maintained by this facility shall be retained for at least five (5) years following the data on which such measurements, records, or data are recorded. These data shall be made available to the Department upon request. [Rule 62-4.070(3), F.A.C.]
- B.14 Two copies of the results of the emission tests for the pollutant listed in Condition B.1 for Unit No. 8 shall be submitted within forty-five days of the last sampling run to the South District office in Ft. Myers. All reports shall be in a format consistent with and shall include the information in accordance with Rule 62-297.310 (8), F.A.C. [Rule 62-297.310(8), F.A.C.]

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

SUBSECTION C. SPECIFIC CONDITIONS (UNIT 001-007)

The following Specific Conditions apply to the following emission units:

EMISSIONS UNIT NO.	System	Emissions Units Description
001	Power	2.0 MW Diesel Electric Generator
002	Power	2.0 MW Diesel Electric Generator
003	Power	3.0 MW Diesel Electric Generator
004	Power	3.0 MW Diesel Electric Generator
005	Power	3.0 MW Diesel Electric Generator
006	Power	2.5 MW Diesel Electric Generator
007	Power	2.5 MW Diesel Electric Generator

EMISSION LIMITATIONS

- C.1 Visible emissions shall not exceed 20% opacity. [Rule 62-296.310, F.A.C.]
- C.2 In order to minimize excess emissions during startup/shutdown/malfunction this emission unit shall adhere to best operational practices. [Rule 62-210.700, F.A.C.]

OPERATIONAL LIMITATIONS

- C.3 The combined maximum heat input to Units No. 001-007 shall not exceed 187 MMBtu/hr while firing No. 2 fuel oil. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]
- C.4 The existing Units No. 001-007 operations shall be limited to either 4380 hours per year per unit or to a total fuel oil consumption of 6,200,000 gallons per year for all seven units, whichever limit is more restrictive. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]
- C.5 No. 2 fuel oil can be fired in the diesel generators 001-007. The maximum sulfur content of the No.
 2 fuel oil shall not exceed 0.50 percent, by weight. [Rule 62-210.200, F.A.C., Definitions:
 Potential-to-Emit]

TEST METHODS AND COMPLIANCE PROCEDURES

- C.6 The No. 2 fuel oil shall be monitored initially and annually for the sulfur content using ASTM D4294 Method (or equivalent). [Rule 62-297.440, F.A.C.]
- C.7 The permittee shall maintain daily records of fuel oil consumption for the emission units. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit.]
- C.8 Compliance with the visible emission standard shall be demonstrated with EPA Reference Method 9 as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in 62-204.800, F.A.C. [Rule 62-297.310, F.A.C.]

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

SUBSECTION 1.0 CONSTRUCTION REQUIREMENTS

Applicable Regulations: Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Part 60, adopted by reference in the Florida Administrative Code regulation [Rule 62-204.800, F.A.C.] Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]

SUBSECTION 2.0 EMISSION LIMITING STANDARDS

- 2.1 General Particulate Emission Limiting Standards. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density if which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). [Rule 62-296-320(4)(b)1, F.A.C.]
- 2.2 Unconfined Emissions of Particulate Matter [Rule 62-296.320(4)(c), F.A.C.]
 - (a) The owner or operators shall not cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any source whatsoever, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrially related activities such as loading, unloading, storing or handling, without taking reasonable precautions to prevent such emission.
 - (b) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.
 - (c) Reasonable precautions include the following:
 - Paving and maintenance of roads, parking areas and yards.
 - Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
 - Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.
 - Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent reentrainment, and from buildings or work areas to prevent particulate from becoming airborne.
 - Landscaping or planting of vegetation.
 - Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.

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EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

- Confining abrasive blasting where possible.
- Enclosure or covering of conveyor systems.

NOTE: Facilities that cause frequent, valid complaints may be required by the Permitting Authority to take these or other reasonable precautions. In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

2.3 General Pollutant Emission Limiting Standards: [Rule 62-296.320, F.A.C.]

- (a) The owner or operator shall not store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems.
- (b) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

<u>NOTE</u>: An objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [F.A.C. 62-210.200(198)]

SUBSECTION 3.0 OPERATION AND MAINTENANCE

- Changes/Modifications: The owner or operator shall submit to the Permitting Authority(s), for review any changes in, or modifications to: the method of operation; process or pollution control equipment; increase in hours of operation; equipment capacities; or any change which would result in an increase in potential/actual emissions. Depending on the size and scope of the modification, it may be necessary to submit an application for, and obtain, an air construction permit prior to making the desired change. Routine maintenance of equipment will not constitute a modification of this permit. [Rule 62-4.030, 62-210.300 and 62-4.070(3), F.A.C.]
- 3.2 <u>Plant Operation Problems</u>: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the Permitting Authority as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]

APPENDIX CSC

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

- 3.3 <u>Circumvention</u>: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]
- 3.4 Excess Emissions Requirements [Rule 62-210.700, F.A.C.]
 - (a) Excess emissions resulting from start-up, shutdown or malfunction of these emissions units shall be permitted 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 Permitting Authority office for longer duration. [Rule 62-210.700(1), F.A.C.]
 - (b) Excess emissions that are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during start-up, shutdown, or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]
 - (c) In case of excess emissions resulting from malfunctions, the owner or operator shall notify Permitting Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the problem; and the corrective actions being taken to prevent recurrence. [Rule 62-210.700(6), F.A.C.]
- Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]

SUBSECTION 4.0 MONITORING OF OPERATIONS

- 4.1 Determination of Process Variables
 - (a) The permitee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
 - (b) Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. [Rule 62-297.310(5), F.A.C]

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

SUBSECTION 5.0 TEST REQUIREMENTS

- 5.1 <u>Test Performance</u> Within 60 days after achieving the maximum production rate at which these emission units will be operated, but not later than 180 days after initial startup and annually thereafter, the owner or operator of this facility shall conduct performance test(s) pursuant to 40 CFR 60.8, Subpart A, General Provisions and 40 CFR 60, Appendix A. No other test method shall be used unless approval from the Department has been received in writing. Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emission unit(s) operating at permitted capacity pursuant to Rule 62-297.310(2), F.A.C. [Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C.]
- 5.2 <u>Test Procedures</u> shall meet all applicable requirements of the Florida Administrative Code Chapter 62-297. [Rule 62-297.310, F.A.C.]
- 5.3 Test Notification: The owner or operator shall notify the Permitting Authority in writing at least (30) days (initial) and 15 days (annual) prior to each scheduled compliance test to allow witnessing. The notification shall include the compliance test date, place of such test, the expected test time, the facility contact person for the test, and the person or company conducting the test. The (30) or (15) day notification requirement may be waived at the discretion of the Department. Likewise, if circumstances prevent testing during the test window specified for the emission unit, the owner or operator may request an alternate test date before the expiration of this window. [Rule 62-297.310 and 40 CFR 60.8, F.A.C.]

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- 5.4 Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Rule 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C. or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Permitting Authority. [Rule 62-297.310(7)(b), F.A.C.]
- 5.5 <u>Stack Testing Facilities</u>: The owner or operator shall install stack testing facilities in accordance with **Rule 62-297.310(6)**, **F.A.C.**.
- 5.6 Exceptions and Approval of Alternate Procedures and Requirements: An Alternate Sampling Procedure (ASP) may be requested from the Bureau of Air Monitoring and Mobile Sources of the Florida Department of Environmental Protection in accordance with the procedures specified in Rule 62-297.620, F.A.C.
- 5.7 Operating Rate During Testing: Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is

APPENDIX CSC

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2) and (3), F.A.C.]

SUBSECTION 6.0 REPORTS AND RECORDS

- 6.1 <u>Duration</u>: All reports and records required by this permit shall be kept for at least (5) years from the date the information was recorded. [Rule 62-4.160(14)(b), F.A.C.]
- 6.2 Emission Compliance Stack Test Reports:
 - (a) A *test report* indicating the results of the required compliance tests shall be filed with the Permitting Authority as soon as practical, <u>but no later than 45 days</u> after the last sampling run is completed. [Rule 62-297.310(8), F.A.C.]
 - b) The *test report* shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in **Rule 62-297.310(8)**, **F.A.C.**
- Excess Emissions Report: If excess emissions occur, the owner or operator shall notify the Permitting Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. [Rules 62-4.130 and 62-210.700(6), F.A.C.]
- Annual Operating Report for Air Pollutant Emitting Facility: Before March 1st of each year, the owner or operator shall submit to the Permitting Authority this required report [DEP Form No. 62-210.900(5)], which summarizes operations for the previous calendar year. [Rule 62-210.370(3), F.A.C.]

SUBSECTION 7.0 OTHER REQUIREMENTS

Waste Disposal: The owner or operator shall treat, store, and dispose of all liquid, solid, and hazardous wastes in accordance with all applicable Federal, State, and Local regulations. This air pollution permit does not preclude the permittee from securing any other types of required permits, licenses, or certifications.

APPENDIX GC

GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

- G.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.
- G.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 or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and 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 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.
- G.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.
- G.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.
- G.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.
- G.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 and 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.

- G.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.

APPENDIX GC

GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

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.

- G.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 extend it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- G.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.
- G.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.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
 - (a) Determination of Best Available Control Technology (X)
 - (b) Determination of Prevention of Significant Deterioration (X); and
 - (c) Compliance with New Source Performance Standards ().
- G.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 or 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:
 - 1. The date, exact place, and time of sampling or measurements;
 - 2. The person responsible for performing the sampling or measurements;
 - 3. The dates analyses were performed;
 - 4. The person responsible for performing the analyses;
 - 5. The analytical techniques or methods used; and
 - 6. The results of such analyses.
- G.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.

Marathon Generation Plant Unit No. 8 Florida Keys Electric Cooperative Association PSD-FL-237 and 0870004-002-AC Marathon, Monroe County

The Florida Keys Electric Cooperative Association (FKEC) plans to install a new Diesel Engine Generator at its existing Marathon Generation Plant (MGP) in Marathon, Monroe County. The unit is a General Motors Electro-Motive Diesel generator model 20-710G4B with a nominal base load rating of 3.58 megawatts (MW) at 32°C and 718 mm Hg. The facility currently consists of seven (7) diesel engine generators used for peaking power. Units 1 & 2 are each rated at 2.0 MW. Units 3, 4 and 5 are each rated at 3.0 MW, and Units 6 & 7 are 2.5 MW each. The existing Units 1-7 are allowed to burn No. 2 fuel oil with a sulfur content of 0.5 percent or less, by weight. The new Unit 8 will be fired with No. 2 low sulfur fuel oil with a sulfur content not to exceed 0.05 percent, by weight, and a fuel oil consumption limit of 2.015 million gallons per year. The facility also has four fuel oil storage tanks and other electrical generating support equipment.

FKEC has indicated that the maximum annual air pollutant emission rates in tons per year for the Unit 8 diesel generator, based on consumption of 2.015 million gallons of No. 2 fuel oil, with a maximum sulfur content of 0.05 percent, by weight, will be:

Pollutant	PSD Significance	Uncontrolled	Controlled	Expected	Subject to
	Levels ¹	Emissions ²	Emissions ³	Emissions⁴	PSD Review?
NO _x	40	423	271	24.2	Yes
СО	100	111	<100	6.4	No
. PM	25	9.5	9.1	, 0.6	No
PM_{10}	15	7.9		0.5	No
SO ₂	40	7.2		0.5	No

¹ Florida Administrative Code 212.400-2

Following is the BACT determination proposed by the applicant:

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	62 lbs/hr by timing retardation and aftercoolers

Florida Keys Electric Cooperative Association Inc. 0870004-002-AC
Marathon Generation Plant Unit No. 8

Air Permit No.

PSD-FL-237

² Based on firing No. 2 fuel oil (0.05% sulfur by weight) at a maximum of 2.015 million gals/yr at full load with no emission controls.

³ Based on firing No. 2 fuel oil (0.05% sulfur by weight) at a maximum of 2.015 million gals/yr at full load with emissions control of timing retardation.

⁴ Based on FKEC's historical and projected actual operating hours of 500 or less.

The Marathon Generation Power Plant is a major source of air pollution or Title V source. Because emissions of nitrogen oxides are greater than 250 tons per year, it is a major facility with respect to the Prevention of Significant Deterioration (Rule 62-212.400). Because the project will result in a significant increase in nitrogen oxides emissions per Table 62-212.400-2, F.A.C., "Regulated Air Pollutants - Significant Emissions Rates," a BACT determination is required pursuant to Rule 62-212.410, F.A.C.

DATE OF RECEIPT OF A BACT APPLICATION:

January 27, 1997

REVIEW GROUP MEMBERS:

Syed Arif (Permit Engineer, prepared BACT) and A. A. Linero (Administrator, reviewed BACT) New Source Review Section.

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 Standards of Performance for New Stationary Sources or 40 CFR Part 61 National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine, for the emission unit in question, the most stringent control available for a similar or identical emission unit or emission unit category. If it is shown that this level of control is technically or economically unfeasible for the emission unit in question, then the next most stringent level of control is determined and similarly evaluated. This process

continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

The air pollutant emissions from this facility can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as follows:

- Combustion Products (e.g., SO₂, NO_X, PM). Controlled generally by good combustion of clean fuels, removal in add-on control equipment.
- *Products of Incomplete Combustion* (e.g., CO, VOC). Control is largely achieved by proper combustion techniques.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "non-regulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., PM, SO₂, H₂SO₄, fluorides, etc.), if a reduction in "non-regulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

BACT POLLUTANT ANALYSIS

NITROGEN OXIDES (NO_X)

Oxides of nitrogen (NO_x) are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel (fuel NO_x) and by thermal fixation of nitrogen in the combustion air (thermal NO_x). As flame temperature increases, the amount of thermally generated NO_x increases. Fuel type affects the quantity and type of NO_x generated. Generally, natural gas is low in nitrogen. However it causes higher flame temperatures and generates more thermal NO_x than oil or coal, which have higher fuel nitrogen content, but exhibit lower flame temperatures.

NO_x emissions represent a significant portion of the total emissions generated by this project, and must be minimized using BACT. A review of EPA BACT/LAER Clearinghouse (BACT Clearinghouse) information indicates that NO_x emissions at most small facilities are minimized by process control and good combustion practices.

The applicant has proposed modification of the combustion process through a combination of fuel injection timing retardation and cooling of combustion air resulting in exhaust temperature reduction. The design specific to FKEC's 20-710G4B includes a 4° injection timing retardation and a 4-pass aftercooler circuit with the addition of a separately cooled aftercooler circuit. The

combination of retarded injection timing and lowered combustion air temperature results in less NO_x formation.

Vendors data indicate that retarding injection timing will reduce NO_x formation by about 20 percent, but will increase PM emissions by about 10 percent and fuel consumption by 1.5 percent. The 4-pass aftercooler will reduce both NO_x and PM emissions by about 10 percent while reducing fuel consumption by about 0.7 percent. The separately cooled aftercooling circuit will decrease both NO_x and PM by another 10 percent and fuel consumption by 0.5 percent. The net result will be a 40 percent reduction in NO_x, a 5 percent increase in PM and about 0.3 percent increase in fuel consumption. The use of low sulfur fuel oil will minimize PM emissions thus reducing or eliminating the increase in PM caused by NO_x controls. This combination of NO_x controls, proper engine design, good combustion practices, and the use of low sulfur fuel should provide effective emissions control.

BACT DETERMINATION BY DEP:

Based on the information provided by the applicant and the information searches conducted by the Department, lower emissions limits can be obtained employing the top-down BACT approach for NO_x.

NO, DETERMINATION

The top-down BACT approach for diesel fired internal combustion engines listed in order from most stringent control to least:

- 1. Selective Catalytic Reduction (SCR)
- 2. Combined technologies of injection timing retardation, turbocharger with aftercoolers
- 3. Good combustion design/practices

The following table summarizes the feasibility of using these control technologies with the EMD 20-710G4B as designed for installation in FKEC's Marathon Generation Plant.

Control Technology	Emission	Technically	Cost Effective	Adverse Environ.	Adverse Energy
·	Reduction (%)	Feasible		Impacts	Impacts
SCR with ammonia	60-90	No	N/A	N/A	N/A
SCR with urea	80	No	N/A	N/A	N/A
Timing retard; turbo					
charger aftercoolers	40	Yes	Yes	No	0.3%
Dry/Low NO _x	18	No	N/A	N/A	N/A

BD-4

SCR is more widely used in Japan and Germany than it is in the United States and the technology is being improved such that the hazards and costs have been reduced. It remains, however, a costly technology for small applications and has hazards associated with the use and storage of ammonia. SCR is not generally used with diesel engines of this size. The BACT/LAER database lists only a single facility which uses SCR on diesel engines. SCR was selected in that instance because a local ordinance mandated strict limits on emissions without regards to cost. SCR is not technically feasible for this diesel engine because the exhaust back pressure maximum allowance for the EMD 20-710G4B is 5 inches H₂O. An SCR system will add 5 to 6 inches H₂O back pressure, exceeding the manufacturers specifications and recommendations.

For NO_x emissions, the Department accepts the applicants proposed use of injection timing retardation and cooling of combustion air as BACT for this project.

The BACT emission levels established by the Department are as follows:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides (NO _x)	62 lbs/hr (271 TPY)
Visible Emissions	20%

COMPLIANCE

Compliance with the visible emission limitations shall be in accordance with the EPA Reference Method 9 as contained in 40 CFR 60, Appendix A.

Compliance with the NO_x limitations shall be in accordance with the EPA Reference Method 7E as contained in 40 CFR 60, Appendix A.

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Syed Arif, Review Engineer (prepared BACT)

A. A. Linero, Administrator, New Source Review Section (reviewed BACT)

Department of Environmental Protection

Bureau of Air Regulation

2600 Blair Stone Road

Tallahassee, Florida 32399-2400

Recommended By:	Approved By:
C. H. Fancy, P.E., Chief Bureau of Air Regulation	Howard L. Rhodes, Director Division of Air Resources Management
9/11/97	9 11197
Date:	Dote:

Florida Department of **Environmental Protection**

Memorandum

TO:

Howard L. Rhodes

Howthe Dout

THRU:

Clair Fancy

Al Linero aakin

FROM

Syed Arif Syal Auf

DATE:

September 12, 1997

SUBJECT: Florida Keys Electric Cooperative Association, Inc., 0870004-002-AC,

PSD-FL-237

Attached for approval and signature is a construction permit number 0870004-002-AC, PSD-FL-237 for Florida Keys Electric Cooperative Association, Inc., Marathon Generation Plant's 3.58 MW diesel generator (Unit No. 8) to be located in Marathon, Florida. A Technical Evaluation and Preliminary Determination was issued, and the facility was required to do a public notice.

The new unit is a source of nitrogen oxides emissions which are controlled by timing retardation and turbocharger aftercoolers. Use of 0.05 percent diesel fuel insures that particulate and sulfur dioxide emissions will be minimized. Because of the short stacks on this unit as well as the other seven generators at the site, it was necessary for FKEC to take restrictions on their operations to avoid consumption of increment.

The project modification provides reasonable assurance that all the requirements of the permit and BACT determination will be complied with. I recommend your approval and signature.

DRAFT

Mr. Al A. Linero Dept. of Environmental Protection New Source Review Section Mail Station 5505 2600 Blairstone Rd. Tallahassee, FL 32399-2400

Re: Comment on NOx emission hourly requirement in Draft Permit No. 0870004-002-AC (PSD-FL-237)

25 August 1997

Dear Mr. Linero:

After discussions between my staff and Mr. David Knowles (DEP, Ft. Myers) and Mr. Syed Arif of your office, I am writing to comment on the Draft permit referenced above. Our vendor, Engine Systems, Inc., has expressed concern that Florida Keys Electric Cooperative Association, Inc.'s (FKEC) new diesel unit No. 008 (EMD 20-710G4B) might not meet the proposed hourly NOx emission requirement of 62 lb/hr as specified in the draft permit (Emission Limitation B.1, in Section III. page 5 of 8). This specific condition limitation is also referenced on pages BD-1 and BD-5. The 62 lb/hr NOx emission rate is a theoretical value based on EPA emission factors and fuel consumption combined with proposed emissions reduction Best Available Control Technology.

FKEC requests that the NOx hourly emission limitation be increased to 71.0 lb/hr in the final permit. Our vendor is confident that FKEC's unit No. 008 will meet that requirement. Please call if any further action is required on our part. Thank you for your assistance.

Sincerely,

Charles A. Russell General Manager and Chief Executive Officer

pc:

S. Arif, DEP

T. Planer, FKEC

D. Shaw, FKEC



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

August 15, 1997

Mr. Clair Fancy, Bureau Chief Bureau of Air Regulation 2600 Blair Stone Road, Mail Station #5505 Tallahassee FL 32399 2400

Re: Proof of Public Notice of Intent to Issue

Air Construction Permit

The Miami Herald, advertised August 13, 1997

Dear Mr. Clair:

In her absence, Deborah Shaw asked that I send the publication as listed above to DEP. This is a follow-up to a copy that was faxed to you on 8/14/97.

Enclosed is a copy of the announcement and a copy that shows the information on the Notary's stamp.

Please advise Ms. Shaw or me if you require any additional information.

Sincerely,

Director of Administration and Assistant to General Manager

JA/lil

CC: S. ary, BAC SD Branch SD EPA

ia97017.wpd

RECEIVED

AUG 18 1997

BUREAU OF AIR REGULATION



PUBLISHED DAILY MIAMI-DADE-FLORIDA

STATE OF FLORIDA COUNTY OF DADE

The Miami Herald Publishing Company

Before the undersigned authority personally appeared:

ROSEMARY PINO

who on oath says that he/she is"

CUSTODIAN OF RECORDS

of The Miami Herald, a daily newspaper published at Miami in Dade County, Florida; that the attached copy of advertisement was published in said newspaper in the issues of:

AUGUST 13, 1997

Affiant further says that the said The Miami Herald is a newspaper published at Miami, in the said Dade County, Florida and that the said newspaper has heretofore been continuously published in said Dade County, Florida each day and has been entered as second class mail matter at the post office in Miami, in said Dade 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 newspapers(s).

Sworn to and subscribed before me this

13TH DAY OF AUGUST

_, 1997

My Commission

Expires: October 17, 1997

on OFFICIAL NOTARY SEAL
VIRGINIA | GALLON
October 17, 1997 NOTARY PUBLIC STATE OF FLORIDA

COMMISSION NO. CC323842

MY COMMISSION EXP. OCT. 17,1997

Notar

Virginia J. Gallon

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DRAFT Permit No. 0870004-002-AC, (PSD-FL-237)

PUBLIC NOTICE OF INTENT TO ISSUE

AIR CONSTRUCTION PERMIT

PUBLISHED DAILY MIAMI-DADE-FLORIDA



The Miami Herald Publishing Company

STATE OF FLORIDA COUNTY OF DADE

Before the undersigned authority personally appeared:

ROSEMARY PINO

who on oath says that he/she is"

CUSTODIAN OF RECORDS

of The Miami Herald, a daily newspaper published at Miami in Dade County, Florida; that the attached copy of advertisement was published in said newspaper in the issues of:

AUGUST 13, 1997

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Sworn to and subscribed before me this

AUGUST 1997 13TH DAY OF

OFFICIAL NOTA

My Commission Expires:

VIRGINIA I GA

Notar

October 17, 1997 NOTARY PUBLIC STAT Virginia J. Gallon COMMISSION NO. Virginia J. Gallon MY COMMISSION EXE

all

One Herald Plaza, Miami, Florio

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAFT Permit No. 0870004-002-AC, (PSD-FL-237) **Marathon Generation Plant Monroe County**

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Florida Keys Electric Cooperative Association, Inc., for Unit 8 located at Marathon Generation Plant, 3421 Overseas Highway, Marathon, Morroe County, A Best Available Control. Technology (BACT) determination was required for nitrogen oxides (NOx), pursuant to Rule 62-212,400, F.A.C. and 40 CFR, 52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Keys Electric Cooperative Association, Inc., 91605 Overseas Highway, P.O. Box, 700377, Tavernier, Florida 33070-0377

This permit is for installation of a 3.58 megawatt diesel generator designated as Unit 8. The diesel generator will burn No. 2 fuel oil with a sulfur content of 0.05 percent or less, by weight. Controls for NOx emissions consist of timing retardation and turbocharger aftercoolers. The diesel generator is allowed to operate continuously with the fuel oil usage limited to 2.015 million gallons per year. Additionally, enforceable conditions are included on Units 1-7 to limit the hours of operation and fuel usage thus insuring that there will be no predicted violations of any ambient air quality standards or PSD increments.

An air quality impact analysis was conducted. Emissions from the facility williconsume PSD increment but will not significantly contribute to or cause a violation of any state or federal ambient air quality standards. The maximum predicted PSD Class II annual nitrogen dioxide (NO2) increment consumed by all sources in the area, including this project, will be as follows:

PSD Class II Increment Consumed (ug/m^a (ug/m^a 18.8 25

Allowable Increment

Percent Increment Consumed 75

The project has no significant impact on the Everglades National Park PSO-Class I area.

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit unless a response received in accordance with the following procedures results in a different decision or significant change of terms o

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

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

set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition, for an administrative heading in accordance with Sections 120.569 and 120.57 FS. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 850/487-4938. Petitions must be filed within fourteen days of publication of the public notice of within fourteen days of receipt of this notice of intent, whichever occurs first. Are petitioner must mall a copy of the petition to the applicant at, the address indicated above, at the time of filling. 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 (heading) under Section 120.569 and 120.57 FS., 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 filling of a motion in compliance with Rule 28-5:207 of the Florida Administrative Code.

A petition must contain the following information: (a) The name address and

the filing of a motion in compliance with Rule 28-5-207 of the Florida Administrative Code.

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

Because the administrative hearing process is designed to formulate final action may be different from the position taken by it in this notice of intent. Persons whose substantial interests will be affected by any sock final accision of the proceeding, in accordance with the requirements set torth above.

proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection/during normal usiness hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at: and romer with

Department of Environmental Protection South District
11 8. Magnolla Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/488-1344
Fax: 850/922-6979

Department of Environmental Protections
South District
2295 Victoria Avenue, Suite 354
Fort Myers; Florida 33901
Telephone: (841) 332-6975
Fax: 941/332-6989

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Orive, Suite 4, Tallahassee, Florida 32301, or call 850/488-1344, for additional information.



Department of Environmental Protection

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

Virginia B. Wetherell Secretary

August 11, 1997

Deterah Shav 305-664-6501

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Deborah Shaw Environmental Affairs Coordinator 91605 Overseas Highway P.O. Box 700377 Tavernier, Florida 33070-0377

Re: DRAFT Permit No. 0870004-002-AC (PSD-FL-237)
Marathon Generation Plant

Dear Ms. Shaw:

Enclosed is one copy of the Draft Air Construction Permit for the Marathon Generation Plant's Unit 8 located at 3421 Overseas Highway, Marathon, Monroe County. The Technical Evaluation and Preliminary Determination, Best Available Control Technology, the Department's Intent to Issue Air Construction Permit and the "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT" must be published within 30 (thirty) days of receipt of this letter. Proof of publication, i.e., 'newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may gesult in the denial of the permit.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please contact Syed Arif or Mr. Linero at 850/488-1344.

Sincerely,

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

CHF/sa

Enclosures

In the Matter of an Application for Permit by:

Florida Keys Electric Cooperative Association, Inc. 91605 Overseas Highway P.O. Box 700377
Tavernier, Florida 33070-0377

DRAFT Permit No. 0870004-002-AC PSD-FL-237
Marathon Generation Plant Unit 8
Monroe County

INTENT TO ISSUE AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of DRAFT Permit attached) for the proposed project, detailed in the application specified above and the attached Technical Evaluation and Preliminary Determination, for the reasons stated below.

The applicant, Florida Keys Electric Cooperative Association, Inc., applied on January 27, 1997 to the Department for an air construction permit to install a 3.58 megawatt diesel generator (Unit 8) at its Marathon Generation Plant located at 3421 Overseas Highway, Marathon, Monroe County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that a review for the Prevention of Significant Deterioration (PSD), a determination of Best Available Control Technology (BACT) and an air construction permit are required to construct the new diesel generator.

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

Pursuant to Section 403.815, F.S., and Rule 62-103.150, F.A.C.; you (the applicant) are required to publish at your own expense the enclosed "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT". The notice shall be published one time only within 30 (thirty) days in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be "affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-1344; Fax 850/922-6979) within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit pursuant to Rule 62-103.150 (6), F.A.C.

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

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

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9730, fax: 850/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

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

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

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

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

Draft Permit No. 0870004-002-AC, (PSD-FL-237) Page 3 of 3

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AIR CONSTRUCTION PERMIT (including the PUBLIC NOTICE, Technical Evaluation and Preliminary Determination, Draft BACT Determination, and the DRAFT permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 8-11-97 to the person(s) listed:

Ms. Deborah A. Shaw, FKEC *

Mr. Brian Beals, EPA

Mr. John Bunyak, NPS

Mr. David Knowles, DEP

Clerk Stamp

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

Clerk

(Date)

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAFT Permit No. 0870004-002-AC, (PSD-FL-237)
Marathon Generation Plant
Monroe County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Florida Keys Electric Cooperative Association, Inc., for Unit 8 located at Marathon Generation Plant, 3421 Overseas Highway, Marathon, Monroe County. A Best Available Control Technology (BACT) determination was required for nitrogen oxides (NOx), pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Keys Electric Cooperative Association, Inc., 91605 Overseas Highway, P.O. Box 700377, Tavernier, Florida 33070-0377.

This permit is for installation of a 3.58 megawatt diesel generator designated as Unit 8. The diesel generator will burn No. 2 fuel oil with a sulfur content of 0.05 percent or less, by weight. Controls for NOx emissions consist of timing retardation and turbocharger aftercoolers. The diesel generator is allowed to operate continuously with the fuel oil usage limited to 2.015 million gallons per year. Additionally, enforceable conditions are included on Units 1-7 to limit the hours of operation and fuel usage thus insuring that there will be no predicted violations of any ambient air quality standards or PSD increments.

An air quality impact analysis was conducted. Emissions from the facility will consume PSD increment but will not significantly contribute to or cause a violation of any state or federal ambient air quality standards. The maximum predicted PSD Class II annual nitrogen dioxide (NO2) increment consumed by all sources in the area, including this project, will be as follows:

PSD Class II Increment	Allowable Increment	Percent Increment
<u>Consumed (μg/m³)</u>	$(\mu \mathbf{g}/\mathbf{m}^{\frac{3}{2}})$	Consumed
18.8	25	75

The project has no significant impact on the Everglades National Park PSD Class I area.

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

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

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 850/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

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

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

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection Bureau of Air Regulation 111 S. Magnolia Drive, Suite 4 Tallahassee, Florida 32301 Telephone: 850/488-1344

Fax: 850/922-6979

Department of Environmental Protection South District 2295 Victoria Avenue, Suite 364 Fort Myers, Florida 33901 Telephone: (941) 332-6975

Fax: 941/332-6969

The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-1344, for additional information.

P 265 659 250

Receipt for Certified Mail

US Postal Service

compiéted on

Is your RETURN ADDRESS

6. Signature: (Addressee or Agent)

PS Form 3811, December 1994

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8 PSD-F1-237	1
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	
card to you. Attach this form to the front of the mailpiece, or on the back if space	e does not 1. Addressee's Address
permit. Write "Return Receipt Requested" on the mailpiece below the article	e number. 2. A Restricted Delivery
■The Return Receipt will show to whom the article was delivered and delivered.	Consult postmaster for fee.
3. Article Addressed to: Duborah Shaw EAC	e does not e number. d the date 2. Restricted Delivery Consult postmaster for fee. 4a. Article Number 4b. Service Type Registered Express Mail Return Receipt for Merchandise COD 7. Date of Delivery 8. Addressee's Address (Only if requested and fee is paid)
911,05 Overseas Hwy	4b. Service Type
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Fla. Keys 33070-0377	nok
5. Received By: (Print Name)	8. Addressee's Address (Only if requested 😤
	and fee is paid)

Domestic Return Receipt



PERMITTEE:

Florida Keys Electric Cooperative Association, Inc.

91605 Overseas Highway Tavernier, Florida 33070

Authorized Representative:

Charles A. Russell

Chief Executive Officer General Manager

FID No. 0870004 PSD No. PSD-FL-237

SIC No.

4911 Project: Unit 8

Permit No.

0870004-002-AC

Expires: January 31, 1999

PROJECT AND LOCATION:

Permit for the construction of a 3.58 megawatt diesel electric generator at the Marathon Generation Power Plant, 3421 Overseas Highway, Marathon. UTM coordinates are Zone 17; 490.7 km E; 2732.7 km N.

STATEMENT OF BASIS:

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297. The above named permittee is authorized to modify the facility in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

Attached appendices are made a part of this permit:

Appendix BD

Appendix GC

Appendix CSC

BACT Determination

Construction Permit General Conditions

Emission Unit(s) Common Specific Conditions

Howard L. Rhodes, Director Division of Air Resources Management

SECTION I. FACILITY INFORMATION

SUBSECTION A. FACILITY DESCRIPTION

The Florida Keys Electric Cooperative Association (FKEC) Marathon Generating Plant presently consists of two nominal 2.0 Megawatt (MW) diesel generators designated as Units 1 and 2, three nominal 3.0 MW diesel generators (Units 3, 4 and 5), and two 2.5 MW diesel generators (Units 6 & 7). This permit is to construct a 3.58 MW diesel generator designated as Unit 8 and to limit the potential-to-emit of the other units.

SUBSECTION B. REGULATORY CLASSIFICATION

The Marathon Generation Power Plant is classified as a Major Source of Air Pollution or Title V Source because it emits or has the potential to emit at least 100 tons per year of nitrogen oxides (NO_X) and carbon monoxide (CO). It is also a Major Facility with respect to preconstruction review because it emits or has the potential to emit at least 250 tons per year of NO_X and CO.

SUBSECTION C. PERMIT SCHEDULE:

- 01-27-97: Date of Receipt of Application
- 02-13-97: Department's Preliminary Incompleteness Letter
- 07-10-97: Company's Response to Department's letter
- 07-10-97: Application deemed complete

SUBSECTION D. RELEVANT DOCUMENTS:

The documents listed below are the basis of the permit. They are specifically related to this permitting action. These documents are on file with the Department.

- 1. Application received 1/27/97.
- 2. Department's letter dated 2/13/97.
- 3. Company letter dated 7/10/97.

AIR CONSTRUCTION PERMIT 0870004-002-AC AND

SECTION II. EMISSION UNIT(S) GENERAL REQUIREMENTS

SUBSECTION A. ADMINISTRATIVE

- A.1 Regulating Agencies: All documents related to applications for permits to operate, reports, tests, minor modifications and notifications shall be submitted to the Department of Environmental Protection, South District Office located at 2295 Victoria Avenue, Suite 364, Ft. Myers, Florida 33901, and phone number (941) 332-6975. All applications for permits to construct or modify an emission unit(s) *subject to the Prevention of Significant Deterioration (PSD)* should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (FDEP) located at 2600 Blairstone Road, Tallahassee, Florida 32399-2400 and phone number (850)488-1344.
- A.2 <u>General Conditions</u>: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in *Appendix GC* of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
- A.3 <u>Emission Unit(s) Common Specific Conditions</u>: The owner and operator is subject to and shall operate under the attached Emission Unit(s) Common Specific Conditions listed in *Appendix CSC* of this permit. The Emission Unit(s) Common Specific Conditions are binding and enforceable pursuant to Chapters 62-204 through 62-297 of the Florida Administrative Code.
- A.4 <u>Terminology</u>: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
- A.5 <u>Forms and Application Procedures</u>: The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. [Rule 62-210.900, F.A.C.]
- A.6 Expiration: This air construction permit shall expire on January 31, 1999. [Rule 62-210.300(1), F.A.C.]. The permittee may, for good cause, request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. However, the permittee shall promptly notify the permitting authority office of any delays in completion of the project which would affect the startup day by more than 90 days. [Rule 62-4.090, F.A.C]
- A.7 <u>Applicable Regulations</u>: The facility is subject to the following regulations: Florida Administrative Code Chapters 62-4; 62-103; 62-204; 62-210; 62-212, 62-296, and 62-297. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

Subsection A. Common Conditions: 40 CFR 60 SUBPART A, General Provisions

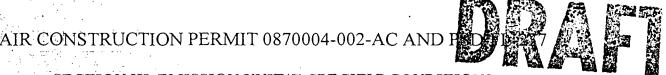
EMISSION UNITS

This permit addresses the following emission units.

EMISSIONS		
Unit No.	System	Emissions Units Description
001#	Power	2.0 MW Diesel Electric Generator
002#	Power	2.0 MW Diesel Electric Generator
003#	Power	3.0 MW Diesel Electric Generator
004#	Power	3.0 MW Diesel Electric Generator
005#	Power	3.0 MW Diesel Electric Generator
006#	Power	2.5 MW Diesel Electric Generator
007#	Power	2.5 MW Diesel Electric Generator
008*	Power	3.58 MW Diesel Electric Generator

- # Existing Emission units
- * New Emission unit

BEST AVAILABLE COPY



SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

SUBSECTION B. SPECIFIC CONDITIONS:

The following Specific Conditions apply to the following emission unit:

EMISSION		
Unit No.	System	Emission Unit Description
008	Power	3.58 MW Diesel Electric Generator

EMISSION LIMITATIONS

- B.1 The maximum allowable emission rates for NO_X for Unit No. 008 shall not exceed 62 pounds per hour (lb/hr) and 271 tons per year (TPY) pursuant to the Best Available Control Technology (BACT) Determination. [Rule 62-212.410, F.A.C.]
- B.2 Visible emissions shall not exceed 20% opacity. [Rule 62-296.310, F.A.C.]
- B.3 In order to minimize excess emissions during startup/shutdown/malfunction this emission unit shall adhere to best operational practices. [Rule 62-210.700, F.A.C.]

OPERATIONAL LIMITATIONS

- B.4 The emission unit is allowed to operate continuously (8760 hours/year) [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].
- B.5 Only No. 2 fuel oil can be fired in the diesel generator. The maximum sulfur content of the No. 2 fuel oil shall not exceed 0.05 percent, by weight. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].
- B.6 The maximum heat input rate to Unit No. 008 shall not exceed 30.2 million Btu per hour (MMBtu/hr) [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit].
- B.7 The maximum No. 2 fuel oil consumption allowed to be burned in Unit No. 008 is 2,015,000 gallons per year, which is equivalent to 8760 hours per year of operation at full load. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]

TEST METHODS AND PROCEDURES

B.8 Compliance with the allowable emission limiting standards for NO_X in B.1 shall be determined by using EPA Reference Method 7E (or equivalent) as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. An annual compliance test shall be performed on the unit if operated for more than 400 hours in the preceding 12-month period. [Rule 62-297.310, F.A.C.]

AIR CONSTRUCTION PERMIT 0870004-002-AC AND PSD-FI

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

- B.9 An initial compliance test shall be conducted for CO emissions using EPA Reference Method 10 as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. If the test indicates emissions to be less than 23 lb/hr, then no further testing will be required. If CO emissions exceed 23 lb/hr, the permittee will have to submit a BACT determination for CO. [Rules 62-297.310, F.A.C.]
- B.10 The fuel shall be monitored initially and annually for the sulfur content using ASTM D4294 Method (or equivalent). [Rule 62-297.440, F.A.C.]
- B.11 The permittee shall maintain daily records of fuel oil consumption for the emission unit. [Rule 62-210.200, F.A.C.]
- B.12 Compliance with the visible emission standard shall be demonstrated with EPA Reference Method 9 as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in Rule 62-204.800, F.A.C. [Rule 62-297.401, F.A.C.]

RECORDKEEPING AND REPORTING REQUIREMENTS

- B.13 All measurements, records, and other data required to be maintained by this facility shall be retained for at least five (5) years following the data on which such measurements, records, or data are recorded.

 These data shall be made available to the Department upon request. [Rule 62-4.070(3), F.A.C.]
- B.14 Two copies of the results of the emission tests for the pollutant listed in Condition B.1 for Unit No. 8 shall be submitted within forty-five days of the last sampling run to the South District office in Ft. Myers. All reports shall be in a format consistent with and shall include the information in accordance with Rule 62-297.310 (8), F.A.C. [Rule 62-297.310(8), F.A.C.]



SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

SUBSECTION C. SPECIFIC CONDITIONS

The following Specific Conditions apply to the following emission units:

Emissions		
Unit No.	System	EMISSIONS UNITS DESCRIPTION
001	Power	2.0 MW Diesel Electric Generator
002	Power	2.0 MW Diesel Electric Generator
003	Power	3.0 MW Diesel Electric Generator
004	Power	3.0 MW Diesel Electric Generator
005	Power	3.0 MW Diesel Electric Generator
006	Power	2.5 MW Diesel Electric Generator
007	Power	2.5 MW Diesel Electric Generator

EMISSION LIMITATIONS

- C.1 Visible emissions shall not exceed 20% opacity. [Rule 62-296.310, F.A.C.]
- C.2 In order to minimize excess emissions during startup/shutdown/malfunction this emission unit shall adhere to best operational practices. [Rule 62-210.700, F.A.C.]

OPERATIONAL LIMITATIONS

- C.3 The combined maximum heat input to Units No. 001-007 shall not exceed 187 MMBtu/hr while firing No. 2 fuel oil. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]
- C.4 The existing Units No. 001-007 operations shall be limited to either 4380 hours per year per unit or to a total fuel oil consumption of 6,200,000 gallons per year for all seven units, whichever limit is more restrictive. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]
- C.5 No. 2 fuel oil can be fired in the diesel generators 001-007. The maximum sulfur content of the No. 2 fuel oil shall not exceed 0.50 percent, by weight. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit]

TEST METHODS AND COMPLIANCE PROCEDURES

- C.6 The No. 2 fuel oil shall be monitored initially and annually for the sulfur content using ASTM D4294 Method (or equivalent). [Rule 62-297.440, F.A.C.]
- C.7 The permittee shall maintain daily records of fuel oil consumption for the emission units. [Rule 62-210.200, F.A.C., Definitions: Potential-to-Emit.]

Florida Keys Electric Cooperative Association, Inc. Marathon, FL

Marathon Generation Power Plant Facility ID No. 0870004

AIR CONSTRUCTION PERMIT 0870004-002-AC AND PSD-FL-237

SECTION III. EMISSION UNIT(S) SPECIFIC CONDITIONS

C.8 Compliance with the visible emission standard shall be demonstrated with EPA Reference Method 9 as described in 40 CFR 60, Appendix A (1996, version) adopted by reference in 62-204.800, F.A.C. [Rule 62-297.310, F.A.C.]



Technical Evaluation and Preliminary Determination

Florida Keys Electric Cooperative Association, Inc.-FKEC Monroe County, Florida

DIESEL GENERATOR (3.58 megawatts)

Construction Permit No. 087004-002-AC PSD-FL-237

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

I. GENERAL INFORMATION

A. Name and address of applicant

Florida Keys Electric Cooperative Association, Inc.-FKEC 91605 Overseas Highway P.O. Box 700377 Tavernier, Florida 33070-0377

B. Reviewing and Process Schedule

Date of Receipt of Application: January 27, 1997

Request for additional information: February 13, 1997

Application Completeness Date: July 10, 1997

C. Facility Location

This facility is located at Marathon Generation Plant, 3421 Overseas Highway, Marathon, Monroe County, Florida. The UTM coordinates are Zone 17, 490.7 km east and 2732.7 km north.

Facility Identification Code (SIC)

Major Group No. 49 - Electric, Gas and Sanitary Services.

Industry Group No. 491 - Combination Electric, Gas and Other Utility Services.

Industry Group No. 4911 - Electric and Other Services Combined.

D. Project Description

The Florida Keys Electric Cooperative Association (FKEC) is proposing to install a Electro-Motive Diesel (EMD) generator. The EMD generator which will be noted as Unit 8 has a nominal base load rating of 3.58 megawatt (MW) at 32°C and 718 mm Hg. The Unit 8 generator will be fired primarily on No. 2 low sulfur fuel oil (0.05%, by weight, sulfur). Fuel oil combustion shall be limited to 2.015 million gallons per year for the generator (which corresponds to 8760 hours of full-load operation per year limit).

The Marathon Generation Plant currently consists of seven (7) diesel engines generators used for peaking power. Units 1 & 2 are 2.0 MW each, and Units 6 & 7 are 2.5 MW each. Low sulfur (0.5% or less, by weight) No. 2 oil is used as fuel for these units. Units 3, 4 and 5 have a rated capacity of 3.0 MW each utilizing 0.5% or less, by weight No. 2 low sulfur fuel oil. Total capacity of the facility with eight (8) units will be 21.5 MW.

E. Project Emissions

The proposed project, a 3.58 MW diesel generator, will produce maximum emissions of 271 tons per year (TPY) of nitrogen oxides (NO_X); 7 TPY of sulfur dioxide (SO₂); <100 TPY of carbon monoxide (CO); 9.1/7.9 TPY of particulate matter (PM/PM₁₀) respectively, based on an annual consumption of 2.015 million gallons of No. 2 fuel oil and 100% capacity factor or 8760 hours of operation for the EMD Diesel Generator. The No. 2 fuel oil will be limited to maximum of 0.05% sulfur content, by weight. The actual emissions for the proposed project

will be much less than the numbers represented above based on FKEC's historical and projected actual operating hours of 500 or less for the other units.

II. RULE APPLICABILITY

The proposed project, installation of a 3.58 MW diesel generator (SIC 4911), in Monroe County, is subject to preconstruction review under the provisions of Chapter 403, Florida Statutes, Chapters 62-212 and 62-4, Florida Administrative Code (F.A.C.), and 40 CFR 60 (July 1, 1996 version).

This facility is located in an area designated attainment for all criteria pollutants in accordance with F.A.C. Rule 62-275.400.

The proposed project was reviewed under Rule 62-212.400(5), F.A.C., New Source Review (NSR) for Prevention of Significant Deterioration (PSD), because it will be a major stationary source. This review consisted of a determination of Best Available Control Technology (BACT) and an analysis of the air quality impact of the increased emissions. The review also includes an analysis of the project's impacts on soils, vegetation and visibility, along with air quality impacts resulting from associated commercial, residential and industrial growth.

The emission units affected by this PSD permit shall comply with all applicable provisions of the Florida Administrative Code and, specifically, the following Chapters and Rules:

Chapter 62-4	Permits.
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.260	Prevention of Significant Deterioration Increments
Rule 62-204.360	Designation of Prevention of Significant Deterioration Areas
Rule 62-204.800	Federal Regulations Adopted By Reference
Rule 62-210.200	Definitions
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Preconstruction Review Requirements
Rule 62-212.400	Prevention of Significant Deterioration
Rule 62-212.410	Best Available Control Technology (BACT)
Rule 62-213	Operation Permits for Major Sources of Air Pollution
Rule 62-296.320	General Pollutant Emission Limiting Standards
Rule 62-297.310	General Test Requirements
Rule 62-297.401	Compliance Test Methods

III. TECHNICAL EVALUATION

The applicant proposes to install a diesel generator with a rated capacity of 3.58 MW at their existing facility which consists of seven additional diesel generators. This facility is a stand-by Electric Generating Plant which generates power only during emergencies or during Peak Power Demand periods when Florida Power and Light (FP&L) cannot provide sufficient power to supply FKEC's customers.

FKEC supplies electric power to the Middle and Upper Florida Keys. FKEC buys its electricity from FP&L to distribute to Florida Keys consumers. The Marathon Generation Plant is maintained in a standby generating capacity, ready to generate power in the event that FP&L cannot supply power to the Keys. FKEC has a contractual agreement with FP&L to have available at all times, and to provide if required by FP&L, capacity and energy from FKEC Resources. PSD is triggered due to the existing Marathon Generation Plant being a major facility, and the emissions of NO_x exceed their respective significance levels.

The diesel generator is a General Motors model 20-710G4B with a nominal base load rating of 3.58 MW at 32°C and 718 mm Hg. The existing units at Marathon Generation Plant consists of two nominal 2.0 MW units, two nominal 2.5 MW units and three nominal 3.0 MW diesel electric generating units, fuel storage tanks, and other electrical generating support equipment.

The primary fuel to the diesel generator will be No. 2 fuel oil, with a maximum sulfur content of 0.05%, by weight. There will be a fuel oil consumption limit of 2.015 million gallons per year. The emissions of NO_X represents a significant proportion of the total emissions generated by this project. The facility is subject to PSD and BACT for NO_X emissions because the proposed increase in annual NO_X emissions exceeds the significant emission rate. The BACT for NO_X , as determined by the Department, will be met by using fuel injection timing retardation and cooling of combustion air. Compliance with the NO_X emission standards will be determined by stack tests

CO emissions from the diesel engine if operated continuously with no emissions reductions, are estimated to be about 111 tpy, just over the PSD significance limit of 100 tpy. The least restrictive emissions reduction technology which will be used on this diesel engine would reduce CO emissions to a level below the PSD limit, therefore, CO will not be subjected to a BACT analysis. Compliance tests for determining CO emissions will be done initially and at permit renewal times to show non-PSD status for CO.

Particulate matter (PM/PM₁₀) emissions from the diesel engine will be below the PSD significance levels, and, therefore will not be subjected to a BACT analysis.

SO₂ emissions will be controlled by the use of low sulfur fuel. The No. 2 fuel oil will be limited to a maximum of 2.015 million gal/yr, and to a maximum sulfur content of 0.05%, by weight. The proposed facility is not subject to PSD and BACT for SO₂ emissions, because the proposed increase in annual SO₂ emissions does not exceed the significant emission rate.

The following table summarizes the potential and expected emissions of air pollutants in tpy:

Pollutant	PSD Significance	Uncontrolled	Controlled	Expected
	Levels ¹	Emissions ²	Emissions	Emissions ³
NO_X	40	423	271	24.2
СО	100	111	<100	6.4
PM	25	9.5	9.1	0.6
PM ₁₀	15	7.9		0.5
SO_2	40	7.2		0.5

Florida Administrative Code 212.400-2.

Based on operating at 100% capacity for 8760 hr/yr.

Based on FKEC's historical and projected actual operating hours of 500 or less.

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IV. AIR QUALITY IMPACT ANALYSIS

A. Introduction

The proposed project will increase NO_x emissions at a level in excess of PSD significant amounts. The air quality impact analyses required by the PSD regulations for this pollutant include:

- * An analysis of existing air quality;
- A significant impact analysis;
- * A PSD increment analysis;
- * An Ambient Air Quality Standards (AAQS) analysis, and
- * An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts.

The analysis of existing air quality generally relies on preconstruction monitoring data collected with EPA-approved methods. The significant impact, PSD increment, and AAQS analyses depend on air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on the required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A discussion of the required analyses follows.

B Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review unless otherwise exempted or satisfied. This monitoring requirement may be satisfied by using previously existing representative monitoring data, if available. An exemption to the monitoring requirement may be obtained if either of the following conditions is met: the maximum predicted air quality impact resulting from the projected emissions increase, as determined by air quality modeling, is less than a pollutant-specific deminimus concentration, or the existing ambient concentrations are less than a pollutant-specific deminimus concentration.

Annual NO₂ impacts from the project are predicted to be 18.8 ug/m^3 , which is greater than the de minimus level of 14 ug/m^3 . Although there are no NO₂ monitors located near this facility, there is an NO₂ monitor located on Virginia Key in Dade County about 150 km northeast of the facility. This monitor had a measured annual average NO₂ concentration of 13 ug/m^3 in 1996. Since this monitor would be effected by the highly populated Miami-Dade County metropolitan area with its large number of motor vehicles and industrial and utility boilers, this measured concentration, which is less than the NO₂ de minimus level, represents a very conservative

estimate of the maximum existing ambient concentration of NO₂ to be found in the vicinity of this facility.

Therefore, results from this monitor can be used to exempt FKEC from the preconstruction monitoring requirement.

C. Models and Meteorological Data Used in Significant Impact, PSD Increment and AAQS Analyses

The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project and other existing major facilities. The model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options in each modeling scenario. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfy the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Key West, Florida (surface data) and West Palm Beach, Florida (upper air data). The 5-year period of meteorological data was from 1987 through 1991. These NWS stations were selected for use in the study because they are the closest primary weather stations to the study area and are most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling. For this project, since only the impacts of NO_X emissions are being evaluated and since the NO₂ standards and increments are based on annual averages, the highest predicted annual averages were compared with the significant impact level, the AAQS and the PSD increments.

D. Significant Impact Analysis

Initially, the applicant conducted modeling to determine whether the proposed project's NOx emissions were predicted to have a significant impact in the vicinity of the facility or in the Class I area. The applicant placed a total of 324 receptors along the site boundary and within I km of the facility, which is located in a PSD Class II area. The Department did further significant impact modeling with an additional 216 receptors placed out to 10 km from the facility. A total of seven receptors were placed along the southern boundary of the Everglades National Park (ENP). ENP is a PSD Class I area which is located approximately 30 km from the project at its closest point. The tables below show the results of this modeling. The radius of significant impact is also shown in the first table below.

Maximum Project Air Quality Impacts for Comparison to the PSD Class II Significant Impact Levels in the Vicinity of the Facility

	OD CIASS II DIE	, IXIII CUIII IIII PUCI	MOTOIS IN TIME	remarkly or the I a	CARLLY
Pollutant	Averaging Time	Maximum Predicted Impact (ug/m³)	Significant Impact Level (ug/m³)	Significant Impact?	Radius of Significant Impact (km)
NO ₂	Annual	18.8	1	YES	5

Maximum Project Air Quality Impacts in the ENP for Comparison to the PSD Class I Significant Impact Level

Pollutant	Averaging Time	Maximum Predicted Impact (ug/m³)	Significant Impact?	Significant Impact Level (ug/m³)
NO ₂	Annual	0.04	NO "	0.1

As shown in the tables the maximum predicted air quality impacts due to NO_X emissions from the proposed project are greater than the PSD Class II significant impact level in the vicinity of the facility. Therefore, the applicant was required to do further NO₂ modeling in the vicinity of the facility, within the applicable significant impact area, to determine the impacts of the project along with all other sources in the vicinity of the facility. The significant impact area is based upon the predicted radius of significant impact.. Full impact modeling is modeling that considers not only the impact of the project but the impacts of the existing facility and other major sources, including background concentrations, located within the vicinity of the project.

E. Procedure For Performing PSD Class II Increment And AAQS Analyses

For the PSD Class II and AAQS analyses, receptor grids normally are based on the size of the significant impact area for each pollutant. The size of the significant impact areas for the required NO₂ analyses were based on a 5 km radius of significant impact. However, the receptor grids used in AAQS and PSD Class II analyses were the same and were as extensive (receptors out to 10 km) as those used in the analysis to determine the extent of significant impact. Preliminary PSD Class II increment and AAQS modeling runs with FKEC Unit 8 and existing Units 1 through 7 operating continuously throughout the year showed predicted violations of both the Class II increment and the AAQS. Refined modeling runs were done with FKEC Unit 8 operating continuously and Units 1 through 7 operating only 50 percent of the time. These runs showed there would be no predicted violations of the PSD Class II increment and the AAQS if FKEC accepted a permit condition limiting operation of Units 1 through 7 to only 50 percent of the year or less. The applicant agreed to this condition. The results of these analyses are shown below.

E.1 PSD Increment Analysis

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant. The results of the required PSD Class II increment analysis presented in the table below show that all of the maximum predicted impacts are less than the allowable Class II increments.

PSD Class II Increment Analysis

Pollutant	Averaging Time	Maximum Predicted Impact (ug/m³)	Impact Greater Than Allowable Increment?	Allowable Increment (ug/m³)
NO ₂	Annual	18.8	NO	25

E.2 AAQS Analysis

The results of the AAQS analysis are summarized in the table below. As shown in this table, emissions from the proposed facility are not expected to cause or significantly contribute to a violation of any AAQS.

Ambient Air Quality Impacts

Pollutant	Averaging Time	Maximum Predicted Impact (ug/m³)	Predicted Impact Greater Than AAQS?	AAQS (ug/m³)
NO ₂	Annual	96	NO	100

F. Additional Impacts Analysis

F.1 Impacts On Soils, Vegetation, Wildlife, and Visibility

The maximum ground-level concentrations predicted to occur due to NO_X emissions as a result of the proposed project, including all other nearby sources, will be below the associated AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils and vegetation in the PSD Class II area. An air quality related values (AQRV) analysis was done by the applicant for the Class I area. No significant impacts on this area are expected. A visibility analysis was done by the Department for the Class I area. This analysis showed no significant impact on visibility in this area.

F.2 Growth-Related Air Quality Impacts

There will be no growth associated with this project since this facility is a stand-by facility and only generates power during emergencies or during peak power demand periods when the mainland-based FP&L cannot provide sufficient power to supply FKEC's customers.

V. CONCLUSION

Based on the foregoing technical evaluation of the application and additional information submitted by FKEC, the Department has made a preliminary determination that the proposed project will comply with all applicable state air pollution regulations provided the Department's Best Available Control Technology Determination is implemented and certain conditions are met. The General and Specific Conditions are listed in the attached draft conditions of approval

Permit Engineer:

Sved Arif

Meteorologist:

Cleve Holladay

Reviewed and Approved by A. A Linero, P.E. Administrator, New Source Review Section

APPENDIX BD BEST AVAILABLE CONTROL TECHNOLOGY DETERMINA

Marathon Generation Plant Unit No. 8
Florida Keys Electric Cooperative Association
PSD-FL-237 and 0870004-002-AC
Marathon, Monroe County

The Florida Keys Electric Cooperative Association (FKEC) plans to install a new Diesel Engine Generator at its existing Marathon Generation Plant (MGP) in Marathon, Monroe County. The unit is a General Motors Electro-Motive Diesel generator model 20-710G4B with a nominal base load rating of 3.58 megawatts (MW) at 32°C and 718 mm Hg. The facility currently consists of seven (7) diesel engine generators used for peaking power. Units 1 & 2 are each rated at 2.0 MW. Units 3, 4 and 5 are each rated at 3.0 MW, and Units 6 & 7 are 2.5 MW each. The existing Units 1-7 are allowed to burn No. 2 fuel oil with a sulfur content of 0.5 percent or less, by weight. The new Unit 8 will be fired with No. 2 low sulfur fuel oil with a sulfur content not to exceed 0.05 percent, by weight, and a fuel oil consumption limit of 2.015 million gallons per year. The facility also has four fuel oil storage tanks and other electrical generating support equipment.

FKEC has indicated that the maximum annual air pollutant emission rates in tons per year for the Unit 8 diesel generator, based on consumption of 2.015 million gallons of No. 2 fuel oil, with a maximum sulfur content of 0.05 percent, by weight, will be:

Pollutant	PSD Significance	Uncontrolled	Controlled	Expected	Subject to
	Levels ¹	Emissions ²	Emissions ³	Emissions ⁴	PSD Review?
NO _x	40	423	271	24.2	Yes
СО	100	111	<100	6.4	No
PM	25	9.5	9.1	0.6	No
PM_{10}	15	7.9		0.5	No
SO ₂	40	7.2		0.5	No

Florida Administrative Code 212.400-2

Following is the BACT determination proposed by the applicant:

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	62 lbs/hr by timing retardation and aftercoolers

Based on firing No. 2 fuel oil (0.05% sulfur by weight) at a maximum of 2.015 million gals/yr at full load with no emission controls.

Based on firing No. 2 fuel oil (0.05% sulfur by weight) at a maximum of 2.015 million gals/yr at full load with emissions control of timing retardation.

⁴ Based on FKEC's historical and projected actual operating hours of 500 or less.

APPENDIX BD BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION BASE

Marathon Generation Power Plant is among the major facilities listed in Florida Admits trailive Corte (F.A.C.) Chapter 62-212, Prevention of Significant Deterioration (PSD), Table 62-212. 400-19 Major Facilities Categories." A BACT determination is required for each pollutant exceeding the significant emission rates in Table 62-212.400-2, "Regulated Air Pollutants Significant Emissions Rates," which in this case is nitrogen oxides (NO_x).

DATE OF RECEIPT OF A BACT APPLICATION:

January 27, 1997

REVIEW GROUP MEMBERS:

Syed Arif (Permit Engineer) and A. A. Linero (Administrator) New Source Review Section.

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- (a) Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 Standards of Performance for New Stationary Sources or 40 CFR Part 61 National Emission Standards for Hazardous Air Pollutants.
- (b) All scientific, engineering, and technical material and other information available to the Department.
- (c) The emission limiting standards or BACT determination of any other state.
- (d) The social and economic impact of the application of such technology.

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

APPENDIX BD BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

The air pollutant emissions from this facility can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as follows:

- o *Combustion Products* (e.g., SO₂, NO_X, PM). Controlled generally by good combustion of clean fuels, removal in add-on control equipment.
- o *Products of Incomplete Combustion* (e.g., CO, VOC). Control is largely achieved by proper combustion techniques.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "non-regulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., PM, SO₂, H₂SO₄, fluorides, etc.), if a reduction in "non-regulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

BACT POLLUTANT ANALYSIS

NITROGEN OXIDES (NO_x)

Oxides of nitrogen (NO_x) are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel (fuel NO_x) and by thermal fixation of nitrogen in the combustion air (thermal NO_x). As flame temperature increases, the amount of thermally generated NO_x increases. Fuel type affects the quantity and type of NO_x generated. Generally, natural gas is low in nitrogen. However it causes higher flame temperatures and generates more thermal NO_x than oil or coal, which have higher fuel nitrogen content, but exhibit lower flame temperatures.

NO_x emissions represent a significant portion of the total emissions generated by this project, and must be minimized using BACT.

A review of EPA BACT/LAER Clearinghouse (BACT Clearinghouse) information indicates that NO_x emissions at most facilities are minimized by process control and good combustion practices.

The applicant has proposed modification of the combustion process through a combination of fuel injection timing retardation and cooling of combustion air resulting in exhaust temperature reduction. The design specific to FKEC's 20-710G4B includes a 4° injection timing retardation and a 4-pass aftercooler circuit with the addition of a separately cooled aftercooler circuit. The combination of retarded injection timing and lowered combustion air temperature results in less NO_x formation. Vendors data indicate that retarding injection timing will reduce NO_x formation by about 20 percent, but will increase PM emissions by about 10 percent and fuel consumption by 1.5 percent. The 4-pass aftercooler will reduce both NO_x and

Florida Keys Electric Cooperative Association Inc. Marathon Generation Plant Unit No. 8 Air Permit No. 0870004-002-AC PSD-FL-237

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION BACT

PM emissions by about 10 percent while reducing fuel consumption by about 0.7 percent. The separately cooled aftercooling circuit will decrease both NO_x and PM by another 10 percent and fuel consumption by 0.5 percent. The net result will be a 40 percent reduction in NO_x, a 5 percent increase in PM and about 0.3 percent increase in fuel consumption. The use of low sulfur fuel oil will reduce PM emissions thus reducing or eliminating the increase in PM caused by NO_x controls. This combination of NO_x controls, proper engine design, good combustion practices, and the use of low sulfur fuel should provide effective emissions control.

BACT DETERMINATION BY DEP:

Based on the information provided by the applicant and the information searches conducted by the Department, lower emissions limits can be obtained employing the top-down BACT approach for NO_x.

NO_x DETERMINATION .

The top-down BACT approach for diesel fired internal combustion engines listed in order from most stringent control to least:

- 1. Selective Catalytic Reduction (SCR)
- 2. Combined technologies of injection timing retardation, turbocharger with aftercoolers
- 3. Good combustion design/practices

The following table summarizes the feasibility of using these control technologies with the EMD 20-710G4B as designed for installation in FKEC's Marathon Generation Plant.

Control	Emission	Technically	Cost Effective	Adverse	Adverse
Technology	Reduction (%)	Feasible		Environ. Impacts	Energy Impacts
SCR with ammonia	60-90	No	N/A	N/A	N/A
SCR with urea	80	No	N/A	N/Å	N/A
Timing retard; turbo charger w/aftercoolers	40	Yes	Yes	No	0.3%
Dry/Low NO _x	18	No	N/A	N/A	N/A

SCR is more widely used in Japan and Germany than it is in the United States and the technology is being improved such that some of the hazards and costs have been reduced. It remains, however, a very costly technology that has significant environmental hazards associated with the use and storage of ammonia. SCR is not generally used with diesel engines of this size. In addition, it is less effective with diesel engines because contaminants in diesel and lube oil (phosphorus) can render the catalyst inactive through coating the catalyst surface or contaminating it. The BACT/LAER database lists only a single facility which uses SCR on diesel engines. SCR was selected in that instance because a local ordinance mandated strict limits on emissions without regards to cost. SCR was not technically feasible for this diesel engine because the exhaust back pressure maximum allowance for the EMD 20-710G4B is 5 inches H₂O. An SCR system will

APPENDIX BD BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

add 5 to 6 inches H₂O back pressure, far exceeding the manufacturers specifications and recommendations. Even if the manufacturer would warrant a redesigned exhaust system, such a system would exceed the spatial limitations of the engine site.

For NO_x emissions, the Department accepts the applicants proposed use of injection timing retardation and cooling of combustion air as BACT for this project.

The BACT emission levels established by the Department are as follows:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides (NO _x)	62 lbs/hr (271 TPY)
Visible Emissions	20%

COMPLIANCE

Marathon Generation Plant Unit No. 8

Compliance with the visible emission limitations shall be in accordance with the EPA Reference Method 9 as contained in 40 CFR 60, Appendix A.

Compliance with the NO_x limitations shall be in accordance with the EPA Reference Method 7E as contained in 40 CFR 60, Appendix A.

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Syed Arif, Review Engineer,
A. A. Linero, Administrator, New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:	Approved By:	
C. H. Fancy, P.E., Chief	Howard L. Rhodes, Director	-
Bureau of Air Regulation	Division of Air Resources Managemer	nt
Date:	Date:	-
Florida Keys Electric Cooperative Association Inc.	Air Pern	nit No. 0870004-002-AC

PSD-FL-237

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

Subsection 1.0 Construction Requirements

Applicable Regulations: Unless otherwise indicated in this permit, the construction and operation of the subject emission unit(s) shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S and Florida Administrative Code Chapters 62-4, 62-103, 62-204, 62-210, 62-212, 62-213, 62-296, 62-297; and the applicable requirements of the Code of Federal Regulations Section 40, Part 60, adopted by reference in the Florida Administrative Code regulation [Rule 62-204.800, F.A.C.]. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements or regulations. [Rule 62-210.300, F.A.C.]

SUBSECTION 2.0 Emission Limiting Standards

- 2.1 <u>General Particulate Emission Limiting Standards</u>. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density if which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). [Rule 62-296-320(4)(b)1, F.A.C.]
- 2.2 <u>Unconfined Emissions of Particulate Matter</u> [Rule 62-296.320(4)(c), F.A.C.]
 - (a) The owner or operators shall not cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any source whatsoever, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrially related activities such as loading, unloading, storing or handling, without taking reasonable precautions to prevent such emission.
 - (b) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.
 - (c) Reasonable precautions include the following:
 - Paving and maintenance of roads, parking areas and yards.
 - Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
 - Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.
 - Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent reentrainment, and from buildings or work areas to prevent particulate from becoming airborne.

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

- Landscaping or planting of vegetation.
- Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
- Confining abrasive blasting where possible.
- Enclosure or covering of conveyor systems.

<u>NOTE</u>: Facilities that cause frequent, valid complaints may be required by the Permitting Authority to take these or other reasonable precautions. In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

2.3 General Pollutant Emission Limiting Standards: [Rule 62-296.320, F.A.C.]

- (a) The owner or operator shall not store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems.
- (b) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

<u>NOTE</u>: An objectionable odor is defined as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [F.A.C. 62-210.200(198)]

SUBSECTION 3.0 OPERATION AND MAINTENANCE

- 3.1 <u>Changes/Modifications</u>: The owner or operator shall submit to the Permitting Authority(s), for review any changes in, or modifications to: the method of operation; process or pollution control equipment; increase in hours of operation; equipment capacities; or any change which would result in an increase in potential/actual emissions. Depending on the size and scope of the modification, it may be necessary to submit an application for, and obtain, an air construction permit prior to making the desired change.

 Routine maintenance of equipment will not constitute a modification of this permit. [Rule 62-4.030, 62-210.300 and 62-4.070(3), F.A.C.]
- 3.2 <u>Plant Operation Problems</u>: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the Permitting Authority as soon as possible, but at least within (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]

- 3.3 <u>Circumvention</u>: The owner or operator shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rules 62-210.650, F.A.C.]
- 3.4 Excess Emissions Requirements [Rule 62-210.700, F.A.C.]
 - (a) Excess emissions resulting from start-up, shutdown or malfunction of these emissions units shall be permitted 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 Permitting Authority office for longer duration. [Rule 62-210.700(1), F.A.C.]
 - (b) Excess emissions that are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during start-up, shutdown, or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]
 - (c) In case of excess emissions resulting from malfunctions, the owner or operator shall notify Permitting Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the problem; and the corrective actions being taken to prevent recurrence. [Rule 62-210.700(6), F.A.C.]
- 3.5 Operating Procedures: Operating procedures shall include good operating practices and proper training of all operators and supervisors. The good operating practices shall meet the guidelines and procedures as established by the equipment manufacturers. All operators (including supervisors) of air pollution control devices shall be properly trained in plant specific equipment. [Rule 62-4.070(3), F.A.C.]

SUBSECTION 4.0 MONITORING OF OPERATIONS

4.1 Determination of Process Variables

- (a) The permitee shall operate and maintain equipment and/or instruments necessary to determine process variables, such as process weight input or heat input, when such data is needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
- (b) Equipment and/or instruments used to directly or indirectly determine such process variables, including devices such as belt scales, weigh hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. [Rule 62-297.310(5), F.A.C]

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

Subsection 5.0 Test Requirements

- Test Performance Within 60 days after achieving the maximum production rate at which these emission units will be operated, but not later than 180 days after initial startup and annually thereafter, the owner or operator of this facility shall conduct performance test(s) pursuant to 40 CFR 60.8, Subpart A, General Provisions and 40 CFR 60, Appendix A. No other test method shall be used unless approval from the Department has been received in writing. Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emission unit(s) operating at permitted capacity pursuant to Rule 62-297.310(2), F.A.C. [Rules 62-204.800, 62-297.310, 62-297.400, 62-297.401, F.A.C.]
- 5.2 <u>Test Procedures</u> shall meet all applicable requirements of the Florida Administrative Code Chapter 62-297. [Rule 62-297.310, F.A.C.]
- 5.3 Test Notification: The owner or operator shall notify the Permitting Authority in writing at least (30) days (initial) and 15 days (annual) prior to each scheduled compliance test to allow witnessing. The notification shall include the compliance test date, place of such test, the expected test time, the facility contact person for the test, and the person or company conducting the test. The (30) or (15) day notification requirement may be waived at the discretion of the Department. Likewise, if circumstances prevent testing during the test window specified for the emission unit, the owner or operator may request an alternate test date before the expiration of this window. [Rule 62-297.310 and 40 CFR 60.8, F.A.C.]
- 5.4 <u>Special Compliance Tests</u>: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in Rule 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C. or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Permitting Authority. [Rule 62-297.310(7)(b), F.A.C.]
- 5.5 <u>Stack Testing Facilities</u>: The owner or operator shall install stack testing facilities in accordance with Rule 62-297.310(6), F.A.C..
- Exceptions and Approval of Alternate Procedures and Requirements: An Alternate Sampling Procedure (ASP) may be requested from the Bureau of Air Monitoring and Mobile Sources of the Florida Department of Environmental Protection in accordance with the procedures specified in Rule 62-297.620, F.A.C.
- 5.7 Operating Rate During Testing: Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum

EMISSION UNIT(S) COMMON SPECIFIC CONDITIONS

permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2) and (3)]

SUBSECTION 6.0 REPORTS AND RECORDS

- 6.1 <u>Duration</u>: All reports and records required by this permit shall be kept for at least (5) years from the date the information was recorded. [Rule 62-4.160(14)(b), F.A.C.]
- 6.2 Emission Compliance Stack Test Reports:
 - (a) A *test report* indicating the results of the required compliance tests shall be filed with the Permitting Authority as soon as practical, <u>but no later than 45 days</u> after the last sampling run is completed. [Rule 62-297.310(8), F.A.C.]
 - b) The *test report* shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8), F.A.C.
- 6.3 Excess Emissions Report: If excess emissions occur, the owner or operator shall notify the Permitting Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. [Rules 62-4.130 and 62-210.700(6), F.A.C.]
- 6.4 <u>Annual Operating Report for Air Pollutant Emitting Facility</u>: Before March 1st of each year, the owner or operator shall submit to the Permitting Authority this required report [DEP Form No. 62-210.900(5)], which summarizes operations for the previous calendar year. [Rule 62-210.370(3), F.A.C.]

Subsection 7.0 Other Requirements

7.1 <u>Waste Disposal</u>: The owner or operator shall treat, store, and dispose of all liquid, solid, and hazardous wastes in accordance with all applicable Federal, State, and Local regulations. This air pollution permit does not preclude the permittee from securing any other types of required permits, licenses, or certifications.

APPENDIX GC

GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

- G.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.
- G.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 or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
- G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and 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 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.
- G.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.
- G.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.
- G.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.
- G.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 and 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.

- G.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.

APPENDIX GC

GENERAL PERMIT CONDITIONS [F.A.C. 62-4.160]

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.

- G.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 extend it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- G.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.
- G.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.
- G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.
- G.13 This permit also constitutes:
 - (a) Determination of Best Available Control Technology (X)
 - (b) Determination of Prevention of Significant Deterioration (X); and
 - (c) Compliance with New Source Performance Standards ().
- G.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 or 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:
 - 1. The date, exact place, and time of sampling or measurements;
 - 2. The person responsible for performing the sampling or measurements;
 - 3. The dates analyses were performed;
 - 4. The person responsible for performing the analyses;
 - 5. The analytical techniques or methods used; and
 - 6. The results of such analyses.
- G.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.

Florida Department of **Environmental Protection**

TO:

Clair Fancy

THRU:

Al Linero aad 4/4

FROM:

Syed Arif Syd Arth 811

DATE:

August 11, 1997

SUBJECT: Florida Keys Electric Cooperative Association, Inc./ Marathon

Generation Plant Unit 8/0870004-002-AC (PSD-FL-237)

Attached is the Public Notice package for installation of a 3.58 MW diesel electric generator at the above referenced facility.

The only pollutant that underwent PSD review was NO_X. The diesel generator will be fired with No. 2 fuel oil with a sulfur content of 0.05 percent or less, by weight. The NO_X controls will be timing retardation and turbocharger aftercoolers.

Various enforceable conditions have been included for their existing Units 1 through 7 as well as the new Unit to insure that the all allowable increment is not consumed.

I recommend your approval and signature.

SA

Attachments

BEST AVAILABLE COPY



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 Keys Electric Cooperative Association Marathon Generation Plant, Unit #8 **Draft Permit No.** 0870004-002-AC] **Facility ID No.** 0870004

Project type: Air Construction Permit for a 3.58 MW diesel engine generator burning 0.05 percent

sulfur fuel with emission retardation and turbocharger cooling for combustion

control.

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).

A.A. Linero, P.E.

Registration Number: 26032

Department of Environmental Protection Bureau of Air Regulation

Date

New Source Review Section 111 South Magnolia Drive, Suite 4 Tallahassee, Florida 32301

Phone (850) 488-1344

Fax (850) 922-6979

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PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAFT Permit Amendment No. 0870004-003-AC, (PSD-FL-237A) Marathon Generation Plant Monroe County

T'he Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit amendment to Florida Keys Electric Cooperative Association, Inc. for higher NOx emission limits for its recently constructed Unit 8 at its Marathon Generation Plant located at 3421 Overseas Highway Marathon, Monroe County. An updated Best Available Control Technology (BACT) determination was required for introgen oxides (NOx), pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Keys Electric Cooperative Association, Inc., 91605 Overseas Highway, P.O. Box 700377, Tavemier, Florida 33070-0377.

This amendment raises the NOx emission limits for Unit 8 from 62 lbs/hr and 271 tons per year (TPY) to 68 lbs/hr and 298 TPY. Unit 8 is a 3.58 megawatt diesel generator, which will burn No. 2 fuel oil with a sulfur content of 0.05 percent or less, by weight. Controls for NOx emissions consist of timing retardation and turbocharger aftercoolers. An updated air quality impact analysis was conducted. Emissions from the facility will consume PSD increment, but will not significantly contribute to or cause a violation of any state or federal ambient air quality standards. The maximum predicted PSD Class II annual nitrogen dioxide (NO2) increment consumed by all sources in the area, including this project, will be as follows:

PSD Class 11 Increment Consumed (ug/m²)
21
Allowable Increment (ug/m²)
25

Percent Increment Consumed
84

The project has no significant impact on the Everglades National Park PSD Class I area.

The project will issue the FINAL Permit Amendment, in accordance with the conditions of the DRAFT Permit Amendment unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed DRAFT Pernit Amendment issuance action for a period of 14 (fourteen) days from the date of publication of this Notice. Any written comments should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit Amendment, the Department shall issue a Revised DRAFT Permit Amendment and require, if applicable, another Public Notice.

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

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 850/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

The complete project file includes the Draft Permit Amendment, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.11 1, F.S. Interested persons may contact the Administrator, New Resource Review Section at 11 I South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/ 488-1344, for additional information.

Published 3/26/98 The Reporter Tavernier, FL 33070

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

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

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection Bureau of Air Regulation 1 1 1 South Magnolia Drive, Suite 4 Tallahassee, Florida, 32301 Telephone: 850/488-1344 Fax: 850/922-6979

Department of Environmental Protection South District 2295 Victoria Avenue, Suite 364 Fort Myers, Florida 33901 Telephone: (941) 332-6975 Fax: 941/332-6969

CC: C. Holladay, BAR S. avy, BAR EPA NPS SD

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ratio of NO_2 to NO_x . (Supplement C to the Guideline on Air Quality Models (revised) (Appendix W of 40 CFR Part 51), EPA, August 1995). Therefore, the first-high concentrations for NAAQS and PSD - Class II are 95.71 : g/m^3 and 18.83 : g/m^3 , respectively. Both these concentrations fall below the annual NAAQS NO_x standard of 100: g/m^3 and the annual PSD NO_x increment standard of 25: g/m^3 , respectively.

3.2 CLASS I INCREMENT ANALYSIS

The National Park Service (NPS) has developed a draft guidance document for assessing source impacts on Class I areas. Modeling levels of significance, similar to those applicable in Class II areas, have been developed by the NPS for Class I areas. Those levels of significance were used in this application to show that the net effect of adding Unit 8 will be insignificant.

The receptors used in this analysis were similar to those used in the PSD Class II and NAAQS analysis except the distance was increased. The receptors were limited to represent only the intersection of the direction radials from 10° to 60° and the nearest boundary of the Everglades Class I area (see Figure 1). The receptors are identified in Table 3. Table 4 sets forth the annual first and second high impact concentrations of the Marathon Unit 8 on the Everglades over five years (1987 through 1991). The distance between Marathon and the Everglades is approximately 30 km. At this distance, the addition of Unit 8 will have an insignificant impact on the Class I area.

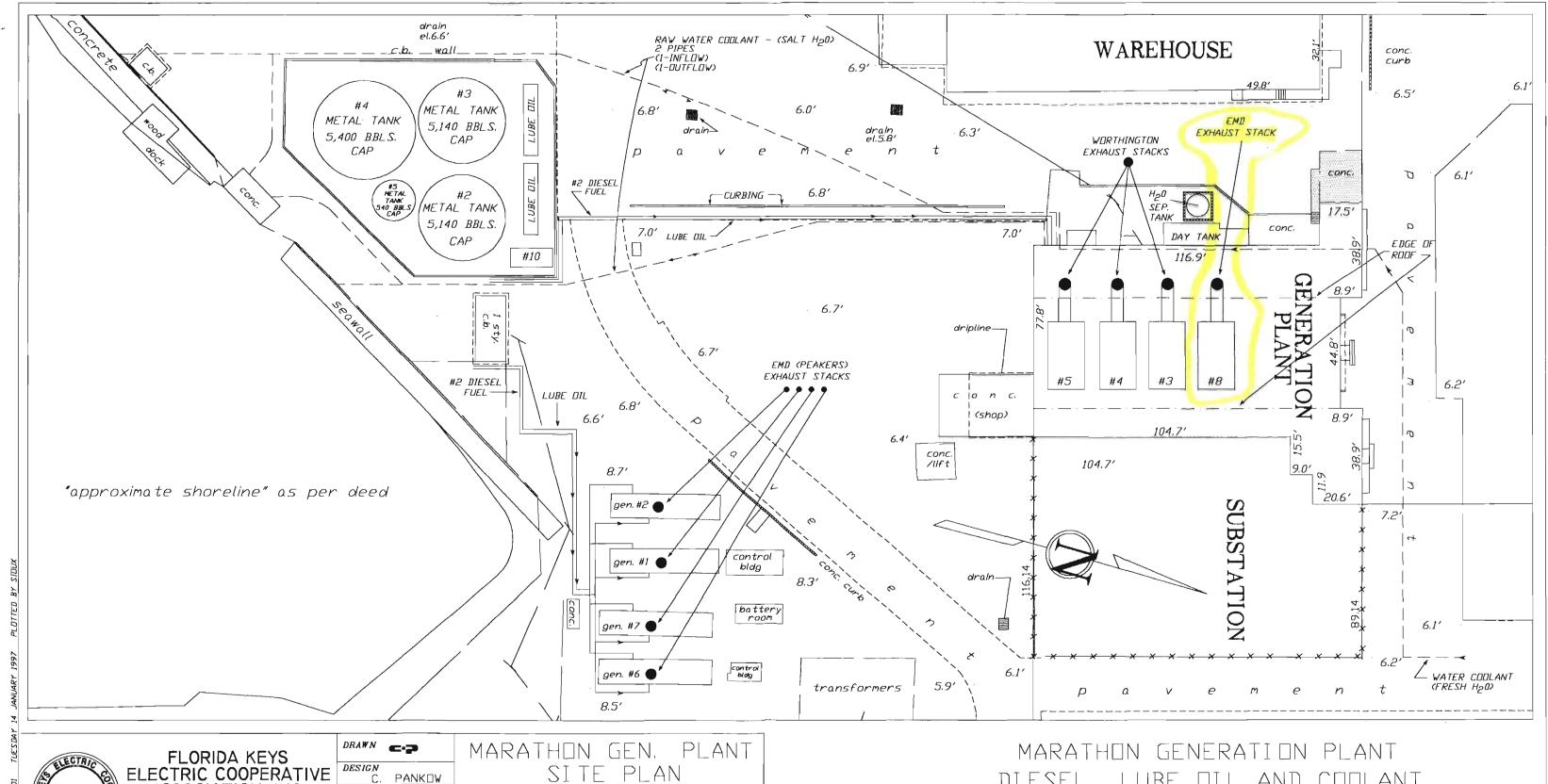
3.3 Air Quality Related Issues

Due to the small size of the proposed new diesel unit and the nature of operation (peaking operation), the air quality impacts on growth, visibility, soils, vegetation, and aquatic life are considered insignificant.

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DESIGN
C. PANKOW

A
PSUBS\MAR\MGP001

DATE 04/29/96

MARATHON GEN. PLANT
SITE PLAN

PLANT. REMOTE UNITS, TANK FARM

DWC. NO. SHEET SCALE REV.
AS NOTED 0

MARATHON GENERATION PLANT DIESEL, LUBE OIL AND COOLANT WATER FLOW DIAGRAM. EXHAUST STACK LOCATIONS.



Department of Environmental Protection

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

Virginia B. Wetherell Secretary

April 29, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Deborah Shaw Environmental Affairs Coordinator 91605 Overseas Highway Post Office Box 700377 Tavernier, Florida 33070-0377

Re: DEP File No. 0870004-003-AC (PSD-FL-237A)

Marathon Generation Plant, Changes to NO_X emission limits for Unit 8

Dear Ms. Shaw:

The Department has reviewed your January 26, 1998 letter requesting a modification of the above referenced permit for the NO_x emission limits for Unit 8. Based on modeling results, the request is acceptable and the permit is hereby amended as follows:

Section III, Subsection B

1. The maximum allowable emission rates for NO_x for Unit No. 008 shall not exceed 62 68 pounds per hour (lb/hr) and 271 298 tons per year (TPY) pursuant to the Best Available Control Technology (BACT) Determination. [Rule 62-212.410 400, F.A.C.]

A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit modification is issued pursuant to Chapter 403, Florida Statutes. Any party to this order (permit modification) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Legal Office; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 (thirty) days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

Howard L. Rhodes, Director

Division of Air Resources

Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT MODIFICATION (including the FINAL permit modification) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 4-29-98 to the person(s) listed:

Ms. Deborah A. Shaw, FKEC *

Mr. Brian Beals, EPA Region 4

Mr. John Bunyak, NPS

Mr. David Knowles, DEP SD

Clerk Stamp

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

Clerk)

(Date)

US Postal Service

Receipt for Certified Mail

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Revised BACT Determination Marathon Generation Plant Unit No. 8 Florida Keys Electric Cooperative Association PSD-FL-237A and 0870004-003-AC Marathon, Monroe County

The Florida Keys Electric Cooperative Association (FKEC) installed a new Diesel Engine Generator at its existing Marathon Generation Plant (MGP) in Marathon, Monroe County. The unit is a General Motors Electro-Motive Diesel generator model 20-710G4B with a nominal base load rating of 3.58 megawatts (MW) at 32°C and 718 mm Hg. The facility currently consists of seven (7) diesel engine generators used for peaking power. Units 1 & 2 are each rated at 2.0 MW. Units 3, 4 and 5 are each rated at 3.0 MW, and Units 6 & 7 are 2.5 MW each. The existing Units 1-7 are allowed to burn No. 2 fuel oil with a sulfur content of 0.5 percent or less, by weight. The new Unit 8 will be fired with No. 2 low sulfur fuel oil with a sulfur content not to exceed 0.05 percent, by weight, and a fuel oil consumption limit of 2.015 million gallons per year. The facility also has four fuel oil storage tanks and other electrical generating support equipment.

FKEC had indicated that the maximum annual air pollutant emission rates in tons per year for the Unit 8 diesel generator, based on consumption of 2.015 million gallons of No. 2 fuel oil, with a maximum sulfur content of 0.05 percent, by weight, would be:

Pollutant	PSD Significance	Uncontrolled	Controlled	Expected	Subject to
	Levels ¹	Emissions ²	Emissions ³	Emissions ⁴	PSD Review?
NO _x	40	423	271 / <u>298</u> 5	24.2	Yes
СО	100	111	<100	6.4	No
PM	25	9.5	9.1	0.6	No
PM_{10}	15	7.9		0.5	No
SO ₂	40	7.2		0.5	No

¹ Florida Administrative Code 212.400-2

Following is the original BACT determination proposed by the applicant:

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	62 lbs/hr by timing retardation and aftercoolers

The Marathon Generation Power Plant is a major source of air pollution or Title V source. Because emissions of nitrogen oxides are greater than 250 tons per year, it is a major facility with

² Based on firing No. 2 fuel oil (0.05% sulfur by weight) at a maximum of 2.015 million gals/yr at full load with no emission controls.

³ Based on firing No. 2 fuel oil (0.05% sulfur by weight) at a maximum of 2.015 million gals/yr at full load with emissions control of timing retardation.

⁴ Based on FKEC's historical and projected actual operating hours of 500 or less.

⁵ Revised NO₂ annual limit

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

respect to the Prevention of Significant Deterioration (Rule 62-212.400). Because the project will result in a significant increase in nitrogen oxides emissions per Table 62-212.400-2, F.A.C., "Regulated Air Pollutants - Significant Emissions Rates," a BACT determination is required pursuant to Rule 62-212.410, F.A.C.

DATE OF RECEIPT OF A BACT APPLICATION:

January 27, 1997

REVIEW GROUP MEMBERS:

Cleve Holladay and Syed Arif New Source Review Section

DATE OF RECEIPT OF REVISED BACT APPLICATION

January 28, 1998

REVIEW GROUP MEMBERS FOR REVISED BACT DETERMINATION:

Cleve Holladay and Syed Arif, P.E. New Source Review Section

REVISED BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	68 lbs/hr (298 TPY) by timing retardation and
	aftercoolers

Based on the results of the initial NO_x emissions compliance test, the applicant has requested that the NO_x emission limit for Unit 8 be revised upward to 68 lbs/hr and 298 TPY. The unit tested at an average NO_x rate of 65.7 lbs/hr during the December 17, 1997 test. For NO_x emissions controls, the applicant used the combination of retarded injection timing and lowered combustion air temperature proposed in the original BACT determination. These measures did not result in emissions reductions as substantial as those originally expected by the applicant.

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes

and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 Standards of Performance for New Stationary Sources or 40 CFR Part 61 National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

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

The air pollutant emissions from this facility can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as follows:

- Combustion Products (e.g., SO₂, NO_X, PM). Controlled generally by good combustion of clean fuels, removal in add-on control equipment.
- *Products of Incomplete Combustion* (e.g., CO, VOC). Control is largely achieved by proper combustion techniques.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "non-regulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., PM, SO₂, H₂SO₄, fluorides, etc.), if a reduction in "non-regulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

BACT POLLUTANT ANALYSIS

NITROGEN OXIDES (NO_x)

Oxides of nitrogen (NO_x) are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel (fuel NO_x) and by thermal fixation of nitrogen in the combustion air (thermal NO_x). As flame temperature increases, the amount of thermally generated NO_x increases. Fuel type affects the quantity and type of NO_x generated. Generally, natural gas is low in nitrogen. However it causes higher flame temperatures and generates more thermal NO_x than oil or coal, which have higher fuel nitrogen content, but exhibit lower flame temperatures.

NO_x emissions represent a significant portion of the total emissions generated by this project, and must be minimized using BACT. A review of EPA BACT/LAER Clearinghouse (BACT Clearinghouse) information indicates that NO_x emissions at most small facilities are minimized by process control and good combustion practices.

The applicant has proposed modification of the combustion process through a combination of fuel injection timing retardation and cooling of combustion air resulting in exhaust temperature reduction. The design specific to FKEC's 20-710G4B includes a 4° injection timing retardation and a 4-pass aftercooler circuit with the addition of a separately cooled aftercooler circuit. The combination of retarded injection timing and lowered combustion air temperature results in less NO_x formation.

Vendors data indicate that retarding injection timing will reduce NO_x formation by about 20 percent, but will increase PM emissions by about 10 percent and fuel consumption by 1.5 percent. The 4-pass aftercooler will reduce both NO_x and PM emissions by about 10 percent while reducing fuel consumption by about 0.7 percent. The separately cooled aftercooling circuit will decrease both NO_x and PM by another 10 percent and fuel consumption by 0.5 percent. The net result will be a 40 percent reduction in NO_x, a 5 percent increase in PM and about 0.3 percent increase in fuel consumption. The use of low sulfur fuel oil will minimize PM emissions thus reducing or eliminating the increase in PM caused by NO_x controls. This combination of NO_x controls, proper engine design, good combustion practices, and the use of low sulfur fuel should provide effective emissions control.

BACT DETERMINATION BY DEP:

Based on the information provided by the applicant and the information searches conducted by the Department, lower emissions limits can be obtained employing the top-down BACT approach for NO_x.

NO_x DETERMINATION

The top-down BACT approach for diesel fired internal combustion engines listed in order from most stringent control to least:

- 1. Selective Catalytic Reduction (SCR)
- 2. Combined technologies of injection timing retardation, turbocharger with aftercoolers
- 3. Good combustion design/practices

The following table summarizes the feasibility of using these control technologies with the EMD 20-710G4B as designed for installation in FKEC's Marathon Generation Plant.

Control Technology	Emission	Technically	Cost Effective	Adverse Environ.	Adverse Energy
	Reduction (%)	Feasible		Impacts	Impacts
SCR with ammonia	60-90	No	N/A	N/A	N/A
SCR with urea	80	No	N/A	N/A	N/A
Timing retard; turbo					
charger aftercoolers	40	Yes	Yes	No	0.3%
Dry/Low NO _x	18	No	N/A	N/A	N/A

SCR is more widely used in Japan and Germany than it is in the United States and the technology is being improved such that the hazards and costs have been reduced. It remains, however, a costly technology for small applications and has hazards associated with the use and storage of ammonia. SCR is not generally used with diesel engines of this size. The BACT/LAER database lists only a single facility which uses SCR on diesel engines. SCR was selected in that instance because a local ordinance mandated strict limits on emissions without regards to cost. SCR is not technically feasible for this diesel engine because the exhaust back pressure maximum allowance for the EMD 20-710G4B is 5 inches H₂O. An SCR system will add 5 to 6 inches H₂O back pressure, exceeding the manufacturers specifications and recommendations.

For NO_x emissions, the Department accepts the applicants proposed use of injection timing retardation and cooling of combustion air as BACT for this project.

The BACT emission levels established by the Department are as follows:

POLLUTANT	EMISSION LIMIT		
Nitrogen Oxides (NO _x)	62 lbs/hr (271 TPY)		
Visible Emissions	20%		

APPENDIX BD

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

REVISED BACT DETERMINATION

The applicant has requested a revised BACT limit of 68 lbs/hr and 298 TPY based on the results of the initial compliance test. The Department has done air quality dispersion modeling with the revised limits. This modeling predicts that the applicant will continue to meet all applicable NO_x air quality standards and increments as shown in the following table (all values in ug/m³).

Ambient Air Quality Standard (AAQS)=100	PSD Class II Increment =25	PSD Class I Significant Impact Level=0.1
Modeled Concentration	Modeled Concentration	Modeled Concentration
97	21	0.04

The revised BACT emissions given below are within the acceptable range of emissions for diesel fired internal combustion engines according to information from the RACT/BACT/LAER Clearinghouse:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides (NO _x)	68 lbs/hr (298 TPY)

COMPLIANCE

Compliance with the visible emission limitations shall be in accordance with the EPA Reference Method 9 as contained in 40 CFR 60, Appendix A.

Compliance with the NO_x limitations shall be in accordance with the EPA Reference Method 7E as contained in 40 CFR 60, Appendix A.

DETAILS OF THE REVISED ANALYSIS MAY BE OBTAINED BY CONTACTING:

Cleve Holladay, Review Engineer (prepared revised BACT)
Syed Arif, P.E. (reviewed BACT)
Department of Environmental Protection
Bureau of Air Regulation
MS 5505
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:	Approved By:
C. H. Fancy, P.E., Chief Bureau of Air Regulation	Howard L. Rhodes, Director Division of Air Resources Management
4/28/98	4/28/98
Date:	Date:

TO:

Howard Rhodes

THRU:

Clair Fancy

Al Linero of Syed Arif

FROM:

Cleve Holladay()

DATE:

April 27, 1998

SUBJECT:

Permit Amendment

Florida Keys Electric Cooperative, Inc. (FKEC)

Revised NO_x Emission Limits for Unit 8

I have attached a letter and a revised BACT determination amending the construction permit for FKEC's recently installed 3.58 megawatt diesel generator (Unit 8). FKEC failed the initial compliance test on this unit in December, 1997. The applicant has requested that the NO_X emission limits on this unit be raised from 62 lbs/hr and 271 TPY to 68 lbs/hr and 298 TPY.

The BACT emission limits for this unit were largely determined by the air quality dispersion modeling results and the need to keep maximum predicted impacts less than the NO₂ annual ambient air quality standard of 100 ug/m³.

Normally, no modeled exceedances would be expected. However, these units have short stacks. I have done air quality dispersion modeling with the proposed higher limit. The results show that this change meets all standards and increments. The original predicted annual impact was 96 ug/m³; the annual impact with the revised limits is 97 ug/m³. According to information from the RACT/BACT/LAER Clearinghouse, the new emission limits are well within the acceptable range for BACT determinations.

I have raised the NO_x emission limits as requested by the applicant. I believe this increase is justifiable. I recommend your approval and signature.

Attachments

CH/kt

The Reporter

Serving the Florida Keys P.O. Box 1197 • Tavernier, Florida 33070-1197 (305) 852-3216 Fax: (305) 852-8249

STATEMENT OF PROOF OF PUBLICATION

USPS #905580

COUNT OF MONROL)
Before the undersigned authority personally appeared DONNA STUTTS , who on oath, says that she i
PUBLISHER of THE REPORTER, a weekly newspaper entitled to publish legal advertising published a
Tavernier, Monroe County, Florida: that the attached copy of advertisement, being a legal ad.

IN THE MATTER OF _ NOTICE OF INTENTION_____.

Affiant further says that the said **REPORTER** is a newspaper published at Tavernier, in said Monroe County, Florida, and that the said newspaper has heretofore been continuously published in the said Monroe County, Florida, each week (on Thursday), and has been entered as second class mail matter at the Post Office in Tavernier, in said County of Monroe, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement;

and affiant further says that she has neither paid nor promised any firm, person, or corporation any discount, rebate, commission or refund for the purpose of securing this said advertisement for publication in the said newspaper.

SEAL

SWORN TO AND SUBSCRIBED BEFORE ME THIS 26TH DAY OF MARCH, A.D., 1998

NOTARY PUBLIC

STATE OF FLORIDA

RECEIVED

MY COMMISSION EXPIRES:

DAVEE R DOVE
My Commission CC431878
Expires Feb. 05, 1999
Bonded by ANB
800-852-5878

MAR 3 () 1998 BUREAU OF AIR REGULATION

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAFT Permit Amendment No. 0870004-003-AC, (PSD-FL-237A) Marathon Generation Plant Monroe County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit amendment to Florida Keys Electric Cooperative Association, Inc. for higher NOx emission limits for its recently constructed Unit 8 at its Marathon Generation Plant located at 3421 Overseas Highway Marathon, Monroe County. An updated Best Available Control Technology (BACT) determination was required for nitrogen oxides (NOx), pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Keys Electric Cooperative Association, Inc., 91605 Overseas Highway, P.O. Box 700377, Tayemier, Florida 33070-0377.

This amendment raises the NOx emission limits for Unit 8 from 62 lbs/hr and 271 tons per year (TPY) to 68 lbs/hr and 298 TPY. Unit 8 is a 3.58 megawatt diesel generator, which will burn No. 2 fuel oil with a sulfur content of 0.05 percent or less, by weight. Controls for NOx emissions consist of timing retardation and turbocharger aftercoolers. An updated air quality impact analysis was conducted. Emissions from the facility will consume PSD increment, but will not significantly contribute to or cause a violation of any state or federal ambient air quality standards. The maximum predicted PSD Class II annual nitrogen dioxide (NO2) increment consumed by all sources in the area, including this project, will be as follows:

PSD Class 11 Increment Consumed (ug/m²)

21
Allowable Increment
(ug/m³)

25

Percent Increment Consumed

The project has no significant impact on the Everglades National Park PSD Class I area.

The project will issue the FINAL Permit Amendment, in accordance with the conditions of the DRAFT Permit Amendment unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed DRAFT Pernit Amendment issuance action for a period of 14 (fourteen) days from the date of publication of this Notice. Any written comments should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit Amendment, the Department shall issue a Revised DRAFT Permit Amendment and require, if applicable, another Public Notice.

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

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 850/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

The complete project file includes the Draft Permit Amendment, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.11 1, F.S. Interested persons may contact the Administrator, New Resource Review Section at II I South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-1344, for additional information.

Published 3/26/98
The Reporter
Tavernier, FL 33070

San July Bullet a line

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

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

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection Bureau of Air Regulation 1 1 1 South Magnolia Drive, Suite 4 Tallahassee, Florida, 32301 Telephone: 850/488-1344 Fax: 850/922-6979

Department of Environmental Protection South District 2295 Victoria Avenue, Suite 364 Fort Myers, Florida 33901 Telephone: (941) 332-6975 Fax: 941/332-6969

CC: (1 ACCIOACIZ, BAR SAIY, BAR EPA NPS 50



Department of Environmental Protection

Lawton Chiles Governor Twin Towers Office Building 2600 Blair Stone Road Tallahassee. Florida 32399-2400

Virginia B. Wetherell Secretary

March 17, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Deborah Shaw Environmental Affairs Coordinator 91605 Overseas Highway P.O. Box 700377 Tavernier, Florida 33070-0377

Re: Permit Amendment No. Permit No. 0870004-003-AC (PSD-FL-237A) Marathon Generation Plant Changes to NO_X Emission Limits for Unit 8

Dear Ms. Shaw:

Enclosed is one copy of the Draft Air Construction Permit Amendment for the Marathon Generation Plant's Unit 8 located at 3421 Overseas Highway, Marathon, Monroe County. The Department's Intent to Issue Air Construction Permit Amendment and the "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT" must be published within 30 (thirty) days of receipt of this letter. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit amendment.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Syed Arif, P.E., New Source Review Section MS 5505 at the above letterhead address. If you have any other questions, please contact Cleve Holladay or Mr. Arif at 850/488-1344.

Sincerely,

- C. H. Fancy, P.E., Chief,

Bureau of Air Regulation

CHF/ch/t

Enclosures

In the Matter of an Application for Permit Amendment by:

Florida Keys Electric Cooperative Association, Inc. 91605 Overseas Highway P.O. Box 700377
Tavernier, Florida 33070-0377

DRAFT Permit No. 0870004-003-AC PSD-FL-237A Marathon Generation Plant Unit 8 Monroe County

INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT

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

The applicant, Florida Keys Electric Cooperative Association, Inc, applied on January 28, 1998 to the Department for an air construction permit amendment for its 3.58 megawatt diesel generator (Unit 8) at its Marathon Generation Plant located at 3421 Overseas Highway, Marathon, Monroe County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that an air construction permit amendment is required to raise the NO_x emission limits for Unit 8. The Department proposes to raise these limits from 62 lbs/hr and 271 tons per year (TPY) to 68 lbs/hr and 298 TPY.

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

Pursuant to Section 403.815, F.S., and Rule 62-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT". The notice shall be published one time only within 30 (thirty) days in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-1344; Fax 850/ 922-6979) within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit amendment pursuant to Rule 62-103.150 (6), F.A.C.

The Department will issue the FINAL Permit Amendment, in accordance with the conditions of the enclosed DRAFT Permit Amendment unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed DRAFT Permit Amendment issuance action for a period of 14 (fourteen) days from the date of publication of "PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT." Any written comments should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit Amendment, the Department shall issue a Revised DRAFT Permit Amendment and require, if applicable, another Public Notice.

Draft Permit Amendment No. 0870004-003-AC, (PSD-FL-237A) Florida Keys Electric Cooperative, Inc. Page 2 of 3

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

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9730, fax: 850/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

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

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

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

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

Draft Permit Amendment No. 0870004-003-AC, (PSD-FL-237A) Florida Keys Electric Cooperative, Inc. Page 3 of 3

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallaliassee, Florida.

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT (including the PUBLIC NOTICE, and DRAFT permit amendment) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 3-18-95 to the person(s) listed:

Ms. Deborah A. Shaw, FKEC *

Mr. Brian Beals, EPA

Mr. John Bunyak, NPS

Mr. David Knowles, DEP

Clerk Stamp

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

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ADDRESS completed	3. Article Addressed to: Mr. Charles W. Jenkins, mgr. Environmental + Safety Ser. Darmland Hydro, ip P o Box 960 Barteri, F1 33831			3a3 Certified Insured COD
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NOTICE TO BE PUBLISHED IN THE NEWSPAPER

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT AMENDMENT

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DRAFT Permit Amendment No. 0870004-003-AC, (PSD-FL-237A)

Marathon Generation Plant

Monroe County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit amendment to Florida Keys Electric Cooperative Association, Inc. for higher NO_X emission limits for its recently constructed Unit 8 at its Marathon Generation Plant located at 3421 Overseas Highway Marathon, Monroe County. An updated Best Available Control Technology (BACT) determination was required for nitrogen oxides (NO_X), pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Florida Keys Electric Cooperative Association, Inc., 91605 Overseas Highway, P.O. Box 700377, Tavernier, Florida 33070-0377.

This amendment raises the NO_X emission limits for Unit 8 from 62 lbs/hr and 271 tons per year (TPY) to 68 lbs/hr and 298 TPY. Unit 8 is a 3.58 megawatt diesel generator, which will burn No. 2 fuel oil with a sulfur content of 0.05 percent or less, by weight. Controls for NO_X emissions consist of timing retardation and turbocharger aftercoolers. An updated air quality impact analysis was conducted. Emissions from the facility will consume PSD increment, but will not significantly contribute to or cause a violation of any state or federal ambient air quality standards. The maximum predicted PSD Class II annual nitrogen dioxide (NO₂) increment consumed by all sources in the area, including this project, will be as follows:

PSD Class II Increment Consumed	Allowable Increment	Percent Increment Consumed
$(\mu g/m^3)$	${(\mu g/m^3)}$	
21	25	84

The project has no significant impact on the Everglades National Park PSD Class I area.

The Department will issue the FINAL Permit Amendment, in accordance with the conditions of the DRAFT Permit Amendment unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed DRAFT Permit Amendment issuance action for a period of 14 (fourteen) days from the date of publication of this Notice. Any written comments should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit Amendment, the Department shall issue a Revised DRAFT Permit Amendment and require, if applicable, another Public Notice.

The Department will issue FINAL Permit Amendment with the conditions of the DRAFT Permit Amendment unless a timely petition for an administrative hearing is filed pursuant to Sections 120.569 and

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

Notice of Intent - 0870004-003-AC Page 2 - PSD-FL-237(A)

120.57 F.S. The procedures for petitioning for a hearing are set forth below. Mediation is not available for this action.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57 F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000, telephone: 850/488-9370, fax: 850/487-4938. Petitions must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. A petitioner must mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-5.207 of the Florida Administrative Code.

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

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

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

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

Fax: 850/922-6979

Department of Environmental Protection South District 2295 Victoria Avenue, Suite 364 Fort Myers, Florida 33901 Telephone: (941) 332-6975 Fax: 941/332-6969

The complete project file includes the Draft Permit Amendment, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-1344, for additional information.

DRAFT



April xx, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Deborah Shaw
Environmental Affairs Coordinator
91605 Overseas Highway
Post Office Box 700377
Tavernier, Florida 33070-0377

Re: Permit Amendment No. 0870004-003-AC (PSD-FL-237A)

Marathon Generation Plant, Changes to NO_X emission limits for Unit 8

Dear Ms. Shaw:

The Department has reviewed your January 26, 1998 letter requesting an amendment to the above referenced permit for the NO_X emission limits for Unit 8. This request is acceptable and the permit is hereby amended as follows:

Section III, Subsection B, Specific Condition B.1, Emission Limitations

FROM:

The maximum allowable emission rates for NO_X for Unit No. 008 shall not exceed 62 pounds per hour (lb/hr) and 271 tons per year (TPY) pursuant to the Best Available Control Technology (BACT) Determination. [Rule 62-212.410, F.A.C.]

TO:

The maximum allowable emission rates for NO_X for Unit No. 008 shall not exceed **68** pounds per hour (lb/hr) and **298** tons per year (TPY) pursuant to the updated Best Available Control Technology (BACT) Determination. [Rule 62-212.410, F.A.C.]

A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit modification is issued pursuant to Chapter 403, Florida Statutes. Any party to this order (permit modification) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appealate 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.





Howard L. Rhodes, Director Division of Air Resources Management

CERTIFICATE OF SERVICE

FINAL PERMIT MODIFICATION (inclu certified mail (*) and copies were mailed b to the person(s) listed:	ding the FINAL perm	it modification) was sent by
Ms. Deborah A. Shaw, FKEC * Mr. Brian Beals, EPA Region 4 Mr. John Bunyak, NPS Mr. David Knowles, DEP SD		
	Clerk Stamp	
	on this date, pursu	CKNOWLEDGMENT FILED pant to §120.52, Florida Statutes, and Department Clerk, receipt of Eknowledged.
	(Clerk)	(Date)

Revised BACT Determination Marathon Generation Plant Unit No. 8 Florida Keys Electric Cooperative Association PSD-FL-237A and 0870004-003-AC Marathon, Monroe County

The Florida Keys Electric Cooperative Association (FKEC) installed a new Diesel Engine Generator at its existing Marathon Generation Plant (MGP) in Marathon, Monroe County. The unit is a General Motors Electro-Motive Diesel generator model 20-710G4B with a nominal base load rating of 3.58 megawatts (MW) at 32°C and 718 mm Hg. The facility currently consists of seven (7) diesel engine generators used for peaking power. Units 1 & 2 are each rated at 2.0 MW. Units 3, 4 and 5 are each rated at 3.0 MW, and Units 6 & 7 are 2.5 MW each. The existing Units 1-7 are allowed to burn No. 2 fuel oil with a sulfur content of 0.5 percent or less, by weight. The new Unit 8 will be fired with No. 2 low sulfur fuel oil with a sulfur content not to exceed 0.05 percent, by weight, and a fuel oil consumption limit of 2.015 million gallons per year. The facility also has four fuel oil storage tanks and other electrical generating support equipment.

FKEC had indicated that the maximum annual air pollutant emission rates in tons per year for the Unit 8 diesel generator, based on consumption of 2.015 million gallons of No. 2 fuel oil, with a maximum sulfur content of 0.05 percent, by weight, would be:

Pollutant	PSD Significance	Uncontrolled	Controlled	Expected	Subject to
	Levels ¹	Emissions ²	Emissions ³	Emissions ⁴	PSD Review?
NO _x	40	423	271/ 298 ⁵	24.2	Yes
СО	100	111	<100	6.4	No
PM	25	9.5	9.1	0.6	No
PM_{10}	15	7.9		0.5	No
SO ₂	40	7.2		0.5	No

¹ Florida Administrative Code 212.400-2

Following is the original BACT determination proposed by the applicant:

BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	62 lbs/hr by timing retardation and aftercoolers

The Marathon Generation Power Plant is a major source of air pollution or Title V source. Because emissions of nitrogen oxides are greater than 250 tons per year, it is a major facility with

² Based on firing No. 2 fuel oil (0.05% sulfur by weight) at a maximum of 2.015 million gals/yr at full load with no emission controls.

³ Based on firing No. 2 fuel oil (0.05% sulfur by weight) at a maximum of 2.015 million gals/yr at full load with emissions control of timing retardation.

⁴ Based on FKEC's historical and projected actual operating hours of 500 or less.

⁵ Revised NO_x annual limit



respect to the Prevention of Significant Deterioration (Rule 62-212.400). Because the project will result in a significant increase in nitrogen oxides emissions per Table 62-212.400-2, F.A.C., "Regulated Air Pollutants - Significant Emissions Rates," a BACT determination is required pursuant to Rule 62-212.410, F.A.C.

DATE OF RECEIPT OF A BACT APPLICATION:

January 27, 1997

REVIEW GROUP MEMBERS:

Syed Arif and A. A. Linero, P.E. New Source Review Section

DATE OF RECEIPT OF REVISED BACT APPLICATION

January 28, 1998

REVIEW GROUP MEMBERS FOR REVISED BACT DETERMINATION:

Cleve Holladay and Syed Arif, P.E. New Source Review Section

REVISED BACT DETERMINATION REQUESTED BY THE APPLICANT:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	68 lbs/hr (298 TPY) by timing retardation and
	aftercoolers

Based on the results of the initial NO_x emissions compliance test, the applicant has requested that the NO_x emission limit for Unit 8 be revised upward to 68 lbs/hr and 298 TPY. The unit tested at an average NO_x rate of 65.7 lbs/hr during the December 17, 1997 test. For NO_x emissions controls, the applicant used the combination of retarded injection timing and lowered combustion air temperature proposed in the original BACT determination. These measures did not result in emissions reductions as substantial as those originally expected by the applicant.

BACT DETERMINATION PROCEDURE:

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes



and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

- Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 - Standards of Performance for New Stationary Sources or 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants.
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determination of any other state.
- The social and economic impact of the application of such technology.

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

The air pollutant emissions from this facility can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as follows:

- Combustion Products (e.g., SO₂, NO_X, PM). Controlled generally by good combustion of clean fuels, removal in add-on control equipment.
- *Products of Incomplete Combustion* (e.g., CO, VOC). Control is largely achieved by proper combustion techniques.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "non-regulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., PM, SO₂, H₂SO₄, fluorides, etc.), if a reduction in "non-regulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.



BACT POLLUTANT ANALYSIS

NITROGEN OXIDES (NO_x)

Oxides of nitrogen (NO_x) are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel (fuel NO_x) and by thermal fixation of nitrogen in the combustion air (thermal NO_x). As flame temperature increases, the amount of thermally generated NO_x increases. Fuel type affects the quantity and type of NO_x generated. Generally, natural gas is low in nitrogen. However it causes higher flame temperatures and generates more thermal NO_x than oil or coal, which have higher fuel nitrogen content, but exhibit lower flame temperatures.

NO_x emissions represent a significant portion of the total emissions generated by this project, and must be minimized using BACT. A review of EPA BACT/LAER Clearinghouse (BACT Clearinghouse) information indicates that NO_x emissions at most small facilities are minimized by process control and good combustion practices.

The applicant has proposed modification of the combustion process through a combination of fuel injection timing retardation and cooling of combustion air resulting in exhaust temperature reduction. The design specific to FKEC's 20-710G4B includes a 4° injection timing retardation and a 4-pass aftercooler circuit with the addition of a separately cooled aftercooler circuit. The combination of retarded injection timing and lowered combustion air temperature results in less NO_x formation.

Vendors data indicate that retarding injection timing will reduce NO_x formation by about 20 percent, but will increase PM emissions by about 10 percent and fuel consumption by 1.5 percent. The 4-pass aftercooler will reduce both NO_x and PM emissions by about 10 percent while reducing fuel consumption by about 0.7 percent. The separately cooled aftercooling circuit will decrease both NO_x and PM by another 10 percent and fuel consumption by 0.5 percent. The net result will be a 40 percent reduction in NO_x, a 5 percent increase in PM and about 0.3 percent increase in fuel consumption. The use of low sulfur fuel oil will minimize PM emissions thus reducing or eliminating the increase in PM caused by NO_x controls. This combination of NO_x controls, proper engine design, good combustion practices, and the use of low sulfur fuel should provide effective emissions control.

BACT DETERMINATION BY DEP:

Based on the information provided by the applicant and the information searches conducted by the Department, lower emissions limits can be obtained employing the top-down BACT approach for NO_x.



NO, DETERMINATION

The top-down BACT approach for diesel fired internal combustion engines listed in order from most stringent control to least:

- 1. Selective Catalytic Reduction (SCR)
- 2. Combined technologies of injection timing retardation, turbocharger with aftercoolers
- 3. Good combustion design/practices

The following table summarizes the feasibility of using these control technologies with the EMD 20-710G4B as designed for installation in FKEC's Marathon Generation Plant.

Control Technology	Emission	Technically	Cost Effective	Adverse Environ.	Adverse Energy
	Reduction (%)	Feasible		Impacts	Impacts
SCR with ammonia	60-90	No	N/A	N/A	N/A
SCR with urea	80	No	N/A	N/A	N/A
Timing retard; turbo					
charger aftercoolers	40	Yes	Yes	No	0.3%
Dry/Low NO _x	18	No	N/A	N/A	N/A

SCR is more widely used in Japan and Germany than it is in the United States and the technology is being improved such that the hazards and costs have been reduced. It remains, however, a costly technology for small applications and has hazards associated with the use and storage of ammonia. SCR is not generally used with diesel engines of this size. The BACT/LAER database lists only a single facility which uses SCR on diesel engines. SCR was selected in that instance because a local ordinance mandated strict limits on emissions without regards to cost. SCR is not technically feasible for this diesel engine because the exhaust back pressure maximum allowance for the EMD 20-710G4B is 5 inches H₂O. An SCR system will add 5 to 6 inches H₂O back pressure, exceeding the manufacturers specifications and recommendations.

For NO_x emissions, the Department accepts the applicants proposed use of injection timing retardation and cooling of combustion air as BACT for this project.

The BACT emission levels established by the Department are as follows:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides (NO _x)	62 lbs/hr (271 TPY)
Visible Emissions	20%



REVISED BACT DETERMINATION

The applicant has requested a revised BACT limit of 68 lbs/hr and 298 TPY based on the results of the initial compliance test. The Department has done air quality dispersion modeling with the revised limits. This modeling predicts that the applicant will continue to meet all applicable NO_x air quality standards and increments as shown in the following table (all values in ug/m³).

Modeled Concentration	Modeled Concentration	Modeled Concentration
Ambient Air Quality Standard (AAQS)=100	PSD Class II Increment =25	PSD ClassI Significant Impact Level=0.1

The revised BACT emissions given below are within the acceptable range of emissions for diesel fired internal combustion engines according to information from the RACT/BACT/LAER Clearinghouse:

POLLUTANT	EMISSION LIMIT		
Nitrogen Oxides (NO _x)	68 lbs/hr (298 TPY)		

COMPLIANCE

Compliance with the visible emission limitations shall be in accordance with the EPA Reference Method 9 as contained in 40 CFR 60, Appendix A.

Compliance with the NO_x limitations shall be in accordance with the EPA Reference Method 7E as contained in 40 CFR 60, Appendix A.

DETAILS OF THE REVISED ANALYSIS MAY BE OBTAINED BY CONTACTING:

Cleve Holladay, Review Engineer (prepared revised BACT)
Syed Arif, P.E. (reviewed BACT)
Department of Environmental Protection
Bureau of Air Regulation
MS 5505
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DRAFT

APPENDIX BD BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Recommended By:	Approved By:
C. H. Fancy, P.E., Chief Bureau of Air Regulation	Howard L. Rhodes, Director Division of Air Resources Management
Date:	Date:

Memorandum

TO:

Clair Fancy Caf for 647

Al Linero Caf 3/17

Syed Arif SA 3/17

THRU:

FROM:

Cleve Holladay

DATE:

March 17, 1998

SUBJECT:

Permit Amendment

Florida Keys Electric Cooperative, Inc. (FKEC)

Revised NO_X Emission Limits for Unit 8

I have attached a letter and a revised BACT determination amending the construction permit for FKEC's recently installed 3.58 megawatt diesel generator (Unit 8). FKEC failed the initial compliance test on this unit in December, 1997. This amendment raises the NO_x emission limits on this unit from 62 lbs/hr and 271 TPY to 68 lbs/hr and 298 TPY. However, according to information from the RACT/BACT/LAER Clearinghouse, the new emission limits are within the acceptable range for BACT determinations.

The BACT emission limits for this unit were largely determined by the air quality dispersion modeling results and the need to keep total predicted facility impacts less than the NO₂ annual ambient air quality standard of 100 ug/m³. I have done air quality dispersion modeling which includes the proposed higher limit. The results show that this change meets all standards and increments. The original predicted annual impact was 96 ug/m³; the annual impact with the revised limits is 97 ug/m³.

I recommend your approval and signature.

Attachments

CH/kt

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FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Cleve Holladay
Dept. of Environmental Protection
Bureau of Air Resources
Mail Station 5505
2600 Blairstone Rd.
Tallahassee, FL 32399-2400

Post-it® Fax Note 7671	Date 3-4-96 pages 2
TO CLAVE HOLLASON	From DEB. SHAW
Co./Dept. FDEY	Co. FICE
Phone # 850/488-1344	Phone # 305/852 -243/
Fax # 850/922-6979	Fax#305/852-9129

Re: Design and engineering measures taken to reduce emissions on Unit #8.

4 March 1998

Dear Mr. Holladay:

As per you request of Monday, 3/2/98, I am faxing additional information describing exactly what measures were taken to reduce emissions from Unit #8 at the Marathon Generating Plant. The information was supplied by Mr. Robin Weeks of Engine Systems, Inc.

Please call me if you need more information or the fax is not legible. I will be working in the field later today and I can be reached at 305/852-6501. I will take my copy with me if you wish to discuss details. Thanks for your assistance, Cleve.

Sincerely,

Deborah A. Shaw, Ph.D.

Environmental Affairs Coordinator/Biologist

Enc:

Letter from Robin Weeks, ESI.

2 V 76. 加州是1. (华文元)

PC:

C. Russell

T. Planner

ENGINE SYSTEMS INC.

BEST AVAILABLE COPY

PO BOX 1928

ROCKY MOUNT, NC 27802-1928

1220 S WASHINGTON STREET

ROCKY MOUNT, NC, 27601

Fax Cover Sheet

DATE:

March 3, 1998

TÓ:

Chris Pankow

PHONE:

305-743-5323

FKEC

305-743-9191

Robin L Weeks

PHONE:

919-977-2720

Sales Support/Engineering

FAX:

919-446-3830

Unit 8 Emissions modifications to Engine

CC:

Number of pages including cover sheet: 1

Message

The following modifications were made to the standard engine configuration to reach the emissions goals Mac. 11. 11. 11. 11. 11.

- 1. The four pass aftercoolers we used were of a higher flow rate design on the water side, i.e. through the tubes. This allowed us to use an aggressive flow rate of 150 gpm through each aftercooler core, and enabled a lowered airbox temperature relative to utilizing the standard aftercooler cores EMD provides with this engine
- 2. The separately cooled circuit uses the available sea water as a relatively cool medium in the heat exchanger. By utilizing the design value of 88°F sea water, we are able to supply the aftercooler cores with approximately 90-92°F fresh water on the engine side of the aftercooler heat exchanger. This greatly reduces the engine airbox temperature relative to using 175-180°F fresh water as would , lightwe been the case using the standard EMD cooling system.
- 3. The 6° retarded fuel injection timing was the third modification. We originally intended to retard 4", however after much discussion with Tim Paulson at EMD, it was decided that 6° retarded fuel injection timing was probably necessary to guarantee meeting our contractual requirements.

I believe the confirment about fuel injectors concerns the spray tip pattern. EMD found that an older version of the injector tip was spraying some fuel directly onto the crowns of some of the valves! which caused incomplete atomization to occur. They changed the angle of the prifices in the apray tip to prevent this from occurring. All of their engines use the new pattern, and we did not change these.

I hope this clarifies the questions you have. Please forward this information(to Dehorah Shawjand Tim Planer

Thank you

6132F121.DOC

Do thoughave a continuous combustion monitoring syptem

February 20, 1998

FKEC's facility was remodeled to reflect its request for a higher NO_x limit for Unit 8. The requested limit is 68 lb/hr or 8.57 g/s. The results of the modeling reflecting this change are shown below

Requested Emission Rates and Stack Parameters for FKEC

-	Emission	Stack	Stack	Stack	Stack
Emission Units	Rate	Height	Temp	Vel	Diameter
	(g/s)	(m)	°K	(m/s)	(m)
Unit 8	8.57	11.79	625	34.6	0.71
Unit 1	2.96	6.15	669	27.3	0.71
Unit 2	3.85	6.15	669	27.3	0.71
Unit 3	4.64	11.43	677	38.9	0.66
Unit 4	4.44	11.43	677	38.9	0.66
Unit 5	5.11	11.43	677	38.9	0.66
Unit 6	4.72	7.20	664	23.8	0.76
Unit 7	4.40	7.20	664	23.8	0.76

Location of Emission Units in Smith

Emission Units	x (m)	y (m)
No. 8	0.0	0.0
No. 1	-71.1	-34.8
No. 2	-71.1	-28.2
No. 3	-6.7	0.0
No. 4	-14.8	0.0
No. 5	-20.4	0.0
No. 6	-74.0	-48.9
No. 7	-74.0	-43.0

MODEL RESULTS FKEC

(All Values in ug/m³, annual average)

	MET DATA	AAQS=100	PSD Class II=25	PSD ClassI SIL=0.1
	1	CONC	CONC	CONC
1987	Key West/Miami	77	18	0.04
1988	Key West/Miami	89	16	0.04
1989	Key West/Miami	89	18	0.03
1990	Key West/Miami	87	21	0.02
1991	Key West/Miami	97	21	0.02

Files: fk50_68.087 throuh fk50_68.091 for AAQS, fkspsd68.087 through fkspsd68.091 for PSD Class II; fkpsdc1.087 through fkpsdc1.090



FINAL TEST REPORT

EMISSIONS COMPLIANCE TEST PROGRAM

FLORIDA KEYS ELECTRIC COOPERATIVE

MARATHON FACILITY

PREPARED FOR:

Engine Systems, Inc.

1220 Washington Street

Rocky Mount, NC 27802-1928

CONCERNING:

NO_x, CO, VOC and Opacity Compliance Testing

Emission Unit #8 3.58 MW Diesel Electric Generator Florida Keys Electric Cooperative Association, Inc.

Marathon Facility December 17, 1997

PREPARED BY:

South Florida Environmental Services

6821 Vista Parkway North

West Palm Beach, Florida 33411

SFES #97-581

Ron C. Cook Jr.

Senior Project Director

Date

RECEIVED

JAN 2 8 1998

BUREAU OF AIR REGULATION

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C	CALIBRATION GAS CERTIFICATIONS
D	FIELD DATA SHEETS
E	STRIP CHARTS
F	NOMENCLATURE
G	FACILITY OPERATING DATA



1.0 COMPENDIUM

South Florida Environmental Services conducted an emissions compliance test program on behalf of Engine Systems, Inc. at Florida Keys Electric Cooperative Association, Inc. located in Marathon, Florida. The testing was conducted on the newly installed EMD generator set rated at 3.58 MW and took place on December 17, 1997.

The objective of the testing program was to determine the Compliance/Performance status of EMD diesel generator #8 with respect to oxides of nitrogen, carbon monoxide, total hydrocarbons and opacity limits. Set forth by the Florida, Department of Environmental Protection (FDEP) and Florida Keys Electric Cooperative.

All test methods and procedures were conducted in strict accordance with EPA Methods 3A, 7E, 9, 10 and 25A as found in the Federal Register (40CFR60), Appendix A. The approved test plan was adhered to throughout the program. All lb/MMBtu emission rates are based on the F-factor for oil in accordance with EPA Method 19.

The gaseous (CEM/VOC) sampling consisted of three 1-hour runs during the test program while the unit was operating at 100% of rated capacity. Finial results can be found in Table 1-1.

The opacity determination was an hour visible emissions run consisting of 240 readings, 4 readings per minute, from which the highest 6-minute average and maximum opacity values were obtained and reported as percent opacity. Finial results can be found in Table 1-2.

Ron C. Cook Jr. Senior Project Director, was responsible for all phases of the test program he was assisted by a team of qualified environmental professionals. Robin L. Weeks of Engine Systems, Inc. coordinated unit operation with testing. Tim Planner of Florida Keys Electric Cooperative was the company's representative.



1.0 COMPENDIUM (cont.)

The following tables summarize the results of the emissions testing program.

Table 1-1
Summary of Results
FKEC Emission Unit # 8
EMD Diesel Electric Generator

NOx

	11011					
Run #	Time	ВНР	NOx Gms/bhp-hr	NOx lb/hr	NOx Tons/yr	
1	1500-1600	4981	6.01	65.95	288.86	
2	1635-1735	4988	6.01	66.09	289.47	
3	1800-1900	4983	5.93	65.10	285.14	
Average			5.98	65.71	287.82	

\mathbf{CO}

Run #	Time	ВНР	CO Gms/bhp-hr	CO lb/hr	CO Tons/yr
1	1500-1600	4981	.49	5.40	23.65
2	1635-1735	4988	.49	5.38	23.56
3	1800-1900	4983	.49	5.38	23.56
Average			.49	5.39	23.59

THC

Run #	Time	ВНР	THC Gms/bhp-hr	THC lb/hr	THC Tons/yr
1	1500-1600	4981	.15	1.70	7.45
2	1635-1735	4988	.16	1.72	7.53
3	1800-1900	4983	.15	1.69	7.40
Average			.15	1.70	7.46

Note: Tons/yr were calculated using 8760 hours or continuous operation

Table 1-2
Visible Emission Results

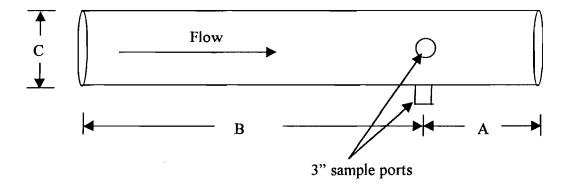
Unit #	Length of Test	Highest 6 min. Average	Readings above 20%
EMD #8	60	5.0%	NONE

Project No. 97-581 01/16/98



2.0 REFERENCE METHOD SAMPLING LOCATION

The emissions were measured in the 2.3-foot diameter exhaust duct. The sampling location is indoors, and is accessible via a man lift platform. Two 3-inch diameter sampling ports are installed 90° apart. Figure 2-1 depicts the sampling location.



Description	Dimension
Port To Downstream (A)	9.5 feet
Upstream To Port (B)	23.5 feet
Duct Diameter (C)	2.3 feet
Number Of Ports	2

Figure 2-1
Stack Sampling Location



3.0 SAMPLING POINT LOCATIONS

The stack has an inside diameter of 2.3-feet at the sampling location. The distance from the sampling ports to the nearest downstream disturbance is 9.5 feet or 4.1 diameters. The distance from the nearest upstream disturbance to the sampling ports is 23.5 feet or 10.2 diameters. Based upon the requirements of Methods in Appendix B, Specification 2, the CEM probe was placed at a total of 3 sampling points. The CEM probe was marked according to the measurements in **Table 3-1**. A rake probe was used to satisfy this criteria.

Table 3-1 CEM Sampling Points

Traverse Point	Distance %	Probe Marking
1	16.7	4.68"
2	50.0	14.00"
3	83.3	23.32"



The subject unit was tested for nitrogen oxides, carbon monoxide, opacity and volatile organic compound emissions. Each pollutant parameter was tested in strict accordance with official EPA procedures at the sampling locations described in Sections 1, 2 and 3. In this section, the test procedures that were used, including sampling and analysis, are discussed.

4.1 DESCRIPTION OF METHODOLOGY

4.1.1 Nitrogen Oxides

Nitrogen oxides were measured in accordance with EPA Method 7E. This Method utilizes continuous emissions monitoring instrumentation. South Florida Environmental Services uses a Thermo Electron Model 10A NOx chemiluminescent monitor with 8 ranges from 0-10,000 ppm. The instrument meets all of the performance specifications of the Method. It was calibrated before and after each test period using calibration gases prepared according to EPA Protocol #1. Three 60-minute runs were conducted.

4.1.2 Carbon Monoxide/Carbon Dioxide

Carbon monoxide was measured in accordance with EPA Method 10 and carbon dioxide in accordance with EPA Method. This Method utilizes continuous emissions monitoring instrumentation. South Florida Environmental services uses a Fuji Model 3400 non-dispersive infra red analyzer with a range of 0-500 ppm for CO and 0-25% for CO₂. The instrument meets all of the performance specifications of the Methods. It was calibrated before and after each test period using calibration gases prepared according to EPA Protocol #1. Three 60-minute runs were conducted.

4.1.3 Volatile Organic Compounds

VOCs (Total Hydrocarbons) were determined in accordance with EPA Method 25A. This method utilizes a FID analyzer which is calibrated with certified methane standards. South Florida Environmental Services uses a TECO Model #51 flame ionization analyzer with four ranges between 0-10,000 ppm. The instrument meets all of the performance specifications of the Method. It was calibrated before and after each test period using three concentrations of calibration gas in the working range of the instrument. The calibration gases were prepared according to EPA Protocol #1. Three 60-minute runs were conducted.



4.1.4 Oxygen

Oxygen was measured in accordance with EPA Method 3A. This Method utilizes continuous emissions monitoring instrumentation. South Florida Environmental Services uses a Teledyne Model 326A analyzer with a range of 0-25%. The instrument meets all of the performance specifications of the Method. It was calibrated before and after each test period using calibration gases prepared according to EPA Protocol #1.

4.1.5 Opacity

Opacity observations were conducted in accordance with EPA Method 9. South Florida Environmental Services provided an EPA certified visible emissions observer. Measurements were made during each of the compliance test runs. Three 60-minutes runs were conducted. Each run consisted of 240 opacity observations which were recorded on Visible Emissions Data Sheets (appended).



4.2 DESCRIPTION OF CEM SAMPLING

4.2.1 CEM Sampling System

What follows is a description of the transportable continuous emissions monitor system that was used to quantify oxygen, carbon dioxide, oxides of nitrogen, and carbon monoxide, from the subject unit at the facility. The system meets all the specifications of Reference Methods 3A (O2/CO2), 7E (NOx), and 10 (CO).

Sample Probe - A stainless steel rake probe of sufficient length was used to sample at the location specified in Section 2.0.

Sample Line - Approximately 100' to 150' of 3/8" Teflon tubing (1/16" wall) was used to transport the sample gas from the probe to the sample conditioning system.

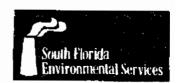
Sample Conditioning System-

Filter - A heated spun glass fiber filter was located at the end of the probe to remove particulate from the gas stream.

Condenser (2) - a Universal Analyzer Sample Cooler or ice cooled condenser was located near the probe for bulk moisture removal and a thermo-electric condenser system was located downstream from the pump to remove any remaining moisture from the gas stream.

Sample Pump - A diaphragm type vacuum pump was used to draw gas from the probe through the conditioning system and to the analyzers. The pump head is stainless steel, the valve disks are Viton and the diaphragm is Teflon coated.

Calibration Valve - A t-valve, located at the base of the probe, allows the operator to select either the sample stream or inject calibration gas to the CEM system.



Sample Distribution System - A series of flow meters, valves and back pressure regulators allowed the operator to maintain constant flow and pressure conditions during sampling and calibration.

Gas Analyzers - capable of the continuous determination of O2, CO2, CO, and NOx concentrations in a sample gas stream. They each meet or exceed the following specifications:

Calibration Error - Less than ±2% of span for the zero, mid- and hi-

range calibration gases.

System Bias - Less than $\pm 5\%$ of span for the zero, mid- or

hi-range calibration gases.

Zero Drift - Less than $\pm 3\%$ of span over the period of

each test run.

Calibration Drift - Less than $\pm 3\%$ of span over the period of each

test run.

Data Acquisition System - A Molytek strip chart/data logger system was used to record analyzer response to the sample and calibration gas streams. The chart recorder operated continuously while the data logger recorded thirty (30) minute interval averages.

The Molytek was linked, via an RS232 cable, to an IBM compatible computer system with a VGA screen. Data was written to file at fifteen (15) second intervals. Separate files for each run, and associated calibrations, were generated. Data was loaded into a spreadsheet for calculation of interval averages and emission rates. Preliminary reports were available on-site.

4.2.2 CEMS Sampling Procedures

All sampling and analytical procedures were conducted in accordance with EPA Reference Methods 3A, 7E, and 10 (40CFR60, Appendix A). The following is the sequence of events leading up to and including the compliance test:

Selection of Sampling Traverse Point Locations - Sampling point locations were determined prior to testing in accordance with EPA Methods 3A, 7E, and 10.

Determination of System Response Time - System response time was determined prior to testing. System response time was determined according to procedures delineated in Performance Specification 2 (40CFR60, Appendix B).



Project No. 97-581 01/16/98

Determination of Analyzer Calibration Error - Analyzer calibration error was determined immediately prior to testing in accordance with EPA Methods 3A, 7E, and 10.

Determination of Sampling System Bias - Sampling system bias was determined immediately prior to testing in accordance with EPA Methods 3A, 7E and 10.

Determination of Zero and Calibration Drift - Before and after each test run, each analyzer's response to zero and mid- or hi-range calibration gases were determined. The pre-and post-test analyzer responses were compared to determine drift. The results were evaluated based upon specifications defined in EPA Methods 3A, 7E and 10.

Data Reduction - An average pollutant/diluent concentration for each test run was determined from the data acquisition system. This data was then reduced to determine relative pollutant concentrations.

4.3 DESCRIPTION OF VOLATILE ORGANIC COMPOUNDS SAMPLING

4.3.1 VOC Sampling Equipment

Probe - A single opening 3/8" OD stainless steel probe was used at each sample location.

Calibration Valve - A three way valve was located at the end of each sample line to select either sample mode or system calibration mode.

Sample Line - A heated 3/8" OD Teflon sample line was used to transport the sample stream from the test locations to the analyzers. The lines were heated to the temperature of the sample duct, or to a maximum of 300°F, to maintain integrity of the sample.

System Calibration Line - A 1/4" OD Teflon tube was used to transfer calibration gas from the cylinder to the calibration valve.

VOC Analyzer - The analyzer used was a TECO Model #51 flame ionization analyzer (FIA).

Data Acquisition - The FIA's response was sent to a Molytek Data Acquisition System (DAS). The DAS recorded the response of each FIA on a strip chart recorder and IBM compatible computer via an RS-232 cable. The computer stored each analyzer's response at fifteen second intervals over the course of each run. Run averages were determined from all stored data points over the course of the run.



4.3.2 **VOC Sampling Procedures**

Calibrations - The FIA was calibrated prior to sampling using zero, low, mid and high calibration gases of certified cylinders of methane in a balance of nitrogen. Calibrations were conducted through the entire sample system. A description of the specific procedures is provided below.

Zero: The zero point of the analyzer was determined using a pre-purified cylinder of nitrogen. The zero point was analyzed for a minimum of five minutes to monitor drift before sampling commenced.

High Span: The high calibration gas, $\sim 85\%$ of span, was introduced to the sample system and the response of the analyzer was adjusted accordingly.

Mid & Low Span: The mid and low calibration gases, ~50% and 30% of span respectively, were introduced to the sample system and the response of the analyzer was recorded. The analyzer met Method 25A criteria for accuracy.

Sampling - Once the analyzer was calibrated, the system calibration valve was switched to sample mode and sampling was conducted. The response time of the system was determined by the time the valve is actuated to the time the response of the FIA is 95% of the steady state sample value.

Post Calibration - Immediately following each test run, the sample system was switched into calibration mode, and the zero and mid span gas was introduced to monitor analyzer drift. All post calibrations met or exceeded the Method 25A criteria for drift.



5.0 QUALITY CONTROL PROCEDURES

Sampling was conducted by trained personnel with extensive experience in Reference Method sampling.

All sampling and analysis was conducted in strict accordance with EPA test procedures. The quality control procedures found in the EPA Quality Assurance Handbook for Air Pollution Measurement Systems was adhered to as well.

South Florida Environmental Services entire equipment inventory is on a schedule of routine maintenance and calibration. This includes meter boxes, thermocouples, barometers, pitot tubes, sampling nozzles and CEM instrumentation

All CEM analyzer and system calibrations were performed using NIST-traceable gas prepared in accordance with EPA Protocol #1.

All calculations were conducted in strict accordance with the equations found in the individual Methods. Emission rate calculations were conducted on a computer and the input data was checked by a person other than the original calculator to ensure that it is correct.

These specific procedures in addition to South Florida Environmental Services usual high standard of quality control I validated the results obtained in this test program. South Florida Environmental Services is staffed by a team of qualified, experienced environmental professionals. As the majority of our emissions testing work is done for compliance purposes, strict QC procedures are incorporated into our everyday work performance.



APPENDIX A CEMS/VOC EMISSION CALCULATIONS



PLANT LOCATION	FKEC GENERATOR #8	RUN# DATE	NOX-1 17-Dec-9	7
Load =	3580 KW			·
PPMV NOx =	652.65	BTu/gl =	= 138870)
O2 % DRY =	13.26	gl/hr =	242.43	3
Humidity =	0.008 lb/lbdry air 58.8 gr/lbdry air	Fuel Density =	= 7.189	b lb/gl
"K" =	0.994956	Air Temp =	: 70)°F
NOx @15% O2	2 = NOx PPMV X (20.9-15(20.9-%O2)	=	503.98	ppmvd
NOx Corrected	= "K" X NOx @15% O2	=	501.44	ppmvd
CS NOx	= NOx PPMV X (1.194 e -7)	=	7.79E-05	lb/scf
NOx lb/mmbtu	= CS NOx X Fd X 20.9/(20.9-%) Fd = 9190	O2) =	1.96	lb/mmbtu
Qs SCFM	= NOx lb/hr / CS NOx / 60	=	14105	scfm
NOx lb/hr	= NOx lb/btu X btu/gl X gl/hr	=	65.95	lb/hr
NOx gms/ BHP_HR	= NOx lb/hr x 454gms/lb / BHP	=	6.01	gms/bhp-hr
TEST BHP	= 4981			



PLANT LOCATION :	FKEC Generator # 8	RUN # DATE	
Load =	3580 KW		
PPMV NOx =	646.79	BTu/gl =	138870
O2 % DRY =	13.35	gl/hr =	242.27
Humidity =	0.008 lb/lbdry air 58.8 gr/lbdry air	Fuel Density =	7.189 lb/gl
"K" =	0.994956	Air Temp =	70 ° F
_	02 = NOx PPMV X (20.9-15(20.9-%) = "K " X NOx @15% O2	oO2) = =	505.34 ppmv 502.79 ppmv
CS NOx	_		.,
NOx lb/mmbtu	= CS NOx X Fd X 20.9/(20.9- Fd = 9190	-%O2) =	1.96 lb/mmbtu
Qs SCFM	= NOx lb/hr / CS NOx / 60	=	14262 scfm
NOx lb/hr	= NOx lb/btu X btu/gl X gl/	hr =	66.09 lb/hr

NOx gms/ = NOx lb/hr x 454gms/lb / BHP = 6.01

TEST BHP = 4988

BHP_HR



PLANT LOCATION .	FKEC Generator # 8	RUN# DATE	
Load =	3580 KW		•
PPMV NOx =	646.80	BTu/gl =	138870
O2 % DRY =	13.26	gl/hr =	241.47
Humidity =	0.008 lb/lbdry air 58.8 gr/lbdry air	Fuel Density =	7.189 lb/gl
"K" =	1.017222	Air Temp =	60 ° F
NOx @15% O	2 = NOx PPMV X (20.9-15(20.9-%O	2) =	499.49 ppmv
NOx Corrected	= "K " X NOx @15% O2	=	508.09 ppmv
CS NOx	= NOx PPMV X (1.194 e -7)	=	7.72E-05 lb/scf
NOx lb/mmbtu	= CS NOx X Fd X 20.9/(20.9-% Fd = 9190	O2) =	1.94 lb/mmbtu
Qs SCFM	= NOx lb/hr / CS NOx / 60	=	14050 scfm
NOx lb/hr	= NOx lb/btu X btu/cf X cf/hr	=	65.10 lb/hr
NOx gms/ BHP_HR	= NOx lb/hr x 454gms/lb / BHP	=	5.93
TEST BHP	= 4983		



PLANT : FKEC LOCATION : GENERATOR#8	RUN# DATE		
Load = 3580 KW			•
PPMV CO = 87.94	BTu/gl	13887	0
O2 % DRY = 13.26	gl/hr	242.43	3
Humidity = 0.008 lb/lbdry air 58.8 gr/lbdry air	Fuel Density	7.189	9 lb/gl
" K " = 0.994956	Air Temp	70)°F
CO @15% O2 = CO PPMVD X (20.9-15(20.9-%O2	=	67.90	ppmvd
CO Corrected = "K " X CO @15% O2	= .	67.56	ppmvd
CS CO = CO PPMVD X (28.010/386.3)/1000000	=	6.38E-06	lb/scf
CO lb/mmbtu = CS CO X Fd X 20.9/(20.9-%O2) Fd = 9190	=	0.16	lb/mmbtu
Qs SCFM = CO lb/hr / CS CO / 60	=	14105	scfm
CO lb/hr = CO lb/btu X btu/gl X gl/hr	=	5.40	lb/hr
CO gms/ = CO lb/hr x 454gms/lb / BHP BHP_HR	=	0.49	gms/bhp-hr
TEST BHP = 4981			



PLANT LOCATION	FKEC GENERATOR #8	RUN# DATE	NOX-2 17DEC97	
Load =	3580 KW		•	
PPMV CO =	86.70	BTu/gl	13887	0
O2 % DRY =	13.35	gl/hr	242.2	7
Humidity =	0.008 lb/lbdry air 58.8 gr/lbdry air	Fuel Density	7.189	9 lb/gl
"K" =	0.994956	Air Temp	70	o°F
CO @15% O	2 = CO PPMVD X (20.9-15(20.9-%O2	=	67.74	ppmvd
CO Corrected	= "K " X CO @15% O2	=	67.40	ppmvd
CS CO = C	O PPMVD X (28.010/386.3)/1000000	=	6.29E-06	lb/scf
CO lb/mmbtu	= CS CO X Fd X 20.9/(20.9-%O2) Fd = 9190	=	0.16	lb/mmbtu
Qs SCFM	= CO lb/hr / CS CO / 60	=	14262	scfm
CO lb/hr	= CO lb/btu X btu/gl X gl/hr	=	5.38	lb/hr
CO gms/ BHP_HR	= CO lb/hr x 454gms/lb / BHP	=	0.49	gms/bhp-hr
TEST BHP	= 4988			



PLANT FREC LOCATION GENERATOR #8	RUN# DATE	NDX-3 17DE097	
Load = 3580 KW			
PPMV CO = 87.98	BTu/gl	13887	0
O2 % DRY = 13.26	gl/hr	241.4	7
Humidity = 0.008 lb/lbdry air 58.8 gr/lbdry air	Fuel Density	7.189	9 lb/gl
"K" = 0.994956	Air Temp	70	o°F
CO @15% O2 = CO PPMVD X (20.9-15(20.9-%O2	. =	67.94	ppmvd
CO Corrected = "K" X CO @15% O2	=	67.60	ppmvd
CS CO = CO PPMVD X (28.010/386.3)/1000000	=	6.38E-06	lb/scf
CO lb/mmbtu = CS CO X Fd X 20.9/(20.9-%O2) Fd = 9190	=	0.16	lb/mmbtu
Qs SCFM = CO lb/hr / CS CO / 60	=	14050	scfm
CO lb/hr = CO lb/btu X btu/gl X gl/hr	=	5.38	lb/hr
CO gms/ = CO lb/hr x 454gms/lb / BHP BHP_HR	=	0.49	gms/bhp-hr
TEST BHP = 4983			

PLANT FKEC PLANT PLANT FKEC PLANT PROPERTY FREC PLANT PROPERTY FREE PLANT PROPERTY FRE	RUN # "." DATE		es 1500as (1505986)
Load = 3580 KW			
PPMVD THC = 48.36	BTu/gl =	138870)
O2 % DRY = 13.26	gl/hr =	242.43	3
Humidity = 0.008 lb/lbdry air 58.8 gr/lbdry air	Fuel Density =	7.189) lb/gl
"K" = 0.994956	Air Temp =	70	°F
THC @15% O2 = THC PPMVD X (20.9-15(20.9-%)	O2) =	37.34	ppmvd
THC Corrected = "K" X CO @15% O2	=	37.16	ppmvd
CS THC = THC PPMVD X (16.043/386.3)/100000	=	2.01E-06	lb/scf
THC lb/mmbtu = CS THC X Fd X 20.9/(20.9-%O2 Fd = 9190	=	0.05	lb/mmbtu
Qs SCFM = THC lb/hr / CS THC / 60	=	14105	scfm
THC lb/hr = THC lb/btu X btu/gl X gl/hr	=	1.70	lb/hr
THC gms/ = THC lb/hr x 454gms/lb / BHF BHP_HR	o =	0.15	gms/bhp-hr
TEST BHP = 4981			



PLANT : FKEC LOCATION : GENERATOR #8	RUN# DATE	NOX-2 17DEC97	
Load = 3580 KW			
PPMVD THC = 48.36	BTu/gl =	138870)
O2 % DRY = 13.35	gl/hr =	242.27	7
Humidity = 0.008 lb/lbdry air 58.8 gr/lbdry air	Fuel Density =	7.189) lb/gl
"K" = 0.994956	Air Temp =	70	°F
THC @15% O2 = THC PPMVD X (20.9-15(20.9-%)	02) =	37.78	ppmvd
THC Corrected = "K" X CO @15% O2	=	37.59	ppmvd
CS THC = THC PPMVD X (16.043/386.3)/100000	=	2.01E-06	lb/scf
THC lb/mmbtu = CS THC X Fd X 20.9/(20.9-%O2 Fd = 9190	· =	0.05	lb/mmbtu
Qs SCFM = THC lb/hr / CS THC / 60	=	14262	scfm
THC lb/hr = THC lb/btu X btu/gl X gl/hr	=	1.72	lb/hr
THC gms/ = THC lb/hr x 454gms/lb / BHF BHP_HR	=	0.16	gms/bhp-hr
TEST BHP = 4988			



PLANT FREC LOCATION GENERATOR #8		RUN# DATE	NOX-3 17DEC97	
Load = 3580 KW				
PPMVD THC = 48.36		BTu/gl =	13887	o
O2 % DRY = 13.26		gl/hr =	241.47	7
Humidity = 0.008 lb/lbdry 58.8 gr/lbdry		Fuel Density =	7.189) lb/gl
"K" = 0.994956		Air Temp =	70)°F
THC @15% O2 = THC PPMVD)	〈 (20.9-15(20.9-%(D2) =	37.35	ppmvd
THC Corrected = "K" X CO	@15% O2	=	37.16	ppmvd
CS THC = THC PPMVD X (16.0	43/386.3)/100000	=	2.01E-06	lb/scf
THC lb/mmbtu = CS THC X Fd > Fd	(20.9/(20.9-%O2 = 9190	=	0.05	lb/mmbtu
Qs SCFM = THC lb/hr / CS	THC / 60	=	14050	scfm
THC lb/hr = THC lb/btu X	btu/gl X gl/hr	=	1.69	lb/hr
THC gms/ = THC lb/hr x BHP_HR	454gms/lb / BHP	=	0.15	gms/bhp-hr
TEST BHP = 4983				



CALIBRATION CORRECTION SHEET

PLANT	FKEC		RUN# NOX-1
			DATE 17DEC97
LOCAT	ION : Generator#	0	DAIL HUEGS
START	TIME: 1500		
END TI			
EMD III	VIC IDUU		

SYSTEM CALIBRATION DATA	SYSTE	ΞM	CAL	IBRA	MOIT	DATA
-------------------------	-------	----	-----	------	------	------

•	POLLUTANT	O2	CO2	co	SO2	NOX
	INITIAL ZERO	0.00	0.00	1.60		3.80
	FINAL ZERO	0.00	0.10	-0.10		5.00
Co=	AVG ZERO	0.00	0.05	0.75		4.40
	INIT SPAN	12.00	10.20	153.30		913.20
	FINAL SPAN	12.10	10.30	153.10		931.80
Cm=	AVG SPAN	12.05	10.25	153.20		922.50
Cma=	CAL GAS	12.30	10.40	154.00		902.00
	Cgas = (C'-Co)xC	ma/(Cm-Co)				
C'=	Raw RM Data	12.99	6.00	87.80		668.70
Cgas=	Adj. RM data	13.26	6.07	87.94		652.65

CALIBRATION CORRECTION SHEET

PLANT : FKEC RUN# NOX-2	
LOCATION Generator #8 DATE 17DEC9	388
PTADETIAND PARE	
	₩
END TIME: 1735	
START TIME: 1635 END TIME: 1735	1

	SYSTEM CALIBRA	ATION DATA				
	POLLUTANT	O2	CO2	со	SO2	NOX
	INITIAL ZERO	0.00	0.10	-0.10		5.00
	FINAL ZERO	0.00	0.20	1.10		2.40
Co=	AVG ZERO	0.00	0.15	0.50		3.70
	INIT SPAN	12.10	10.30	153.10		931.80
	FINAL SPAN	12.30	10.30	153.80		926.30
Cm=	AVG SPAN	12.20	10.30	153.45		929.05
Cma=	CAL GAS	12.30	10.40	154.00		902.00
	Cgas = (C'-Co)xCm	a/(Cm-Co)				
C'=	Raw RM Data	13.24	6.01	86.61		667.23
Cgas=	Adj. RM data	13.35	6.00	86.70		646.79

CALIBRATION CORRECTION SHEET

PLANT FKEC LOCATION : Generator # 8	
PLANT : FKEC	RUN# NOX-3
LOCATION Generator # 8	DATE 17DEC97
LUGATION CONCINCTO	D
START TIME: 1800	
END TIME: 1900	
m11m 1131m	

POLLUTANT	02	CO2	СО	SO2
INITIAL ZERO	0.00	0.20	1.10	
FINAL ZERO	0.00	0.20	3.50	
AVG ZERO	0.00	0.20	2.30	
INIT SPAN	12.30	10.30	153.80	
FINAL SPAN	12.30	10.30	155.80	
ÁVG SPAN	12.30	10.30	154.80	

NOX

2.40 2.40

2.40 926.30 912.60

919.45

902.00

Cgas = (C'-Co)xCma/(Cm-Co)

Co≠

Cm=

Cma= CAL GAS

SYSTEM CALIBRATION DATA

C'= Raw RM Data 13.26 6.05 87.98 659.99

10.40

154.00

12.30

Cgas= Adj. RM data 13.26 6.02 86.52 646.80

APPENDIX B OPACITY OBSERVATIONS



VISIBLE EMISSIONS TEST

DATA REDUCTION SHEET

COMPANY: FKEC DATE: 17DEC97

SOURCE: UNIT #8 RUN TIME: 1500-1600

MIN/SEC	0	15	30	45	MIN/SEC	0	15	30	45
1. 2. 3. 4. 5. 6. 7. 8. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 27. 28. 29.	555555555555555555555555555555	5555555555555555555555555555555555555	55555555555555555555555555555555	555555555555555555555555555555555555555	31. 32. 33. 34. 35. 36. 37. 38. 39. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 54. 55. 56. 57. 58. 59. 60.	ភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភភ	555555555555555555555555555555555555	555555555555555555555555555555555555555	5555555555555555555555555555555

NUMBER OF READINGS ABOVE 20% - 0

HIGHEST SIX MINUTE AVERAGE - 5.0 %

OVERALL AVERAGE OPACITY - 5.0 %

READINGS RANGED FROM - 5 TO 5 %



EPA

VISIBLE EMISSION OBSERVATION FORM 1

Method 9 203A	203B	Other		
Company Name FKEC				
Focility Name SAME				
Street Address MM	29			
Mara thow	S	FL	Zp	
Generator #	8	F S	Ira Mode 58 W	w

Height of Erniss, Pt. Height of Erniss, Pt. Rel. to Observer	Height of Emiss. Pt. Stort ~ 30 End ~ 30 Stort ~ 30 End ~ 30	Left most S	ilver STACK
	Start ~ 30 End ~ 30 Start ~ 30 End ~ 30 Distance to Emiss. Pt. (Degrees)		
	Distance to Emiss, Pt. (Degrees)		

Verifical Angle to Obs. Pt.	Direction to Obs. Pt. (Degrees)
Stort 75 End 25	Start 70 End 70
Distance and Direction to Observation Point	2000 00
stort 000 90	End 200 70 .

Sand Sandke		sm Sc	nobe	
Start Smoke Emission Color Start LT 9'ey End	Sme	Water Droplet	Plume Detoched	None 🗹
Daniel de Carre de la constant				

Describe Purps Brickground	Ck.
Start - X Y Background Color	End >K /
Background Color	Sky Conditions,
Start Blace End SAME Wind Speed	Ston Scattered and Stone
Wind Speed	Wind Direction
Start N 5-10 " End N 5-10 "	Start WGIT End WEST
Ambient lemp.	Wet Bulb Temp. RH Percent
Start 70 End 63	1

	Source Layout Sketa	h Draw North Arrow
i	50000 10,001 3,010	□IN □MN
	X Observation Pair	16
		FEET
\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Observer's Position	Stack With Purns
	Sun logation line	sun \oplus
Longitude	Cattude	Declination

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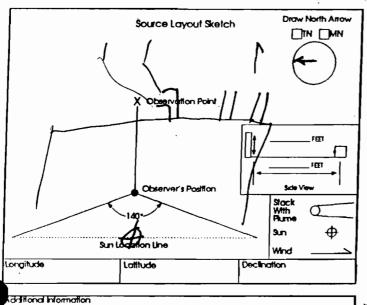
Observer e (Print) Cook	
Observer Standius Class	12/17/97
Offigibilition SFES	
Certified By ETA	Date 7/5/57

EPA

VISIBLE EMISSION OBSERVATION FORM 1

Method 9 203A 2038	Other:
Company Name FKEC	
Focility Norme SAME Street Address	
mn 29	
Marathon	State FL Zp
Process L #4	Unit Operating Mode
Severata #8	Operating Mode
Describe Emission Point	
Describe Emission Point LCF+mos+	Silver Stack
Height of Erriss, Pt.	Height of Emiss. Pt. Rel. to Observer
Start ~30 End ~30 Distance to Emiss. Pt.	Start 30 End 30 Direction to Emiss. Pt. (Degrees)
Start 300 End 700	Direction to Emiss. Pt. (Degrees) Start End
Verlical Angle to Obs. Pt.	Direction to Obs. Pt. (Degrees) Start 90 End 90
Start ~ 1500 End ~ 1500 Distance and Direction to Observation Point Start ~ 200 / 90	from Emission Point
stort ~ 200 / 90°	End - 200 90°
Describe Emissions	

SOLY OLL PUR SALAR	IATIOCHED L. Detoched L. None IA
Describe Plume Brackground	Cla
Stort Sk V Bockground Color	Ind Sky Conditions
Start Blue End Blue	Stat Scatter and SAME
Stat 5-10 End 5-10	Wind Direction Start WEST End WEST
Amblent lemp. Start 70 End 65	Wel Bulb Temp. RH Percent



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Observer's Norme (Print) Now C Cook Iv	
Som Clook 12	12/17/97
Organization SFES	
ETA.	Date 7/15/57

APPENDIX C CALIBRATION GAS CERTIFICATIONS



BEST AVAILABLE COPY

NATIONAL SPECIALTY GASES **630 UNITED DRIVE** DURHAM, NC

27713

					_F -0.	RTIFICATE (44-377:		~~ Y >=	ימוזיקיעין	re			
REFERENCE	E.#:	88-528	89	CYLIN	DER#:	KILFICALE	CC 50751			ESSURE:		2000 PSIG	P.O. #:	43416	
EXP. DATE:		5/29/99	9		ANALYSIS I	DATE:	5/29/97		USTOM			SOUTHHEA	AST AIRGAS		
METHOD:													ALIBRATION STA	NDARDS-SEPTE	MBER
COMPONI		NTRIC O		I DE USE		'S GAS PRESS COMPONENT		ON MON			130 P31C	1).		 	
STANDAR	Ð			*		STANDARD		÷.							
SRM#:		1687B				SRM#:	1680E							•	
CYL.#:		CLM 9893			Ì	CYL#	CLM	251.1							
CONC:		986.0 PPM	(er			CONC:	490.A	PPM							
			70					a	. :: ::				*. #		
INSTRUM	ENT:	BECKMA	NCHEMI	UMINES	CENT	INSTRUMEN	T: ROSE	MOUNT	NDIR		•	•			
MODEL#:		951A				MODEL#:	880A	#							•
SERIAL#:		0100532			7	SERIAL#:	20001	72				•			
LAST CAL	.:	5/1/97	2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1,4	LAST CAL:	5/15/5	7		•					
MEAN CO	NC:			J+1-	7.22 PP	M MEAN CON	1C.:	1 286	PPM	+/-	2	29 PPM			
REPLICAT	E CONC	<u>.</u>				REPLICATI	E CONC.	4							
DATE:	5/2	2/97	DATE:	5/2	9/97	DATE:	5/22/97	DA	TÉ:	5/2	9/97				
	898	PPM	1	906	PPM	2	86 PPM			285	PPM		- 35 - 434		
	899	PPM	1	905	PPM	2	86 PPM			286	PPM				·
	898	PPM		.906	PPM	2	85 PPM			286	PPM				
BALANCI	2045	NITROGE		TED ACTO	CACEC AT	TROGEN DIO	ZIDE < 0.1 M						· .		
BALANCE	GAS:	NITROGE		TRACE	Gases: Ni	ROGEN DIO	CIDE < 0.1 Pr	M					·		
REPLICA	TE DAT	A				REPLICATI	E DATA		_			REPLICA	TE DATA		
DATE:	5/22/97					DATE:	5/22/97								
Z	0	R	420.4	C	382.9	Z	0	R	490		C	286			
R	420.3	Z	0	(383.2	R	490	Z	0		С	286			
Z	0	С	383.0	3	R 420.5	Z	0	C	284		R	489			
DATE	5/29/97					DATE:	5/29/97	•							
Z	0	R	440.4	•	C 404.7	Z	0	R	490		С	285			
R	440.5	Z	0		C 404.3	R	491	Z	0		С	286			
Z	0	C	404.9	1	R 440.6	_ Z	0	C	286		R	490			

APPROVED BY:

APPROVED BY:

THIS REPORT STATED ACCURATELY THE RESILETS OF THE EVENT SHADE UPON THE MATURAL SUBMITTED TO THE ANALYTICAL LABORATORY. EVERY EFFORT HAS BEEN MADE TO DETERMINE OBJECTIVELY THE INFORMATION REQUESTED: HOWEVER, IN CONNECTION WITH THIS RESOLUTIVE OF THE STATE OF THE SERVICE.

ASSAYED AT: NATIONAL SPECIALTY CASES, 630 UNITED DRIVE DURHAM NC 27713. 919544-3772



325 McCausland Court Cheshire, CT 06410 Phone: (203) 250-6827 FAX: (203) 250-6842

Certificate of Analysis: E.P.A. Protocol Gas Mixture

 Rec#
 2085

 Cylinder No :
 CC46128

Cylinder Pressure: 2000 Certification Date 3/31/97 Purchase Order #

Expiration Date: Laboratory:

100416 3/31/99 Cheshire, CT

Reference Standard Information:

Type NTRM Component Nitric Oxide Cyl. Number CC50149 Concentration 980 ppm

Instrumentation:

Instrument/Model/Serial No. Nicolet/550/ACN9402102

<u>**Analytical Principle**</u>

FTIR

Analytical Methodology does not require correction for analytical interferences.

Certified Concentrations:

Component Contentration	Accuracy Procedure
	Accuracy Procedure
\$1000000000000000000000000000000000000	55555 ** C. A. A. A. A. C. A. * 500 500 500 500 500 500 500 500 500 5
Nitific Oxide 1,779,38 ppin	+/- 1% G1
Nitroben Balance	**************************************
Nitrogen Balance	· · · · · · · · · · · · · · · · · · ·

Analytical Results:

<u>1st C</u>	component:		Witho Oxide		4.4		
1st An	alysis Date:	3/24/97			•		
Ŕ	973.600	S	1766,300	Z	0.406	Conc	1778.244 ppm
S	1768.300	z –	0.117	R T	974.300	Conc -	1778.741 ppm
Z	0.226	R	974.200	s ¯	1766.800	Conc -	1777.504 ppm
		-		_		AVG: Z	1776.163 ppin
2nd Án	alysis Date:	3/31/97	•		#	•	
R	980,500	S	1785.000	Ż	0.289	Conc	1784.327 ppm
S	1766.700	z . –	0.336	R -	975.900	Conc	1774.396 ppm
Z	0.363	R _	974.700	s -	1773.100	Conc	1783.040 ppm
				i –		AVG. —	1780 588 nnm

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1993)" using the assay procedures listed.

Do not use cylinder below 150 psig.

Approved for Release



Scott Specialty Gases

1750 EAST CLUB BLVD, DURHAM, NC 27704

Phone: 919-220-0803

Fax: 919-220-0808

CERTIFICATE OF ANALYSIS:Interference-Free Multi-Component EPA Protocol Gas

Customer EASTMOUNT ENVIRONMENTAL STEVEN BLAKE C/O S FLORIDA ENV SERV 6821 VISTA PARKWAY NORTH WEST PALM BEACH,FL 33411 Assay Laboratory

SCOTT SPECIALTY GASES 1750 EAST CLUB BLVD DURHAM,NC 27704

Project No.: 12-20784-003

P.O. No.: 2289

ANALYTICAL INFORMATION
This certification of Gaseous Calibration Standards:
Procedure #61 September, 1993.

Cylinder Nulfilber: Cylinder Pressure * * *:

ALM011221 1940 PSIG

Cartification Date:

2/19/97

Exp. Date:

COMPONENT CARBON MONOXIDE NITRIC D'AIDE SULFUR DIOXIDE OXIDES OF NITROGEN NITROGEN OXYGEN FREE

CERTIFIED CONCENTRATION 154.0 124:7 122.8 124.7

ANALYTICAL ACCURACY**
+7-1% NIST Traceable
+/-1% NIST Traceable
+/-1% NIST Traceable Reference Value

1 · B Hot Use When cylinder pressure is below 150 paig.

· Analytical docuracy is inclusive of usual known error soutcos which at least include precision of the measurement processes.

Product Control as +/- 1% analytical abburdoy is directly transable to NIST standards.

This Protocol His been certified using corrected NIST 802 standard values, per EPA guidance dated 7/24/98 and will not correlate with uncorrected Protocols.

REFERENCE STANDARD

TYPESRM NOTH EXPIRATION DATE

NTM 1880 7 1708/88

NTM 1688 7 7/10/97

NTM 16280 6/24/87

CYLINDER NUMBER ALM024842,

ALMOS0738 ALMO42284

CONCENTRATION

474.0 PPM 247.8 PPM 266.0 PPM

CO/N2 NO/N2 SO2/N2

INSTRUMENTATION
INSTRUMENT/MODEL/SERIAL#
FTIIT System/8210/AAB9400252
FTIIT System/8220/AAB9400252
FTIIT System/8220/AAB9400252

LAST BATE CALIBRATED

02/17/97 02/17/97 02/17/97

ANALYTICAL PRINCIPLE

Scott Enhanced FTIR Scott Enhanced FTIR Scott Enhanced FTIR

ANALYZER READINGS

(Z = Zero Gas

R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis

CARBON MONOXIDE Data: 02/11/87 Response Unit: PPM R1 =479.68 21 ~ 0.0680

11 = 184.18 H2 = 473.56 Z2=0.0411 t2=163.70 Z3 # 0.0738 T3 = Avg. Concentration: H3=474.78 T3=164.18 164.0

ti = 124.68 12=124.52

H3 = 247.77 Avg. Concentration: 124.7 PPM

SULFUR BIBRIDE .

Date: 52/11/97 Response Unit: PPM $z_1 = 0.0014$ R1 = 264.88 11 = 122.3912 = 122.52#3 = 265.25

122.7 PPM · Second Triad Analysis

1),

bate: 62/19/97 Response Unit: PPM ft = 183.87 21 40.0617 H1 474.27 R2 443.46 22-0.0807 12 4 163.86 2340.1111 H3 # 474.26

Ave. Concentration:

134 164.03 163.6

THE PARTY OF THE P

M44

Date: 02/19/97 Response Unit: PPM 21 40.2334 H1 = 247.38 f1 4 124.85 H2 4 247.41 Z2 = 0.3540 12=124.68 23=0.3822 †3 € 124.80 H3=247.72

Avd. Containtration: 124.8

Date: 82/19/97 Response Unit: PPM 21 a 0.2080 H1 = 264.67 t1 = 122.59 h2 = 266.11 Z2 = 0.3195 +2 ≤ 123.10 23 - 0.1043 13 ± 123.14 M3 = 285.32 Ave. Concentration: 122.9

Concentration = A + Bx + Cx2 + Dx3 + Ex4

r=0.999990

A = 0.000000 B = 1.000000 C = 0.000000 D = 0.000000F = 0.000000

Concentration = A + Bx + Cx2 + Dx3 + Ex4

t = 0.999990Constants:

A = 0.000000B = 1.000000 C = 0.000000

D = 0.000000E = 0.000000

Concentration = A + Bx + Cx2 + Dx3 + Ex4

t = 0.999990

Constante B = 1.0000000b = 0.000000

A = 0.000000C = 0.000000E = 0.000000

Still Notes:



Scott Specialty Gases

1750 EAST CLUB BLVD, DURHAM, NC 27704

Phone: 919-220-0803

Fax: 919-220-0808

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer

EASTMOUNT ENVIRONMENTAL STEVEN BLAKE C/O S FLORIDA ENV SERV 8821 VISTA PARKWAY NORTH WEST PALM BEACH, FL 33411

Assay Laboratory

SCOTT SPECIALTY GASES 1750 EAST CLUB BLVD DURHAM, NC 27704

Project No.: 12-20784-001

P.O. No.: 2289

ANALYTICAL INFORMATION

This cartification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards;

Procedure #G1; September, 1993.

cvillidet Number: Cylinder Pressure * * *:

AAL17320 2000 PSIG

Certification Date:

2/12/97

Exp. Date:

2/12/2000

COMPONENT CARBON BIOXIDE

OXYGEN NITROGEN : CERTIFIED

CONCENTRATION

10.4 12.3

ANALYTICAL ACCURACY**

+/- 1% NIST TRACEABLE +/- 1% NIST TRACEABLE

BALANCE

Product control se + /- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SAM NO. NTAM 18000

NTM 2659

EXPIRATION DATE

4/30/97

11/30/98

ALMO47899

CYLINDER NUMBER

AAL17320

CONCENTRATION

17.95 % 20.72 PCT COMPONENT

CARBON DIOXIDE

OXYGEN

INSTRUMENTATION INSTRUMENT/MODEL/SERIAL#

VARIAN 86/3400/0160 VARIAN GC/3400/18804 LAST DATE CALIBRATED

01/31/97

01/13/97

ANALYTICAL PRINCIPLE

GC / TCD

GC / TCD

ANALYZER READINGS

(Z = Zero Gas

Reference Gas Te Test Gas

r = Correlation Coefficient)

Calibration Curve

First Triad Analysis

Date: 02/10/97 Response Unit: AREA

T1=875884 h2 - 11704 1 22 - 0.0000

25 - 0.0000 P

12-676483

H3 = 117049

Sacond Triad Analysis

Concentration = A + fix + Cx2 + Dx3 + Fx4 r = 0.999990

Constants:

B = 1.00 C=0.00

D = 0.00

E = 0.00

OXYGEN

na - 517018

t1 = 305184 2 - 0.0000 12-306069

23 = 0.6800 T3 - 308023 108. Concempation:

R3-517592

Concentration = A + Bx + Cx2 + Dx3 + Ex4

r=0.99999

Constants: B = 1.00

A = 0.00Ċ=0.00

D = 0.00

E=0.00

A = 0.00

Special Notes!

Do not use When cylinder pressure is below 150 psig.

^{* 4.} Analytical decuracy is inclusive of usual known error éculoss which et least include précision of the measurement processes.

SCOTT SPECIALTY NO



Scott Specialty Gases

1750 EAST CLUB BLVD, DURHAM, NC 27704

Phone: 919-220-0803

Fax: 919-220-0808

P.O. No.: 2289

CERTIFICATE OF ANALYSIS:Interference-Free Multi-Component EPA Protocol Gas

EASTMOUNT ENVIRONMENTAL STEVEN BLAKE C/O S FLORIDA ENV SERV 6821 VISTA PARKWAY NORTH WEST PALM BEACH,FL 33411

Assay Laboratory

Project No.: 12-20783-004

SCOTT SPECIALTY GASES 1750 EAST CLUB BLVD DURHAM,NC 27704

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gazeous Calibration Standards;

Procedure #G1; September, 1993.

Cylinder Number: Cylinder Pressure * * *: ALM045678 1790 PSIG

Certification Date:

1/20/97 Exp. Date: 1/20/1999

COMPONENT CARBON MONOXIDE SULFUR DIOXIDE ' OXIDES OF NITROGEN NITROGEN - OXYGEN FREE

CERTIFIED CONCENTRATION 296.6 229.7 PPM PPM 223.7 PPM PPM 229.8 BALANCE

ANALYTICAL ACCURACY**
+7-1% NIST Traceable
+/-1% NIST Traceable +/- 1% NIST Traceable Reference Value

- *** Do not use when cylinder pressure is below 150 psig.
- ** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes. Product certified as + /- 1% analytical accuracy is directly traceable to NIST standards.
- * This Protocol has been centified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/95 and will not correlate with uncorrected Protocols.

REFERENCE STANDARD

TYPE/SRM NO. EXPIRATION DATE CONCENTRATION 474.0 PPM CYLINDER NUMBER COMPONENT NTRM 1680 1/08/98 NTRM 1685 ALM050988 247.5 PPM 7/10/97 NO/N2 NTRM 80260 ALM042108 265.0 PPM 502/N2

INSTRUMENTATION INSTRUMENT/MODEL/SERIAL#

FTIR System/8220/AA88400252 FTIR System/8220/AAB9400252 FTIR System/8220/AAB9400262

ANALYZER READINGS

LAST DATE CALIBRATED

01/16/97 01/16/97

ANALYTICAL PRINCIPLE

Scott Enhanced FTIR Scott Enhanced FTIR Scott Enhanced FTIR

First Triad Analysis

(Z = Zero Gas	R = Reference Gas	T = Test Gas	r = Correlation Coefficient)
	Second Tried A	nalysis	Calibration Cui

CARBON MONOXIDE

Date: 01/13/97	Response Unit:	PPM
21 = -0.055	R1 - 473.33	T1 = 295.77
R2 = 473.66	22 - -0.026	T2 = 298.81
23 = -0.084	T3 = 296.86	R3 = 476.02
Avg. Concentrat	tion: 298.3	PPM

Z1=0.2842 R1-247.66 T1=231.31 R2=247.96 Z2=0.2889 T2=230.21

ZZ = 0.2889 12 = 230.21 T3 = 229.66 R3 = 248.38

230.4

Date: 01/13/97 Response Unit: PPM

21 = 0.0248 R2 = 474.16 23 = 0.0449	R1 -4 22-0 T3-2	0192	T1 - 297.32 T2 - 296.72 R3 - 474.01
Avg. Concentre		295.9	PPM

Date: 01/20/97 Response Unit: PPM

Callbration	Curve	

Dáte: 01/20/97		
*1 -0 +000	D4 - 347 40	** - 1

D816: 01/20/8/	Masbouse Out:	Privi
21 - 0.1665	R1 - 247.48	T1 = 229.43
R2 - 24 7.53	Z2 = 0.1928	12 = 229.08
23 - 0.2059	T3=228.84	R3 = 247.49
Avg. Concentre	tion: 229.1	PPM

Concentration = A	4 + 8x + Cx2 + Dx3 + Ex4
r =0.999990	
Constanta:	A = 0.000000
B = 1.000000	C = 0.0000000

E = 0.000000

Concentration = A + Bx + Cx2 + Dx3 + Ex4r = 0.999990Constants:

D = 0.0000000

A - 0.000000 B = 1.000000 C = 0.0000000D=0.000000 F = 0.000000

Avg. Concentration; SULFUR DIOXIDE *

NITRIC OXIDE

Z3=0.3182

Date: 01/13/97	Response Unit:	PPM
Z1 = 0.0859	R1 = 264.87	T1 = 223.05
R2 = 204.88	22 = 0.2205	T2 × 223.58
Z3~0.2775	T3 = 223.41	R3 = 265.24
Avg. Concentrat	tion: 223.3	PPM

Date: 01/20/97 Response Unit: PPM

Z1 =-0.118	R1 = 265.36	T1-224.11
R2 = 264.96	Z2=0.0720	T2 - 224.19
23 = 0.0493	13 - 224.20	R3 = 284.69
Avg. Concentra	tion: 224.2	PPM

Concentration = A + 8x + Cx2 + Dx3 + Ex4

088888.0=1 Constants: A - 0.000000 B ≃ 1.000000 C-0.000000 D = 0.000000 E = 0.000000

Special Notes:

ANALYST: B. Hacta gr



Scott Specialty Gases

1760 EAST CLUB BLVD, DURHAM, NG 27704

Fax: 919-220-0808

CERTIFICATE OF ANALYSIS: EPA PROTOGOL GAS

Customer ENVIRONMENTAL STEVEN BLAKE Alusara Alogith WEST PA

CONTRACTOR OF THE eudinaling de la comme

Project No.: 12-20784-002

P.O. No.: 2289

ENTERNIATION:

to viscounted describing to 12 11 in tany a route dance a transmitted by Calibration Standards;

110 ALMO39900 2000 PSIG

JOMETIN .

CARBO NITROGE

Lap. Date: 2/12/2000

entra de la constanción de la

ANALYTICAL ACCURACY**

AVALYTICAL ACCURACY**

AVALYTICAL ACCURACY**

AVALYTICAL ACCURACY**

AVALYTICAL ACCURACY**

Do not use you h avilifeter preseure is below 160 paigr

Applytical cy il amolusive of Usual known effort ourself and the List moder in a cision at illaminastrament processes.

REFERENCE STANDARD

TYPE/FIRM NO EXPINATION DATE NTRASSA NTAM 2859

#188797 1787/08

CYLINDER ALUMBER CONCERNIA TO CARBON DIOXIDE UXYGEN

INSTRUMENTALION INSTRUME MOBELS ERIAL

VARIAN GC/3400/0160 VARIAN GC/3400/18804

ELUTION CAMERATED

estration Association WIAR

ANALYTICAL PRINCIPLE

ANAL SELECTIONS

A Reference Cat Sin Test Cat 7 Gerfelation Coefficient)

Date: 02/10/97 Ž1 = 0.0000

117118 71 - 118328 240,0000 172-118487 13-118481 13-117049

Čőńcentrátlott = A + Bž + Cž2 + Dx3 + Ex4

0.999990 Constants: À=0.00

B≅ 1.00 C=0 00

Date: OFTE 1 ASSESSALE UNIT AREA 21 40 0 48 18480 (11 - 822388 H2 817014 40.0000 12 - 823180

Concentration = A + Bx + Cx2 + Dx3 + Ex4 deeeee.o

Constants: Á≅0.òò. C = 0.00

BEST AVAILABLE COPY



Scott Specialty Gases, Inc.

3 F I

1250 EAST CLUS BLVO.

追出食料商益

Phone: 919-220-0903

22204

Fax: 919-220-0808

CERTIFICATE ANALYSIS

MICH CLOSIDA

TUTOUMMENTAL SERVICES

#176 91008

三尺手 化十分半角 医有效性隔离术 网络放木科

州州 "等一片角层桥" 经股份股份

ft. 33411

PRODUCT #: 12-10820-004 PO#1 ACCT #20051000

11EM # 12022750 -

0410: 3709795

TOYETMOER ## ALMOSTBOA

ANALYTICAL ACCURACY: 17-2%

PLEMO TYPE : CERTIFIED MASTER DAS

COMEONENI 情况 1 目白村包 HII (1990)

REQUESTED GAS <u>CONC_MOLES_</u>

BALANCE

ANALYSIS 30.2 00K

9.41.440%

k. cooke



Scott Specialty Gases, Inc.

107.1

1250 EAST CLUB SEVO.

DURNAM

MC 22204

Phone: 919-220 0803

F#x: 919-220-0808

CERTIFICATE OF ANALYSIS

COUNTY CLOSION

1917年の名誉記載下海北、多位記載1月月日日

30013 3815

THE VISTA PARKMAY MORFIL

图片 计广泛有机器 电复角电棒

33411

PROJECT #1 12-10020-006 POR: ACCT #20351300 17EM #4 12022251 #46.

0ATE: 3/09/95

1170 F#088 # # : AAL6500

- ANALYTICAL ACCURACY: 17-2%

DUEND TYPE : CERTIFIED MASTER GAS

COMPONENT METHAME MATRIGUES

REQUESTED GAS __CONC_MOLES_

BALANCE

ANALYSIS - (MOLES)

BALANCE



Scott Specialty Gases, Inc.

ripped 7:17:17

1750 EAST CLUB BLVO.

OURHAM

Phone: 919-220-0003

27704 **N!** !::

Fax: 919-220-0808

CERTIFICATE OF ANALYSIS

TOUTH CLUBTON

VVICORMENTAL SERVICES

MIHE R1008

STATE OF VARIABLE PARKMAY MORTH

M OF PAUM BEACH

33411

PROJECT #1 12-10920-005 PO#1 ACCT #20351300

041E: 3709795

与了与主持的职权 并注 有让两句处本分字形

ANALYTICAL ACCURACY: 47-2%

THE CHO TYPE : CERTIFIED MASTER DAS

REQUESTED GAS

__CONC_MOLES_

ANALYSIS

000

BALANDE

COMPONENT 40 1 11440 引用 医自由性性

BALANCE

COOKE

APPENDIX D FIELD DATA SHEETS



ANALYZER CALIBRATION SHEET

CLIENT:	FI	KEO	<u> </u>			OPER	ATOR:	R Cook	_	
PLANT:	Ma	rath	<i>1</i> 2V				DATE:	12/17/	15.2	
LOCATION	1:		•					, , , , , , , , ,		
SPAN:	02	<u>Q</u>	CO2	*	со	PPM	<i>5</i> 02	PPM	хои	PPM

g	AS / RANGE	CYLINDER VALUE	ANALYZER RESPONSE		PERCENT SPAN
	LOW	0.0	0.0	0.0	0.0
02	MID	12.3	12.2	0.1	0. Y
	нісн	21.0	21.0	0.0	0-0
	LOW	0.0	0.0	0.0	0.0
CO2	MID	10.4	10.4	0.0	0.0
	HIGH	18.16	18.4	0.24	1.2
	LOW	0.0	2.2	2.2	0.4
CO	MID	154.0	154.2	0.2	0.1
	HIGH	296.6	257.3	0.7	0.1
	LOW	0.0			
S 02	MID				
_	HIGH				
	LOW	0.0	2.5	2.5	0.1
хои	MID	902	906.4	4. 4	0.2
	HIGH	1779.38	1758.9	420.48	1.02

PERCENT SPAN = (CYLINDER VALUE - ANALYZER RESPON)/SPAN * 100

(ALLOWED 2% SPAN)



SYSTEM CALIBRATION DATA SHEET

CLIENT: FKEC	TIME:/500 to/600_
PLANT: Marethon	DATE: 12/17-/57
LOCATION: UNIT #8	RUN #: //

O2 CO2 CO SO2 NOX SPAN: % % PPM PPM PPM

	×			X		
GVB	ANALYZER CAL RESPONSE	INIT SYSTEM CAL RESPON	TIAL 8YSTEM BIAS \$SPAN	FINA SYSTEM CAL RESPON	SYSTEM BIAS &SPAN	DRIFT
O2 ZERO	0.0	0.0	0.0	0.0	0.0	0-0
UPSCALE	12.2	12.0	-0.8	12./	-0.4	0.4
ZERO CO2	0.0	0.0	0.0	0./	6.5	0.4
UPSCALE	10.4	10.2	-/.0.	10.3	-0-5	0.5
ZERO CO	2, 2	1.6	-0.1	-0./	-0.5	-0.3
UPSCALE	154.2	153.3	-0.2	153.1	-0.2	-0.1
ZERO SO2	_	1		-		^
UPSCALE))	-	_	_
ZERO NOX	2.5	3.8	0.1	5.0	0.2	0.1
UPSCALE	906.4	9/3.2	0.7	931.8	2.5	1.9

SYSTEM CAL BIAS = (SYS CAL RESPON - ANALYZER RESPON)/SPAN * 100 (5%)
DRIFT = (FNL SYS CAL RESPON - INTL SYS CAL RESPON)/SPAN * 100 (3%)

	02	CO2	CO	S O2	хои
RAW	12.59	6.00	87.80		668.70
CAL CORR	13.24	6.07	87.94		652.65
POUND PER	MILLION BI	THE SME ONE	0.49		6.01
POUND PER	HOUR		5.40		65.95
PLANT					
POUND PER	MILLION BT	U			
POUND PER	HOUR				

THC 9MS/BHP-HR = 0.15



SYSTEM CALIBRATION DATA SHEET

CLIENT:	FKE	(TIME://3	5 to/735	_	
PLANT:	Marath	sh_		DATE:	12/17/17		
LOCATION	" ON'T M	; 8°		RUN #:	2		
SPAN:	O2 &	CO2	CO P	SO2 PM	PPM	NOX PPI	4
вив	ANALYZER CAL RESPONSE	INIT BYBTEM CAL RESPON	TIAL SYSTEM BIAS &SPAN	FIN BYSTEM CAL RESPON	AL SYSTEM BIAS %SPAN	DRIFT	
ZERO	0.0	0.0	0.0	0.0	0.0	0.0	
UPSCALE	12.2	12.1	-0.4	12.3	0.4	0.8	
ZERO	0.0	0.1	0.5	0.2	1.0	0.5	
UPSCALE	10.4	10.3	~0.5	10.3	-0-5	0.0	
ZERO	2.2	-0.1	-05	1.1	-0.7	0.2	
UPSCALE	154.2	153.1	-0.0	153.8	-0.1	0.1	
ZERO							
UPSCALE	_						
ZERO OX	2.5	5.0	0.2	2.4	-0.1	-0.2	
UPBCALE	906.4	931.8	2.5	924.3	2.0	-0.6	

SYSTEM CAL BIAS = (SYS CAL RESPON - ANALYZER RESPON)/SPAN * 100 (5%)
DRIFT = (FNL SYS CAL RESPON - INTL SYS CAL RESPON)/SPAN * 100 (3%)

	02	CO2	CO	802	NOx
RAW	13.24	6.01	86.61		667.23
CAL CORR	13.35	6.00	84.70		646.79
POUND PER	MILLION BY	TH GMS/BHD-			
POUND PER	HOUR				66.09
PLANT					
POUND PER MILLION BTU					
POUND PER	HOUR				



SYSTEM CALIBRATION DATA SHEET

DE MAIO				to/900	
PLANT: M.	arathan		DATE:	1/17/87	
LOCATION: U	wit #8		RUN #:	3	
O2 SPAN:	CO2	CO	SO2	NOX PPM	PPM

GAS	ANALYZER CAL RESPONSE	INIT BYSTEM CAL RESPON	TIAL SYSTEM BIAS &SPAN	FIN SYSTEM CAL RESPON	AL BYSTEM BIAS %SPAN	DRIFT
ZERO	0.0	0.0	0.0	0.0	0.0	0.0
UPSCALE	12.2	123	0.4	N2.3	0.4	0.0
ZERO CO2	0.0	0.2	1.0	0.2	1,0	0.0
UPSCALE	10.4	10.3	-0.5	10.3	-0.5	0.0
CO ZERO	2.2	1.1	-0.2	3.5	0.3	0.5
UPSCALE	154.2	1538	-0.1	155.8	0.3	0.4
ZERO SO2		-		_	-	
UPSCALE	1	1	_		_	
ZERO NOX	2.5	2.4	-0.1	2.4	-011	0.0
UPSCALE	906.4	926.3	2.0	9/2.6	0.6	-1.4

SYSTEM CAL BIAS = (SYS CAL RESPON - ANALYZER RESPON)/SPAN * 100 (5%)
DRIFT = (FNL SYS CAL RESPON - INTL SYS CAL RESPON)/SPAN * 100 (3%)

	02	CO2	CO	802	хОИ
RAW	13.26	4.05	87.98		659.55
CAL CORR	13.26	4.02	86.52		648.80
POUND PE	NIBELION BY	TU 9MS/BHP	×23	•	5.93
POUND PER	HOUR		25-10		65.10
PLANT					
POUND PER	MILLION BT	U			
POUND PER	HOUR				



EPA METHOD 25A FIELD DATA SHEET ANALYZER ERROR DATA

LOCATION:	<u>FREC</u>		 	
DATE:	12/17/97	-		
INSTRUMENT	: KS 55	RANGE:	 то 100	

GAS	CALIBRATION CYLINDER VALUE (PPM)	ANALYZER RESPONSE (PPM)	ANALYZER ERROR
ZERO	0.0	0.3	0-3
LOW	30.2	30,9	0.7
MID	50.6	51.6	1.0
HIGH	86.1	86.9	0.8

ANALYZER		CYLINDER	VALUE	-	ANALYZER	RESPONSE		
CALIBRATION	=						Х	100
ERROR			CATI	1DI	ER VALUE			



EPA METHOD 25A FIELD DATA SHEET SYSTEM DRIFT DATA

LOCATION: FKEC		RUN #:	1-3	
DATE: ///7/54	RUN TIME:	SEE	TO CEM SX	es < A C
INSTRUMENT: KS55	RANGE:		то 108	

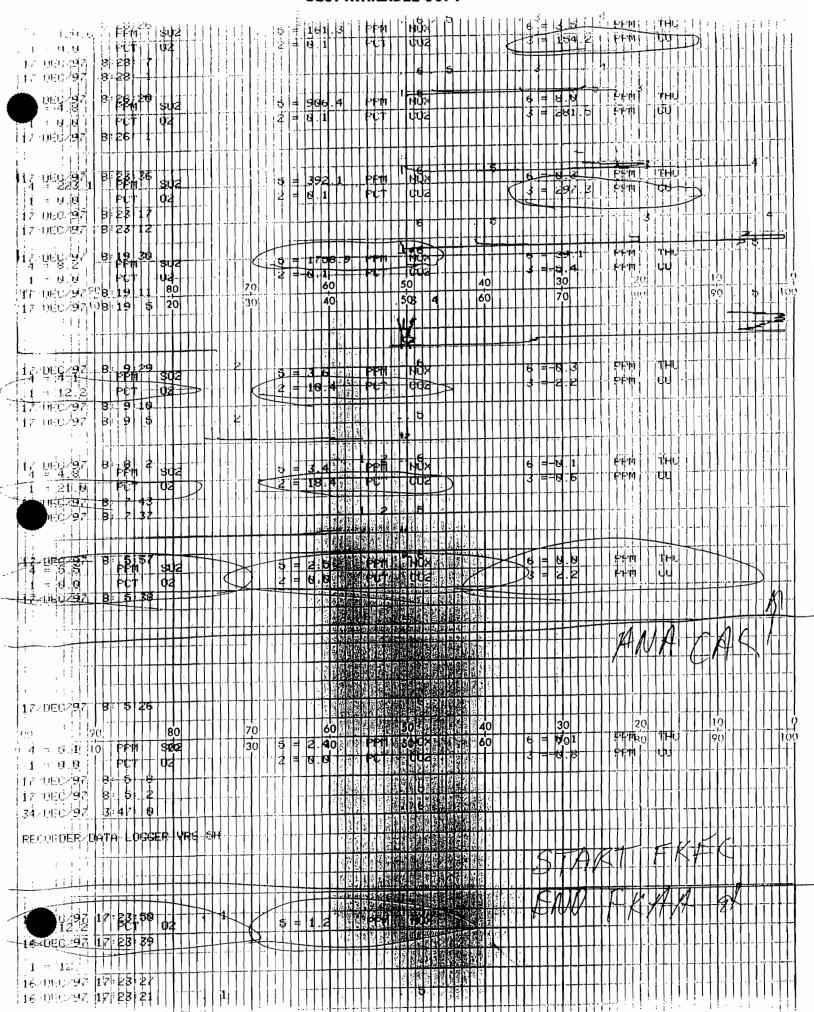
		ТІИІ	IAL	FINA	.L		
GAS	ANALYZER CAL RESPONSE	SYSTEM CAL RESPONSE	SYSTEM BIAS % SPAN	SYSTEM CAL RESPONSE	SYSTEM BIAS % SPAN	SYSTEM DRIFT	
ZERO	0.3	0.1	-0.2	0.6	0.3	0.5	4
SPAN	30.9	30.8	~ O. [30.9	0.0	0.1]/'
ZERO	0.3	0.6	0.3	6.3	0.0	-0.3	4
SPAN	30.9	30.9	0.0	30.7	-0.2	-0.2	'-
ZERO	0.3	0.3	0.0	6.1	-O.7	-O. d	277
SPAN	30.9	30.7	-0.2	30.7	-O. d	0.0	47

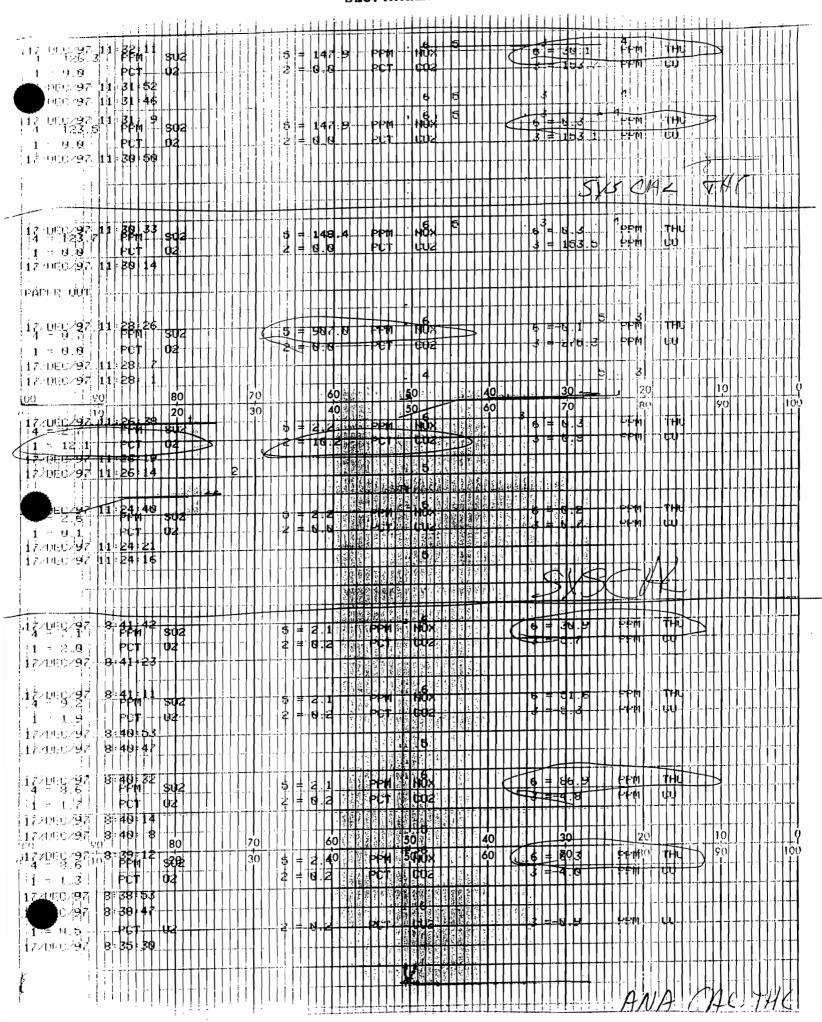
SYSTEM BIAS		=	SYST	EM RESPON	SE - A		RESPONSE		100	
51516	DINO				SPAN			^	100	
SYSTEM	DDTEW		SYSTEM	RESPONSE	IN	SYSTEM	RESPONSE	our.	v	100
SISTEM	DRIFI				SPA	A N			– <i>x</i>	100



APPENDIX E. STRIP CHARTS



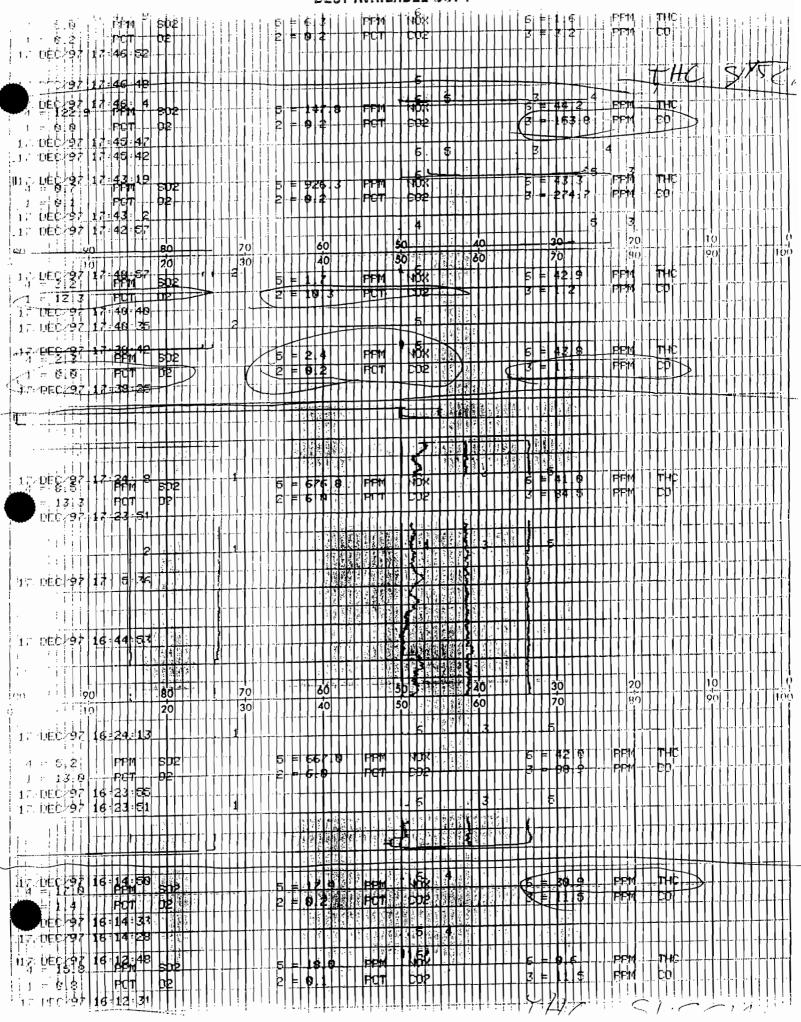


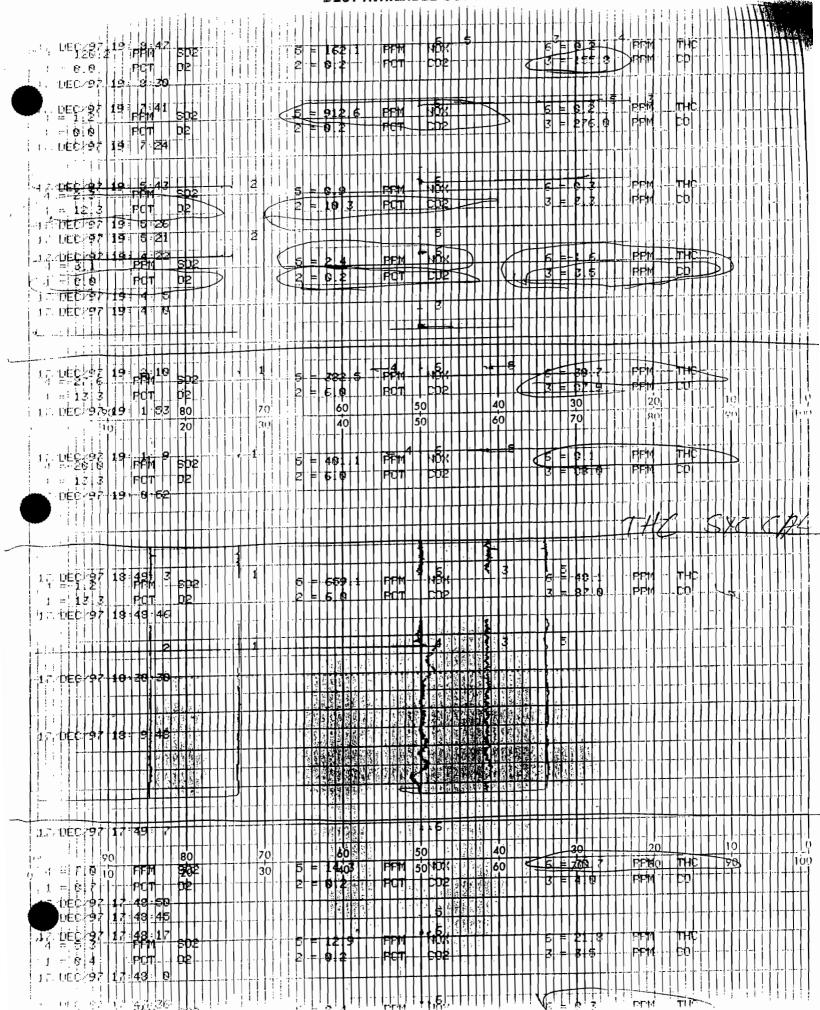


ETO! Variation of a	
13.8 PUI 12	20
1. UEC 97 14:55:16 302	- 구구히 : ''구나'
17/DEC/97 14 48 30 502 5 = 6.2 504 7 18	
17/DEC 97 14 47 48 6 17/DEC 97 14 47 48 502 5 2 6 PPM 160 1 1 1 2 4 1 1 2 4 1 1 2 4 1 1 2 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1	-1-91 (194) -1-91 (1.0)
	TAYC CAL
1 = 0.0 PCT 02 2 = 0.0 PCT 002 03 = 103.9 17.000.97 14:44:45	
17. DEC. 97904: 43: 11 80 70 30 50 60 50 60 60 60 70 60 60 60 70 60 60 60 60 60 60 60 60 60 60 60 60 60	h 20 10 10 50 11 5만에 나 나 나 나 나 나 나 나 나 나 나 나 나 나 나 나 나 나 나
17 DEC 97 14:41:59	는
1 = 12.0	
17 - 14 - 36 8	PPM
DEG/97 14:14:35	
1. (DEC) 97 13 53 57 56 1 70 5 = 6360 9 9 9 1 50 2 60 70 5 1 DEC 97 13 53 52 1 1 0 5 6 7 1 3 53 52 1 1 1 0 5 7 1 3 53 52 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	FFT301 TTT 10

: i	BEST ATRILABLE GUTT	ppM
DEC/97 18 31 41	4 = 6.8	
1 = 3 6 FGT - G2	5 = 675 1	5-17-16
1 = 13 0 FCT C2 1 CCC 97 15 31 4 1 CCC 98015 36 59 80 170		┧╎╢┞┿╢╏╟┩╃╢╬╬╬
17 DEC 97 15 31 4 170 PCT 020 30	60 50 4 40 ⁸ 50 30 2 = 6.80 PCT 50072 60 3 = 207.8	
1 + 13 010 PCT 020 30 1 DEC 97 15 30 24 1 DEC 97 15 30 16		
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17 0EC 97 15 28 2		
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	2 = 6.0 PC 3000 300 3 = 50 0	###
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BEST AVAILABLE COPY 1 = 18.8 1 = 0 8 1. DEC 97 # 122 5 FRM 1 = 0 0 FCT 1 - 0 EC - 97 16 9 22 帥 PFM ___co_ 17. DEC 97 15:46 50 She 1 = 13 0 Pch D2 1 : DEC 97 15:46 23 сo 15-43 - 13-3 P.C 20 90 80 20 10 15 22 58 32 41 32 36 32 25 31 25 15 15 17 LIEU 197 17 15 17 17 DEC 97





APPENDIX F NOMENCLATURE



NOMENCLATURE

%DRE = percent destruction/removal efficiency

% ISO = percent isokinetic sampling rate

 $%CO_2$ = percent carbon dioxide by volume (dry)

 $%H_2O$ = percent moisture

 $\%N_2$ = percent nitrogen by volume (dry) $\%O_2$ = percent oxygen by volume (dry)

μg = micrograms

 $\Delta H_{@}$ = pressure drop across orifice of meter for 0.75 CFM at standard conditions

 ΔP_{avg} = average velocity pressure

A_n = sampling nozzle cross-sectional area (ft2) Ar = acetone residue - result of blank evaporation

 A_s = stack cross sectional area (ft2)

B_{wo} = moisture content of stack gas; expressed as a decimal

C = final emissions data reported by CEMs, adjusted for calibration drift

C' = raw emissions data reported by the CEMs, uncorrected for calibration drift.

Cm = average CEM response to initial and final span gas system calibration
Co = average CEM response to initial and final zero gas system calibration

 C_p = pitot tube coefficient

 C_s = concentration in stack gas in pounds per standard cubic foot $C_{s'}$ = concentration in stack gas in grains per standard cubic foot

 C_{s12} = concentration corrected to 12 percent CO_2 D_e = equivalent diameter of rectangular stack

D_n = nozzle diameter in inches D_s = stack inside diameter in feet

Delta H(abs) = the meter orifice differential, absolute conditions in inches of mercury

Delta H = the meter orifice differential

dgm = dry gas meter

Dry Gas In = temperature of the dgm inlet in degrees Fahrenheit
Dry Gas Out= temperature of the dgm outlet in degrees Fahrenheit

F factor = a factor representing a ratio of the volume of dry flue gases generated to the calorific

value of the fuel combusted

F_c = a factor representing a ratio of the volume of carbon dioxide generated to the calorific

value of the fuel combusted

Fw = a F factor on a wet basis dscf = dry standard cubic foot

dscfli = dry standard cubic foot per hour
dscfin = dry standard cubic foot per minute

E = emission rate in pounds per million Btu



NOMENCLATURE (cont.)

End Meter = the dgm reading in cubic feet at the end of the sampling period

F_d = F-factor dry standard cubic feet per million Btu at zero percent oxygen and at 68

FID = flame ionization detection F_0 = EPA method 3 fuel factor

fps = feet per second GC = gas chromatograph

GC/MS = gas chromatograph/mass spectrograph
gr = grain of particulate; 1 lb. = 7000 grains

gr/dscf = grains per dry standard cubic foot

gr@12% = grains per dry standard cubic foot corrected to 12 percent oxygen gr@7% = grains per dry standard cubic foot corrected to 7 percent oxygen

Hg = mercury
int/i = initial
IN = inches

Int Meter = the dgm reading in cubic feet at the beginning of the test period

K = degrees Kelvin

PIT Coeff = pitot tube coefficient

lb/SCF = pounds per standard cubic foot

1b/hr = pounds per hour

1b/MMBtu = pounds per million Btu

Cma = concentration of the calibration gases

M_d = dry molecular weight of flue gas

mg = milligrams

mg/DSCM = milligrams per dry standard cubic meter

ml = milliliters

MM5 = modified EPA method 5 MMBtu/hr = million Btu per hour

M_s = molecular weight of flue gas, wet basis
Md = molecular weight of flue gas, dry basis

ng = nanograms

NMHC = non-methane hydrocarbons O = net run time in minutes

°C = degrees Celsius
°F = degrees Fahrenheit
°R = degrees Rankine

P bar = barometric pressure in inches of mercury P stk = pressure of the stack in inches of water

Pabs = absolute pressure



NOMENCLATURE (cont.)

 ppm_{vd} = parts per million by volume, dry

Ps = flue gas static pressure in absolute pressure

P_{std} = standard absolute pressure at 29.92 inches of mercury
Qa = volumetric air flow rate actual cubic feet per minute

Q_s = volumetric air flow rate dry standard cubic feet per minute

rh = relative humidity scf = standard cubic feet

scfm = standard cubic feet per minute

T_m = dry gas meter temperature in degrees Fahrenheit

 T_s = flue gas temperature in degrees Fahrenheit t_{std} = standard temperature in degrees Fahrenheit

 T_{std} = standard absolute temperature

THC = total hydrocarbons

V = volume

VI = total volume of liquid collected in impingers and silica gel

V_m = volume of metered gas sampled in cubic feet

V_{m std} = volume of metered gas sample at dry standard conditions in dry standard cubic feet

VOC = volatile organic compounds

VS = average flue gas velocity in feet per second

V_{w std} = volume of water vapor in cubic feet wscfin = wet standard cubic feet per minute Y = dry gas meter calibration factor



APPENDIX G FACILITY OPERATING DATA



END POWER PRODUCTS





File: 963612t.xls

SAE J1349-EDPS 218 engine test

						29.60"Hg FUELS	
DATE: 12-17-97 SAE J1349	INLET AIR - F	BAROM - "HG	AIRWET - P.S.I.	FUEL-(bs/hr	BHP-obs	RPM	AIRDRY-kpa
EMISS. TEST # 1	70	30.4892449	0.21	1742.82927	4981.3166	900	101.758144
Includes Power Factor>	<u> </u>	Gen-obs MW	012.1	17 12.02>27	1701.5100	700	101.750144
		3.58					
		3.59		Site Perfo	rmance of	servations	
BAROMETER-millibars		3.59		NOx - ppm>	652.65		
1017		3.59		%R. Humidity>	55		
		3.58		Air Temp-F>	70		
Start 3:00 PM (15:00)		3.59		Fuel temp-F>	97		
Stop 4:00 PM (16:00)		3.58		Barometer>	30.489		
6.01 gm NOx/BHP-hr		3.59		Fuel rate-obs>	1742.8	<< <lbs hour<="" td=""><td></td></lbs>	
133 deg. F airbox		3.58		Fuel S.G.>	0.8633		
2.1 in. water exh. b	ackpressure	3.59		Eng BHP-obs>	4981.3		
STD. DEVIATION>>	>>>>>	0.004898979					
TEST at ESI-F	lorida Key	s Electr.	100% of F	RATED L	OAD -	TEST POI	NT
	T		0.965	<<< <key in<="" td=""><td>Generator</td><td>efficiency (use</td><td>ed in column 'L' c</td></key>	Generator	efficiency (use	ed in column 'L' c
6 deg. ATDC 1	iming	F	LOWDATA	METERS	USED	AS FUEL D	ATA INPUT
EDPS #218 PERFO		CULATIONS P	er Tim Paulson -	EMD PM&I E	ngineering		
CALCULATIONS USE	EMD STANDAR	D CONDITIONS:	AIR IN=60°F FUE	L IN=60°F BAR	OM=29.92"	lg FUEL S.G.=.8	45
O#963612E1	20G4B	ENG. S/N	π	JRBO S/N		900 RPM	P/N 5235595 INJECTORS
BAROMETER	INLET AIR	INLET FUEL	FUEL S.G.	FUEL RATE	OBS. K.W.	B.H.Pcorr.	B.S.F.Ccorr.
IN. Hg.	DEG. F	Flowmeter DEG. F		LBS-OBSERVED	at GEN.		AIRBOX DRAINS CLOSE
30.4892449	70	97	0.863	1743	3586	5009	0.3500
DATE: 12-17-97		TIME: 16:00:00	.8633 S.Gspec.	Flowdata	KW-corr.>>>	3736	AIRBOX P.S.I = 25.0
	242.43	TURBO P/N				EMD-gm/KWH >>>>	212.82
AVG. GPH/meter>>							
AVG. GPH/meter>> Test Time Period>>	1:00						

File: 963612t.xls

SAE J1349-EDPS 218 engine test

DATE: 12-17-97	INLET AIR - F	BAROM - "HG	AIRWET - P.S.I.	FUEL-lbs/hr	BHP-obs	RPM	AIRDRY-kpa
SAE J1349							· · · · · · · · · · · · · · · · · · ·
EMISS. TEST # 2	70	30.4892449	0.21	1741.67903	4988.2621	900	101.758144
Includes Power Factor>	>>>>>	Gen-obs MW	·				
		3.59					
		3.59		Site Perfor	rmance ol	oservations	Sep. Aftroooi stats.
BAROMETER-millibars		3.58		NOx - ppm>	646.79		LB pre A/C duct = 274 F
1017		3.59		%A. Humidity>	55		LB A/C water in = 72 F
		3.59		Air Temp-F>	70		LB post A/C duct ≈ 98 F
Start 4:35 PM (16:35)		3.59		Fuel temp-F>	97		LB A/C water out = 82 F
Stop 5:35 PM (17:35)		3.6		Barometer>	30.489		RB pre A/C duct = 266 F
		3.59		Fuel rate-obs>	1741.7	<< <lbs hour<="" td=""><td>RB A/C water in = 70 F</td></lbs>	RB A/C water in = 70 F
135 deg. Fairbox		3.6	·	Fuel S.G.>	0.8633		RB post A/C duct = 93 F
1.9 in. water exh. b		3.59		Eng BHP-obs>	4988.3		RB A/C water out = 83 F
STD. DEVIATION>>	>>>>>	0.005385165					
TEST at ESI-F	lorida Key:	s Electr.	100% of F	RATED L	OAD -	TEST POI	NT
						. 551 . 1	
			0.965	<<< <key (<="" in="" td=""><td>Generator</td><td><u>eπiciency</u> (use</td><td>ed in column 'L' ca</td></key>	Generator	<u>eπiciency</u> (use	ed in column 'L' ca
6 deg. ATDC 1	timing	F					ed in column 'L' ca ATA INPUT
6 deg. ATDC 1 EDPS #218 PERFO		L	LOWDATA	METERS	USED .		
	RMANCE CAI	CULATIONS I	LOWDATA per Tim Paulson	METERS EMD PM&I E	USED angineering	AS FUEL D	ATA INPUT
EDPS #218 PERFO	RMANCE CAI	CULATIONS I	LOWDATA Der Tim Paulson AIR IN=60°F FUE	METERS EMD PM&I E	USED angineering	AS FUEL D	ATA INPUT
EDPS #218 PERFO	RMANCE CAI	CULATIONS FOR CONDITIONS:	LOWDATA Der Tim Paulson AIR IN=60°F FUE	METERS EMD PM&I E L IN=60°F BAR	USED angineering	AS FUEL D	ATA INPUT
EDPS #218 PERFO CALCULATIONS USE O#963612E1	RMANCE CAI EMD STANDAR 20G4B	CULATIONS ; D CONDITIONS: ENG. S/N	LOWDATA per Tim Paulson AIR IN=60°F FUE	METERS EMD PM&I E L IN=60°F BAR JRBO S/N	USED angineering	AS FUEL DA Hg FUEL S.G.=.8 900 RPM B.H.Pcorr.	ATA INPUT 45 P/N 5235595 INJECTORS
EDPS #218 PERFO CALCULATIONS USE O#963612E1 BAROMETER	RMANCE CAI EMD STANDAR 20G4B INLET AIR	CULATIONS I D CONDITIONS: ENG. S/N INLET FUEL	LOWDATA per Tim Paulson AIR IN=60°F FUE	METERS EMD PM&I E L IN=60°F BAR JRBO S/N FUEL RATE	USED ingineering OM=29.92"I	AS FUEL DA Hg FUEL S.G.=.8 900 RPM B.H.Pcorr.	45 P/N 5235595 INJECTORS B.S.F.Ccorr.
EDPS #218 PERFO CALCULATIONS USE O#963612E1 BAROMETER IN. Hg.	RMANCE CAI EMD STANDAR 20G4B INLET AIR DEG. F	CULATIONS TO CONDITIONS: ENG. S/N INLET FUEL Flowmeter DEG. F	LOWDATA DET TIM Paulson AIR IN=60°F FUE TUEL S.G.	METERS EMD PM&I E L IN=60°F BAR JRBO S/N FUEL RATE LBS-OBSERVED	USED Ingineering OM=29.92"I OBS. K.W. at GEN.	AS FUEL DA 1g FUEL S.G.=.8 900 RPM B.H.Pcorr.	45 P/N 5235595 INJECTORS B.S.F.Ccorr. AIRBOX DRAINS CLOSE
EDPS #218 PERFO CALCULATIONS USE O#963612E1 BAROMETER IN. Hg. 30.4892449	RMANCE CAI EMD STANDAR 20G4B INLET AIR DEG. F	CULATIONS TO CONDITIONS: ENG. S/N INLET FUEL Flowmeter DEG. F	LOWDATA DET TIM Paulson AIR IN=60°F FUE FUEL S.G. 0.863	METERS EMD PM&I E L IN=60°F BAR JRBO S/N FUEL RATE LBS-OBSERVED 1742	USED Ingineering OM=29.92"I OBS. K.W. at GEN. 3591	AS FUEL DATE OF THE PROPERTY O	45 P/N 5235595 INJECTORS B.S.F.Ccorr. AIRBOX DRAINS CLOSE 0.3493
EDPS #213 PERFO CALCULATIONS USE O#963612E1 BAROMETER IN. Hg. 30.4892449 DATE: 12-17-97	RMANCE CAI EMD STANDAR 20G4B INLET AIR DEG. F 70	CULATIONS INCOMPLET FUEL Flowmeter DEG. F 97 TIME: 17:35:00	LOWDATA DET TIM Paulson AIR IN=60°F FUE FUEL S.G. 0.863	METERS EMD PM&I E L IN=60°F BAR JRBO S/N FUEL RATE LBS-OBSERVED 1742	USED Ingineering OM=29.92"I OBS. K.W. at GEN. 3591	AS FUEL D. 1g FUEL S.G.=.8 900 RPM B.H.Pcorr. 5016 3742	ATA INPUT 45 P/N 5235595 INJECTORS B.S.F.Ccorr. AIRBOX DRAINS CLOSE 0.3493 AIRBOX P.S.I = 26.1
EDPS #218 PERFO CALCULATIONS USE O#963612E1 BAROMETER IN. Hg. 30.4892449 DATE: 12-17-97 AVG. GPH/meter>>	RMANCE CAI EMD STANDAR 20G4B INLET AIR DEG. F 70 .	CULATIONS INCOMPLET FUEL Flowmeter DEG. F 97 TIME: 17:35:00	LOWDATA Der Tim Paulson AIR IN=60°F FUE FUEL S.G. 0.863 .8633 S.Qspec.	METERS EMD PM&I E L IN=60°F BAR JRBO S/N FUEL RATE LBS-OBSERVED 1742 Flowdata	USED ingineering OM=29.92"I OBS. K.W. at GEN. 3591	AS FUEL D. 1g FUEL S.G.=.8 900 RPM B.H.Pcorr. 5016 3742	ATA INPUT 45 P/N 5235595 INJECTORS B.S.F.Ccorr. AIRBOX DRAINS CLOSE 0.3493 AIRBOX P.S.I = 26.1 212.39

File: 963612t.xls

SAE J1349-EDPS 218 engine test

ALCULATIONS USE							
DATE: 12-17-97	INLET AIR - F	BAROM - "HG	AIRWET - P.S.I.	FUEL-lbs/hr	BHP-obs	RPM	AIRDRY-kpa
SAE J1349 EMISS. TEST # 3	70	20 4902440	0.21	1775 00702	4002 2052	000	101.7501.44
	70	30.4892449	0.21	1735.92783	4982.7057	900	101.758144
Includes Power Factor>	>>>>> 	Gen-obs MW					
***		3.58					
		3.57				oservations	Sep. Aftroool stats.
BAROMETER-millibars		3.59		NOx - ppm>	648.8		LB pre A/C duct = 275 F
1017		3.59		%R. Humidity>	55		LB A/C water in = 72 F
		3.59		Air Temp-F>	70		LB post A/C duct = 97 F
Start 6:00 PM (18:00)		3.59		Fuel temp-F>	97		LB A/C water out = 82 F
Stop 7:00 PM (19:00)		3.59		Barometer>	30.489		RB pre A/C duct = 267 F
5.93 gm NOx/BHP-hr		3.59		Fuel rate-obs>	1735.9	<< <lbs hour<="" td=""><td>RB A/C water in = 70 F</td></lbs>	RB A/C water in = 70 F
131 deg. F airbox		3.59		Fuel S.G.>	0.8633		RB post A/C duct = 88 F
2.0 in. water exh. ba	ackpressure	3.59		Eng BHP-obs>	4982.7		RtB A/C water out = 82 F
STD. DEVIATION>>	>>>>>	0.006403124					
TEST at ESI-F	lorida Key	s Electr.				TEST POI	
			0.965	<<< <key in<="" td=""><td>Generator</td><td>efficiency (use</td><td>ed in column 'L' c</td></key>	Generator	efficiency (use	ed in column 'L' c
6 deg. ATDC t	iming	F	LOWDATA	METERS	USED A	AS FUEL D	ATA INPUT
EDPS #218 PERFO	RMANCE CAI	LCULATIONS P	er Tim Paulson -	EMD PM&I E	ngineering		
CALCULATIONS USE	EMD STANDAR	D CONDITIONS:	AIR IN=60°F FUE	L IN=60°F BAR	OM=29.92"	lg FUEL S.G.=.8	45
O#963612E1	20G4B	ENG. S/N	T	JRBO S/N		900 RPM	P/N 5235595 INJECTORS
BAROMETER	INLET AIR	INLET FUEL	FUEL S.G.	FUEL RATE	OBS. K.W.	B.H.Pcorr.	B.S.F.Ccorr.
IN. Hg.	DEG. F	Flowmeter DEG. F		LBS-OBSERVED	at GEN.		AIRBOX DRAINS CLOSE
30.4892449	70	97	0.863	1736	3587	5010	0.3485
DATE: 12-17-97		TIME: 19:00:00	.8633 S.Gspec.	Flowdata	KW-corr.>>>	3738	AIRBOX P.S.1 = 26.3
AVG. GPH/meter>>	241.47	TURBO P/N				EMD-gm/KWH >>>>	211.92
Test Time Period>>	1:00						
		7.189	< <kev fuel<="" in="" td=""><td>weight per ga</td><td>llon at corr</td><td>ect Fuel Specifi</td><td>ic Gravity</td></kev>	weight per ga	llon at corr	ect Fuel Specifi	ic Gravity
91.75		7.105					
91.75		7.105				:	



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Clair Fancy
Chief
Bureau of Air Regulation
Dept. of Environmental Protection
Mail Station 5505
2600 Blairstone Rd.
Tallahassee, FL 32399-2400

Re: PSD-FL-237. NOx emissions test result.

RECEIVED

JAN 28 1998

BUREAU OF AIR REGULATION

26 January 1998

Dear Mr. Fancy:

Enclosed are the results of the emissions compliance testing conducted on Florida Keys Electric Cooperative's Marathon Generating Plant Unit # 8 by South Florida Environmental Services. The engine passed all test parameters except for NOx, which was emitted at an average rate of 65.71 lbs/hr. FKEC's permitted limit for NOx is 62 lbs/hr. The 62 lbs/hr limit was based on theoretical calculations that I made over one year ago based on EPA emissions data (AP-42, which EPA acknowledges has limited value based on small sample sizes and variable operating conditions) and on manufacturer's estimates on fuel consumption and emissions rates (there were no units of this type and model running then so no real emissions data were available). Based on the data available to me at the time, I calculated that the uncontrolled NOx emissions of the EMD 20-710G4B would be 96.6 lbs/hr. Based on the manufacturer's claim of a 40% reduction in NOx emissions with the emissions reduction package that FKEC had ordered, I further reduced my emissions calculation by 36% (taking what I thought was a conservative approach) resulting in the projected 62 lbs/hr NOx emission rate.

In August 1997, FKEC's vendor informed us that the lowest feasible NO_x emission rate would be 71 lbs/hr. I immediately contacted your office for guidance on how to change the hourly limit proposed in our draft permit which was at that time undergoing the public notice period. During August 1997, I had several conversations with David Knowles, Syed Arif and Al Linero of your Ft. Myers and Tallahassee offices. We were advised that we could write a "comment letter" on the draft permit and ask that the NO_x hourly limit be increased to 71 lbs/hr. Doing that would have required further review by your office and another 30-day public notice period. FKEC did write a comment letter (copy enclosed for your reference), but elected not to send it because our construction schedule had no slack left for further delays. Instead, FKEC asked the vendor to strive for the best NO_x emission rate possible under FKEC's specifications. The fact that the engine tested at an average NO_x rate of 65.71 lbs/hr (significantly better than the

vendor thought feasible) demonstrates that our efforts to reduce NOx were successful, but we were striving for an unrealistic goal. The technician conducting the emissions tests commented that he had never tested a cleaner running engine.

Where does this leave us? FKEC has already accepted a 50% reduction in operating hours for Units 1-7 at the Marathon Generating Plant. FKEC is reluctant to accept further limits on operating hours. It should be noted that while Unit # 8 is currently allowed unlimited operating hours, in reality, no unit can operate 8760 hours per year. So while Unit # 8 cannot meet the hourly NOx limit of 62 lbs/hr, it will never exceed the current 271 tons/yr annual limit. Therefore, FKEC requests an increase in the hourly NOx limit to 68 lbs/hr for our operating permit for Unit # 8 and for our Title V air operating permit.

Thank you for your consideration and assistance.

Sincerely,

Deborah A. Shaw, Ph.D.

Environmental Affairs Coordinator

buch a Sheer

Enc:

- 1) Draft comment letter.
- 2) Final Test Report So. Fla. Environmental Services

PC: without test report.

C.A. Russell, CEO/GM, FKEC

T.E. Planer, Supt. Transmission, FKEC

D.M. Knowles, Air Program Administrator, FDEP



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Clair Fancy Chief Bureau of Air Regulation Dept. of Environmental Protection Mail Station 5505 2600 Blairstone Rd. Tallahassee, FL 32399-2400

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C.A. Russell, CEO/GM, FKEC

T.E. Planer, Supt. Transmission, FKEC

D.M. Knowles, Air Program Administrator, FDEP

ENGINE SYSTEMS, INC.

P.O. Box 1928

1220 South Washington St.

Rocky Mount, NC 27802-1928

Telephone: 919/977-2720 Fax:

919/446-1136 or 919/446-3830

Page 1 of 1

DOCUMENT TRANSMITTAL RECORD

Florida Keys Electric Cooperative To:

91605 Overseas Highway

Tavernier, FL 33070

Date:

January 20, 1998

Ref. S/N:

51229C-O-0050

Attn: Tim Planer

Subject:

Marathon Generating

Plant - Diesel Generating Set

P.O. 961588

ESI Job No. 51229

Enclosed are the following:

Copies	<u>Code</u>	Drawing/Document No.	Sheet	Rev.	<u>Title/I</u>	Description
3	В	N/A	All		Test Pr	Fest Report - Emissions Compliance rogram - Florida Keys Electric Cooperative non Facility
Code:	A B C D E	Submitted For Approval Submitted For Information Submitted For Comments Final Drawings/Documents Issued For Construction	Enclosed		E G H I	Approved Approved As Noted Revise and Resubmit Not Approved Return Signed Copies
Remark	cs :		·			

Signed:

Wanda D. Davis - Contract Administrator

Copy To:

R. Weeks

Doc. Control

South Florida Environmental Services

FINAL TEST REPORT

EMISSIONS COMPLIANCE TEST PROGRAM

FLORIDA KEYS ELECTRIC COOPERATIVE

MARATHON FACILITY

PREPARED FOR:

Engine Systems, Inc. 1220 Washington Street

Rocky Mount, NC 27802-1928

CONCERNING:

NO_x, CO, VOC and Opacity Compliance Testing Emission Unit #8 3.58 MW Diesel Electric Generator Florida Keys Electric Cooperative Association, Inc.

Marathon Facility
December 17, 1997

PREPARED BY:

South Florida Environmental Services

6821 Vista Parkway North

West Palm Beach, Florida 33411

SFES #97-581

Ron C. Cook Jr.

Senior Project Director

Date

RECEIVED

JAN 2 8 1998

BUREAU OF AIR REGULATION

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В	OPACITY OBSERVATIONS
C	CALIBRATION GAS CERTIFICATIONS
D	FIELD DATA SHEETS
E	STRIP CHARTS
F	NOMENCLATURE
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Engine Systems, Inc Florida Keys Electric Cooperative EMD Diesel Electric Generator

1.0 COMPENDIUM

South Florida Environmental Services conducted an emissions compliance test program on behalf of Engine Systems, Inc. at Florida Keys Electric Cooperative Association, Inc. located in Marathon, Florida. The testing was conducted on the newly installed EMD generator set rated at 3.58 MW and took place on December 17, 1997.

The objective of the testing program was to determine the Compliance/Performance status of EMD diesel generator #8 with respect to oxides of nitrogen, carbon monoxide, total hydrocarbons and opacity limits. Set forth by the Florida, Department of Environmental Protection (FDEP) and Florida Keys Electric Cooperative.

All test methods and procedures were conducted in strict accordance with EPA Methods 3A, 7E, 9, 10 and 25A as found in the Federal Register (40CFR60), Appendix A. The approved test plan was adhered to throughout the program. All lb/MMBtu emission rates are based on the F-factor for oil in accordance with EPA Method 19.

The gaseous (CEM/VOC) sampling consisted of three 1-hour runs during the test program while the unit was operating at 100% of rated capacity. Finial results can be found in Table 1-1.

The opacity determination was an hour visible emissions run consisting of 240 readings, 4 readings per minute, from which the highest 6-minute average and maximum opacity values were obtained and reported as percent opacity. Finial results can be found in Table 1-2.

Ron C. Cook Jr. Senior Project Director, was responsible for all phases of the test program he was assisted by a team of qualified environmental professionals. Robin L. Weeks of Engine Systems, Inc. coordinated unit operation with testing. Tim Planner of Florida Keys Electric Cooperative was the company's representative.

Project No. 97-581 01/16/98



Engine Systems, Inc Florida Keys Electric Cooperative EMD Diesel Electric Generator

1.0 <u>COMPENDIUM</u> (cont.)

The following tables summarize the results of the emissions testing program.

Table 1-1 Summary of Results FKEC Emission Unit # 8 EMD Diesel Electric Generator

NOx

Run #	Time	ВНР	NOx Constitution has	NOx	NOx Tons/out
1	1500-1600	4981	Gms/bhp-hr 6.01	1b/hr 65.95	Tons/yr 288.86
2	1635-1735	4988	6.01	66.09	289.47
3	1800-1900	4983	5.93	65.10	285.14
Average			5.98	65.71	287.82

\mathbf{CO}

Run #	Time	ВНР	CO Gms/bhp-hr	CO lb/hr	CO Tons/yr
1	1500-1600	4981	.49	5.40	23.65
2	1635-1735	4988	.49	5.38	23.56
3	1800-1900	4983	.49	5.38	23.56
Average			.49	5.39	23.59

THC

Run #	Time	ВНР	THC Gms/bhp-hr	THC lb/hr	THC Tons/yr
1	1500-1600	4981	.15	1.70	7.45
2	1635-1735	4988	.16	1.72	7.53
3	1800-1900	4983	.15	1.69	7.40
Average			.15	1.70	7.46

Note: Tons/yr were calculated using 8760 hours or continuous operation

Table 1-2
Visible Emission Results

Unit #	Length of Test	Highest 6 min. Average	Readings above 20%
EMD #8	60	5.0%	NONE

Project No. 97-581 -01/16/98





FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Al A. Linero Dept. of Environmental Protection Bureau of Air Resources Mail Station 5505 2600 Blairstone Rd. Tallahassee, FL 32399-2400

Re: PSD and NAAQS Compliance Assessment

Dear Mr. Linero:

In accordance with recent conversations with Mr. Cleve Holladay and Mr. Syed Arif, the attached PSD and NAAQS Compliance Assessment is submitted to support Florida Keys Electric Cooperative's (FKEC) PSD permit application for the Unit 8 addition at the Marathon Generating Plant. In order to assure compliance with both PSD and NAAQ Standards, we are proposing to limit annual operations of the existing diesel units at the plant to 50 percent. We propose the following language as an operating limit for the existing units 1 to 7 at the Marathon plant:

"The existing diesel Units 1 through 7 operations shall be limited to either 4380 hours per year per unit or to a total fuel oil consumption of 6.2 million gallons per year for all seven units, which ever limit is more restrictive."

Note the total fuel consumption value is slightly larger than the earlier discussed 5.9 million gallons. The new value is based on a slightly lower fuel oil heating value. Original calculations assumed a fuel oil heating value of 140,000 Btu/gal. We have checked with our fuel supplier and determined that a more accurate heating value should be 132,000 Btu/gal. The basis for the 6.2 million gallon limit is as follows:

Unit	Capacity	Design Heat Rate	Capacity Factor	Fuel Consumtion
Oint	(MW)	(Btu/kwh)	(%)	(MM gal/yr)
1	2	10200	50	0.677
2	2	10200	50	0.677
3	3	10200	50	1.015
4	3	10200	50	1.015
5	3	10200	50	1.015
6	2.5	10800	50	0.896
7	2.5	10800	50	0.896
			TOTAL	6.2

If you have any questions or need any further information, please do not hesitate to call.

Sincerely,

Deborah A. Shaw

Environmental Affairs Coordinator

boul a Shaw

CC: C. Holladay, BAR 5D-Branch Office 5D EPA NPS PSD AND AMBIENT AIR QUALITY COMPLIANCE ASSESSMENT FOR MARATHON DIESEL POWER PLANT

Florida Keys Electric Cooperative

July 1997



PSD AND AMBIENT AIR QUALITY COMPLIANCE ASSESSMENT

1. INTRODUCTION

The addition of Unit 8 (a 3.58 MW diesel generating unit) at Florida Key Electric Cooperative's Marathon Diesel Plant will constitute an addition of a major source. Under the provisions of the regulations for Prevention of Significant Deterioration (PSD) of air quality, an air quality compliance assessment is required as technical support for the PSD permit application. The primary objective of this air quality assessment is to demonstrate compliance with applicable PSD Class I and Class II increments and National Ambient Air Quality Standards (NAAQS) for those pollutants emitted from the source in quantities defined by the regulations as significant (40 CFR 52.21 (b)(23)(i) and Table 17-212.400-2, F.A.C.).

Dispersion modeling has been conducted to determine the significance of the impacts from Unit 8 and the existing Units 1 through 7 on the regional ambient air quality due to the emissions of NO_x. This assessment presents the results of the comprehensive air quality assessment which indicates that the addition of the source will not cause or contribute to a violation of the NAAQS. The analysis also demonstrates that Class I and Class II PSD increments will not be exceeded.

2. MODELING METHOD

2.1 MODEL SELECTION

The model used for this air dispersion analysis was USEPA's ISCST3 model. This steady-state Gaussian plume model contains algorithms for predicting area and volume source impacts, modified downwash algorithms for non-buoyant plumes, and an Huber-Snyder algorithm which incorporates wind-direction specific building heights and widths similar to the Schulman-Scire algorithm. This software also allows each model run to include several averaging intervals and multiple receptors.

2.2 TOPOGRAPHICAL FEATURES

Vaca Key, on which Marathon is located, and the surrounding islands are essentially flat. The Marathon Plant site is at approximately 2.5 m msl, with the surrounding area dropping to about 2 m msl. Since the variation in terrain is minimal and is less than the height of the Unit 8 exhaust stack (11.79 m), the use of a flat terrain dispersion model is appropriate for the analysis.



2.3 METEOROLOGICAL LAND USE CLASSIFICATION

The meteorological land use classification is used to determine the profile of the vertical wind speed and associated mechanical turbulence due to surface roughness. The wind speed profile is then used to extrapolate wind speeds at various heights for use in the estimates of atmospheric pollutant dispersion. USEPA Guidelines on Air Quality Models stipulates that the land use within the total area circumscribed by a 3-km radius around the source can be classified using Auer's scheme of meteorological land use typing proposed in the Journal of Applied Meteorology (1976). Auer's classifications are as follows:

Туре	Description
I1	Heavy Industrial
I2	Light/Moderate Industrial
C1	Commercial
R1	Common Residential
R2/R3	Compact Residential
R4	Estate Residential
A1	Metropolitan Natural
A2	Agricultural Rural
A3/A4	Undeveloped
A5	Water Surfaces

According to the Guidelines, if more than 50 percent of the total area in the circle is classified by land use as I1, I2, C1, R2, or R3, urban dispersion coefficients should be used in the modeling, otherwise, appropriate rural dispersion coefficients should be used. A USGS 7.5-minute series topographical map was used to estimate the land use around the project site as more than 50% in type "A5: Water Surfaces". Therefore, default rural dispersion coefficients were used in the analysis.

2.4 BACKGROUND AMBIENT AIR QUALITY

Marathon is designated attainment or unclassified for all criteria pollutants. This designation is consistent with several features of the area. First, there are no large sources of air pollution nearby. Second, there is no significant terrain which could trap pollution and cause exceedances of the NAAQS. Third, the prevailing winds are east and southeast bringing clean air off of the Atlantic Ocean.

2.5 Source Data

The existing diesel stacks and their emissions at the Marathon Plant are described in Table 1 under unrestricted conditions. The installation of Unit 8, one nominal 3.58-MW diesel generator, is the proposed addition to the site. Emissions of NO_x from the unit will be controlled by using a combination of fuel

injection timing retardation 4° , a 4-pass aftercooler circuit with a separately cooled aftercooler circuit, good combustion practices and the use of low sulfur fuel ($\leq 0.05\%$). The modeling parameters presented in Table 1 represent Unit 8 operating at 100% of capacity with these controls in place.

2.6 METEOROLOGICAL DATA

The refined analysis presented herein used five complete years (1987 through 1991) of wind and stability data consisting of actual surface observations in Key West and twice-per-day upper air soundings concurrently recorded at a station in Miami. Default wind speed profile exponents (indicative of increasing wind speed with increasing distance from the surface) and vertical potential temperature gradients (indicative of decreasing temperature with increasing distance above the surface) were used in the modeling. Five years of meteorology were processed using unrestricted source parameters. After reviewing the first-high concentration results for each of the five years, it was determined that 1991 had the highest concentration, and therefore would be used in further analyses (Table 2).

2.7 STACK HEIGHT CONSIDERATIONS

According to 40 CFR 51.100(hh), a good engineering practice (GEP) stack height is the greater of:

```
\begin{array}{lll} 65 \text{ meters} \\ \text{or} \\ H_g = H_b + 1.5L \\ \text{where:} \quad H_g &= \text{ the GEP stack height} \\ H_b &= \text{ the height of the dominant nearby building, and} \\ L &= \text{ the lesser dimension of the height or projected} \\ \text{width of the dominant nearby building.} \end{array}
```

As shown in Table 1, the Unit 8 stack and the stacks of the existing units are less than 65 m. This in combination with the building dimensions indicate the potential for building downwash. For this reason, building downwash analysis was included in the dispersion modeling.

Structures tend to disrupt air flow across a region and create turbulence around the structure. This disruption is referred to as the building wake effect or building downwash effect. This effect can result in high local ground-level pollutant concentrations if the emission point of the source is not far enough above or away from the structure to avoid the effect. A stack constructed at a height approximately 2.5 times the height of a nearby building is not likely to be affected by structural turbulence. If a stack is located within 5L of a building, and the building height is greater than approximately 40 percent of the stack height, then the stack is considered to be affected by building downwash.

The ISCST model used in the ambient air quality assessment uses a combination of two algorithms for predicting building wake effects. The Schulman-Scire algorithm is applicable when the stack height is less than 1.5 H_b and takes into account wind-direction-specific building heights and widths when determining wake effects. The Huber-Snyder algorithm is applicable when the stack height is between 1.5 H_b and 2.5 H_b and uses the actual building height and maximum projected width for all wind directions. Software packages are available to determine the values of the building heights and widths which can influence each stack and one such package, Building Profile Input Program (BPIP), has been used for this analysis to estimate the wake effects caused by the structures at the Marathon Plant. The only structure at the Marathon Plant site with the potential to affect air flow is the Power Plant Building, with a height of 30 feet.

After BPIP was run, it was found that the Units 6 and 7 were located at a distance greater than 5L from the building and were therefore not included in the building downwash analysis. All other units were included, and the results of BPIP can be found in the input for the modeling run (Attachment 1).

2.8 RECEPTOR NETWORKS

The receptor grid for the refined air quality analysis consists of a polar coordinate system centered on the Unit 8 stack. The grid system consisted of 36 direction radials separated by 10-degree increments. Receptors were placed at ground level at 50, 100, 200, 300, 400, 500, 750 and 1000m intervals. The orientation of the polar grid is rotated so that 0° is located 104° off True North. This grid analysis provided sufficient resolution and downwind coverage to identify the areas of expected maximum concentrations.

3. RESULTS OF MODELING ANALYSIS

3.1 Refined Analysis

ISCST was used with real-time meteorological data to account for the consistency of the meteorology from the east and southeast. Further, the influence of structural downwash on the exhaust plumes was included in the refined calculations.

The preliminary analysis that was conducted to determine the year of meteorology (1991) which resulted in the significant impact (Table 2), also showed that when all eight units are run under unrestricted conditions, the AAQS standards for NO_x are exceeded. Therefore, another run was performed where Units 1 through 7 were operating at 50 percent of emissions, and Unit 8 remained at 100 percent. This run produced a first-high concentration of 127.61 : g/m³ for NAAQS and 25.10 : g/m³ for PSD - Class II (Attachment 1). In accordance with USEPA-approved practices and consistent with modeling protocol, these concentrations can be reduced by 25 percent for NO_x , due to the

ratio of NO₂ to NO₃. (Supplement C to the Guideline on Air Quality Models (revised) (Appendix W of 40 CFR Part 51), EPA, August 1995). Therefore, the first-high concentrations for NAAQS and PSD - Class II are 95.71 :g/m³ and 18.83 : g/m³, respectively. Both these concentrations fall below the annual NAAQS NO_x standard of 100: g/m³ and the annual PSD NO_x increment standard of 25 : g/m³, respectively.

3.2 CLASS I INCREMENT ANALYSIS

The National Park Service (NPS) has developed a draft guidance document for assessing source impacts on Class I areas. Modeling levels of significance, similar to those applicable in Class II areas, have been developed by the NPS for Class I areas. Those levels of significance were used in this application to show that the net effect of adding Unit 8 will be insignificant.

The receptors used in this analysis were similar to those used in the PSD Class II and NAAQS analysis except the distance was increased. The receptors were limited to represent only the intersection of the direction radials from 10° to 60° and the nearest boundary of the Everglades Class I area (see Figure 1). The receptors are identified in Table 3. Table 4 sets forth the annual first and second high impact concentrations of the Marathon Unit 8 on the Everglades over five years (1987 through 1991). The distance between Marathon and the Everglades is approximately 30 km. At this distance, the addition of Unit 8 will have an insignificant impact on the Class I area. **

3.3 AIR QUALITY RELATED ISSUES

Due to the small size of the proposed new diesel unit and the nature of operation (peaking operation), the air quality impacts on growth, visibility, soils, vegetation, and aquatic life are considered insignificant.

DATA
Available

upon

Request

coeve has it-



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Clair Fancy Chief Bureau of Air Regulation Dept. of Environmental Protection Mail Station 5505 2600 Blairstone Rd. Tallahassee, FL 32399-2400

RECEIVED

JUN 20 1997

BUREAU OF AIR REGULATION

Re: Air modeling analysis for Marathon Generating Plant.

19 June 1997

Dear Mr. Fancy:

Enclosed is the final document required to answer Florida Department of Environmental Protection's (FDEP) Incompleteness Letter issued on 2/13/97 for the Prevention of Significant Deterioration review for Florida Keys Electric Cooperative's (FKEC) new diesel engine. After completing the air modeling analysis, FKEC's consultants recommend that to comply with NAAQS and PSD increments, the Marathon Generating Plant existing units 1-7 be limited to a 50% capacity factor and that the new unit #8 be unlimited. FKEC requests that the operating limits placed on units 1-7 be based on annual fuel consumption. A 50% capacity factor would be achieved by limiting fuel consumption to approximately 5.9 million gallons of No. 2 diesel oil. Please see the attached letter from Ivan Clark, R.W. Beck Senior Director of Environmental Services, for details.

Submission of the air modeling analysis should complete FKEC's permit application packet for the Prevention of Significant Deterioration review of FKEC's new diesel engine. Please advise me if any further information is needed.

Sincerely,

Deborah A. Shaw

Environmental Affairs Coordinator

Enc:

1)Letter from Ivan Clark

2) Air modeling run (partial copy - 15 pages)

PC:

C.A. Russell, CEO/GM, FKEC

T.E. Planer, Supt. Transmission, FKEC

CC: Syed arif, BAR Cleve Holladay, BAR R.J. Hebling, Marathon 50

NPS

via Federal Express

R·W·]ECK

Ms. Deborah A. Shaw Environmental Affairs Coordinator Florida Keys Electric Cooperative 91605 Overseas Highway PO Box 700377 Tavernier, FL 33070-0377

Subject:

NOx Modeling for Marathon Generating Plant

Dear Deborah:

Enclosed is a portion (exclusive of receptor-by-receptor results for various averaging times) of the ISC3 input/output indicating NAAQS and PSD increment analysis for the subject plant with emission rates for Units 1-7 at 50%. NAAQS modeling considered all eight diesel generators, while PSD included only Unit 8. Key West 1991 meteorology (annual worst case for 1987-1991) was used to predict concentrations at polar receptors located at eight downwind distances from Unit 8 (50m, 100m, 200m, 300, 400m, 500m, 750m, 1000m). As discussed, in order to achieve compliance with the annual NAAQS of 100ug/m3 and the PSD increment of 25ug/m3 it is necessary to limit the capacity factor of Units 1-7 to 50% and to use a 0.75 conversion factor for NO2/NOx (reference Supplement C to the Guideline on Air Quality Models, revised June 1994). As indicated on the output, calculated values are128ug/m3 for Units 1-8 and 25ug/m3 for Unit 8.

We recommend that DEP consider an enforceable permit condition for Units 1-7 based on annual fuel consumption. To achieve a 50% capacity factor, this condition would be annual No. 2 fuel oil consumption of 5.9million gallon (18MW, average heat rate of 10,500Btu/kWh and HHV of 140,000Btu/gallon).

If we can be of further assistance do not hesitate to call.

Sincerely,

R. W. BECK, INC.

lvan L. Clark

Senior Director

Environmental Services

ILC/smm

Enclosure

c: Mike Henderson, R. W. Beck

02-00576-02000-1000| g:\002557\02-00576\smm001ic.doc

6/12/97 all except 8 @ 50%

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SO BUILDWID unit3	48.42	48.28	46.68	43.65	44.36	47.11
SO BUILDWID unit3	48.43	48.27	46.65	43.61		33.69
SO BUILDWID unit3	27.11	28.50	34.89	40.22		47.09
SO BUILDWID unit3	48.42	48.28	46.68	43.65		47.11
SO BUILDWID unit3	48.43	48.27	46.65	43.61	39.24	33.69
SO BUILDHGT unit4	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit4	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit4	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit4	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit4	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit4	10.00	10.00	10.00	10.00		10.00
SO BUILDWID unit4	27.11	28.50	34.89	40.22	44.33	47.09
SO BUILDWID unit4	48.42	48.28	46.68	43.65		47.11
SO BUILDWID unit4	48.43	48.27	46.65	43.61		33.69
SO BUILDWID unit4	27.11	28.50	34.89	40.22	44.33	47.09
SO BUILDWID unit4	48.42	48.28	46.68	43.65	44.36	47.03
SO BUILDWID unit4	48.43	48.27	46.65	43.63	39.24	33.69
		10.00	10.00	10.00	10.00	10.00
	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit5	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit5	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit5	10.00		10.00	10.00	10.00	10.00
SO BUILDHGT unit5		10.00		10.00	10.00	10.00
SO BUILDHGT unit5	10.00	10.00	10.00			47.09
SO BUILDWID unit5	27.11	28.50	34.89	40.22	44.33	47.09
SO BUILDWID unit5	48.42	48.28	46.68	43.65	44.36	
SO BUILDWID unit5	48.43	48.27	46.65	43.61	39.24	33.69 47.09
SO BUILDWID unit5	27.11	28.50	34.89	40.22	44.33	47.03
SO BUILDWID unit5	48.42	48.28 48.27	46.68	43.65	44.36	33.69
SO BUILDWID unit5	48.43 .00		46.65	43.61	39.24 .00	.00
SO BUILDHGT unit6		.00 .00	.00	.00		
SO BUILDHGT unit6 SO BUILDHGT unit6	.00		.00	.00 .00	.00 .00	.00 .00
		.00				.00
SO BUILDHGT unit6	.00	.00	.00	.00 .00	.00 .00	.00
SO BUILDHGT unit6		.00			.00	.00
SO BUILDHGT unit6	.00				.00	.00
SO BUILDWID unit6	.00	.00			.00	.00
SO BUILDWID unit6	.00	.00 .00			.00	.00
SO BUILDWID unit6	.00	.00	.00		.00	.00
SO BUILDWID unit6 SO BUILDWID unit6	.00	.00	.00		.00	.00
SO BUILDWID unit6	.00	.00		.00	.00	.00
SO BUILDHGT unit7	.00	.00	.00		.00 .00	.00 .00
SO BUILDHGT unit7		.00	.00			
SO BUILDHGT unit7					0 0	.00
SO BUILDHGT unit7					.00 .00	
SO BUILDHGT unit7						
SO BUILDHGT unit7	.00				.00	
SO BUILDWID unit7	.00				.00	.00
SO BUILDWID unit7	.00		.00	.00	.00	.00
SO BUILDWID unit7	.00	.00	.00	.00	.00	.00
SO BUILDWID unit7	.00	.00	.00	.00	.00	.00
SO BUILDWID unit7	.00	.00	.00	.00	.00	.00
		.00	.00	.00	.00	.00
SO BUILDHGT unit8	10.00	10.00	10.00	10.00	10.00	
SO BUILDHGT unit8 SO BUILDHGT-unit8 SO BUILDHGT unit8	10.00	10.00	10.00	10.00	10.00	
SO BUILDHGT-unit8	10.00	10.00	10.00	10.00	10.00	10.00
SO BUILDHGT unit8	10.00	10.00	10.00	10.00	10.00	10.00

```
SO EMISUNIT .100000E+07 (GRAMS/SEC) (MICROGRAMS/CUBIC-METER)
SO SRCGROUP NAAQS unit1-unit8
SO SRCGROUP PSD unit8
SO FINISHED
RE STARTING
RE GRIDPOLR POL STA
**GRID ORIGIN CENTERED ON unit 8
RE GRIDPOLR POL ORIG 0.0 0.0 RE GRIDPOLR POL DIST 50.0 100. 200. 300. 400. 500. 750. 1000.
RE GRIDPOLR POL GDIR 36 10.0 10.0
RE GRIDPOLR POL END
RE FINISHED
ME STARTING
ME INPUTFIL KYWPRE91.LST
ME ANEMHGHT 6.700 METERS
ME SURFDATA 12836 1991
                             key west
ME UAIRDATA 12844 1991
                              miami
ME FINISHED
OU STARTING
OU RECTABLE ALLAVE FIRST SECOND
OU FINISHED
*********
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*** SETUP Finishes Successfully ***

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*** ISCST3 - VERSION 96113 ***
                                  *** 1991 FLORIDA KEYS ELECTRIC COOP - NO2 - A
                                   *** GENERAL SCREENING GRID ANNUAL 24-HR AND 3
**MODELOPTs: CONC
                                         RURAL
                                               {	t FLAT}
                                                              DFAULT
                                                   MODEL SETUP OPTIONS SUMMARY
**Intermediate Terrain Processing is Selected
**Model Is Setup For Calculation of Average CONCentration Values.
     SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION. DDPLETE = F
**Model Uses NO WET DEPLETION.
                                WDPLETE = F
**NO WET SCAVENGING Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations
**Model Uses RURAL Dispersion.
**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode
**Model Assumes Receptors on FLAT Terrain.
**Model Assumes No FLAGPOLE Receptor Heights.
**Model Calculates 2 Short Term Average(s) of: 3-HR 24-HR
   and Calculates PERIOD Averages
**This Run Includes: 8 Source(s); 2 Source Group(s); and 288 Receptor
**The Model Assumes A Pollutant Type of: OTHER
**Model Set To Continue RUNning After the Setup Testing.
**Output Options Selected:
        Model Outputs Tables of PERIOD Averages by Receptor
        Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE
**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
                                                                m for Missing Ho
                                                                b for Both Calm
**Misc. Inputs: Anem. Hgt. (m) =
                                      6.70 ;
                                              Decay Coef. = 0.0000
                Emission Units = (GRAMS/SEC)
                                                                               \operatorname{\mathsf{Em}}
                Output Units = (MICROGRAMS/CUBIC-METER)
**Input Runstream File: fexist50.i91
                                                                ; **Output Prin
```

*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

**MODELOPTs: CONC

RURAL FLAT DFAULT

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	S EX (
UNIT1	0	0.29600E+01	-71.1	-34.8	0.0	6.15	669.00	
UNIT2	0	0.38500E+01	-71.1	-28.2	0.0	6.15	669.00	
UNIT3	0	0.46400E+01	-6.7	0.0	0.0	11.43	677.00	
UNIT4	0	0.44400E+01	-14.8	0.0	0.0	11.43	677.00	
UNIT5	0	0.51100E+01	-20.4	0.0	0.0	11.43	677.00	
UNIT6	0	0.47200E+01	-74.0	-48.9	0.0	7.20	664.00	
UNIT7	0	0.44000E+01	-74.0	-43.0	0.0	7.20	664.00	
UNIT8	0	0.78000E+01	0.0	0.0	0.0	11.79	625.00	

*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

**MODELOPTs: CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS

GROUP ID SOURCE IDS

NAAQS UNIT1 , UNIT2 , UNIT3 , UNIT4 , UNIT5 , UNIT6 , UNIT7 ,

PSD UNIT8 ,

*** ISCST3 - VERSION 96113 ***

*** 1991 FLORIDA KEYS ELECTRIC COOP - NO2 - A
*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

**MODELOPTs: CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSI

SOURC IFV 1 7 13 19 25 31	E ID: UBH 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,	DNIT1 BW WAK 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0	IFV 2 8 14 20 26 32	BH 0.0, 0.0, 0.0, 0.0, 0.0,	BW WAK 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0	IFV 3 9 15 21 27 33	BH 0.0, 0.0, 0.0, 0.0, 10.0,	BW WAK 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0 46.6, 0	IFV 4 10 16 22 28 34	BH 0.0, 0.0, 0.0, 0.0, 10.0,	4
SOURC IFV 1 7 13 19 25 31	E ID: U BH 10.0, 0.0, 0.0, 0.0, 0.0,	DNIT2 BW WAK 27.1, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0	IFV 2 8 14 20 26 32	BH 0.0, 0.0, 0.0, 0.0, 0.0,	BW WAK 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0	IFV 3 9 15 21 27 33	BH 0.0, 0.0, 0.0, 0.0,	BW WAK 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0 0.0, 0	IFV 4 10 16 22 28 34	BH 0.0, 0.0, 0.0, 0.0, 10.0,	4
SOURC IFV 1 7 13 19 25 31	E ID: U BH 10.0, 10.0, 10.0, 10.0,	DNIT3 BW WAK 27.1, 0 48.4, 0 48.4, 0 27.1, 0 48.4, 0 48.4, 0	IFV 2 8 14 20 26 32	BH 10.0, 10.0, 10.0, 10.0, 10.0,	BW WAK 28.5, 0 48.3, 0 48.3, 0 28.5, 0 48.3, 0 48.3, 0	IFV 3 9 15 21 27 33	BH 10.0, 10.0, 10.0, 10.0, 10.0,	BW WAK 34.9, 0 46.7, 0 46.6, 0 34.9, 0 46.7, 0 46.6, 0	IFV 4 10 16 22 28 34	BH 10.0, 10.0, 10.0, 10.0, 10.0,	4 4 4 4 4
SOURC IFV 1 7 13 19 25 31	E ID: U BH 10.0, 10.0, 10.0, 10.0,	TNIT4 BW WAK 27.1, 0 48.4, 0 48.4, 0 27.1, 0 48.4, 0 48.4, 0	IFV 2 8 14 20 26 32	BH 10.0, 10.0, 10.0, 10.0, 10.0,	BW WAK 28.5, 0 48.3, 0 48.3, 0 28.5, 0 48.3, 0 48.3, 0	IFV 3 9 15 21 27 33	BH 10.0, 10.0, 10.0, 10.0, 10.0,	BW WAK 34.9, 0 46.7, 0 46.6, 0 34.9, 0 46.7, 0 46.6, 0	IFV 4 10 16 22 28 34	BH 10.0, 10.0, 10.0, 10.0, 10.0,	4 4 4 4 4

*** ISCST3 - VERSION 96113 ***

**MODELOPTs: CONC

*** 1991 FLORIDA KEYS ELECTRIC COOP - NO2 - A *** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSI

SOURC	SOURCE ID: UNIT5														
IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	вн	BW WAK	IFV	вн					
1	10.0,	27.1, 0	2	10.0,	28.5, 0	3	10.0,	34.9, 0	4		4				
7	10.0,	48.4, 0	8	10.0,	48.3, 0	9	10.0,	46.7, 0	10	10.0,	4				
13	10.0,	48.4, 0	14	10.0,	48.3, 0	15	10.0,	46.6, 0	16	10.0,	4				
19	10.0,	27.1, 0	20	10.0,	28.5, 0	21	10.0,	34.9, 0	22	10.0,	4				
25	10.0,	48.4, 0	26	10.0,	48.3, 0	. 27	10.0,	46.7, 0	28	10.0,	4				
31	10.0,	48.4, 0	32	10.0,	48.3, 0	33	10.0,	46.6, 0	34	10.0,	4				
SOURC	E ID: U	NIT8													
IFV	BH	BW WAK			BW WAK			BW WAK		BH					
1	,	•	2	•	28.5, 0		•	34.9, 0	4	10.0,	4				
7		48.4, 0		•	48.3, 0		,	46.7, 0		10.0,	4				
13	•	48.4, 0	14		48.3, 0			46.6, 0		10.0,	4				
19	•	27.1, 0	20	10.0,	·	21	•			10.0,	4				
25	•	48.4, 0	26		48.3, 0		•	46.7, 0		10.0,					
31	10.0,	48.4, 0	32	10.0,	48.3, 0	33	10.0,	46.6, 0	34	10.0,	4 .				

'* ISCST3 - VERSION 96113 *

**MODELOPTs: CONC

*** 1991 FLORIDA KEYS ELECTRIC COOP - NO2 - A

*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

RURAL FLAT

DFAULT

***	GRIDDED	RECEPTOR	NETWORK	SUMMARY	***

*** NETWORK ID: POL ; NETWORK TYPE: GRIDP

*** ORIGIN FOR POLAR NETWORK ***

X-ORIG =0.00; Y-ORIG = 0.00 (METE

> *** DISTANCE RANGES OF NETWORK *** (METERS)

50.0,	100.0,	200.0,	300.0,	400.0,	500.0,	750.0
			*** DIRECTI	ON RADIALS DEGREES)	OF NETWORK	***

10.0,	20.0,	30.0,	40.0,	50.0,	60.0,	70.0
110.0,	120.0,	130.0,	140.0,	150.0,	160.0,	170.0
210.0,	220.0,	230.0,	240.0,	250.0,	260.0,	270.0
310.0,	320.0,	330.0,	340.0,	350.0,	360.0,	

*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

***MODELOPTS: CONC

RURAL FLAT

DFAULT

* SOURCE-RECEPTOR COMBINATIONS FOR WHICH CALCULATIONS MAY N
LESS THAN 1.0 METER OR 3*ZLB IN DISTANCE, OR WITHIN OP

SOURCE

- RECEPTOR LOCATION - D
ID
XR (METERS)
YR (METERS)

UNIT5

*** 1991 FLORIDA KEYS ELECTRIC COOP - NO2 - A

-50.0 0.0

*** ISCST3 - VERSION 96113 ***

*** ISCST3 - VERSION 96113 ***

*** 1991 FLORIDA KEYS ELECTRIC COOP - NO2 - A
*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

**MODELOPTs: CONC RURAL FLAT DFAULT

*** METEOROLOGICAL DAYS SELECTED FOR (1=YES; 0=NO)

-	1 :	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	1	1	1	1	1	1	1	1	1	1	1
-	L :	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1	1	1	1	1	1	1	1	1
•	L :	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1											1	1	1
:	1 :	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	_	1	1	1	1	1	1	1	1	1	1	1
:	1 :	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	_	1	1	1	1	1	1	1	1	1	1	1
	1 :	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	1	1	1	1	1	1	1	1	1	1	1
	1 :	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	1	1	1	1	1	1	1	1	1	1	1
•	1 '	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																	

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPE (METERS/SEC)

1.54, 3.09, 5.14, 8.23, 1

*** WIND PROFILE EXPONENTS ***

STABILITY		WIND	SPEED CATEGORY	
CATEGORY	1	2	3	4
A	.70000E-01	.70000E-01	.70000E-01	.70000
В	.70000E-01	.70000E-01	.70000E-01	.70000
С	.10000E+00	.10000E+00	.10000E+00	.10000
D	.15000E+00	.15000E+00	.15000E+00	.15000
E	.35000E+00	.35000E+00	.35000E+00	.35000
F	.55000E+00	.55000E+00	.55000E+00	.55000

*** VERTICAL POTENTIAL TEMPERATURE GRAD (DEGREES KELVIN PER METER)

STABILITY		WIND	SPEED CATEGORY	
CATEGORY	1	2	3	4
A	.00000E+00	.00000E+00	.00000E+00	.00000
В	.00000E+00	.00000E+00	.00000E+00	.00000
C .	.00000E+00	.00000E+00	.00000E+00	.00000
D	.00000E+00	.00000E+00	.00000E+00	.00000
E	.20000E-01	.20000E-01	.20000E-01	.20000
F	.35000E-01	.35000E-01	.35000E-01	.35000

*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

**MODELOPTs: CONC

RURAL FLAT

DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: KYWPRE91.LST

FORMAT: (412,2F9.4,F6.

SURFACE STATION NO.: 12836

UPPER AIR STATION NO.:

NAME: KEY

NAME:

YEAR: 1991

YEAR:

YEAR	MONTH	DAY	HOUR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEI RURAL
 -								
91	1	1	1	251.0	6.69	297.0	4	1073.0
91	1	1	2	238.0	6.17	296.5	$\overset{-}{4}$	1069.0
91	1	1	3	234.0	6.17	296.5	4	1065.0
91	1	1	4	233.0	3.60	295.9	4	1061.0
91	1	1	5	223.0	4.63	295.9	4	1057.0
91	1	ī	6	222.0	4.63	295.9	5	1053.0
91	1	1	7	235.0	4.12	295.9	4	1049.0
91	1	1	8	273.0	5.14	295.4	4	1045.0
91	1	1	9	257.0	4.63	295.4	4	1041.0
91	1	1	10	231.0	4.63	297.0	4	1037.0
91	1	1	11	274.0	4.63	299.3	3	1033.0
91	1	1	12	316.0	5.66	299.8	4	1029.0
91	1	1	13	313.0	7.20	299.8	4	1025.0
91	1	1	14	309.0	7.20	299.8	4	1021.0
91	1	1	15	292.0	6.69	299.8	4	1021.0
91	1	1	16	284.0	5.66	299.8	4	1021.0
91	1	1	17	301.0	7.20	299.3	4	1021.0
91	1	1	18	297.0	7.20	298.2	4	1029.8
91	1	1	19	294.0	6.17	298.2	4	1066.0
91	1	1	20	297.0	6.69	298.2	4	1102.2
91	1	1	21	300.0	6.69	297.6	4	1138.4
91	1	1	22	292.0	5.66	298.2	4	1174.6
91	1	1	23	300.0	5.66	298.2	4	1210.8
91	1	1	24	280.0	5.14	297.6	5	1247.0

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.

FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

**MODELOPTs: CONC

* 14 j

RURAL FLAT

DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (

** CONC OF OTHER IN (MICROGRAMS/CUBIC-

GROUP	ID	AVERAGE CONC	RECEPTOR	(XR, YR, ZEL
NAAQS	1ST HIGHEST VALUE IS	127.60801 AT	(-86.60,	50.00, 0
	2ND HIGHEST VALUE IS	112.25087 AT	(-93.97,	34.20, 0
	3RD HIGHEST VALUE IS	104.11713 AT	(-76.60,	64.28, 0
	4TH HIGHEST VALUE IS	78.18972 AT	(-98.48,	17.36, 0
	5TH HIGHEST VALUE IS	68.92725 AT	(-43.30,	25.00, 0
	6TH HIGHEST VALUE IS	60.77991 AT	(-64.28,	76.60, 0
PSD	1ST HIGHEST VALUE IS	25.10266 AT	(-38.30,	32.14, 0
	2ND HIGHEST VALUE IS	23.47974 AT	(-43.30,	25.00, 0
	3RD HIGHEST VALUE IS	22.83569 AT	(-76.60,	64.28, 0
	4TH HIGHEST VALUE IS	21.04785 AT	(-86.60,	50.00, 0
	5TH HIGHEST VALUE IS	14.62818 AT	(-153.21, 1	28.56, 0
	6TH HIGHEST VALUE IS	13.59366 AT	(-32.14,	38.30, 0

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLRDC = DISCCART

DP = DISCPOLR

BD = BOUNDARY

*** ISCST3 - VERSION 96113 ***

*** 1991 FLORIDA KEYS ELECTRIC COOP - NO2 - A

*** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

**MODELOPTs: CONC

RURAL FLAT

DFAULT

*** THE SUMMARY OF HIGHEST 3-HR

** CONC OF OTHER IN (MICROGRAMS/CUBIC-

GROUP	ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTO
NAAQS	HIGH HIGH	1ST HIGH 2ND HIGH	VALUE IS VALUE IS	4307.21631 3296.98706	ON 91051506: AT ON 91030724: AT	
PSD	HIGH HIGH		VALUE IS VALUE IS	983.10052 836.16162	ON 91121924: AT ON 91052124: AT	

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

BD = BOUNDARY

*** ISCST3 - VERSION 96113 ***

*** 1991 FLORIDA KEYS ELECTRIC COOP - NO2 - A *** GENERAL SCREENING GRID ANNUAL 24-HR AND 3

**MODELOPTs: CONC

RURAL FLAT

DFAULT

*** THE SUMMARY OF HIGHEST 24-HR

** CONC OF OTHER IN (MICROGRAMS/CUBIC-

GROUP	ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTO
NAAQS	HIGH HIGH	1ST HIGH 2ND HIGH	1091.23096 913.11652	ON 91052124: AT ON 91030224: AT	
PSD	HIGH HIGH	1ST HIGH 2ND HIGH	489.74548 382.71411	ON 91052124: AT ON 91120424: AT	

*** RECEPTOR TYPES: GC = GRIDCART

GP = GRIDPOLR

DC = DISCCART

DP = DISCPOLR

BD = BOUNDARY



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Cleve Holladay
Dept. of Environmental Protection
Bureau of Air Resources
Mail Station 5505
2600 Blairstone Rd.
Tallahassee, FL 32399-2400

RECEIVED MAY 2 s 1997

BUREAU OF AIR REGULATION

Re: Florida Keys Electric Cooperative (FKEC) property boundaries for air modeling.

27 May 1997

Dear Mr. Holladay:

As per our discussion of last Friday, I am sending you a Marathon Generating Plant site plan with 10° radial overlay at 50, 100 and 150 meter distances from the stack of unit #8. Please note that FKEC owns 5.1 acres of bay bottom adjoining the plant site and extending south into Boot Key Harbor. Most of this area is too shallow for boating traffic so there is very limited public use of this area (as can be seen from the distribution of boats in the aerial photo). In addition, FKEC owns a 14+ acre parcel adjoining the plant site to the east. Part of this parcel (Kelly's Marina) will be sold and is accessible by the public. The remaining area is open grassland east of the plant and south of US Highway 1. This area is fenced and has no public access.

Please treat the site plan as a confidential document for security reasons. Please call me if you have questions. Thank you for your assistance with the air modeling.

Sincerely,

Ochral A. Shaw

Environmental Affairs Coordinator

Enc:

MGP site plan with radial overlay. Redi aerial photo.

PC:

C. Russell

T. Planner

BEST AVAILABLE COPY



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Syed Arif Dept. of Environmental Protection Bureau of Air Resources Mail Station 5505 2600 Blairstone Rd. Tallahassee, FL 32399-2400

Re: Vendor contact for EMD 20-710G4B.

RECEIVED

TER SS TAM

20 May 1997

BUREAU OF AIR REGULATION

Dear Mr. Arif:

For your records, you may list Michael J. Thiel, Sales Support Engineer, for Engine Systems, Inc. as our vendor contact. His address is:

Engine Systems, Inc. 1220 S. Washington St. Rocky Mount, NC 27801

Telephone: 919/407-8228

Please call me if you require any further information.

Sincerely,

Deborah A. Shaw

Environmental Affairs Coordinator

bout h. Shaw

PC:

T.E. Planer, Supt. Transmission, FKEC



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Clair Fancy Chief Bureau of Air Regulation Dept. of Environmental Protection Mail Station 5505 2600 Blairstone Rd. Tallahassee, FL 32399-2400

RECEIVED

MAY 20 1997

BUREAU OF AIR REGULATION

Re: BACT Analysis response to Incompleteness Letter of 2/13/97.

19 May 1997

Dear Mr. Fancy:

Enclosed is Florida Keys Electric Cooperative Association, Inc.'s (FKEC) response to the letter of incompleteness issued by your department. The letter requested additional information regarding FKEC's application for an air construction/operating permit for a new 3.58 MW diesel engine for the Marathon Generating Plant. I have been working closely with Mr. Syed Arif and Mr. Cleve Holladay during the development of the Best Available Control Technology (BACT) analysis, therefore, I faxed the response to Mr. Arif to expedite his technical analysis. He has asked that I send the original to you.

FKEC will submit the air modeling data as soon as possible in order to complete the permit application packet for the Prevention of Significant Deterioration review of FKEC's new diesel engine.

I would like to add that the Bureau of Air Regulation staff (particularly Syed Arif and Cleve Holladay) has been very helpful during this long process.

Sincerely,

Deborah A. Shaw

Environmental Affairs Coordinator

John R. Slaw

Enc:

Response to Incompleteness Letter Stack Sketch BACT Analysis

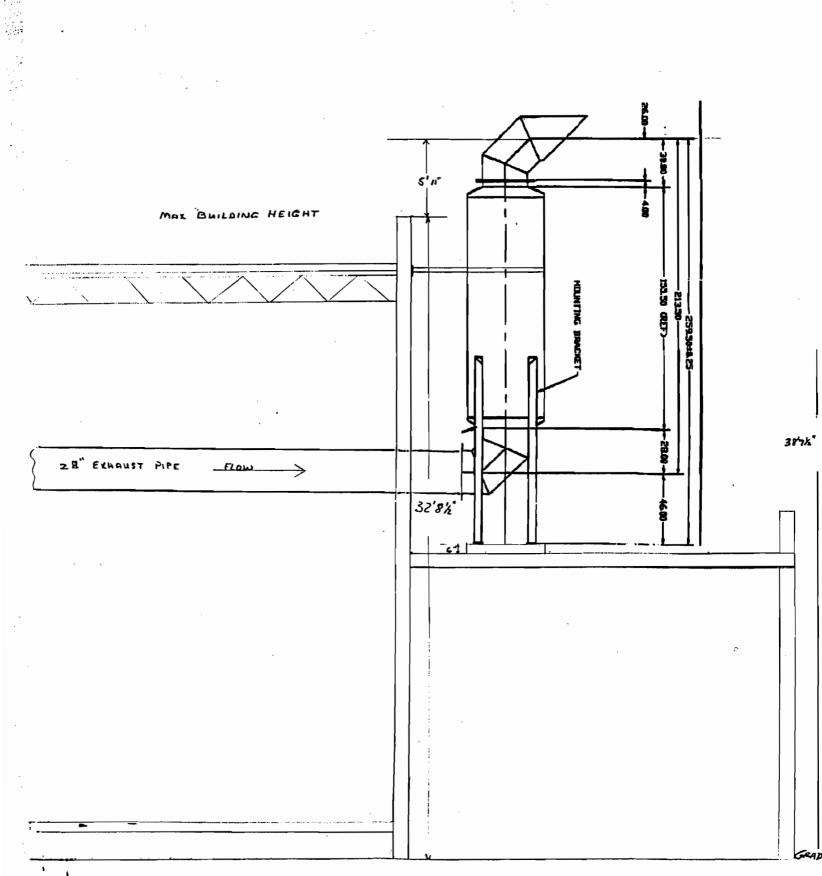
PC:

C.A. Russell, CEO/GM, FKEC

T.E. Planer, Supt. Transmission, FKEC

CC: J. Wif, BAK R.J. Helseing, Marathon SD EPA

BEST AVAILABLE COPY FLORIDA KEYE ELECTRIC COOPERATIVE ENGINE GEN. # 8 STACK ELEVATION DWG. SCALE 14" . 1'



BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

Addendum to:

Air Construction/Operation Permit Application

19 May 1997

BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

Introduction

This Best Available Control Technology (BACT) analysis is submitted as part of Florida Keys Electric Cooperative Association, Inc's (FKEC) Prevention of Significant Deterioration (PSD) application. The review is being conducted as part of the permitting process for a 3.58 MW turbocharged diesel engine (EMD 20-710G4B) to be installed at FKEC's Marathon generating plant.

The BACT analysis will be conducted for nitrogen oxides (NOx) as the diesel engine has the potential to emit this pollutant in significant quantities if the unit were operated continuously at its maximum capacity (Table 1). Carbon monoxide (CO) emissions for this diesel if operated continuously with no emissions reductions, are estimated to be about 111 tons per year (tpy), just over the PSD significance limit of 100 tpy. The least restrictive emissions reduction technology which might be used on this engine would reduce CO emissions to a level below the PSD limit, therefore, CO will not be subjected to a full BACT analysis. Particulate matter (PM) and particulate matter less than 10 microns diameter (PM10) will be emitted in less than significant levels, therefore, will not be included in the BACT analysis. Sulfur dioxide (SO2) emissions will be reduced below significant levels by restricting fuel sulfur content to ≤0.05%, therefore, SO2 will also not be included in the BACT analysis.

Table 1. Potential and expected emissions from EMD 20-710G4B (tpy).

Pollutant	Significant Levels ¹	Uncontrolled Emissions ²	Controlled Emissions ³	Expected Emissions ⁴
NOx	40	423 (96.6 lb/hr)	271 (36%reduction)	24.2
СО	100	111	<100	6.4
PM	25	9.5	9.1 (4% reduction)	0.6
PM10	15	7.9		0.5
SO ₂	40	7.2		0.5

¹ Florida Administrative Code 212.400-2.

²Based on operating at 100% capacity for 8760 hr/yr.

³ Based on emissions control package offered by diesel engine vendor.

⁴ Based on FKEC's historical and projected actual operating hours of 500 or less.

Best Available Control Technology

A search of the U. S. Environmental Protection Agency's (USEPA) BACT/LAER Clearinghouse database and discussions with industry vendors yielded the following NOx control technologies to be considered as BACT for diesel fired internal combustion engines listed in order from most stringent control to least:

- 1. Selective Catalytic Reduction (SCR)
- 2. Combined technologies of injection timing retardation, turbocharger with aftercoolers
- 3. Good combustion design/practices
- 4. Low sulfur fuel

Table 2 summarizes the feasibility of using these control technologies with the EMD 20-710G4B as designed for installation in FKEC's Marathon Generating Plant.

Table 2. NOx BACT Summary

Control Technology	Emission Reduction (%)	Technically Feasible	Cost Effective	Adverse Environ. Impacts	Adverse Energy Impacts
SCR with ammonia	60-90	No	No	Yes	No Data
SCR with urea	80	No	No	Yes	No Data
Timing retard; turbo charger with aftercoolers	40	Yes	Yes	No	0.3%
Dry/Low NOx	18	No			
Low sulfur fuel		Yes	Yes	No	No

Technical Analysis

Introduction

Oxides of nitrogen (NOx) are formed in combustion sources by the thermal oxidation of nitrogen in the combustion air and the reduction and subsequent oxidation of organic nitrogen chemically bound in the fuel. The rate of formation of thermal NOx is a function of residence time, free oxygen, turbulence, and peak flame temperature. Primary control techniques for NOx are aimed at minimizing one or more of these variables. Secondary control methods, involving post-combustion techniques, remove NOx from the exhaust stream.

Each of the listed control technologies will be reviewed and eliminated until a technology is reached that cannot be eliminated for technological, economic, or environmental reasons. That control technology will be selected as BACT for FKEC's EMD 20-710G4B.

Selective Catalytic Reduction

Selective Catalytic Reduction (SCR) is more widely used in Japan and Germany than it is in the United States and the technology is being improved such that some of the hazards and costs have been reduced. It remains, however, a very costly technology that has significant environmental hazards associated with the use and storage of ammonia. SCR is not generally used with diesel engines of this size. In addition, it is less effective with diesel because contaminants in diesel and lube oil (phosphorus) can render the catalyst inactive through coating the catalyst surface or contaminating it. The BACT/LEAR database lists only a single facility (Philadelphia Southwest Water Treatment Plant) (Table 3) which used SCR on diesel engines. SCR was selected in that instance because local ordinance mandated strict limits on emissions without regard to cost.

Even though, in FKEC's case, SCR is not a preferred technology because of high costs, and because of environmental and human safety factors associated with the storage and use of large quantities of ammonia in close proximity to residential areas, this technology initially appeared to be feasible for FKEC's EMD20-710G4B, therefore, it was thoroughly investigated as a possible control technology. However, FKEC was informed by the vendor that design alterations necessary to install an SCR system on this engine are impractical and that SCR should not be considered for this unit. Exhaust back pressure maximum allowance for the EMD 20-710G4B is 5 inches H₂O. An SCR system will add 5 to 6 inches H₂O back pressure, far exceeding the manufacturers specifications and recommendations. Even if the manufacturer would warrant a redesigned exhaust system, such a system would exceed the spacial limitations of the engine site. In addition re-engineering the system would add significantly to the already high cost of SCR. For the above reasons, SCR cannot be considered BACT for this unit and, therefore, will not be considered further in this analysis.

Table 3. Summary of BACT Determinations for Diesel Engines as of March 1997. (U.S.E.P.A. BACT/LEAR Clearinghouse)

RBLCID	FACILITY	IDDATE	PROCESS	THRUPUT	THRUPUTUNT	POLL.	FMISS	PRIMEUNIT	CONTROL DESCRIPTION	%FFF	. BASIS
CA-0422	RYAN-MURPHY INCORPORATED	3/24/95	GENERATOR, DIESEL-FIRED, NON-EMERGENC	211.0	BHP @ 1800 RP	CO		LB/H	3-WAY CATALYTIC CONVERTER	90	BACT-PSD
HI-0011	CITIZENS UTILITIES CO., KAUAI ELECT. DIV.	3/24/95	ENGINE, I.C. DIESEL-FIRED, 4 EACH	7.9	MW EACH	co		PPMVD FULL LOAD	HIGH COMBUSTION EFFICIENCY	0	BACT-PSD
HI-0016	MAUI ELECTRIC COMPANY LIMITED	2/27/96	ENGINE GENERATOR, DIESEL (3)	2.2	MW	co		PPMVD	COMBUSTION TECHNOLOGY/DESIGN	0	BACT-PSD
HI-0017	MAUI ELECTRIC COMPANY, LTD.	8/19/96	ENGINE GENERATORS (3), DIESEL	2.2	MW	co		PPMVD	COMBUSTION TECHNOLOGY/DESIGN	0	BACT-PSD
NY-0044	BROOKLYN NAVY YARD COGENERATION PARTNERS L	6/30/95	TURBINE OIL FIRED	240.0	MW	co		PPM @ 15% O2	Company (Editored) Princip	0	LAER
NY-0044	BROOKLYN NAVY YARD COGENERATION PARTNERS L	6/30/95	GENERATOR, 3000 KW ENERGENCY	3000.0	KW	co	0.3	LB/MMBTU		0	LAER
NY-0047	PASNY/HOLTSYILLE COMBINED CYCLE PLANT	9/13/94	FIRE PUMP (DIESEL)	1.3	MMBTU/HR	co	0.7	LB/MMBTU	COMBUSTION CONTROL	0	BACT-OTHER
NY-0072	KAMINE/BESICORP SYRACUSE LP	4/27/95	DIESEL GENERATOR (EP #00005)	22.0	MMBTU/HR	co	0.4	LB/MMBTU, 8,27 LB/	NO CONTROLS	0	BACT-OTHER
NY-0081	LII CO SHORFHAM	3/30/95	(3) GE FRAME 7 TURBINES (EP #S 00007-	850.0	MMBTU/HR	co	10.0	PPM, 19.7 LB/HR	NO CONTROLS	0	BACT-OTHER
PA-0083	NORTHERN CONSOLIDATED POWER	7/20/94	GENERATORS, DIESEL, 2	1135.0	KW EACH	co	7.9	LB/H EACH		0	OTHER
PA-0096	PHILADELPHIA SOUTHWEST WATER TREATMENT PLA	3/24/95	ENGINES (11) (DIESEL)	1156.0	KW (EACH)	co	0.0		\$CR	0	OTHER
PA-0097	PHILADELPHIA NORTHEAST WATER TREATMENT PLA	3/24/95	ENGINES (7) (DIESEL)	1635.0	KW (EACH)	co	0.0		SCR	0	OTHER
SC-0027	SOUTH CARDLINA ELECTRIC AND GAS COMPANY	3/24/95	GENERATOR, NO 2 OIL - EMERGENCY	400.0	KILOWATTS	co	1.0	LB/HR		0	BACT-PSD
VA-0191	RW POWER PARTNERS, L.P.	3/24/95	GENERATORS, ELECTRIC (DIESEL) (3)	1200.0	KW (EACH)	со	3.4	LB/HR	GOOD COMBUSTION PRACTICES	0	BACT-OTHER
VA-0207	PORTSMOUTH NAVAL HOSPITAL	3/24/95	GENERATORS, DIESEL, 6	1200.0	GALYR	co	6.4	LB/HR	RETARDING THE TIMING BY 5 DEGREES	22	NSP\$
WI-0083	CARDINAL FLAT GLASS	8/11/95	GENERATOR, BACK-UP, DIESEL	0.0		со	12.4	LBS/HR	FUEL SPEC: LOW SULFUR (0.05%) DIESEL FUEL	0	BACT-PSD
MN-0022	LSP-COTTAGE GROVE, L.P.	5/29/95	OIESEL ENGINE-DRIVEN FIRE PUMP	2.7	MMBTU/HR	H2SO4	0.0	LB/HR	FUEL SELECTION	0	BACT-PSD
AK-0026	COMINCO ALASKA INC.	3/24/95	GENERATOR, WARTSILLA #2 & #5	0.0		NO2	135.0	LB/HR	3 DEGREE TIMING RETARD	66	BACT-PSD
AK-0028	CITY OF UNALASKA	7/29/96	POWER GENERATION, DIESEL	6.5	MW	NO2		TPY	LIMIT OPERATION HOURS AND AFTERCODLERS	0	BACT-PSD
AK-0029	CITY OF ST PAUL POWER PLANT	7/29/96	POWER GENERATION DIESEL	3.4	MW	NO2		TPY	AFTERCOOLERS	0	BACT-PSD
MD-0017	SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SM	3/24/95	TURBINE, OIL FIRED ELECTRIC	90.0	MW	NO2		LB/HR	WATER INJECTION	0	BACT-PSD
MD-0018	PEPCO - CHALK POINT PLANT	7/20/94	TURBINE, 105 MW OIL FIRED ELECTRIC	105.0	MW	NO2	25.0	PPM @ 15% O2	DRY PREMIX BURNER	0	BACT-PSD
MD-0018	PEPCO - CHALK PDINT PLANT	7/20/94	TURBINE, 84 MW OIL FIRED ELECTRIC	84.0	MW	NO2		PPM @ 15% O2	QUIET COMBUSTION AND WATER INJECTION	0	BACT-PSD
MD-0019	BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	3/24/95	TURBINE, 140 MW DIL FIRED ELECTRIC	140.0	MW	NO2	65.0	PPM @ 15% O2	WATER INJECTION	72	BACT-PSD
MD-0021	PEPCO - STATION A	7/20/94	TURBINE, 124 MW OIL FIRED	125.0	MW	NO2	77.0	PPM @ 15% O2	WATER INJECTION	0	BACT-PSD
AK-0026	COMINCO ALASKA INC.	3/24/95	GENERATOR, TRANSPORTABLE	0.0		NOX	26.3	LB/HR	RESTRICTED TO 3,000 HRSAYR AND MANUF.INSTALLED CTL	0	BACT-PSD
AK-0026	COMINCO ALASKA INC.	3/24/95	GENERATOR, CATERPILLAR #1, #2 B #3	0.0		NOX	71.1	LB/YR	RESTRICTED TO 1,690,000 KWHYR	0	BACT-PSD
CA-0417	UPF CORPORATION	3/24/95	ENGINE, DIESEL, EMERGENCY POWER GENER	410.0	HP	NOX	0.0		TURBOCHARGER/AFTERCOOLER, TIMING RETARD > OR = TD 4	40	BACT-PSD
CA-0422	RYAN-MURPHY INCORPORATED	3/24/95	GENERATOR, DIESEL-FIRED, NON-EMERGENC	211.0	BHP @ 1800 RP	NOX	2.9	LB/H	TIMING RETARDED, TURBOCHARGED WATER INJECTION*	64	BACT-PSD
CA-0453	UPF CORPORATION	3/24/95	ENGINE, DIESEL	410.0	HP	NOX	0.0		TURBOCHARGER WI AFTERCOOLER	40	BACT-PSD
CA-0562	RESOURCE RENEWAL TECHNOLOGIES, INC.	3/24/95	ENGINE, I.C.	951.0	BHP	NOX	6.6	G/B-HP-H	TURBOCHARGER, AFTERCOOLER, INJ. TIMING RETARD	40	BACT-OTHER
CA-0586	ROBISON, CARLON AND CARLON	8/5/94	GENERATOR, DIESEL	0.0		NOX	4.0	DEGREE TIMING RETA	4 DEGREE TIMING RETARD	0	BACT-OTHER
CA-0611	BANK OF AMERICA LOS ANGELES DATA CENTER	3/24/95	TURBINE, DIESEL & GENERATOR (SEE NOTE	0.0		NOX	163.0	PPM @ 15% O2	FUEL SPEC: LOW NOX DIESEL FUEL (SEE NOTES)	0	BACT-OTHER
HI-0011	CITIZENS UTILITIES CO., KAUAI ELECT. DIV.	3/24/95	ENGINE, I.C. DIESEL-FIRED, 4 EACH	7.9	MW EACH	NOX	590.0	PPMVD FULL LOAD	VARIABLE FITR, TURBOCHARGING AND INTERCOOLING	19	BACT-PSD
HI-0016	MAUI ELECTRIC COMPANY LIMITED	2/27/96	ENGINE GENERATOR, DIESEL (3)	2.2	MW	NOX	656.0	PPMVD	FUEL INJECTION TIMING RETARD WITH INTAKE AIR COOLING	0	BACT-PSD
HI-0017	MAUI ELECTRIC COMPANY, LTD.	8/19/96	ENGINE GENERATORS (3), DIESEL	2.2	MW	NOX	656.0	PPMVD	FUEL INJECTION TIMING RETARD WITH INTAKE AIR COOLING	0	BACT-PSD
MA-0015	PEABODY MUNICIPAL LIGHT PLANT	3/24/95	TURBINE, 38 MW OIL FIRED	412.0	MMBTU/HR	NOX	40.0	PPM @ 15% O2	WATER INJECTION	0	BACT-OTHER
MN-0022	LSP-COTTAGE GRDVE, L.P.	5/29/95	DIESEL ENGINE-DRIVEN FIRE PLIMP	2.7	MMBTU/HR	NOX	5.0	LB/HR	RETARD ENGINE TIMING; TURBOCHARGER, AFTERCOOLER	0	BACT-PSD
NY-0044	BROOKLYN NAVY YARD COGENERATION PARTNERS L	6/30/95	TURBINE, OIL FIRED	240.0	MW	NOX	10.0	PPM @ 15% O2	SCR SCR	0	LAER
NY-0044	BROOKLYN NAVY YARD COGENERATION PARTNERS L	6/30/95	GENERATOR, 3000 KW EMERGENCY	3000.0	KW	NOX	2.6	LB/MMBTU		0	LAER
NY-0072	KAMINE/BESICORP SYRACUSE LP	4/27/95	DIESEL GENERATOR (EP #00005)	22.0	MMBTU/HR	NOX	1.2	LB/MMBTU, 26.0 LB/	NO CONTROLS	0	BACT-OTHER
NY-0081	LILCO SHOREHAM	3/30/95	(3) GE FRAME 7 TURBINES (EP #S 00007-	850.0	MMBTU/HR	NOX	55.0	PPM +FBN & HEAT RA	WATER INJECTION	30	BACT
PA-0083	NORTHERN CONSOLIDATED POWER	7/20/94	GENERATOR9, DIESEL, 2	1135.0	KW EACH	NOX	36.0	LB/H EACH		0	OTHER
PA-0096	PHILADELPHIA SOUTHWEST WATER TREATMENT PLA	3/24/95	ENGINES (11) (DIESEL)	1156.0	KW (EACH)	NOX	2.0	G/B-HP-H	SCR	80	BACT-OTHER
PA-0097	PHILADELPHIA NORTHEAST WATER TREATMENT PLA	3/24/95	ENGINES (7) (DIESEL)	1635.0	KW (EACH)	NOX	2.0	G/B-HP-H	SCR	80	BACT-OTHER
SC-0027	SOUTH CAROLINA ELECTRIC AND GAS COMPANY	3/24/95	GENERATOR, NO 2 OIL - EMERGENCY	400.0	KILOWATTS	NOX	13.1	LB/HR		0	BACT-PSD
VA-0191	RW POWER PARTNERS, L.P.	3/24/95	GENERATORS, ELECTRIC (DIESEL) (3)	1200.0	KW (EACH)	NOX	137.3	LB/HR	TURBOCHARGER AND INNER COOLER	0	BACT-OTHER
VA-0207	PORTSMOUTH NAVAL HOSPITAL	3/24/95	GENERATORS, DIESEL, 6		GAL/YR	NOX	33.2	LB/HR	RETARDING THE TIMING BY 5 DEGREES	22	NSPS
WF0083	CARDINAL FLAT GLASS	8/11/95	GENERATOR, BACK-UP, DIESEL	0.0		NOX	67.5	LBS/HR	FUEL SPEC: LOW SULFUR (0.06%) DIESEL FUEL	0	BACT-PSD
HI-0011	CITIZENS UTILITIES CO., KAUAI ELECT. DIV.	3/24/95	ENGINE, I.C. DIESEL-FIRED, 4 EACH	7.9	MW EACH	PM	0.1	LB/MMBTU FULL LOAD	DIESEL FUEL OIL, HIGH COMB. EFF.	0	BACT-PSD
HI-0017	MAUI ELECTRIC COMPANY, LTD.	8/19/96	ENGINE GENERATORS (3), DIESEL	2.2	MW	PM	0.1	GR/DSCF @ 12% CO2	COMBUSTION DESIGN	0	BACT-PSD
MA-0015	PEABODY MUNICIPAL LIGHT PLANT	3/24/95	TURBINE, 38 MW OIL FIRED	412.0	MMBTU/HR	PM	0.1	LB/MMBTU	FUEL SPECIFICATION: NO. 2 LIGHT OIL	0	BACT-OTHER
PA-0096	PHILADELPHIA SOUTHWEST WATER TREATMENT PLA	3/24/95	ENGINES (11) (DIESEL)	1156.0	KW (EACH)	PM	0.3	G/B-HP-H	SCR	0	BACT-OTHER
PA-0097	PHILADELPHIA NORTHEAST WATER TREATMENT PLA	3/24/95	ENGINES (7) (DIESEL)	1635.0	KW (EACH)	PM	0.3	G/B-HP-H	SCR	0	BACT-OTHER
WI-0083	CARDINAL FLAT GLASS	8/11/95	GENERATOR, BACK-UP, DIESEL	0.0		PM	4.8	LBS/HR	FUEL SPEC: LOW SULFUR (0.05%) DIESEL FUEL	0	BACT-PSD
NY-0072	KAMINE/BESICORP SYRACUSE LP	4/27/95	OIESEL GENERATOR (EP #00005)	22.0	MMBTU/HR	PM,PM10	0.0	LB/MMBTU, 0.53 LB/	NO CONTROLS	0	BACT-OTHER
H ⊦0 016	MAUI ELECTRIC COMPANY LIMITED	2/27/96	ENGINE GENERATOR, DIESEL (3)	2.2	MW	PM/PM10	0.1	GR/DSCF @ 12% CO2	COMBUSTION DESIGN	0	BACT-PSD

Table 3. Summary of BACT Determinations for Diesel Engines as of March 1997. (U.S.E.P.A. BACT/LEAR Clearinghouse)

RBLCID	FACILITY	UPDATE	PROCESS	THRUPUT	THRUPUTUNT	POLL.	EMISS.	PRIMEUNIT	CONTROL DESCRIPTION	%EFF.	BASIS
CA-0422	RYAN-MURPHY INCORPORATED	3/24/95	GENERATOR, DIESEL-FIRED, NON-EMERGENC	211.0	BHP @ 1800 RP	PM10	0.1	LB/H	WATER INJECTION	40	BACT-PSD
MN-0022	LSP-COTTAGE GROVE, L.P.	5/29/95	DIESEL ENGINE-DRIVEN FIRE PUMP	2.7	MMBTU/HR	PM10	0.7	LB/HR	FUEL SELECTION; GOOD COMBUSTION	0	BACT-PSD
NY-0081	LILCO SHOREHAM	3/30/95	(3) GE FRAME 7 TURBINES (EP #S 00007-	850.0	MMBTU/HR	PM10	0.0	LB/MMBTU, 10.2 LB/	NO CONTROLS	0	BACT-OTHER
AK-0026	COMINCO ALASKA INC.	3/24/95	GENERATOR, WARTSILLA & & 66	0.0		SO2	49.2	TPY	FUEL SPEC: 0.25% S IN FUEL	0	BACT-PSD
AK-0026	COMINCO ALASKA INC.	3/24/95	GENERATOR, TRANSPORTABLE	0.0		SO2	3.4	TPY	FUEL SPEC: 0.25% S IN FUEL	0	BACT-PSD
AK-0026	COMINCO ALASKA INC.	3/24/95	GENERATOR, CATERPILLAR #1, #2 & #3	0.0		SO2	2.3	TPY	FUEL SPEC: 0.25% S IN FUEL	0	BACT-PSD
CA-0417	UPF CORPORATION	3/24/95	ENGINE, DIESEL, EMERGENCY POWER GENER	410.0	HP	SO2	0.0		FUEL SPEC: FUEL OIL W/ < 0.05% SULFUR CONTENT	0	BACT-PSD
CA-0562	RESOURCE RENEWAL TECHNOLOGIES, INC.	3/24/95	ENGINE, I.C.	951.0	BHP	SO2	0.2	G/B-HP-H	FUEL SPEC: LOW SULFUR FUEL (<= 0.05% S BY WT)	75	BACT-OTHER
HI-0011	CITIZENS UTILITIES CO., KAUAI ELECT. DIV.	3/24/95	ENGINE, I.C. OIESEL-FIRED, 4 EACH	7.9	MW EACH	SO2	95.0	PPMVD	FUEL SPEC: MAX FUEL S CONTENT 0.5% BY WEIGHT	0	BACT-PSD
HI-0016	MAUI ELECTRIC COMPANY LIMITED	2/27/96	ENGINE GENERATOR, DIESEL (3)	2.2	MW	SO2	76,0	PPMVD	FUEL SPEC: SULFUR CONTENT .47 BY WEIGHT	0	BACT-PSD
HI-0017	MAUI ELECTRIC COMPANY, LTD.	8/19/96	ENGINE GENERATORS (3), DIESEL	2.2	MW	SO2	76.0	PPMVD	FUEL SPEC: SULFUR CONTENT 0.4% BY WEIGHT	0	BACT-PSD
MD-0017	SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SM	3/24/95	TURBINE, OIL FIRED ELECTRIC	90.0	MW	SO2	0.0		FUEL SPEC: FUEL LIMITED AND 0.3 % S	0	BACT-PSD
SC-0027	SOUTH CAROLINA ELECTRIC AND GAS COMPANY	3/24/95	GENERATOR, NO 2 OIL - EMERGENCY	400.0	KILOWATTS	SO2	1.2	LB/HR	FUEL SPEC: 0.3% S CONTENT FUEL; LIMIT OPER <500 HR	0	BACT-PSD
VA-0191	RW POWER PARTNERS, L.P.	3/24/95	GENERATORS, ELECTRIC (DIESEL) (3)	1200.0	KW (EACH)	SO2	18.1	LB/HR	FUEL SPEC: USE OF 0.6% SULFUR FUEL	0	BACT-OTHER
VA-0207	PORTSMOUTH NAVAL HOSPITAL	3/24/95	GENERATORS, DIESEL, 6		GAL/YR	SO2	5.4	LB/HR	RETARDING THE TIMING BY 6 DEGREES	22	NSPS
WI-0083	CARDINAL FLAT GLASS	8/11/95	GENERATOR, BACK-UP, DIESEL	0.0		SO2	0.7	LBS/HR	FUEL SPEC: LOW SULFUR (0.06%) DIESEL FUEL	0	BACT-PSD
CA-0422	RYAN-MURPHY INCORPORATED	3/24/95	GENERATOR, DIESEL-FIRED, NON-EMERGENC	211.0	BHP @ 1800 RP	SOX	0.0	LB/H AS SO4	FUEL SPEC: 0.05% DIESEL FUEL SULFUR CONTENT	0	BACT-PSD
CA-0453	UPF CORPORATION	3/24/95	ENGINE, DIESEL	410.0	HP	SOX	0.0		FUEL SPEC: FUEL OIL W/ < 0.05% SULFUR CONTENT	0	BACT-PSD
VA-0191	RW POWER PARTNERS, L.P.	3/24/95	GENERATORS, ELECTRIC (DIESEL) (3)	1200.0	KW (EACH)	TSP/PM10	3.4	LB/HR	GODD COMBUSTION PRACTICES	0	BACT-OTHER
VA-0207	PORTSMOUTH NAVAL HOSPITAL	3/24/95	GENERATORS, DIESEL, 6		GAL/YR	TSP/PM10	3.6	LB/HR	RETARDING THE TIMING BY 6 DEGREES	22	NSPS
CA-0417	UPF CORPORATION	3/24/95	ENGINE, DIESEL, EMERGENCY POWER GENER	410.0	HP	VE	0.0	% OPACITY	CRANKCASE COLLECTOR	90	BACT-PSD
CA-0422	RYAN-MURPHY INCORPORATED	3/24/95	GENERATOR, DIESEL-FIRED, NON-EMERGENC	211.0	BHP @ 1800 RP	VE	0.0	% OPACITY	POSITIVE CRANKCASE VENT VALVE	100	BACT-PSD
SC-0027	SOUTH CAROLINA ELECTRIC AND GAS COMPANY	3/24/95	GENERATOR, NO 2 OIL - EMERGENCY	400.0	KILOWATTS	VE	20.0	% OPACITY		0	BACT-PSD
AK-0026	COMINCO ALASKA INC.	3/24/95	GENERATOR, WARTSILLA & & 6	0.0		VOC	6.1	LBS/HR	3 DEGREE TIMING RETARD	0	BACT-PSD
CA-0422	RYAN-MURPHY INCORPORATED	3/24/95	GENERATOR, DIESEL-FIRED, NON-EMERGENC	211.0	BHP @ 1800 RP	voc	0.1	LB/H	3-WAY CAT. CONVERTER, POSITIVE CRANKCASE VENT.	30	BACT-PSD
CA-0562	RESOURCE RENEWAL TECHNOLOGIES, INC.	3/24/95	ENGINE, I.C.	951.0	BHP	voc	0.3	G/B-HP-H	POSITIVE CRANKCASE VENTILLATION	0	BACT-OTHER
HI-0011	CITIZENS UTILITIES CD., KAUAI ELECT. DIV.	3/24/95	ENGINE, i.C. DIESEL-FIRED, 4 EACH	7.9	MW EACH	voc	228.0	PPMVD FULL LOAD	HIGH COMBUSTION EFFICIENCY	0 -	BACT-PSD
HI-0016	MAU! ELECTRIC COMPANY LIMITED	2/27/96	ENGINE GENERATOR, OIESEL (3)	2.2	MW	voc	81.0	PPMVD	COMBUSTION DESIGN (INCLUDING FITR)	0	BACT-PSD
H-0017	MAUI ELECTRIC COMPANY, LTD.	8/19/96	ENGINE GENERATORS (3), DIESEL	2.2	MW	voc	81.0	PPMVD	COMBUSTION DESIGN, INCLUDING FITR	0	BACT-PSD
MN-0022	LSP-COTTAGE GROVE, L.P.	5/29/95	DIESEL ENGINE-DRIVEN FIRE PUMP	2.7	MMBTU/HR	voc	1.9	LB/HR	FUEL SELECTION; GOOD COMBUSTION	0	BACT-PSD
NY-0072	KANINE/BESICORP SYRACUSE LP	4/27/95	DIESEL GENERATOR (EP #00005)	22.0	MMBTU/HR	voc	0.0	LB/MMBTU, 0.34 LB/	NO CONTROLS	0	BACT-OTHER
PA-0096	PHILADELPHIA SOUTHWEST WATER TREATMENT PLA	3/24/95	ENGINES (11) (DIESEL)	1156.0	KW (EACH)	voc	0.0		SCR	0	OTHER
PA-0097	PHILADELPHIA NORTHEAST WATER TREATMENT PLA	3/24/95	ENGINES (7) (DIESEL)	1635.0	KW (EACH)	voc	0.0		SCR	0	OTHER
VA-0191	RW POWER PARTNERS, L.P.	3/24/95	GENERATORS, ELECTRIC (DIESEL) (3)	1200.0	KW (EACH)	voc	4.6	LB/HR	GOOD COMBUSTION PRACTICES	0	BACT-OTHER
VA-0207	PORTSMOUTH NAVAL HOSPITAL	3/24/95	GENERATORS, DIESEL, 6		GALYR	voc	0.9	LB/HR	RETARDING THE TIMING BY 6 DEGREES	22	NSPS

Injection Timing Retardation/Aftercoolers

The next most stringent control technology is to modify the combustion process through a combination of fuel injection timing retardation and cooling of combustion air resulting in exhaust temperature reduction. The design specific to FKEC's EMD 20-710G4B includes 4° injection timing retardation and a 4-pass aftercooler circuit with the addition of a separately cooled aftercooler circuit. The combination of retarded injection timing and lowered combustion air temperature results in less NOx formation. Vendor's data indicate that retarding injection timing will reduce NOx formation by about 20%, but will increase PM emissions by about 10% and fuel consumption by 1.5%. The 4-pass aftercooler will reduce both NOx and PM emissions by about 10% while reducing fuel consumption by about 0.7%. The separately cooled aftercooling circuit will decrease both NOx and PM by another 10% and fuel consumption by 0.5%. The net result will be a 40% reduction in NOx, a 5% increase in PM and about a 0.3% increase in fuel consumption. The use of low sulfur fuel will reduce PM emissions thus reducing or eliminating the increase in PM caused by NOx controls. This combination of NOx controls, proper engine design, good combustion practices, and the use of low sulfur fuel should provide effective emissions control.

The cost of this emissions control package is about \$1285/ton of NOx reduction (Tables 4 - 7) which is within Florida Department of Environmental Protection's acceptable limits. There are no significant adverse environmental or energy impacts associated with this technology, therefore, BACT for FKEC's EMD 20-710G4B is determined to be a combination of fuel injection timing retardation 4°, a 4-pass aftercooler circuit with a separately cooled aftercooler circuit, good combustion practices and the use of low sulfur fuel (≤0.05%).

Table 4. Capital Cost Estimation Factors

COSTS	FORMAT					
DIRECT COSTS						
1) Purchased Equipment						
a) Basic Equipment	Vendor Data					
b) Auxiliaries	Vendor Data					
c) Instrumentation	0.10(1a+1b)					
d) Structural Support	0.10(1a+1b)					
e) Freight	0.05(sum 1a1d)					
2) Direct Installation	0.25 - 0.30 (sum 1a1e)					
Total Direct Cost (TDC)	(1) + (2)					
INDIRECT COSTS						
3) Indirect Installation						
a) Engineering	(0.05 to 0.10) (TDC)					
b) Construction and Field Expenses	0.10(TDC)					
c) Construction Fee	0.05(TDC)					
d) Contingencies	0.20(TDC)					
4) Start-up and Testing	0.01(TDC)					
Total Indirect Costs (TIC)	(3) + (4)					
Total Capital Costs	TDC + TIC					

Source: EPA OAQPS Cost Manual, 1990.

Table 5. Capital Costs for NOx Controls for EMD 20-210G4B

DIRECT COSTS		
1) Purchased Emissions Reduction Package: a) Timing Retardation 4° b) Separately Cooled aftercooler c) Turbocharger/Aftercooler d) Instrumentation e) Structural Support f) Freight	\$ 5,700. 26,100. 107,500. 13,930. 13,930. 8,358.	
2) Direct Installation	52,655.	
Total Direct Costs	228,173.	
INDIRECT COSTS		
3) Indirect Installation a) Engineering b) Construction and Field Expenses c) Construction Fee d) Contingencies	22,817. 22,817. 11,407. 45,635.	
4) Start-up and Emissions Testing	20,420.	(Vendor Data)
Total Indirect Costs	123,096.	
Total Capital Costs	\$351,269.	

Table 6. Annualized Cost Factors

DIRECT OPERATING COSTS	FACTOR
1) Labor	
a. Operating	\$40.00/man-hr
b. Supervisor	15% of Operating Labor
2) Maintenance	5% of Direct Costs
3) Replacement Parts	3% of Direct Costs
4) Utilities	
a. Electricity	\$0.07/kW-hr
c. Fuel Penalty	
INDIRECT OPERATING COSTS	
6) Overhead	30% Labor + 12% Maintenance
7) Property Tax	1% Total Capital Cost
8) Insurance	1% Total Capital Cost
9) Administration	2% Total Capital Cost
10) Capital Recovery	Capital Recovery x TDC
Total Annualized Cost	Sum (110)
Cost Effectiveness	Annual Cost/Tons Removed

Source: EPA OAQPS Cost Manual, 1990.

Table 7. Annualized Cost Factors

DIRECT OPERATING COSTS	FACTOR
1) Labor	·
a. Operating	\$ 41,600.
b. Supervisor	6,240.
2) Maintenance	11,408.
3) Replacement Parts	68,452.
4) Utilities	
a. Electricity	34,309.
c. Fuel Penalty	3,513.
INDIRECT OPERATING COSTS	
6) Overhead	15,721.
7) Property Tax	3,513.
8) Insurance	3,513.
9) Administration	7,025.
10) Capital Recovery	
Total Annualized Cost	195,294. (w/o Cap. Recovery)
Cost Effectiveness	\$1,285.



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Syed Arif
Dept. of Environmental Protection
Bureau of Air Resources
Mail Station 5505
2600 Blairstone Rd.
Tallahassee, FL 32399-2400

Re: BACT Analysis response to Incompleteness Letter of 2/13/97.

14 May 1997

Dear Mr. Arif:

I will address the three items of your incompleteness letter in order as they appeared in your letter.

- 1. Sulfur content of fuel The EMD 20-710G4B will burn low sulfur diesel (≤ 0.05%S) which will reduce sulfur dioxide emission below Prevention of Significant Deterioration (PSD) levels.
- 2. PSD pollutants The original emissions calculations were based on outdated factors taken from the Environmental Protection Agency (EPA) BACT/LEAR Clearinghouse database. After consulting with EPA personnel, I was referred to the current database (FIRE v 5.1B, 1997) for emission factors. Using the new emission factors, PM and PM10 emissions are below PSD levels. NOx emissions remain above PSD levels and are the subject of the attached BACT analysis. CO emissions are marginally above the PSD levels, but EPA acknowledges that its emission factors are imprecise and that, FKEC's CO levels might actually be below PSD levels. It is believed that the control measures to be used for NOx in addition to good combustion practices and the use of low S fuel will result in net CO emissions below PSD levels therefore no separate control should be necessary for CO.
- 3. Ambient air quality standards (AAQS) air modeling The flat terrain of the Marathon area, its air modeling classification of "rural" (because more than 50% of the surrounding area is "water surfaces" USEPA Guideline on Air Quality Models) combined with the ESE prevailing wind which brings relatively clean air from the open ocean and the lack of heavy industry in the area contribute to the area's designation as attainment for all criteria pollutants. Discussions with DEP's Cleve Halladay (DEP air modeler) and "screening" air modeling based on the Marathon

Generating Plant site predicted that only PM and PM₁₀ emissions would exceed AAQS (based on the original calculations). Calculations using EPA's new factors show those emissions to be below PSD levels, therefore, the engine's emissions will not exceed AAQS. The exhaust stack follows good engineering design and has been raised an additional 45 inches to minimize any local air entrapment (drawing attached).

Attached, please find the BACT analysis for Florida Keys Electric Cooperative's PSD review. In order to expedite the review process, I am faxing it to you. I will mail the original to you. Please call me if any additional information is required. Thank you for your continued assistance in this long process.

Sincerely,

Deborah A. Shaw

Environmental Affairs Coordinator

In h. Shew

Enc: Stack Sketch BACT Analysis

PC:

C.A. Russell, CEO/GM, FKEC

T.E. Planer, Supt. Transmission, FKEC



FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Syed Arif
Dept. of Environmental Protection
Bureau of Air Resources
Mail Station 5505
2600 Blairstone Rd.
Tallahassee, FL 32399-2400

RECEIVED

APR 09 1997

BUREAU OF AIR REGULATION

Re: Changes to application for air construction permit.

0870004-002-AC

7 April 1977

Dear Mr. Arif:

As per my discussions with you and Cleve Holladay, I have modified the calculations for engine emissions using the most recent EPA emissions standards (FIRE version 5.1B, 1997). Please use the enclosed applications sheets (7) to replace the corresponding sheets in our application packet. I am also sending replacement sheets to Cleve and Art Lyall.

Please call me if you have any questions. Thank you.

Sincerely,

Deborah A. Shaw

Environmental Affairs Coordinator

1016

pc:

C.A. Russell, CEO/GM, FKEC T.E. Planer, Supt. Transmission, FKEC C. Holladay, Air Modeling, FDEP-Tallahassee A.E. Lyall, Engr., FDEP-Ft. Myers

EPA NIPS

R.J. Hebling, Marathon D. Knowles, SD Emissions Unit Information Section _____ of ____

F. SEGMENT (PROCESS/FUEL) INFORMATION (Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 1

1.	Segment Description (Process/Fuel Type and Associated (limit to 500 characters):	d Operating Method/Mode)
	No. 2 Fuel Oil burned in diesel engine.	
2.	Source Classification Code (SCC): 2 - 02 - 004	- 01
3.	SCC Units: Thousand gallons burned	
4.	Maximum Hourly Rate: 0.229 Thousand gal.	5. Maximum Annual Rate: 2,006
6.	Estimated Annual Activity Factor:	
7.	Maximum Percent Sulfur: 0.1%	8. Maximum Percent Ash:
9.	Million Btu per SCC Unit: 132	
10.	Segment Comment (limit to 200 characters):	
	Florida Keys Electric Cooperative Associa 0.05% sulfur diesel for this engine to re	

Emissions Unit Information Section 1 of 6

BEST AVAILABLE COPY

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

1.	Pollutant Emitted: C0		
2.	Total Percent Efficiency of Control:	%	
3.	Potential Emissions: 25.4 lb/hour	111 tons/year [See # 9]	
4.	Synthetically Limited?		···
	☐ Yes X No		
5.	Range or Estimated Fugitive/Other Emissions:		
	☐ 1 ☐ 2 ☐ 3	to	tons/year
6.	Emission Factor: 0.84 lbs/MMBtu		
	Reference: EPA FIRE v.5.1B, 1997		
7.	Emissions Method Code:		
	□ 0 □ 1 □ 2	☐ 4	□ 5
8.	Calculation of Emissions (limit to 600 characters):		
	0.84 lbs/MMBtu x 30.2 MMBtu/hr = 25.4 lbs/hr 25.4 lbs/hr x 8760 hrs/yr ÷ 2000 lbs/ton = 111.3 tpy		
	229 gal/hr Fuel Consumption		
9.	Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		
	Based on anticipated, actual operating hours of < 500 hrs/yr, actual CO emissions will be < 6.4 tpy.		
		`	

Emissions Unit Information Section 2 of 6

BEST AVAILABLE COPY

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

1.	Pollutant Emitted:		
2.	Total Percent Efficiency of Control:	36 %	
3.	Potential Emissions: 96.6 lb/hour	423 tons/yea [See # 9	
4.	Synthetically Limited?		
	☐ Yes X No		
5.	Range of Estimated Fugitive/Other Emissions:		
	☐ 1 ☐ 2 ☐ 3	to	tons/year
6.	Emission Factor: 3.2 1bs/MMBtu		
	Reference: EPA FIRE v.5.1B, 1997		
7.	Emissions Method Code:		
	□ 0 □ 1 □ 2	☐ 4	☐ 5
8.	Calculation of Emissions (limit to 600 characters):		
9.	3.2 lbs/MMBtu x 30.2 MMBtu/hr = 96.6 lbs/hr 96.6 lbs/hr x 8760 hrs/yr ÷ 2000 lbs/ton = 423 tpy. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): Based on anticipated, actual operating hours of < 500 hrs/yr, actual NO _x emissions will be < 24.2 tpy.		
	actual No _X emissions will be \ 24.2 tpy.		

• Emissions Unit Information Section 3 of 6

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

1.	Pollutant Emitted: PM		
2.	Total Percent Efficiency of Control:	%	
3.	Potential Emissions: 2.18 lb/hour	9.5 tons/yea [See # 9]	
4.	Synthetically Limited?		
	☐ Yes X No		
5.	Range of Estimated Fugitive/Other Emissions:		
	☐ 1 ☐ 2 ☐ 3	to	tons/year
6.	Emission Factor: 9.55 lbs/1000 gal		
	Reference: EPA FIRE v.5.1B, 1997		
7.	Emissions Method Code:		
	□ 0 □ 1 □ 2 □ 3	4	x 5
8.	Calculation of Emissions (limit to 600 characters):	<u> </u>	
	9.55 lbs/1000 gal x 1000 gal/132 MMBtu x 30.2 MMBtu/8	ar = 2.18 lbs/b	<u>,</u>
	2.18 lbs/hr x 8760 hrs/yr $\frac{1}{2}$ 2000 lbs/ton = 9.5 tp	oy.	
9.	Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		
	Based on anticipated, actual operating hours of < 500 hrs actual PM emissions will be < 0.6 tpy.	s/yr,	

- 6/18/96 11:20 AM - Emissions Unit Information Section 4 of 6

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

1.	Pollutant Emitted: PM 10		
2.	Total Percent Efficiency of Control:	%	
3.	Potential Emissions: 1.80 lb/hour	7.9 tons/year [See # 9]	
4.	Synthetically Limited?		
	☐ Yes X No		
5.	Range of Estimated Fugitive/Other Emissions:		
	☐ 1 ☐ 2 ☐ 3	to	tons/year
6.	Emission Factor: 7.85 lbs/1000 gal		
	Reference: EPA FIRE v.5.1B, 1997		
7.	Emissions Method Code:		
	□ 0 □ 1 □ 2 □ 3	4	X 5
8.	Calculation of Emissions (limit to 600 characters):		
9.	7.85 lbs/1000 gal x 1000 gal/132 MMBtu x 30.2 MMBtu/hr 1.80 lbs/hr x 8760 hrs/yr - 2000 lbs/ton = 7.9 tpy. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): Based on anticipated, actual operating hours of < 500 hrs/yr actual PM ₁₀ emissions will be < 0.5 tpy.		nr
			_

• Emissions Unit Information Section 5 of 6

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

1.	Pollutant Emitted: S0 ₂		
2.	Total Percent Efficiency of Control:	%	
3.	Potential Emissions: 1.65 lb/hour	7 tons/year [See # 9]	
4.	Synthetically Limited?		
	Yes X No		
5.	Range of Estimated Fugitive/Other Emissions:		
	□ 1 □ 2 □ 3	to	tons/year
6.	Emission Factor:		
	Reference: Mass Balance		
7.	Emissions Method Code:		
	□ 0 □ 1	☐ 4	□ 5
8.	Calculation of Emissions (limit to 600 characters):	_	
	1000 gal/132 MMBtu x 7.2 lbs/gal x 0.05% S x 2 = 0.05	345 lbs/MMBtu	
	0.0545 lbs/MMBtu x 30.2 MMBtu/hr = 1.65 lbs/hr		
	1.65 lbs/hr x 8760 hrs/yr ÷ 2000 lbs/ton = 7.2 tpy.		
	, , , , , , , , , , , , , , , , , , , ,		
	Dell's de la Delevis d'Estima de d'Estima de la Companya d'Estima 2000 els controls		
9.	Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):		
	Based on anticipated, actual operating hours of < 500 hrs/yr, actual SO_2 emissions will be < 0.5 tpy.		·

- Emissions Unit Information Section 6 of 6

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

1.	Pollutant Emitted: V0C		
2.	Total Percent Efficiency of Control:	%	
3.	Potential Emissions: 3.13 lb/hour	13.7 tons/year [See # 9]	
4.	Synthetically Limited?		
	Yes X No		
5.	Range of Estimated Fugitive/Other Emissions:		
	□ 1 □ 2 □ 3	to	tons/year
6.	Emission Factor: 13.7 lbs/1000 gal		
	Reference: EPA FIRE v.5.1B, 1997		
7.	Emissions Method Code:		
	□ 0 □ 1 □ 2	☐ 4	□ 5
8.	Calculation of Emissions (limit to 600 characters):	_	
9.	13.7 lbs/gal x 1000 gal/132 MMBtu x 30.2 MMBtu/hr = 3.13 lbs/hr x 8760 hrs/yr ÷ 2000 lbs/ton = 13.7 t	tpy.	
	Based on anticipated, actual operating hours of < 500 hrs/actual VOC emissions will be < 0.8 tpy.	/yr,	



Department of Environmental Protection

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

Virginia B. Wetherell Secretary

February 13, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Deborah A. Shaw
Environmental Affairs Coordinator
Florida Keys Electric Cooperative Association,
Inc. - FKEC
91605 Overseas Highway
P.O. Box 700377
Tavernier, FL 33070-0377

Re: DRAFT Permit No. 087004-002-AC, PSD-FL-237 Marathon Generating Plant

Dear Ms. Shaw:

The Department has reviewed your application for an air construction/operation permit for a 3.58 MW diesel generator for your Marathon Generating Plant. The application was received on January 27, 1997. We need the additional information listed below to process this request.

- 1. The application states that No. 2 fuel oil with maximum sulfur content of 0.5% will be burned in the Diesel Engine. Later, in the application, calculations were done using a different sulfur content of 0.05% to determine if SO₂ will trigger Prevention of Significant Deterioration (PSD) review. Based on those calculations, SO₂ was non-PSD. Please indicate what is the correct sulfur content of the No. 2 fuel oil. If it is 0.5%, SO₂ will also be a PSD pollutant, and a Best Available Control Technology (BACT) determination will be required for that pollutant.
- 2. Based on the calculations submitted with the application, CO, NO_x, PM and PM₁₀ are PSD pollutants. Please provide the available control technologies for those pollutants for a diesel generator. Documentation, including actual cost data, should be provided for the chosen control technology as well as those that are economically infeasible for this project.
- 3. PSD regulations require air quality impact analyses for all pollutants subject to PSD review. The analyses required for each pollutant are the following: (1) an analysis of existing air quality, (2) a significant impact analysis to determine whether multiple source modeling is required, (3) a PSD increment analysis for both the PSD Class II area in the vicinity of the generating plant and for the Everglades National Park (ENP) Class I area, (4) an ambient air quality standards analysis (AAQS) in the vicinity of the plant, (5) an additional impacts analysis to include an air quality related values (AQRV) analysis for both PSD Class I area in the vicinity of the generating plant and the ENP PSD Class I area, and (6) a good engineering stack height

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Draft Permit No.: 0870004-002-AC, PSD-FL-237

Page 2 of 2

analysis. Please provide these analyses using department approved models and modeling methods for all pollutants subject to PSD review.

We are enclosing a New Source Review Workshop Manual for your review that will be of some help in answering the incompleteness questions. Please return the manual at your earliest convenience. The Department will resume processing this application after receipt of the requested information. If you have any questions on this matter, please call Al Linero, Syed Arif or Cleve Holladay at 904/488-1344.

Sincerely,

A. A. Linero, P.E.

Administrator

New Source Review Section

AAL/sa

cc: Mr. Brian Beals, EPA

Mr. John Bunyak, NPS Mr. David Knowles, DEP

Mr. R. J. Hebling, Marathon Office

P 265 659 168

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SENDER: • Complete items 1 and/or 2 for additional services.	I also wish to receive the
Complete items 3, and 4a & b.	following services (for an extra
Print your name and address on the reverse of this form so that	(we can fee)
o return this card to you. Attach this form to the front of the mailpiece, or on the back if	space Addressee's Address
does not permit.	WARREST TO THE REAL PROPERTY OF THE PARTY OF
 Write "Return Receipt Requested" on the mailpiece below the article. 	le number. 2. Restricted Delivery
The Return Receipt will show to whom the article was delivered at	id the date.
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FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 700377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

Mr. Al A. Linero Dept. of Environmental Protection Bureau of Air Resources Mail Station 5505 2600 Blairstone Rd. Tallahassee, FL 32399-2400

1997 24 January (1977) RECEIVED

JAN 27 1997

AIR REGULATION

Dear Mr. Linero:

E.

Enclosed is Florida Keys Electric Cooperative, Inc.'s (FKEC) application for an air construction/operation permit for a 3.58 MW diesel generator for our Marathon Generating Plant (MGP). Also attached is FKEC check No. 00064316 in the amount of seven thousand five hundred dollars (\$7,500.00) in payment of the application processing fee.

Prior to completing the application, I met with Mr. Jerry Smith and Mr. Art Lyall in Ft. Myers to discuss the power supply situation that we have here in the Keys. FKEC purchases electric power from Florida Power & Light (FP&L) and distributes it to Middle and Upper Keys residents. FKEC's long-term contract with FP&L (effective May, 1992) requires that FKEC maintain the capability of generating power in the event that FP&L cannot supply the Keys (e.g., during hurricanes or peak demand periods). Since the onset of the agreement with FP&L, the total operating hours for the MGP have averaged 551 hours/year (including the two weeks that MGP generated power during Hurricane Andrew). FKEC expects this level of operation to continue.

Even though MGP's actual operating hours are few and the air emissions are minimal, because of legal, contractual obligations, FKEC cannot accept operating limitations on hours or fuel consumption, therefore, FKEC is obliged to apply for this permit as a major source of air emissions. Because of our unusual situation of relying on a mainland power supply while maintaining standby generating capability, I would ask that any regulatory flexibility allowed in the permitting process, be applied in the evaluation of FKEC's application for a new generating unit.

In an effort to expedite the review process, one copy of the application packet has been sent directly to Mr. Art Lyall. Three copies are enclosed for further distribution by your office. Please call me if you have questions or if you require further information.

Air Resources Management staff in Ft. Myers and Tallahassee has been very helpful throughout this process. Thank you.

Sincerely,

Odnt a Shaw

Deborah A. Shaw

Environmental Affairs Coordinator

Enc: 3 permit application packets - each containing:

Cover Letter.

FDFP Application Form N

FDEP Application Form No. 62-210.900(1).

Attachments A-H.

Current FDEP Permits for Generators 1-7.

pc: Cover letter only.

C.A. Russell, CEO/GM - FKEC

J.M. Burch, P.E., Dir. Engineering - FKEC

T.E. Planer, Supt. Transmission - FKEC

J. R. Smith, P.E., FDEP

A.E. Lyall, Engr., FDEP

CC: EPA



ACCOUNTS PAYABLE CHECK

FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC.

P. O. BOX 700377 - TAVERNIER, FL 33070

CHECK NO. DATE 00064316 01/23/97 \$****7,500.00

AMOUNT

Phone: (305) 852-2431

EXACTLY *****7,500*DOLLARS AND *00*CENTS

VOID AFTER 60 DAYS

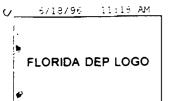
TO THE ORDER OF: FL DEFT OF ENVIRON PROTECTION BUREAU OF AIR RESOURCES MAIL STATION 5505 2600 BLAIR STONE RD

BARNETT BANK OF THE KENGLLAHASSEE FL 32399-2400

92200 S. Overseas Hwy. Tavemier, FL 33070

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BEST AVAILABLE COPY Department of Environmental Protection

File Copy

DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - LONG FORM

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

This section of the Application for Air Permit form identifies the facility and provides general information on the scope and purpose of this application. This section also includes information on the owner or authorized representative of the facility (or the responsible official in the case of a Title V source) and the necessary statements for the applicant and the professional engineer, where required, to sign and date for formal submittal of the Application for Air Permit to the Department. If the application form is submitted to the Department using ELSA, this section of the Application for Air Permit must also be submitted in hard-copy.

Identification of Facility Addressed in This Application

Enter the name of the corporation, business, governmental entity, or individual that has ownership or control of the facility; the facility site name, if any; and the facility's physical location. If known, also enter the facility identification number.

1.	Facility Owner/Company Name:	
	Florida Keys Electric Cooperative Associati	on, Inc.
2.	Site Name:	
	Marathon Generation Plant	
3.	Facility Identification Number:	Unknown
	52 FTM 440004	
4.	Facility Location: Marathon Generation Plant	
	Street Address or Other Locator: 3421 Overseas Hi	ghway
	City: Marathon County: Mor	roe Zip Code : 33050
5.	Relocatable Facility?	6. Existing Permitted Facility?
	Yes X No	X Yes No
		-

<u>Application Processing Information (DEP Use)</u>

1.	Date of Receipt of Application:	Damara 27, 1997
2.	Permit Number:	0870004-002-AC
3.	PSD Number (if applicable):	PSD-F1-837
4.	Siting Number (if applicable):	

DEP Form No. 62-210.900(1) - Form

Effective: 3-21-96

6/18/96 11:18 AM

Owner/Authorized Representative or Responsible Official

1.	Name and Title of Owner/Authorized Representative or Responsible Official:				
	Charles A. Russell				
	Chief Executive Officer and General Manager				
2.	. Owner/Authorized Representative or Responsible Official Mailing Address:				
	Organization/Firm: Florida Keys Electric Cooperative Association, Inc.				
	Street Address: 91605 Overseas Highway				
	City: Tavernier State: Florida Zip Code: 33070				
3.	Owner/Authorized Representative or Responsible Official Telephone Numbers:				
	Telephone : (305) 852-2431				
4.	Owner/Authorized Representative or Responsible Official Statement:				
	I, the undersigned, am the owner or authorized representative* of the non-Title V source addressed in this Application Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inque that the statements made in this application are true, accurate, and complete and that, to the best of my knowledge any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions unit and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof, understand that a permit, if granted by the Department, cannot be transferred without authorization from the	this iry, ge, in			

Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.

Signature

Date

* Attach letter of authorization if not currently on file.

6/18/96 11:19 AM Scope of Application

This application for Air Permit addresses the following emissions unit(s) at the facility. An Emissions Unit Information Section (a Section III of the form) must be included for each emissions unit listed.

Emissions Unit ID	Description of Emissions Unit	Permit Type
<u>8</u> 00	3.58 MW EMD Engine Model 20-710G4B	AC1A
	-	
	· · · · · · · · · · · · · · · · · · ·	
-		

6/18/96 11:19 AM Purpose of Application and Category

Check one (except as otherwise indicated):

Cat	egory I:	All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.
This	s Application	n for Air Permit is submitted to obtain:
	Initial air o	peration permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.
		peration permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly d or modified emissions units addressed in this application, would become classified as a Title V source.
		Current construction permit number:
	Air operation	on permit renewal under Chapter 62-213, F.A.C., for a Title V source.
		Operation permit to be renewed:
		on permit revision for a Title V source to address one or more newly constructed or modified emissions units in this application.
		Current construction permit number:
		Operation permit to be revised:
		on permit revision or administrative correction for a Title V source to address one or more proposed new or missions units and to be processed concurrently with air construction permit application. Also check Category
		Operation permit to be revised/corrected:
	Give reaso	on permit revision for a Title V source for reasons other than construction or modification of an emissions unit. In for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early be" proposal.
		Operation permit to be revised:
		Reason for revision:

	/96 11:19 AM ry II: All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.
This App	plication for Air Permit is submitted to obtain:
	ial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a thetic non-Title V source.
	Current operation/construction permit number(s):
Rer	newal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.
	Operation permit to be renewed:
	operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g., to address one or more wly constructed or modified emissions units.
	Operation permit to be revised:
	Reason for revision:
Categor	ry III: All Air Construction Permit Applications for All Facilities and Emissions Units
This App	plication for Air Permit is submitted to obtain:
	construction permit to construct or modify one or more emissions units within a facility (including any facility ssified as a Title V source).
	Current operation permit number(s), if any: A044-227958; A044-252749
	construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more sting, permitted emissions units.
	Current operation permit number(s):
☐ Air	construction permit for one or more existing, but unpermitted, emissions units.

<u>A</u>	6/18/96 11:19 AM pplication Processing Fee	
	heck one:	
	Attached - Amount: \$ _7,500.	00 Not Applicable.
<u>C</u>	onstruction /Modification Inform	<u>nation</u>
1	Description of Proposed Project	t or Alterations:
	Installation of a new 3. Association, Inc.'s Mara	.58MW EMD Diesel Generator at Florida Keys Electric Cooperative athon Stand-By Generating Plant.
2	Projected or Actual Date of Con	nmencement of Construction:
	June 23, 1997	
3.	Projected Date of Completion o	f Construction:
	September 15, 1997	
<u> </u>	rofessional Engineer Certification	<u>.</u> <u>on</u>
1.	Professional Engineer Name:	John M. Burch
	Registration Number:	PE - 0048974
2.	Professional Engineer Mailing A	Address:
	Organization/Firm:	Florida Keys Electric Cooperative Association, Inc.
	Street Address:	91605 Overseas Highway, P.O. Box 700377,
	City:	Tavernier State: Florida Zip Code: 33070
3.	Professional Engineer Telephon	e Numbers:
	Telephone: (305) 852-243	1 Fax : (305) 852-9129

€	W18/96 11:19 AM BEST AVAILABLE COPY
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 \(\) 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.
	Signarure Date

Attach and exception to certification statement.

6/18/96 11:19 AM Application Contact

Name and Title of Application Contact:

Deborah A. Shaw Environmental Affairs Coordinator

2. Application Contact Mailing Address:

Organization/Firm:

Florida Keys Electric Cooperative Association, Inc.

Street Address:

91605 Overseas Highway, P.O. Box 700377

City:

Tavernier

State: Florida

Zip Code: 33070

Application Contact Telephone Numbers:

Telephone: (305) 852-2431

Fax: (305) 852-9129

Application Comment

Florida Keys Electric Cooperative Association, Inc. (FKEC) supplies electric power to the Middle and Upper Florida Keys. FKEC buys its electricity from Florida Power & Light (FP&L) to distribute to Florida Keys Consumers. The Marathon Generation Plant (MGP) is maintained in a standby generating capacity, ready to generate power in the event that FP&L cannot supply power to the Keys. FKEC entered a 20-year extendable contract with FP&L that became effective May 1, 1992 and which requires that FKEC maintain the capability of generating electricity in the event the mainland power supply fails and can no longer continue to deliver alternate economic energy above the effective Base Demand, (See Attachment "F").

Since the implementation of that contract agreement, the MGP total, annual operating hours have averaged 551 hours during "non-hurricane" years (See Attachment "G").

Because FKEC must be able to generate electricity for the Keys during emergencies (e.g., hurricanes), we cannot accept operating limitations on the MGP. Therefore, even though the MGP annual emissions are far below the levels which define a major air pollution source, we are obliged to apply for this permit as a major source.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates:

Zone:

17

East (km):

490.70

North (km):

2732.70

2. Facility Latitude/Longitude:

Latitude (DD/MM/SS):

24 42 38

Longitude (DD/MM/SS):

81 5

Governmental

Facility Code:

Facility Status Code:

Facility Major Group SIC Code: 6. Facility SIC(s):

0

Α

49

7. Facility Comment (limit to 500 characters):

This Facility is a Stand-By Electric Generating Plant consisting of seven (7) diesel engines driving electric generators.

An eighth (8th) unit is being added. Total capacity of the facility with eight (8) units will be 21.5 Megawatts. This facility generates power only during emergencies or during Peak Power Demand periods when Florida Power and Light cannot provide sufficient power to supply Florida Keys Electric Cooperative Association, Inc.'s customers.

Facility Contact

1. Name and Title of Facility Contact:

Charles A. Russell Chief Executive Officer and General Manager

2. Facility Contact Mailing Address:

Organization/Firm:

Florida Keys Electric Cooperative Association, Inc.

Street Address:

91605 Üverseas Highway, P.O. Box 700377

City:

Tavernier

State: Florida

Zip Code:

33070

3. Facility Contact Telephone Numbers:

Telephone: (305) 852-2431

Fax:

(305) 852-4794

6/18/96 11:19 AM Facility Regulatory Classifications

1.	Small Business Stationary Source?	
<u>l</u>	☐ Yes ☐ Unknown	
2.	Title V Source?	
3.	Synthetic Non-Title V Source?	
	☐ Yes X No	
4.	Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
	X Yes Potentially No	
5.	Synthetic Minor Source of Pollutants Other than HAPs?	
	☐ Yes X No	
6.	Major Source of Hazardous Air Pollutants (HAPs)?	
	☐ Yes X No	
7.	Synthetic Minor Source of HAPs?	
	☐ Yes No	
8.	One or More Emissions Units Subject to NSPS?	
	☐ Yes X No	
9.	One or More Emission Units Subject to NESHAP?	П
	☐ Yes X No	
10.	Title V source by EPA Designation?	
	X Yes No	
11.	Facility Regulatory Classifications Comment (limit to 200 characters):	٦
	This Facility is classified as a Major Title V Source only because it has the potential to emit 250 tons of air pollutants. The plant typically operates less than 10% of the time, to supply power during emergencies and during Peak Power Demand periods when Florida Power and Light cannot fill the demand.	
	; 	

B. FACILITY REGULATIONS

Rule Applicability A sources. See Instruction	nalysis (Required for ions.)	r Category II appl	ications and Cateç	jory III application	ns involving non T	itle-V
		•				
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		2				

DEP Form No. 62-210.900(1) - Form Effective: 3-21-96

6/18/96 11:19 AM
<u>List of Applicable Regulations</u> (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

B. FACILITY REGULATIONS

40 CFR 70	State Operating Permit Programs
62-4.001 through 62-4.160, FAC	Permits Part I General
62-4.210,FAC	Construction Permits
62-4.220, FAC	Operation Permits for New Sources
62-103.150, FAC	Public Notice of Application and Proposed Agency Action
62-210, FAC	Stationary Sources
62-212.300, FAC	Sources Not Subject to PSD or Nonattainment Requirements
62-213, FAC	Operating Përmits for Major Sources of Air Pollution (Title V)
62-204.240, FAC	Ambient Air Quality Standards
62-296.320(4)(b), FAC	General Visible Emissions Standards
62-296.320(4)(c), FAC	Unconfined Emissions of Particulate Ma
62-296.320, FAC	General Pollutant Emission Limiting Standard, Objectionable Odor
62-297.310, FAC	General Test Requirements
62-297.620, FAC	Exceptions and Approvals of Alternative Procedures and Requirements
62-297.401, FAC	Compliance Test Methods
	,
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C. FACILITY POLLUTANTS

Facility Pollutant Information

Pollutant Emitted	2. Pollutant Classification
SO _z	A
СО	A
NO x	A
PM	A
PM ₁₀	A
Voc	В
	·

D. FACILITY POLLUTANT DETAIL INFORMATION

1.	acility Pollutant Detail Information: Pollut	tant 1 of 6	
"	Pollutant Emitted:		
	SO ₂		
2.	Requested Emissions Cap:	(lb/hour)	(tons/year)
3.	Basis for Emissions Cap Code:	<u></u>	
4.	Facility Pollutant Comment (limit to 400 o	characters):	
<u>F</u>	acility Pollutant Detail Information: Pollut	tant 2 of 6	
1.	Pollutant Emitted:		
2.	Requested Emissions Cap:	(lb/hour)	
		(ID/NOti)	(tons/year)
3.	Basis for Emissions Cap Code:	(Ib/Nodi)	(tons/year)

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DEP Form No. 62-210.900(1) - Form Effective: 3-21-96

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Detail Information: Pollutant 3 of 6

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Basis for Emissions Cap Code:							
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DEP Form No. 62-210.900(1) - Form

Effective: 3-21-96

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Detail Information: Pollutant 5 of 6

1.	Pollutant Emitted:							
	PM ₁₀							
2.	Requested Emissions Cap:	(lb/hour)	(tons/year)					
	•	,	, ,					
3.	Basis for Emissions Cap Code:							
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♣.	Facility Pollutant Comment (limit to 400 charac	stersy.						
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	<u>cility Pollutant Detail Information:</u> Pollutant Pollutant Emitted:	<u> </u>						
	·	<u>6</u> of <u>6</u>						
1.	Pollutant Emitted:		(tons/year)					
1.	Pollutant Emitted:	6 of 6	(tons/year)					
1.	Pollutant Emitted: V0C Requested Emissions Cap:		(tons/year)					
1.	Pollutant Emitted:		(tons/year)					
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DEP Form No. 62-210.900(1) - Form Effective: 3-21-96

6/18/96 11:19 AM

E. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for Applications:

-										
Area Map Showing Facility Location:										
	☐ Attache	d, Document ID: Figure 1		Not Applicable		Waiver Requested				
2.	2. Facility Plot Plan:									
	X Attache	d, Document ID: Figure 2		Not Applicable		Waiver Requested				
3.	Process Flo	w Diagram(s): Figure 2								
	X Attache	d, Document ID: Attachment B		Not Applicable		Waiver Requested				
4.	4. Precautions to Prevent Emissions of Unconfined Particulate Matter:									
	X Attache	d, Document ID: Attachment (H	-	Not Applicable		Waiver Requested				
5.	Fugitive Em	issions Identification:								
	Attache	d, Document ID:	X	Not Applicable		Waiver Requested				
6.	Supplement	al Information for Construction Permi	t App	lication:	-					
	X Attache	d, Document ID : <u>Attachm</u> ents F&G	; <u> </u>	Not Applicable						
<u>A</u>	ditional Sup	plemental Requirements for Categ	ory I	Applications Only		•				
7.	List of Propo	sed Exempt Activities:								
	Attache	d, Document ID:		Not Applicable						
8.	8. List of Equipment/Activities Regulated under Title VI:									
	☐ Attache	d, Document ID:								
	Equipment/Activities On site but Not Required to be Individually Listed									
	☐ Not App	olicable								
9.	Alternative N	Methods of Operation:								
	Attache	d, Document ID:		Not Applicable		_				
10.	10. Alternative Modes of Operation (Emissions Trading):									
	☐ Attache	d. Document ID:	\Box	Not Applicable						

6/18/96 11:20 AM 11. Identification of Additional Requirements: Attached, Document ID: _ Not Applicable Compliance Assurance Monitoring Plan: 12. Attached, Document ID: __ Not Applicable 13. Risk Management Plan Verification: Plan Submitted to Implementing Agency - Verification Attached, Document ID:_ Plan to be Submitted to Implementing Agency by Required Date Not Applicable 14. Compliance Report and Plan: Attached, Document ID: ___ Not Applicable 15. Compliance Certification (Hard-copy Required):

Not Applicable

Attached, Document ID: __

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Emissions	Unit Information Section _	1_	of	

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT (Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1.	Regulated or Unregulated Emissions Unit? Check one:
X	The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.
	The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.
2.	Single Process, Group Process, or Fugitive Only? Check one:
X	This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).
	This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.
	This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

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Emissions	Unit Information Section	1	of 1	

B. GENERAL EMISSIONS UNIT INFORMATION (Regulated and Unregulated Emissions Units)

<u>En</u>	Emissions Unit Description and Status				
1.	Description of Emissions Unit Addressed in This Section (limit to 60 characters):				
	3.58MW EMD Diesel Genera	ator # 8.			
		DELINITE.			
2.	Emissions Unit Identification Number	NEW UNIT per: No Corresponding ID	X Unknown		
3.	Emissions Unit Status Code:	4. Acid Rain Unit?	5. Emissions Unit Major Group		
	С	☐ Yes ☒ No	SIC Code:		
6.	Emissions Unit Comment (limit to 5	00 characters):			
	This is a New Unit necessary for Florida Keys Electric Cooperative Association, Inc. to maintain Contractural Generating Capacity for use during emergency and Peak Power Demand periods.				
Emissions Unit Control Equipment					
A. 1.	Description (limit to 200 characters)):			
	i. Description (infilt to 200 characters).				
	<pre>Electro-Motive Diesel (EMD) package:</pre>	, states the following about FKI	EC's emissions reduction		
	 Retarding fuel injector timing, reduces firing pressure and combustion temperature. 				

2. Separately cooling the 4 pass after coolers increases combustion air

density, therefore, increasing the ratio of air to fuel, reducing the output of NO $_{\rm X}$ by 36% and PM by 4%.

2. Control Device or Method Code:

•	-	
	В.	
į	1.	Description (limit to 200 characters):
ļ		
	2.	Control Device or Method Code:
١		
	C.	
ſ	1.	Description (limit to 200 characters):
l		Description (minic to 200 characters).
١		

Control Device or Method Code:

2.

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Emissions	Unit Information Section	of

C. EMISSIONS UNIT DETAIL INFORMATION (Regulated Emissions Units Only)

Emissions Unit Details

1.	Initial Startup Da	te: September, 1997			
2.	Long-term Reser	rve Shutdown Date:			
3.	Package Unit:	EMD			
	Manufacturer:	General Motors	Model Number:	20-710G4B	
4.	Generator Name	plate Rating:	4 MW		
5.	Incinerator Inform	nation:			
		Dwell Temperature:			°F
		Dwell Time:			seconds
	Incinerator Afte	rburner Temperature:			°F

Emissions Unit Operating Capacity

1.	Maximum Heat Input Rate:		32	mmBtu/hr
2.	Maximum Incineration Rate:	lb/hr		tons/day
3.	Maximum Process or Throughput Rate:			
4.	Maximum Production Rate:			
5.	Operating Capacity Comment (limit to 200 ch While we request Unlimited Operat Florida Keys Electric Cooperative only during emergencies and during Power and Light cannot supply power	ing Capacity, this unit, Association, Inc.'s uni g Peak Power Demand peri	ts, will op	perate

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule: Please See Application Comment on Page 8.

24 hours/day 7 days/week

52 weeks/year 8,760 hours/year

Effective: 3-21-96

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D. EMISSIONS UNIT REGULATIONS (Regulated Emissions Units Only)

Rule Applicability Analysis sources. See Instructions.)	(Required for Category II a	applications and Catego	ry III applications involv	ring non Title-V
		7.00		
5			·	

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

40 CFR 70	State Operating Permit Programs
62-4.001 through 62-4.210, FAC	Permits Part I General
62-210, FAC	Construction Permits
62-4.220, FAC	Uperation Permits for New Sources
62-103.150, FAC	Public Notice of Application and Proposed Agency Action
62-210 (except 62-210.550 Stack Height), FAC	Stationary Sources
62-213, FAC	Operating Permits for Major Sources of Air Pollution (Title V)
62-204.240, FAC	Ambient Air Quality Standards
62-296.320(4)(b), FAC	General Visible Emissions Standards
62-296.320, FAC	General Pollutant Emission Limiting Standard, Objectionable Odor
62-297.310, FAC	General Test Requirements
62-297.620, FAC	Exceptions and Approvals of Alternativ Methods and Requirements
62-297.401, FAC	Compliance Test Methods
:	

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Emissions	Unit Information Section _	of

E. EMISSION POINT (STACK/VENT) INFORMATION (Regulated Emissions Units Only)

Emission Point Description and Type

4	Identification of Point o	n Diet Dien er Ele	Diogram:		-	
1.	Identification of Form o	IN Plut Flati of Flux	w Diagram:	C F 4	•	
				See Figure	e 2	
2.	Emission Point Type Co	ode:				
	x 1	□ 2		3	□ 4	
2			ing this Emissi			\ characters per point\:
3.	Descriptions of Ethiosic	ans Points Compus	ang this ethissi	IONS UTILLION	VE Tracking (limit to 100	cnaracters per point).
	15 M. J. J. Daniel	· · · · · · · · · · · · · · · · · · ·	1 to the state Africa	~taratara Da		
4.	ID Numbers or Descript	tions of Emissions	Units with this	Emission Po	int in Common:	
		N/A				
			•			
5.	Discharge Type Code:					
	□ D	□F		Н	Г⊓Р	
		· □ v	[X]	W	<u> </u>	
	<u> </u>				3	
6.	Stack Height:			•	J / .	5 feet
7.	Exit Diameter:				3.0) feet
			-			
8.	Exit Temperature:				<u> </u>	
	NOTE: Emis	ssions Reductio	on Package m	nay Reduce	Temperature _	by 15-25°F

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Emissions Unit Information Section _____ of ____

9.	Actual Volumetric Flow Rate:			acfm
10.	Percent Water Vapor:		•	%
11.	Maximum Dry Standard Flow Rate:			dscfm
12.	Nonstack Emission Point Height:		•	feet
13.	Emission Point UTM Coordinates:			
	Zone:	East (km):	North (km):	
14.	Emission Point Comment (limit to 20	00 characters):		

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Emissions	Unit Infor	mation Section	of

F. SEGMENT (PROCESS/FUEL) INFORMATION (Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 1

1.	Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters):
	No. 2 Fuel Oil Burned in Diesel Engine.
2.	Source Classification Code (SCC): 2-01-001-02
3.	SCC Units: Thousand Gallons Burned
4.	Maximum Hourly Rate: 0.23 5. Maximum Annual Rate: 2,015
6.	Estimated Annual Activity Factor:
7.	Maximum Percent Sulfur: 0.50 8. Maximum Percent Ash:
9.	Million Btu per SCC Unit: 140
10.	Segment Comment (limit to 200 characters):

Segment Description and Rate: Segment of

1.	Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters):				
2.	Source Classification Code (SCC):				
3.	SCC Units:				
4.	Maximum Hourly Rate:	5.	Maximum Annual Rate:		
6.	Estimated Annual Activity Factor:				
7.	Maximum Percent Sulfur:	8.	Maximum Percent Ash:		
9.	Million Btu per SCC Unit:				
10.	Segment Comment (limit to 200 characters):		•		
			·		
	· · · · · · · · · · · · · · · · · · ·				

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G. EMISSIONS UNIT POLLUTANTS (Regulated and Unregulated Emissions Units)

Pollutant Emitted	Primary Control Device Code	Secondary Control Device Code	Pollutant Regulatory Code
со			NS
NOX			NS
РМ			NS
PM ₁₀			NS
SO ₂			EL
VOC			NS
_			

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Emissions	Unit Information Section	1	of	б	

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1.	Pollutant Emitted:				
2.	Total Percent Efficiency of Control:			%	
3.	Potential Emissions: 25.97 lb/	hour	114	tons/yea [See	
4.	Synthetically Limited?				
	☐ Yes ☒ No				
5.	Range of Estimated Fugitive/Other Emissions:				
	□ 1 □ 2 □ 3			to	tons/year
6.	Emission Factor: 0.81 lbs/MMBtu		_		
	Reference: AP - 42				
7.	Emissions Method Code:				
	□ 0 □ 1 □ 2	X 3		4	<u> </u>
8.	Calculation of Emissions (limit to 600 characters):			<u> </u>	
	0.81 lbs/MMBtus x 32.06 MMBtu/hr =	25.97 lbs/hr			
	25.97 lbs/hr x 8760 hrs/yr x ton/20	000 lbs = 114 tp	у		
	229 G/HR Fuel Consumption				
9.	Pollutant Potential/Estimated Emissions Comment dissist	to 200 share-ters):			
9.	Pollutant Potential/Estimated Emissions Comment (limit	-			
	Based on anticipated, actual operating hour	rs of < 500 hrs/yr,			
	Actual CO Emissions will be < 6.5 tpy.				
	:				

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H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1.	Pollutant Emitted:	10 _x			•
2.	Total Percent Efficiency of Cont	rol:		36 %	
3.	Potential Emissions:	99.39 lb/	hour	435 tons/yea [See #	
4.	Synthetically Limited?				
	☐ Yes ☒ No				
5.	Range of Estimated Fugitive/Ot	her Emissions:			•
	□ 1 □ 2	3		to	tons/year
6.	Emission Factor: 3.10 1b	s/MMBtu			
	Reference: AP -	42			
7.	Emissions Method Code:				
	□ 0 □ 1	2	☑ 3	4	□ 5
8.	Calculation of Emissions (limit to	o 600 characters):			
	3.1]bs/MMBtu x 32.06	MMBtu/hr = 99.3	39 lbs/hr		
9.	99.39 lbs/hr x 8760 Pollutant Potential/Estimated Er		·	-py	
9 .	Based on Anticipated, Ac Actual NO _X Emissions wil	tual Operational Ho		s/yr,	

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Emissions Unit Information Section 3 of 6

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information;

1.	Pollutant Emitted: PM			
2.	Total Percent Efficiency of Control:			%
3.	Potential Emissions:	11.45 lb/hour	50	tons/year [See # 9]
4.	Synthetically Limited?			
	Yes X No			
5.	Range of Estimated Fugitive/Other Emission	s:		
	□ 1 □ 2 □	3		_to tons/year
6.	Emission Factor: 0.3571 lbs/MMBtu	or 50 lbs/1000 gal	•	
	Reference: AIRS			
7.	Emissions Method Code:			
	0 1	2 🗍 3	☐ 4	X 5
8.	Calculation of Emissions (limit to 600 charac	ters):		
	50 lbs/1000 gal x 1000 gal/140	MMBtu x 32.06 MMBtu/hr =	11.45	
	11.45 lbs/hr x 8760 hrs/yr x	ton _{/2000} lbs = 50 tpv		
	11:45 105/111 \ \ 0/00 1113/31 \	/ 2000 TBS 30 cpy		
9.	Pollutant Potential/Estimated Emissions Con	,		
	Based on Anticipated, Actual Opera			
	Actual PM Emissions will be < 2.9	tpy.		
		·		
		•		
		:		

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H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1.	Pollutant Emitted: PM.	10	_	
2.	Total Percent Efficiency of Cor	trol:	%	
3.	Potential Emissions:	10.54 lb/hour	46 tons/yea [See # 9	
4.	Synthetically Limited?			-
	☐ Yes ☒ No			
5.	Range of Estimated Fugitive/C	ther Emissions:		
	☐ 1 ☐ 2	□ 3	to	tons/year
6.	Emission Factor: 0.3286	lbs/MMBtu or 46 lbs/1000 gal	-	
	Reference: AIRS			
7.	Emissions Method Code:	· .		
	□ 0 □ 1	□ 2 □ 3	□ 4	X 5
8.	Calculation of Emissions (limit	to 600 characters):		
9.	10.54 lbs/hr x 8760	in gal / 140 MMBtu x 32.06 MMBtu/hr hrs/yr x ton /2000 lbs = 46 tpy imissions Comment (limit to 200 characters):	= 10.54 lbs/	hr
		ctual Operating Hours of < 500 hrs/yr	.,	

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H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1.	Pollutant Emitted:	SO _z					
2.	Total Percent Effic	iency of Control:	,		-	%	
3.	Potential Emission	s:	1.65 lb/ l	hour	7	tons/year [See #	
4.	Synthetically Limite	ed?					
	☐ Yes	X No					
5.	Range of Estimate	d Fugitive/Other E	missions:				
	□ 1	□ 2	□ 3			to	tons/year
6.	Emission Factor:						
	Reference:	Mass Balance					
7.	Emissions Method	Code:					
	□ 0	□ 1	X 2	☐ 3		4	□ 5
8.	Calculation of Emi	ssions (limit to 600	characters):	_			
	1000 gal/140 N	MMBtu x 7.2	lbs/gal x 0.0	5% S x 2 = 0.0	0514 1bs/	MMBtu	
	0.0514 lbs/MME	3tu x 32.06	$\frac{MMBtu}{hr} = 1.65$	lbs/hr			
			nr x ^{ton} /2000 11				
	1.05 105/11/ /	C 8700 Hrs/yr	X /2000 II	os = 7.2 tpy			
				•			
9.			ons Comment (limit	•			
				rs of < 500 hrs/	yr,		
	Actual SO ₂ Emi	ssions will be	e < 0.5 tpy.				
			:				

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Emissions Unit Information Section 6 of 6

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION (Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information;

1.	Pollutant Emitted: V0C	 	
2.	Total Percent Efficiency of Control:		%
3.	Potential Emissions:	3.21 lb/hour	14 tons/year [See # 9]
4.	Synthetically Limited?		
	☐ Yes X		
5.	Range of Estimated Fugitive/Other	Emissions:	
	□ 1 □ 2	□ 3	totons/year
6.	Emission Factor: 0.10		
	Reference: AP - 42		
7.	Emissions Method Code:		
	□ 0 □ 1	□ 2	☐ 4 ☐ 5
8.	Calculation of Emissions (limit to 60	00 characters):	
	U.1 lbs/MMBtu x 32.06 MMI	Btu/hr = 3.21 lbs/hr	
	3.21 lbs/hr x 8760 hrs/y	r x ^{ton} /2000 lbs = 14 tpy	•
		·	
		•	
		•	
9.	Pollutant Potential/Estimated Emiss	sions Comment (limit to 200 characters):	
		al Operating Hours of < 500 hrs	/yr,
	Actual VOC Emissions will b	oe < 0.8 tpy.	
		;	

En	6/18/96 11:20 AM missions Unit Information Sectionof		
All	lowable Emissions (Pollutant identified on front of pa	age)	
A.			
1.	Basis for Allowable Emissions Code:		
2.	Future Effective Date of Allowable Emissions:		
3.	Requested Allowable Emissions and Units:		
4.	Equivalent Allowable Emissions:	lb/hour	tons/year
5.	Method of Compliance (limit to 60 characters):		
6.	Pollutant Allowable Emissions Comment (Desc. of Recognition (limit to 200 characters):	Related Operating Method/Mode)	
В.			
1.	Basis for Allowable Emissions Code:		
2.	Future Effective Date of Allowable Emissions:		
3.	Requested Allowable Emissions and Units:		
4.	Equivalent Allowable Emissions:	lb/hour	tons/year
5.	Method of Compliance (limit to 60 characters):		
6.	Pollutant Allowable Emissions Comment (Desc. of R (limit to 200 characters):	telated Operating Method/Mode)	

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Emissions	Unit Information Section	of

I. VISIBLE EMISSIONS INFORMATION (Regulated Emissions Units Only)

7	<u>Visible Emissions Limitation:</u> Visib	DIE EMISSIONS LIMI	tation1	of		
1	1. Visible Emissions Subtype:	VE:20				
2	2. Basis for Allowable Opacity:		X Rule		Other	
3	3. Requested Allowable Opacity:					
	Normal Conditions:	20 %	Exception	nal Conditions:		100 %
	Maximum Period of Excess Opa	city Allowed:				10 min/hour
4	 Method of Compliance: Annua Equivalent Method, condu Rated Capacity. 					
	 Visible Emissions Comment (lim FAC. Exceptional Condit During Startup. As per or Malfunction shall be four (24) hour period. 	tions Opacity L 62-210.700(1):	_imit reque , FAC, Exce	sted is to a ss Emissions	llow for Excess During Startup	Emissions , Shutdown,
	Visible Emissions Limitations: Vis 1. Visible Emissions Subtype:	ible Emissions Lim	nitation2	of2		
2	2. Basis for Allowable Opacity:		X Rule		Other	
3	3. Requested Allowable Opacity:					
	Normal Conditions:	100 %	Exception	nal Conditions:		100%
	Maximum Period of Excess Opa	city Allowed:				60 min/hour
4	 Method of Compliance: The Du Ensure that Excessive Op (24) hour period. 	ration of Exce pacity Emission	essive Opac ns do not E	ity Emissions xceed two (2	will be Monit) hours in any	ored to twenty-four
5	5. Visible Emissions Comment (lim Malfunction and Annual Lo Emissions During Startup exceed two (2) hours in a	ow Load Testing , Shutdown or N	g Requireme Malfunction	nts. As per shall be pe	62-210.700(1)	, FAC, Excess

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Emissions	Unit l	nformation	Section	of

J. CONTINUOUS MONITOR INFORMATION (Regulated Emissions Units Only)

	ontinuous Monitoring System: Continuous Monito	г от			
1.	Parameter Code:	2. Pollutant(s):			
3.	CMS Requirement:	Rule		Other	
4.	Monitor Information:				
	Manufacturer:				
_	Model Number:	Serial Number:			
5.	Installation Date:				
6.	Performance Specification Test Date:				
7.	Continuous Monitor Comment (limit to 200 charac	ters):			
Continuous Monitoring System: Continuous Monitor of					
1.	Parameter Code:	2. Pollutant(s):			
				Other	
1.	Parameter Code:	2. Pollutant(s):		Other	
1. 3.	Parameter Code: CMS Requirement:	2. Pollutant(s):		Other	
1. 3.	Parameter Code: CMS Requirement: Monitor Information:	2. Pollutant(s):		Other	
1. 3.	Parameter Code: CMS Requirement: Monitor Information: Manufacturer:	2. Pollutant(s):		Other	
1. 3. 4.	Parameter Code: CMS Requirement: Monitor Information: Manufacturer: Model Number:	2. Pollutant(s):		Other	
1. 3. 4.	Parameter Code: CMS Requirement: Monitor Information: Manufacturer: Model Number: Installation Date:	2. Pollutant(s): Rule Serial Number:		Other	
1. 3. 4.	Parameter Code: CMS Requirement: Monitor Information: Manufacturer: Model Number: Installation Date: Performance Specification Test Date:	2. Pollutant(s): Rule Serial Number:		Other	

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<	Emissions	Unit Information Section _	of

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION (Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1.

Inc	rement Consuming for Particulate Matter or Sulfur Dioxide?
que	ne emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of estions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for ticulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip the remaining statements.
	The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.
X	The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, an emissions unit consumes increment.
	The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
	For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.
	None of the above apply. If so, the baseline emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

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Emissions	Unit	Information	Section	of	

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION (Regulated Emissions Units Only)

<u>Supplemental Requirements for All Applications</u>

1.	Pro	cess Flow Diagram			
	X	Figure 2 Attached, Document ID: Attachment B		Not Applicable	Waiver Requested
2.	Fue	l Analysis or Specification			
	X	Attached, Document ID: Attachment C		Not Applicable	Waiver Requested
3.	Deta	ailed Description of Control Equipment			
	X	Attached, Document ID: Attachment D		Not Applicable	Waiver Requested
4.	Des	cription of Stack Sampling Facilities			
		Attached, Document ID:	X	Not Applicable	Waiver Requested
5.	Con	npliance Test Report			
		Attached, Document ID:			
		Previously submitted, Date:	_		
	X	Not Applicable			
6.	Prod	cedures for Startup and Shutdown			
	X	Attached, Document ID: Attachment E		Not Applicable	
7.	Ope	ration and Maintenance Plan			
		Attached, Document ID:	X	Not Applicable	
8.	Sup	plemental Information for Construction Permi	it App	lication	
		Attached, Document ID: Attachment F-G		Not Applicable	
9.	Othe	er Information Required by Rule or Statute			
		Attached, Document ID:	X	Not Applicable	

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Emissions	Unit	Information Section_	of

Additional Supplemental Requirements for Category I Applications Only

<i>-</i>			
10	Alternative Methods of Operation		
		Attached, Document ID: Not Applicable	
11	. Alte	Alternative Modes of Operation (Emissions Trading)	
		Attached, Document ID: Not Applicable	
12	. Ide	ntification of Additional Applicable Requirements	
		Attached, Document ID: Not Applicable	
13	. Co	mpliance Assurance Monitoring Plan	
		Attached, Document ID: Not Applicable	
14	. Aci	d Rain Application (Hard-copy Required)	
		Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:	
		Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:	
		New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:	
		Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:	
		Not Applicable	

ATTACHMENTS AND FIGURES

Figure 1

SITE MAP MARATHON GENERATING PLANT LOCATION MARATHON, FLORIDA

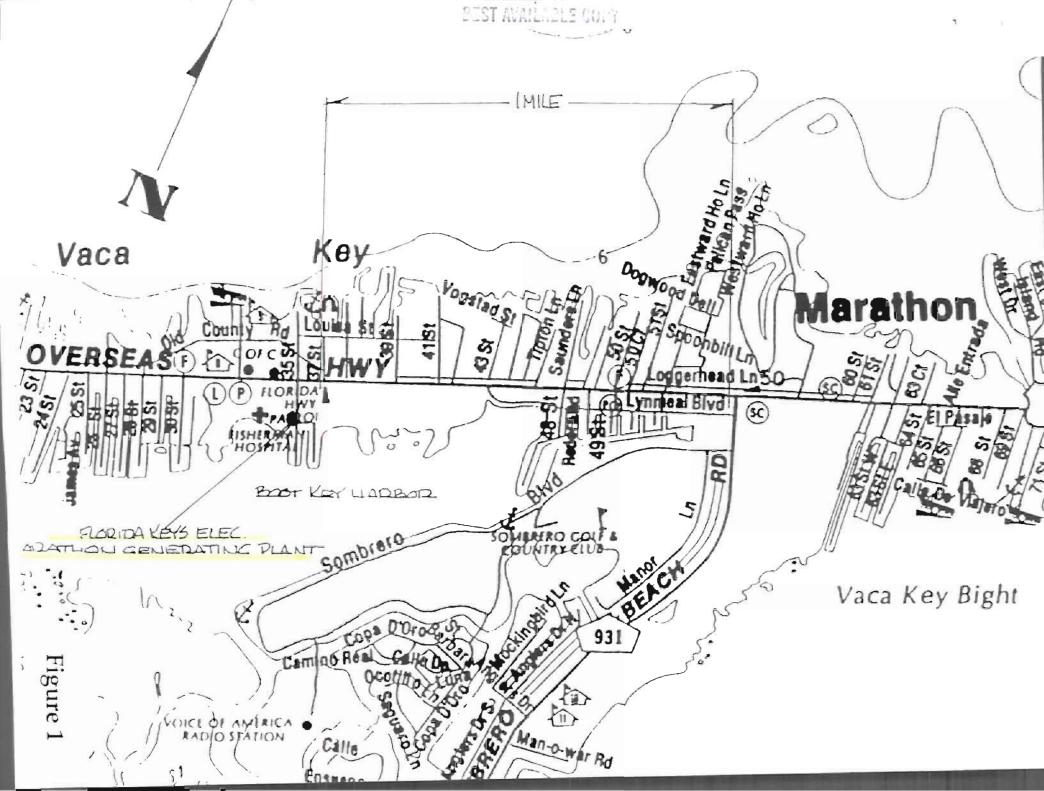
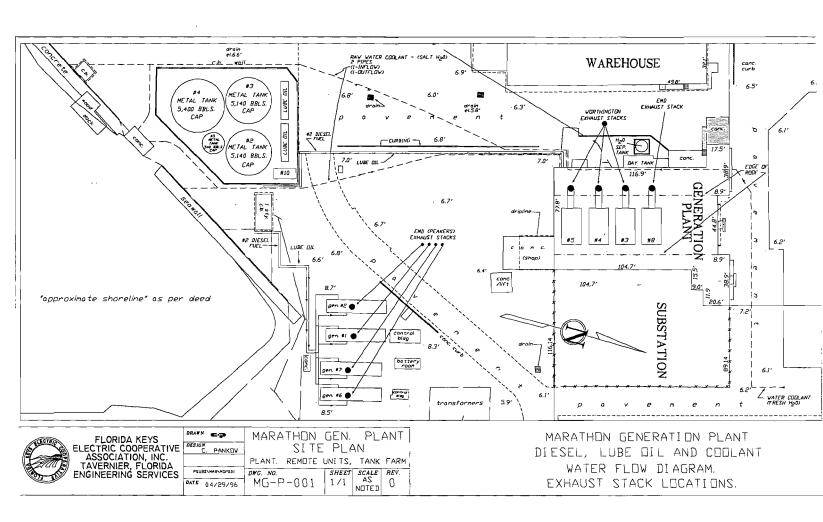


Figure 2

MARATHON GENERATING PLANT SITE PLAN SHOWING LOCATION OF NEW UNIT # 8 AND ITS STACK

BEST AVAILABLE COPY



ARTICLE V

FKEC RESOURCES

Section 5.1 - FKEC Resources: Prior to the beginning of a Billing Year, FKEC shall designate the FKEC-owned generating units that shall constitute FKEC Resources for the Billing Year. FKEC may designate as FKEC Resources only those FKEC-owned generating resources that FKEC reasonably determines will be available for reliable dispatch and operation during the Billing Year, subject to the further limitations of Section 5.4. FKEC is obligated to have available at all times, and to provide if required by FPL, capacity and energy from FKEC Resources to meet any portion of FKEC's Load above the then-effective Base Demand. FPL will dispatch such FKEC Resources pursuant to Article 6.2. FKEC agrees to maintain the FKEC Resources in good operating condition in accordance with Prudent Utility Practice. Notwithstanding the foregoing, the amount of FKEC Resources for a Billing Year shall not exceed twenty-five percent (25%) of the FKEC System peak load for the prior Billing Year; provided, that in the event either Party gives seven years' notice to terminate the Agreement pursuant to Section 2.1, the amount of FKEC Resources for a Billing Year shall not exceed thirty percent (30%) of the FKEC System peak load for the Prior Billing Year, effective in the Billing Year immediately following the year in which such termination notice is given. FKEC's designation of the FKEC Resources shall include the name, operational status and rating of each generating unit (in kW) based on the unit's summer capability. FKEC's designation of FKEC Resources shall not be subject to change during the Billing Year.

Section 5.1.1 In the event FKEC contemplates constructing or owning a generating facility located off its system or entering into a long-term contract for the purchase of capacity and energy, and desires to designate such power

FKEC Resources (for the purpose of supplying FKEC's Load above the Base Energy) upon thirty (30) minutes notice from FPL, in the event FPL determines, in FPL's sole judgement, that FPL can no longer continue the delivery of Alternate Economic Energy to FKEC for any reason.

ARTICLE VII

CHARGES

Section 7.1 - Formula Rate: FPL and FKEC recognize that the cost of supplying the capacity and energy to be provided under this Agreement may change during the term of this Agreement. In order to equitably compensate FPL for the cost of supplying capacity and energy under this Agreement, certain of the demand and energy charges shall be determined using the formulae contained in Appendices I, II and III. These formulae allow periodic revision of certain of the demand and energy charges to reflect changes in the cost of providing such services. FPL will furnish FKEC with such documentation as is reasonably necessary to calculate any periodic revision of the demand and energy charges that reflect changes in FPL's cost of providing service under this Agreement, including any true-up to calculations and adjustments. Such documentation shall be furnished at the same time that FPL notifies FKEC of any change in the demand and energy charges, or of any true-up calculations or adjustments.

Section 7.2 - Demand Charges:

Section 7.2.1 - Base Demand Charge: No later than July 1 of each year FPL shall provide to FKEC the Base Demand Charge, in \$/kW, for use in the next Billing Year. FPL shall also provide, at the same time, the estimated Base Demand Charge for the

the provisions of Article V of this Agreement. FPL agrees to give FKEC at least thirty (30) minutes notice prior to interrupting the delivery of Alternate Economic Energy to FKEC.

The amount of Alternate Economic Energy provided to FKEC shall be the amount of energy supplied to FKEC on a kilowatt-hour (kWh) basis which is over and above the amount of energy supplied to FKEC as Base Energy, Unavailable FKEC Resource Energy and Deficient FKEC Resource Energy.

Section 6.2 - Dispatch for FKEC Resources: FKEC shall initially provide FPL, as required by FPL, with the most accurate and up-to-date data regarding FKEC Resources so that FPL can include this data in its System Control Center. FKEC shall provide to FPL updates to such data as such information becomes available. FPL will incorporate on an ongoing basis the data regarding FKEC Resources into FPL's System Control Center as a service to FKEC to determine if energy from FKEC Resources would be more economical than Alternate Economic Energy to meet FKEC's Load requirements above the Base Energy supplied by FPL.

In the event FPL projects that energy from FKEC Resources will be more economical than Alternate Economic Energy and FKEC's Load will exceed the Base Demand for any clock hour, FPL agrees to notify FKEC, at least one day in advance if possible. Provided further, if at any time FPL determines that energy from FKEC Resources is more economical than Alternate Economic Energy, FPL will notify FKEC at least thirty (30) minutes prior to such occurrence, if possible, and at FKEC's sole option, FKEC may elect to put on-line FKEC Resources to supply such energy needs in lieu of Alternate Economic Energy.

Pursuant to the provisions of Article V, FKEC will stand ready to start up and place on-line

Attachment A

COMPLIANCE STATEMENT

Attachment A

MARATHON GENERATING PLANT

Compliance Statement

"I, the undersigned, am the responsible official as defined in Chapter 62-213, F.A.C., of the Title V source for which this construction/operation permit application is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate, and complete."

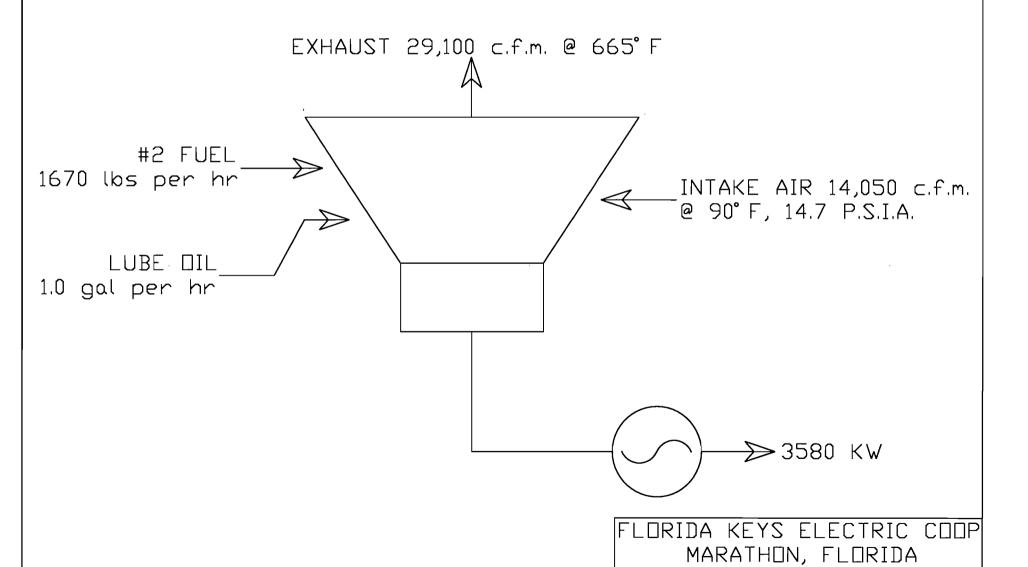
Charles A. Russell

Chief Executive Officer and General Manager

Attachment B

PROCESS FLOW DIAGRAM

PROCESS FLOW DIAGRAM MARATHON HIGH SPEED DIESEL UNIT #8



C:\R13\WIN\SAMPLE\FLOWDIAG

DATE: 12-31-96

Attachment C

FUEL ANALYSIS FOR NO. 2 FUEL OIL

TABLE 1 Detailed Requirements for Diesel Fuel Oils⁴

Property	ASTM Test Method ⁸	Grade Low Sulfur No. 1-D	Grade Low Sullur No. 2-D	Grade No. 1-D ^c	Grade No. 2-DC	Grade No. 4-DC
Pash Point, °C, min.	D 93	38	52 (125)	38	52	55
water and Sediment, %vol, max	D 1796	0.05	0.05	0.05	0.05	0.50
Distillation Temperature, °C 90 % %vol Recovered	D 86					
min			282 <i>0</i>	• • •	2820	
max		288 (550)	338	288 (550)	338	• • •
Knematic Viscosity, mm ² /S at 40°C	D 445	•				
min.		1.3	1.9	1.3	1.9	5.5
max	• • •	2.4	4.1	2.4	4.1	24.0
Ash % mass, max	D 482	Q. 01	0.01	0.01	0.01	0.10
Sulfur, % mass, max ^e	D 2622 F	0.05	0.05			
	D 129			0.50	0.50	2.00
Copper strip corrosion rating max 3 h at 50°C	D 130	No. 3	No. 3	No. 3	No. 3	•••
Cetane number, min a	D 613	40 <i>m</i>	40 <i>*</i>	40 ^M	40 ^M	30*
One of the following properties must be met:						
(1) Cetane index, min.	D 976G	40	40			
(2) Aromalicity, %vol, max	D 1319*	35	35			
Cloud point, °C, max	D 2500	•		1	•	
Ramsboltom carbon residue on 10 % distillation residue, % mass, max	D 524	0.15	0.35	0.15	0.35	•••

A To meet special operating conditions, modifications of individual limiting requirements may be agreed upon between purchaser, seller and manufacturer.

The test methods indicated are the approved referee methods. Other acceptable methods are indicated in 4.1.

Grades No. 1-D, No. 2-D and No. 4-D are required to contain a sufficient amount of 1,4-dialkyl amino anthraquinone (blue dye) so its presence is visually apparent.

⁹ When a cloud point less than -12°C is specified, the minimum viscosity at 40°C shall be 1.7 mm²/s and the minimum 90 % recovered temperature shall be waived.

Other sulfur limits can apply in selected areas in the United States and in other countries.

^{*} These test methods are specified in CFR 40 Part 80.

Where cetane number by Test Method D 613 is not available, Test Method D 4737 can be used as an approximation.

[&]quot;Low ambient temperatures as well as engine operation at high altitudes may require the use of fuels with higher cetane ratings.

It is unrealistic to specify low temperature properties that will ensure satisfactory operation at all ambient conditions. However, satisfactory operation should be achieved in most cases if the cloud point (or wax appearance point) is specified at 6°C above the tenth percentile minimum ambient temperature for the area in which ambient temperatures for U.S. locations are shown in Appendix X2. This guidance is general. Some equipment designs or operation may allow higher or require lower cloud point fuels. Appropriate low temperature operability properties should be agreed upon between the fuel supplier and purchaser for the intended use and expected ambient temperatures.

Attachment D

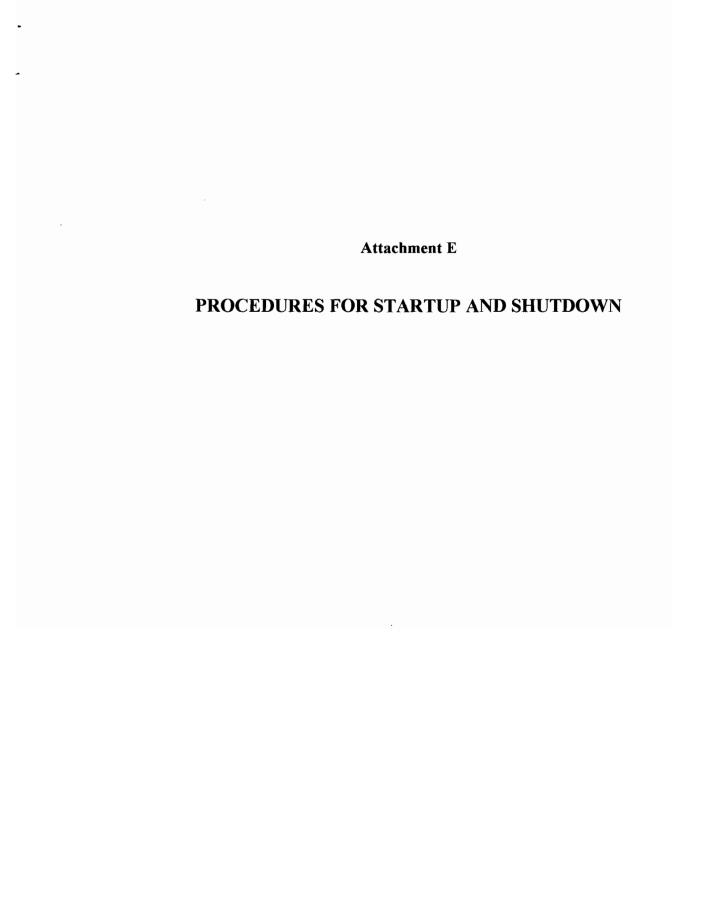
EMISSION REDUCTION EQUIPMENT DESCRIPTION

Attachment D

EMD PROCESS AND EQUIPMENT FOR EMISSIONS REDUCTION

Electro-Motive Diesel (EMD), states the following about FKEC's emissions reduction package:

- 1. Retarding fuel injector timing, reduces firing pressure and combustion temperature.
- 2. Separately cooling the 4 pass after coolers increases combustion air density, therefore, increasing the ratio of air to fuel, reducing the output of NOx by 36% and PM by 4%.



Attachment E

MARATHON GENERATING PLANT STARTUP PROCEDURES FOR MINIMIZING EMISSIONS

Each of the seven (7) existing diesel engines used for generation are constantly kept at operating temperatures through the use of immersion heaters and electrically heated oil filter units. This practice allows the engine to "come on line" with an absolute minimum of idle, or warm-up time. Further, engines are shut down completely when the requirements for electrical generation no longer is present. The eighth engine will be operated under the same protocols.

Regularly scheduled inspection and maintenance of each engine provides both economical and efficient operation.

Attachment F

FKEC'S CONTRACTURAL OBLIGATION TO PROVIDE POWER WHEN FP&L CANNOT SUPPLY THE FLORIDA KEYS

Excerpts from: Longterm Agreement to Provide Capacity and Energy by Florida Power and Light to Florida Keys Electric Cooperative Association, Inc.

Attachment G

Supplemental Information for Construction Permit Appplication

MARATHON GENERATING PLANT ACTUAL ANNUAL OPERATING HOURS AND FUEL CONSUMPTION 1992 - 1996

Note: Longterm FP&L contract became effective May, 1992.

MARATHON GENERATING PLANT OPERATING HOURS AND FUEL CONSUMPTION

4	O	O	7
1	м	м	/

Engine No.	Total Running Hours	Fuel consumption (gals)	
1	278	33,274	
2	288	41,193	
3	319	48,788	
4	292	47,261	
5	302	45,816	
6	315	57,599	
7	361	70,591	
Totals	2,155*	344,527*	

^{* 1631} hours and 257,478 gals were accumulated during the months of August and September. (Hurricane Andrew era)

1993

Engine No.	Total Running Hours	Fuel consumption (gals)		
1	92	10,335		
2	111	16,745		
3	109	17 ,24 7		
4	76	11,694		
5	74	8,662		
6	108	19,525		
7	111	20,882		
Totals	681	105,090		

1994

Engine No.	Total Running Hours	Fuel Consumption (gals)
1	100	11,174
2	94	13,810
3	33	4.313
4	44	4,957
5	35	3,407
6	93	17,662
7	97	18,954
Totals	496	74,277

Engine No.	Total Running Hours	Fuel Consumption (gals)	
1	85	6,923	
2	85	9,419	
3	58	8,719	
4	124	17,376	
5	76	8,320	
6	86	14,514	
7	97	15,402	
Totals	611	80,673	
		•	

	10	
Engine No.	Total Running Hours	Fuel Comsumption (gals)
1	59.2	6,545
2	58.6	8,474
3	56 .3	9,781
4	65 .0	10,867
5	56 .1	10,759
6	63.0	11,121
7	57.0	9,389
Totals	415.2	66.936

Attachment H

Supplemental Information for Construction Permit Application

PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

Attachment H

MARATHON GENERATING PLANT PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

The only potential source of unconfined particulate matter emissions associated with operation of the facility are fugitive emissions from vehicular traffic providing fuel deliveries. Paved fuel delivery areas and roads are used as precautions taken to prevent and control unconfined emissions of particulate matter.