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BUREAU OF AIR REGULATION

R·W·BECK

September 7, 2000

via Federal Express

Mr. A.A. Linero, Administrator
New Source Review Section
Florida Department of Environmental Protection
Twin Tower Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

Subject: **DEP File No. 0870004-004-AC; PSD-FL-285**
Unit 9, Marathon Generation Plant

Dear Mr. Linero:

On August 24, 2000 we submitted additional information which evaluated Selective Catalytic Reduction (SCR) for the control of NO_x emissions from the proposed Unit 9 at Florida Keys Electric Cooperative, Inc.'s (FKEC) Marathon Generation Plant. R.W. Beck performed the analysis contained in that letter, which is in response to your July 19, 2000 request for additional information, based on guarantees and cost data provided by the SCR manufacturers.

As required under 62-4.050(3), F.A.C. and in your letter dated July 19, 2000, I hereby certify the additional SCR Best Available Control Technology evaluation performed for the subject Project.

Sincerely,

R.W. BECK, INC.

Ivan L. Clark, P.E.
Principal and Senior Director
Environmental Services

c: S. Arif, DEP
T. Planer, FKEC
A. Hacker, Beck

| G:\002557\02-00811\FDEPCERT.DOC

1125 Seventeenth Street, Suite 1900 Denver, CO 80202-2615 Phone (303) 299-5200 Fax (303) 297-2811

RECEIVED
AUG 28 2000
BUREAU OF AIR REGULATION

R·W·BECK

August 24, 2000

via Federal Express

Mr. A.A. Linero, Administrator
New Source Review Section
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

Subject: **DEP File No. 0870004-004-AC; PSD-FL-285**
Unit 9, Marathon Generation Plant

Dear Mr. Linero:

In response to your letter dated July 19, 2000, we offer the following discussion that addresses the comments provided by the Environmental Protection Agency (EPA) concerning the evaluation of Selective Catalytic Reduction (SCR) for the control of NO_x emissions from the proposed Unit 9 at Florida Keys Electric Cooperative, Inc.'s (FKEC) Marathon Generation Plant (the Project).

TECHNICAL INFEASIBILITY

It is our opinion that the installation of a SCR system on the proposed Unit 9 would be technically infeasible due to operating conditions of a two-stroke engine, limited guarantees by the SCR manufacturer, limited demonstration on similar units and back pressure restrictions.

TWO-STROKE ENGINE OPERATING CONDITIONS

As a result of the operating characteristics of a two-stoke engine, lube oil must be injected into the engine. The proposed EMD 20-710 engine requires lube oil injected at a rate of approximately 1.0-gallon per hour. Due to the two-stroke design (performing intake, compression, power and exhaust in two piston strokes and one crankshaft revolution) an additional 'blower' or turbocharger must be included. The turbocharger works to 'pull' the exhaust from the chamber, therefore also pulling in lube oil, which is then exhausted. If an SCR, which is an after treatment device, is placed on a two-stroke engine, the lube oil in the exhaust will pass through the SCR, thus contaminating and fouling the catalyst.

LIMITED GUARANTEES FROM SCR MANUFACTURERS

Siemens Westinghouse was initially contacted to provide information on the feasibility of installing an SCR catalyst on the Project. Due to the typical oil consumption of a two-stroke

1125 Seventeenth Street, Suite 1900 Denver, CO 80202-2615 Phone (303) 299-5200 Fax (303) 297-2811

engine, Siemens Westinghouse would not offer a SCR system because the catalyst would become contaminated.

SCR vendor Johnson Matthey was then contacted to obtain information about an SCR system for the proposed Project. Although Johnson Matthey did provide cost data for an SCR that could potentially be placed on Unit 9, the guarantees provided for performance are limited. In the information provided, Johnson Matthey does not provide a guarantee for the catalyst life for a two-stroke diesel engine due to the "dirty" operating conditions found on these engines. Additionally, Johnson Matthey will only provide a performance guarantee for 8,000 hours after exhaust gas initially passes across the catalyst, or one-year after start-up, whichever occurs first. Based on this data, the SCR vendor will not provide suitable guarantees for the proposed two-stroke diesel engine, indicating technical infeasibility of SCR.

LIMITED DEMONSTRATION ON SIMILAR UNITS

From 1986 until 2000, Johnson Matthey has installed SCR at 22 facilities (based on information provided by Johnson Matthey). Natural gas is exclusively fired at 11 of these sites, while two more are dual fired, with natural gas being the primary fuel. The remaining nine facilities burn diesel fuel. However, the majority of these installations are four-stroke engines, indicating that SCR has not been widely applied on two-stroke units similar to the proposed unit for the Project. The only two-stroke engines for which Johnson Matthey has supplied a catalyst are the units at the Water Treatment Plants (Northeast and Southwest) in Philadelphia.

These Philadelphia facilities (both owned by CogenAmerica and now Calpine) are the only ones in the RBLC database that have installed SCR on small diesel engines. As discussed in FKEC's letter dated June 19, 2000, this facility installed SCR because NO_x emissions had to be comparable to those from a lean burn natural gas fired unit without regard to cost. These Philadelphia units are manufactured by Detroit Diesel and are not lean burn engines. Additionally, seven 1,635 kW units (11,445 kW) exhaust through one SCR at the Northeast facility and ten 1,000 kW units (10,000 kW) exhaust through one SCR at the Southwest facility. Therefore, due to larger total capacity, total uncontrolled emissions from these plants are greater than those from FKEC's 3,580 kW Unit 9.

It should also be noted that between 1993 and 1998, the units at the Northeast facility have each operated for approximately 166 hours. While typical operating hours were not available for the Southwest Plant, it is assumed that they are similar to those at the Northeast Plant. The Southwest facility originally failed stack tests for particulates and NO_x emissions. Corrections were made to the engines and SCR, which solved the NO_x and particulates problem, however the ammonia slip emissions in connection with SCR operation were found to be higher than the permitted limit. Additionally, the operator of

the Philadelphia facilities reported that one catalyst was burned during startup and had to be replaced.

Based on stringent NO_X emission control without regard to cost, greater total emissions exhausting through the SCR, the use of non-lean burn engines, limited operating experience, equipment malfunctions and permit limit exceedances at the Philadelphia facilities, this technology has not been proven on a unit similar to the one being permitted by FKEC. Additionally, an SCR is more cost effective for the Philadelphia units on a dollar per kW and dollar per ton basis due to the larger total capacity exhausting through each SCR and a greater NO_X reduction based on total emissions passing through the SCR.

EPA provided the following installations from the California Air Resources Board's (CARB) database that have included SCR.

1. Manson Construction Company – Detroit Diesel 6063-GK60
2. Ross Island Sand and Gravel – Cummins KTA 19-G3
3. Western Pacific Dredging Co. – Cooper Bessemer LSV-16 and GM 12-567
4. Smith-Rice Co. – Caterpillar 3606

Each unit was reviewed to determine if it could be compared to the proposed Unit 9. The Manson Construction Company's Detroit Diesel was found to have an enforceable permit NO_X limit of 6.22 g/bhp-hr. This limit is approximately the NO_X emission rate for the proposed Unit 9 with timing retard and aftercoolers, as shown in the testing results for FKEC's identical Unit 8. Therefore, this unit cannot be compared to the Project due to uncontrolled emissions and the final controlled emissions being higher than those with the more technologically feasible timing retard/aftercooler control technologies. Ross Island Sand and Gravel's Cummins engine is a four-stroke engine, therefore, based on the previous discussion, this unit cannot be compared to the proposed Unit 9, which is a two-stroke engine. The two engines owned by Western Pacific Dredging are manifolded together with a third engine. One SCR system serves all three units. In addition to greater NO_X emissions being produced from all three engines, the Cooper Bessemer LSV-16 is a four-stroke engine, which affects operating conditions of the SCR system. Therefore, these units and their controlled emissions cannot be compared to FKEC's Unit 9. The engine at the Smith-Rice Co., a Caterpillar 3606 is also four-stroke engine, which cannot be compared to the operating conditions of a two-stroke engine.

At this time, the current permitting trends and pollution control measures in California cannot be applied to Florida. Due to numerous areas that do not currently meet the National Ambient Air Quality Standards (non-attainment areas), California is forced to implement more stringent Lowest Achievable Emission Rate (LAER) Technology than what is required in southern Florida in terms of Best Available Control Technology (BACT). Although we do not believe that these units from the CARB database can be accurately compared to the proposed unit due to the more stringent permitting requirements in

California (LAER), we have investigated them to assure a thorough evaluation. This investigation indicates that these units are not similar to the Project due to engine type, configuration or emission rates.

BACK PRESSURE RESTRICTIONS

As discussed in FKEC's June 19, 2000 letter, the increased exhaust back pressure due to the addition of an SCR system is also of concern. The maximum allowed back pressure for the 20-710GB unit is 5 inches H_2O. According to calculations done by the engine vendor, the expected exhaust back pressure of the unit to be installed at Marathon will be approximately 4 inches H_2O. Although Johnson Matthey has indicated that they can increase the exhaust ducting size to meet back pressure requirements of the exhaust system, they have not conducted a site visit to determine the feasibility of increasing duct size and the placement of the SCR in relation to the engine and engine building. Due to space constraints at the Marathon Plant, increased ducting may be found to be infeasible or installation costs may significantly increase.

COST ANALYSIS

Since Johnson Matthey has supplied information in regards to the installation of a SCR on Unit 9 at the Marathon Generation Plant, we have proceeded with a cost analysis of SCR compared with a combination of timing retard and aftercoolers. However, we continue to uphold the technical infeasibility of SCR on the proposed unit. This cost analysis is based on the information provided by Johnson Matthey, however, many assumptions were required due to the limited data and guarantees available for two-stroke engines.

The total estimated capital cost for the Johnson Matthey SCR is $882,151. For purposes of the cost analysis, it was assumed that 90 percent of this price is Total Direct Costs (TDCs) and 10 percent is Total Indirect Costs (TICs). Because this cost only includes start-up services to provide a functional test of the SCR system, an additional cost was considered for testing to ensure that the SCR is functioning properly and adequately reducing NO_x emissions on the two-stroke engine. A standard assumption of three percent of TDCs was assumed for the testing price. The data provided by Johnson Matthey merely represents a budgetary quote in order to analyze the feasibility of SCR; final costing would be developed subsequent to a site visit. Therefore, it is entirely possible that this estimated cost could increase.

Other assumptions for the cost analysis include the catalyst replacement frequency. Since Johnson Matthey only guarantees the performance of the SCR for 8,000 hours after exhaust gas initially passes across the catalyst, or one year after start-up, whichever is less, it was assumed that the catalyst would have to be replaced every year to ensure the proper reduction in NO_x emissions. Additionally, a risk factor of 25 percent was included in the SCR cost analysis to account for degradation of the system due to high back pressure and technology uncertainties. Finally, since the proposed engine will already include timing

retard and aftercoolers, the SCR will not have a reduction efficiency of 62.5 percent, as indicated by Johnson Matthey. Instead, the timing retard/aftercoolers will reduce the NO_x emissions by 32 percent and the SCR, which is an after treatment device, will only reduce NO_x emissions by another 50 percent to 3 g/bhp-hr. Therefore, the total reduction efficiency of the SCR is decreased. As shown in the attached incremental cost analysis, the cost per ton of SCR for the proposed Unit 9 is approximately $5,100, while timing retard/aftercoolers is approximately $1,400 per ton. The dollars per ton removal for timing retard/aftercoolers has slightly changed from the figure submitted in the February 2000 Application. While performing the cost analysis for SCR, several adjustments were found to be necessary and have been included herein.

Although FKEC is requesting unrestricted operation for the proposed Unit 9 to be able to generate electricity for the Keys during emergencies, the Marathon Generation Plant's total, annual operating hours (for the existing eight diesel engines) have averaged 640 hours during 'non-hurricane' and other typical operating years, as shown in the Permit Application (February 2000). Conservatively estimating that Unit 9 would operate 640 hours by itself, the cost per ton of SCR would dramatically increase to $70,000. Should FKEC be required to install SCR, this cost would severely affect their ability to provide cost effective power to their customers.

If you have any questions regarding the infeasibility of SCR on FKEC's proposed Unit 9, please call me at (303) 299-5219.

Sincerely,

R. W. BECK, INC.

Amy P. Hacker
Engineer
Environmental Services

APH/smm

c: S. Arif, DEP
R. D. Neeley, USEPA, Region IV
K. Forney, USEPA, Region IV
C. Russell, FKEC
T. Planer, FKEC
D. Shaw, FKEC
I. Clark, Beck
C. Halladay
SD
NPS

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COMPARISON OF CAPITAL COSTS FOR NO_x CONTROLS
EMD20-710 ENGINE

ITEM	COST ($1,000) [1]	
	Timing Retard and Aftercoolers	SCR
DIRECT COSTS		
1 Purchased Equipment		
	5.70 (Timing Retardation 4°) 26.10 (Separately Cooled Aftercooler) 107.50 (Aftercooler)	
a) Basic Equipment/Auxiliaries	139.30	
b) Instrumentation	13.93	
c) Structural Support	13.93	
d) Freight	8.36	
2 Direct Installation	52.66	
TOTAL DIRECT COSTS (TDC)	**228.17**	**793.94**
INDIRECT COSTS		
3 Indirect Installation		
a) Engineering	22.82	
b) Construction and Field Expenses	22.82	
c) Construction Fee	11.41	
d) Contingencies	45.63	
4 Other Indirect Costs		
a) Start-up and Testing	6.85	23.82
TOTAL INDIRECT COSTS (TIC)	**109.52**	**88.22**
TOTAL CAPITAL COSTS (TCC)	**337.70**	**905.98**

(1) Cost based on EPA's Office of Air Quality Planning and Standards Manual (1990).

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COMPARISON OF ANNUALIZED COSTS FOR NO_x CONTROLS EMD20-710 ENGINE

ITEM	COST ($1,000) [1][2]	
	Timing Retard and Aftercoolers	SCR
DIRECT OPERATING COSTS		
1 Personnel		
a) Labor at $40/man-hr	41.60	41.60
b) Supervisor at 15% of Labor	6.24	6.24
2 Maintenance at 5% of TDC	11.41	39.70
3 Replacement Parts		
a) at 10% of TDC	22.82	79.39
b) Catalyst Replacement (1 year)		162.15
4 Utilities		
a) Electricity	34.30	34.30
b) Fuel Penalty	3.50	
c) Urea		113.88
TOTAL DIRECT OPERATING COSTS (TDOC) with Risk Factor of 25% for SCR	**119.87**	**596.58**
INDIRECT OPERATING COSTS		
5 Overhead		
a) 30% of Labor	14.35	14.35
b) 12% of Maintenance	1.37	4.76
6 Property Tax at 1% of TCC	3.38	9.06
7 Insurance at 1% of TCC	3.38	9.06
8 Administration at 2% of TCC	6.75	18.12
9 Capital Recovery at 10% of TCC	33.77	90.60
TOTAL INDIRECT OPERATING COSTS (TIOC)	**63.00**	**145.95**
TOTAL ANNUALIZED COSTS (TAC)	**182.86**	**742.53**
TONS REMOVED	**133.5**	**145**
DOLLARS PER TON REMOVAL	**1369.77**	**5120.89**

(1) Cost based on EPA's Office of Air Quality Planning and Standards Manual (1990).

(2) All costs are in $1,000 except for TONS REMOVED and DOLLARS PER TON REMOVAL.

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

July 19, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles A. Russell, CEO and General Manager
Florida Keys Electric Cooperative Association, Inc.
91605 Overseas Highway
Tavernier, Florida 33070

Re: DEP File No. 0870004-004-AC; PSD-FL-285
Unit 9, Marathon Generation Plant

Dear Mr. Russell:

The Department has received the additional information on June 20, 2000 for the construction of a 3.58 MW high-speed diesel engine electric generator at the above referenced facility in Monroe County. Based on our interactions with the Environmental Protection Agency (EPA), we are enclosing comments submitted by them in regards to the SCR issue for this project. Please submit the information as requested by the EPA to the Department's Bureau of Air Regulation.

The Department will resume processing this application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. A new certification statement by the authorized representative or responsible official must accompany any material changes to the application. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days.

We will be happy to meet and discuss the details with you and your staff. Mr. Syed Arif, P.E. is responsible for the technical review of the application. He may be contacted at 850/921-9528.

Sincerely,

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

AAL/sa

cc: Amy Hacker, R.W. Beck
Tim Planer, FKEC
Phil Barbaccia, DEP-SD
Gregg Worley, EPA Region IV
John Bunyak, NPS

so that we can return the card to you.
■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Charles A. Russell, CEO & Gen. Mgr.
Florida Keys Electric Cooperative
Association, Inc.
91605 Overseas Highway
Tavernier, FL 33070

C. Signature
X E. Burrows FKEC ☐ Agent ☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
Z 341 355 339

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

Z 341 355 339

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

Sent to Charles Russell	
Street & Number 91605 Overseas Hwy	
Post Office, State, & ZIP Code Tavernier FL 33070	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date FL Keys Electric 7/19/01	

PS Form 3800, April 1995

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUL 1 8 2000

4APT-ARB

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

SUBJ: PSD Permit Application for Florida Keys Electric Cooperative - Marathon Generation Plant (PSD-FL-285) located in Monroe County, Florida

Dear Mr. Linero:

Thank you for sending the prevention of significant deterioration (PSD) permit application for the Florida Keys Electric Cooperative (FKEC) - Marathon Generation Plant dated February 22, 2000. The PSD permit application is for the installation of one diesel-fired engine and electric generator at the existing Marathon Generation facility. The high-speed engine proposed for the facility is an EMD model 20-710G4B engine rated at 4,988 bhp, coupled to a 3.58 MW generator. As proposed, the engine will be allowed to fire No. 2 fuel oil up to 8,760 hours per year. Total emissions from the proposed project are above the threshold requiring PSD review for nitrogen oxides (NO_x). Our comments, based on our review of the PSD permit application and additional information received on April 10, 2000 and June 19, 2000, are detailed below.

The PSD permit application concluded that BACT for NO_x control at the Marathon Generation facility was a combination of timing retardation and aftercoolers. The top BACT for NOx, selective catalytic reduction (SCR), was deemed technically infeasible and not evaluated for economic feasibility. In the additional information received on June 19, 2000, FKEC acknowledged that a water treatment plant in Philadelphia, Pennsylvania, has installed SCR on small diesel engines. We would like to point out that in addition to this facility, four other facilities are listed in either the RBLC or the CARB databases (see enclosed database printouts) that have installed SCR on small diesel engines. The facilities' name, location, engine model and regulatory basis are listed below and we suggest they be investigated further for comparison to the FKEC Marathon Generation project.

1. Western Pacific Dredging (Cooper Bessemer model LSV-16) - California (BACT-PSD)
   Western Pacific Dredging (GM model 12-567) - California (BACT)
2. Smith-Rice (Caterpillar model 3606) - California (BACT-PSD)

3. Rose Island Sand & Gravel (Cummins KTA19-G3) - California (LAER)
4. Manson Construction Company (Detroit Diesel) - California

Additionally, the additional information sent on June 19, 2000, indicates that the engine manufacturer used by Philadelphia's water treatment plant (Detroit Diesel) may somehow be better able to accommodate SCR than the EMD model chosen by FKEC. The above mentioned facilities have installed engines from a wide variety of manufacturers. If the EMD model engine proposed for the FKEC Marathon Generation facility is significantly different from all the other engines mentioned above and precludes the use of SCR, sufficient documentation from the engine manufacturer and/or SCR vendor should be obtained.

Finally, if SCR is eventually determined to be a technically feasible BACT option for controlling NO_x emissions at the FKEC Marathon Generation Plant, a detailed economic analysis will be required to support rejection of this technology.

Thank you for the opportunity to comment on the Florida Keys Electric Cooperative - Marathon Generation Plant PSD permit application. If you have any questions regarding these comments, please direct them to either Katy Forney at 404-562-9130 or Jim Little at 404-562-9118.

Sincerely,

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides and Toxics
Management Division

Enclosures

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUL 1 8 2000

4APT-ARB

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

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   Western Pacific Dredging (GM model 12-567) - California (BACT)
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4. Manson Construction Company (Detroit Diesel) - California

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Sincerely,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides and Toxics
Management Division

Enclosures

FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

RECEIVED

JUN 20 2000

BUREAU OF AIR REGULATION

June 19, 2000

Mr. Al A. Linero
Florida Department of Environmental Protection
Mail Station 5505
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: **Response to Letter Dated May 16, 2000**
Unit 9 Air Construction Permit Application, Marathon Generation Plant

0870004-004-AC
PSD-FL-285

Dear Mr. Linero:

Florida Keys Electric Cooperative Association, Inc. (FKEC) offers the following responses to the comments provided by Florida Department of Environmental Protection (FDEP) (dated May 16, 2000) in regards to FKEC's submittal, *Air Construction Permit Application for Unit 9 at the Marathon Generation Plant.*

1. Please provide the necessary information from the vendor of the diesel generator as well as from the SCR manufacturer that shows the technical infeasibility of installing SCR with this diesel generator. If SCR can be used with this generator, please provide the necessary cost data in $/ton of NOX removed to reflect the use of this control equipment.

In response to the letter dated May 16, 2000, additional information on the infeasibility of SCR for the FKEC unit was obtained. The diesel generator vendor is not familiar with a SCR system being installed on any other EMD unit. Additionally, the vendor indicated that the maximum allowed exhaust back pressure for the 20-710GB unit is 5 inches H_2O. According to calculations done by the vendor, the expected exhaust back pressure of the

unit to be installed at Marathon will be approximately 4 inches H_2O. Correspondence with the vendor on expected and allowable exhaust back pressure values are attached to this letter.

Although SCR vendors indicated that their product's back pressure contribution could be as low as 2 inches H_2O, the total exhaust back pressure would still exceed the maximum allowed for the engine. Additionally, the diesel engine vendor indicated that a SCR system would be too large and heavy to fit on the engine as it is currently designed. Therefore, the SCR would have to be mounted outside the engine building, which would increase the ducting required as well as the exhaust back pressure added to the engine.

As part of this BACT review, the Water Treatment Plant in Philadelphia was contacted. This facility is the only one in the RBLC database that has installed SCR on small diesel engines. The decision was made to install SCR because emissions from these units had to be comparable to those from a lean burn natural gas fired unit (approximately 2 g/bhp-h), without regard to cost. These diesel units are manufactured by Detroit Diesel and are not lean burn engines. The Plant has not experienced significant problems recently with the SCR unit, although it is noted that one catalyst was burned during startup and had to be replaced.

Due to the stringent emission requirements, regardless of cost, as well as the various differences between them and the FKEC unit, the Philadelphia engines do not represent the use of SCR technology on a small diesel engine similar to the FKEC unit. The planned FKEC unit will be a lean burn unit, with uncontrolled emissions less than those from the Philadelphia units when uncontrolled. Additionally, the engine manufacturer is different, indicating that there may be design characteristics of the Detroit Diesels that better accommodate a SCR system. Therefore, it does not appear that this technology has been proven on a unit similar to the one being permitted by FKEC. Additionally, the amount of exhaust back pressure added to the system by the SCR would surpass the allowable back pressure when combined with the normal expected back pressure of the engine.

In addition to the technical infeasibility of a SCR system for the planned unit at FKEC, there are also serious environmental concerns raised with the use SCR at the Marathon Plant, as discussed in the BACT analysis submitted in the February 2000 application. The primary environmental hazard is transportation of ammonia to and from the site. The only road

leading to the Florida Keys is U.S. Highway 1 (Overseas Highway), a mostly two lane, heavily traveled, scenic by-way. This road passes through significant areas of commercial properties (hotels) and residential properties that have been built along the Overseas Highway. Since ammonia would have to be delivered to the site approximately twice a month (assuming full load operation) and the delivery truck would have to travel approximately 60 miles along the Overseas Highway, there is potential for an accident and a chemical spill. Additionally, ammonia is designated as an 'extremely hazardous substance' and any spill could be exceptionally dangerous for the Keys, as well as for the people living or vacationing on them. Similarly, spent catalyst material must be transported from the site and disposed. This material will contain various heavy metals, including titanium and vanadium, which are hazardous wastes. Therefore, the same environmental concerns raised with transporting ammonia to site also apply to removing spent catalyst from the site. It is expected that the catalyst life with fuel oil firing will be reduced due to particulate, sulfur and trace metals in the fuel. Thus, catalyst replacement and transport would be more frequent for the FKEC engine than for a gas-fired unit.

2. Please provide the necessary historical data and the appropriate calculations that reflect the total capacity requirements of 25.2 MW for the facility.

FKEC provided a response to FDEP on May 18, 2000. The response is attached to this letter.

Sincerely,

Charles A. Russell
Chief Executive Officer and
General Manager

Enclosures

| N:\011SHARO\DEPLET-BACT.DOC

cc: Legal Staff
C. Holladay
SD
EPA
NPS

Enclosures

c w/encl: S. Arif, DEP
T. Planer, FKEC
D. Shaw, FKEC
I. Clark, R. W. Beck
A. Hacker, R. W. Beck

ENGINE DATA

Engine Models		8-710GB	12-710GB	16-710GB	20-710GB
	'M	525	800	1070	1155
	'SI	42 (±2)	43 (±4)	53 (±3)	50 (±2)
	°F	155-170	155-170	155-170	155-170
	°F	165-180	165-180	165-180	165-180
	°F	3-5	3-5	3-5	3-5
	°F	8-10	8-10	8-10	8-10
	°F	150-165	150-165	150-165	150-165
	°F	180	180	180	180
(From Engine)	°F	208 (Models Equipped with Accessory Rack) 190 (Models Equipped with Loose Accessories)			
		60,000	90,000	120,000	150,000
		525	800	1070	1155
		180	180	180	180
		85	85	85	85
		15-17	17-19	16-18	22-24
Pressure Rise Across Water Pump (Maximum Suction 4 PSI Negative @ Pump Inlet)	PSI	27 (±2)	27 (±2)	23 (±2)	23 (±12)
Raw Water Pump Flow, Including Allowance for Gear Oil Cooler	GPM	720	720	845	845
Air Starting System					
Air Starting Motors		1	2	2	2
Starting Air Pressure	PSI	150	150 or 200	200	150
Air Starting Control Solenoid		120 Volts AC (Basic)			
Exhaust System					
Exhaust Back Pressure - Maximum Allowance		5 inches H_2O			
Exhaust Gas Volume	CFM	—	17,200	23,400	29,100
Exhaust Temperature	°F	—	590	625	665
Engine Radiation					
Radiation (Approx.)	BTU/min.	9,600	14,400	19,200	24,000

Amy Hacker
303-297-2811

RECEIVED
MAY 12 2000
R.W. BECK
DENVER, CO

GREGORY B. MORMAN
Area Sales Manager
Bus: 770-514-9111
Fax: 770-514-9881
Cell: 770-655-1721
1-888-514-9111
sandssail@mindspring.com
5345 Bells Ferry Rd.
Suite 136
Acworth, GA 30102

FAX COVER DOCUMENT

May 31, 2000

To: Amy Hacker

RE: Exhaust Back Pressure New EMD Unit Florida Keys Electric

Fax: 303-297-2811

Amy:

Our calculations indicate that the exhaust backpressure for the new EMD generating unit to be installed in the Marathon plant will be approximately 4" H20. As indicated in the information I previously provided the maximum exhaust back pressure acceptable to the engine manufacturer is 5"H20.

Greg Morman
Area Sales Manager
Stewart & Stevenson Services
5345 Bells Ferry Road Suite 136
Acworth, GA 30102
Phone: 1-888-514-9111 Fax: 770-514-9881 Phone: 770-514-9111
20-15

Florida Keys Electric Coop

Generation Resources Overview

UNITS - K	Location	Name Plate Year 2000	Actual Year 2000
1	Marathon	2,000	2,000
2	Marathon	2,000	2,000
3	Marathon	3,000	2,500
4	Marathon	3,000	2,500
5	Marathon	3,000	2,500
6	Marathon	2,500	2,500
7	Marathon	2,500	2,500
8	Marathon	3,500	3,500
9	Marathon		
	Load Mgt.		1,500
		21,500	21,500

Actual Total	21,500
Station Power Use	(200)
City Electric Emerg. Contract	12,000
System Resources Declared	33,300 *

FKEC Peak demand	138,121
Declared Resources *	(33,300)
FPL Base Demand	104,821

Max. Resources Calculation

FKEC Peak Demand	138,121
25% of Peak Demand	34,530

FKEC declared resources (33,300) do not exceed the 25% (34,530) maximum under the FPL contract.

FACSIMILE COVER SHEET

R·W·BECK

To: SYED ARIF - FDEP
FAX: 850-922-6979

From: AMY HACKER-
PHONE: 303-299-5219

Date: 6/14/00

Pages (including cover): 7

Cost Account: 088110

Transmission Questions: Receptionist / 303-299-5200

Message:

Thanks for taking the time to review the attached draft letter.

Amy

1125 Seventeenth Street, Suite 1900 Denver, CO 80202-2615 Phone (303) 299-5200 Fax (303) 297-2611

June 13, 2000

DRAFT LETTER

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

Subject: **Response to Letter Dated May 16, 2000**
Unit 9 Air Construction Permit Application, Marathon Generation Plant

Dear Mr. Linero:

Florida Keys Electric Cooperative Association, Inc. (FKEC) offers the following responses to the comments provided by Florida Department of Environmental Protection (FDEP) (dated May 16, 2000) in regards to FKEC's submittal, *Air Construction Permit Application for Unit 9 at the Marathon Generation Plant.*

1. Please provide the necessary information from the vendor of the diesel generator as well as from the SCR manufacturer that shows the technical infeasibility of installing SCR with this diesel generator. If SCR can be used with this generator, please provide the necessary cost data in $/ton of NOX removed to reflect the use of this control equipment.

In response to the letter dated May 16, 2000, additional information on the infeasibility of SCR for the FKEC unit was obtained. The diesel generator vendor is not familiar with a SCR system being installed on any other EMD unit. Additionally, the vendor indicated that the maximum allowed exhaust back pressure for the 20-710GB unit is 5 inches H_2O. According to calculations done by the vendor, the expected exhaust back pressure of the unit to be installed at Marathon will be approximately 4 inches H_2O. Correspondence with the vendor on expected and allowable exhaust back pressure values are attached to this letter.

Although SCR vendors indicated that their product's back pressure contribution could be as low as 2 inches H_2O, the total exhaust back pressure would still exceed the maximum allowed for the engine. Additionally, the diesel engine vendor indicated that a SCR system would be too large and heavy to fit on the engine as it is currently designed. Therefore, the SCR would have to be mounted outside the

engine building, which would increase the ducting required as well as the exhaust back pressure added to the engine.

As part of this BACT review, the Water Treatment Plant in Philadelphia was contacted. This facility is the only one in the RBLC database that has installed SCR on small diesel engines. The decision was made to install SCR because emissions from these units had to be comparable to those from a lean burn natural gas fired unit (approximately 2 g/bhp-h), without regard to cost. These diesel units are manufactured by Detroit Diesel and are not lean burn engines. The Plant has not experienced significant problems recently with the SCR unit, although it is noted that one catalyst was burned during startup and had to be replaced.

Due to the stringent emission requirements, regardless of cost, as well as the various differences between them and the FKEC unit, the Philadelphia engines do not represent the use of SCR technology on a small diesel engine similar to the FKEC unit. The planned FKEC unit will be a lean burn unit, with uncontrolled emissions less than those from the Philadelphia units when uncontrolled. Additionally, the engine manufacturer is different, indicating that there may be design characteristics of the Detroit Diesels that better accommodate a SCR system. Therefore, it does not appear that this technology has been proven on a unit similar to the one being permitted by FKEC. Additionally, the amount of exhaust back pressure added to the system by the SCR would surpass the allowable back pressure when combined with the normal expected back pressure of the engine.

In addition to the technical infeasibility of a SCR system for the planned unit at FKEC, there are also serious environmental concerns raised with the use SCR at the Marathon Plant, as discussed in the BACT analysis submitted in the February 2000 application. The primary environmental hazard is transportation of ammonia to and from the site. The only road leading to the Florida Keys is U.S. Highway 1 (Overseas Highway), a mostly two lane, heavily traveled, scenic by-way. This road passes through significant areas of commercial properties (hotels) and residential properties that have been built along the Overseas Highway. Since ammonia would have to be delivered to the site approximately twice a month (assuming full load operation) and the delivery truck would have to travel approximately 60 miles along the Overseas Highway, there is potential for an accident and a chemical spill. Additionally, ammonia is designated as an 'extremely hazardous substance' and any spill could be exceptionally dangerous for the Keys, as well as for the people living or vacationing on them. Similarly, spent catalyst material must be transported from the site and disposed. This material will contain various heavy metals, including titanium and vanadium, which are hazardous wastes. Therefore, the same environmental concerns raised with transporting ammonia to site also apply to removing spent catalyst from the site. It is expected that the catalyst life with fuel oil

DRAFT LETTER

firing will be reduced due to particulate, sulfur and trace metals in the fuel. Thus, catalyst replacement and transport would be more frequent for the FKEC engine than for a gas-fired unit.

2. Please provide the necessary historical data and the appropriate calculations that reflect the total capacity requirements of 25.2 MW for the facility.

FKEC provided a response to FDEP on May 18, 2000. The response is attached to this letter.

ENGINE DATA

Engine Models		8-710GB	12-710GB	16-710GB	20-710GB
	RPM	525	800	1070	1155
	BHP	42 (±2)	43 (±4)	53 (±3)	50 (±2)
	°F	155-170	155-170	155-170	155-170
	°F	165-180	165-180	165-180	165-180
	°F	3-5	3-5	3-5	3-5
	°F	8-10	8-10	8-10	8-10
	°F	150-165	150-165	150-165	150-165
	°F	180	180	180	180
(From Engine)	°F	208 (Models Equipped with Accessory Rack) 190 (Models Equipped with Loose Accessories)			
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		525	800	1070	1155
		180	180	180	190
		85	85	85	85
		15-17	17-19	16-18	22-24
Pressure Rise Across Water Pump (Maximum Suction 4 PSI Negative @ Pump Inlet)	PSI	27 (±2)	27 (±2)	23 (±2)	23 (±12)
Raw Water Pump Flow, Including Allowance for Gear Oil Cooler	GPM	720	720	845	845
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Air Starting Motors		1	2	2	2
Starting Air Pressure	PSI	150	150 or 200	200	150
Air Starting Control Solenoid		120 Volts AC (Basic)			
Exhaust System					
Exhaust Back Pressure - Maximum Allowance		5 inches H2O			
Exhaust Gas Volume	CFM	—	17,200	23,400	29,100
Exhaust Temperature	°F	—	590	625	685
Engine Radiation					
Radiation (Approx.)	BTU/min.	9,600	14,400	19,200	24,000

GREGORY B. MORMAN
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1-888-514-9111
sundesstl@mindspring.com
5345 Bells Ferry Rd.
Suite 136
Acworth, GA 30102

FAX COVER DOCUMENT

May 31, 2000

To: Amy Hacker

RE: Exhaust Back Pressure New EMD Unit Florida Keys Electric

Fax: 303-297-2811

Amy:

Our calculations indicate that the exhaust backpressure for the new EMD generating unit to be installed in the Marathon plant will be approximately 4" H20. As indicated in the information I previously provided the maximum exhaust back pressure acceptable to the engine manufacturer is 5"H20.

Greg Morman
Area Sales Manager
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Acworth, GA 30102
Phone: 1-888-514-9111 Fax: 770-514-9881 Phone: 770-514-9111
20-15

Florida Keys Electric Coop

Generation Resources Overview

UNITS - K	Location	Name Plate Year 2000	Actual Year 2000
1	Marathon	2,000	2,000
2	Marathon	2,000	2,000
3	Marathon	3,000	2,500
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5	Marathon	3,000	2,500
6	Marathon	2,500	2,500
7	Marathon	2,500	2,500
8	Marathon	3,500	3,500
9	Marathon		
	Load Mgt.		1,500
		21,500	21,500
	Actual Total		21,500
	Station Power Use		(200)
	City Electric Emerg. Contract		12,000
	System Resources Declared		33,300 *

FKEC Peak demand	138,121
Declared Resources *	(33,300)
FPL Base Demand	104,821

Max. Resources Calculation

FKEC Peak Demand	138,121
25% of Peak Demand	34,530

FKEC declared resources (33,300) do not exceed the 25% (34,530) maximum under the FPL contract.

FLORIDA KEYS ELECTRIC COOPERATIVE ASSOC., INC.

P.O. BOX 377
91605 OVERSEAS HIGHWAY
TAVERNIER FL 33070 0377

TELEPHONE: (305) 852-2431
FAX: (305) 852-4794

FAX TRANSMITTAL SHEET

DATE: 5-18-00 TIME SENT: 8:45 AM

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME: Syed Arif FAX #: 850-922-6979

FROM: Randy Chaney PAGES: 2
INCLUDING COVER SHEET

- ☐ FOR YOUR INFORMATION
- ☐ FOR YOUR COMMENTS
- ☐ AS WE DISCUSSED
- ☐ HARD COPY WILL NOT FOLLOW
- ☐ HARD COPY WILL FOLLOW VIA U.S. MAIL
- ☐ HARD COPY WILL FOLLOW VIA OVERNIGHT DELIVERY
- ☐ **PLEASE CALL ME UPON RECEIPT**

COMMENTS: Mr. Arif:

At the request of Tim Player, I have attached an overview of FKEC's current generation resources. Please call if you have any questions.

Randy

A Member Owned Utility

Florida Keys Electric Coop

Generation Resources Overview

UNITS - K	Location	Name Plate Year 2000	Actual Year 2000
1	Marathon	2,000	2,000
2	Marathon	2,000	2,000
3	Marathon	3,000	2,500
4	Marathon	3,000	2,500
5	Marathon	3,000	2,500
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Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

May 16, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles A. Russell, CEO and General Manager
Florida Keys Electric Cooperative Association, Inc.
91605 Overseas Highway
Tavernier, Florida 33070

Re: DEP File No. 0870004-004-AC; PSD-FL-285
Unit 9, Marathon Generation Plant

Dear Mr. Russell:

The Department has received the additional information on April 17, 2000 for the construction of a 3.58 MW high-speed diesel engine electric generator at the above referenced facility in Monroe County. Based on our interactions with the Environmental Protection Agency (EPA), we have determined that additional information is needed in order to continue processing this application package. Please submit the information requested below to the Department's Bureau of Air Regulation:

1. Please provide the necessary information from the vendor of the diesel generator as well as from the SCR manufacturer that shows the technical infeasibility of installing SCR with this diesel generator. If SCR can be used with this generator, please provide the necessary cost data in $/ton of NO_x removed to reflect the use of this control equipment.

2. Please provide the necessary historical data and the appropriate calculations that reflect the total capacity requirements of 25.2 MW for the facility.

The Department will resume processing this application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. A new certification statement by the authorized representative or responsible official must accompany any material changes to the application. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days.

We will be happy to meet and discuss the details with you and your staff. Mr. Syed Arif, P.E. is responsible for the technical review of the application. He may be contacted at 850/921-9528.

Sincerely,

5/16

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

AAL/sa

cc: Amy Hacker, R.W. Beck
Tim Planer, FKEC
Phil Barbaccia, DEP-SD
Gregg Worley, EPA Region IV
John Bunyak, NPS

so that we can return the card to you.
■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Charles Russell, CEO
Fla. Keys Electric
91605 Overseas Hwy
Tavernier, Fl
33070

C. Signature
X [signature] FKEC
☐ Agent
☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)* Z 341 355 292

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

Z 341 355 292

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

Sent to	Charles Russell
Street & Number	Fla. Keys Electric
Post Office, State, & ZIP Code	Tavernier Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	5-17-00 0570004-004-EC PSD-FI-285 Unit 9

PS Form 3800, April 1995

Syed

FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. – FKEC

91605 OVERSEAS HIGHWAY P.O. BOX 377, TAVERNIER, FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

RECEIVED
APR 17 2000
BUREAU OF AIR REGULATION

April 10, 2000

A.A. Linero, P.E. Administrator
Department of Environmental Protection
New Source Review Section
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Response to DEP File No. 0870004-004-AC; PSD-FL-285
Unit # 9 Marathon Generating Plant

Dear Mr. Linero:

Florida Keys Electric Cooperative Association, Inc. (FKEC) has received your letter requesting additional information to the "Air Construction Permit" application for the new 3.58 MW unit # 9 generator. Regarding questions 1 and 2, please accept the following information along with excerpts from the FKEC/FP&L Contract.

In August of 1991 FKEC and FP&L entered into a long term agreement for FKEC to purchase the capacity and energy required to serve FKEC's base demand, and FP&L to provide the same for a period of twenty years. One of the provisions in this contract allowed the incorporation of FKEC's existing generation capacity to offset a portion of the capacity (demand) charge, in lieu paying the full capacity charge. This credit represents a savings to FKEC and is passed along to our members through low rates.. The maximum savings amount of 25% of the annual peak demand portion of the monthly wholesale power bill is possible, providing FKEC maintains resources at that percentage. This single features allows FKEC members to continue to have competitive electric rates while providing the availability of emergency power as needed for this long radial electric system. In return for this credit, FP&L has the option to not provide capacity and energy above the base demand, at times when supply is limited in there system, or when it is not economical to provide non-firm power. FKEC will have to generate the portion of the power above the established base demand in order to continue to serve all of FKEC's customers at those times. This brief description is intended to provide additional background information to the contract excerpts attached.

Attachments for questions 1 and 2.
Contract page 7 FP&L Capacity Commitment above base.
Contact page 12 FKEC Resources.
Contract pages 17 and 18 Alternate Economic Energy, including FKEC response time.
Page one of Annual Peak Demand Forecast letter to FP&L.

N:\tim2000\unit9_incom_letter.wpd

Also please find the attached information compiled by our consultant R.W. Beck, regarding the six questions in your letter of incompleteness dated March 15, 2000.

Should you have any questions regarding this additional information provided, please call Tim Planer at Florida Keys Electric Cooperative Association, Inc. at 305-852-2431 or Ms. Amy Hacker at R.W. Beck at 303-299-5219.

Sincerely,

Charles A. Russell
C.E.O. & General Manager

copies to: Tim Planer
Chris Pankow
Deb Shaw
Amy Hacker

cc: S. Arnf, Bar
C. Holladay, Bar
SD
EPA
NPS

N:\tim2000\unit9_incom_letter.wpd

Florida Keys Electric Cooperative Association, Inc. (FKEC) offers the following responses to the comments provided by Florida Department of Environmental Protection (FDEP) in regards to FKEC's submittal, *Air Construction Permit Application for Unit 9 at the Marathon Generation Plant.*

1.

COMMENT: Please provide the pertinent sections of the contract that Florida Keys Electric Cooperative Association, Inc. (FKEC) entered with Florida Power & Light requiring FKEC to maintain the capability of generating electricity in case FP&L fails to provide the contractual power.

RESPONSE: The sections of the contract requiring FKEC to maintain the capability of generating electricity in case FP&L fails to provide the contractual power are included as an attachment to this submittal.

2.

COMMENT: Please provide the necessary sections of the contract that details the total capacity requirements for the Marathon Generation Plant. After the addition of the 9th unit, the total capacity of the facility will be 25.2 MW.

RESPONSE: The sections of the contract that details the total capacity requirements for the Marathon Generation Plant are included as an attachment to this submittal.

3.

COMMENT: The Title V Operating Permit lists under the permit history that Unit 1 & 2 were retired on 01-88 and 02-88 respectively. The application states that those two units are still operational. Please explain the discrepancy.

RESPONSE: Subsequent to retiring Units 1 and 2, FKEC installed two new units that were designated identical numbers as the retired units. The two new units differ from the retired units in that they are located outside and have a larger capacity.

4.

COMMENT: Please provide all input/output modeling files in diskette format.

RESPONSE: The air dispersion modeling input and output runs are included on the attached diskette.

5.

COMMENT: What are the modeled significant impact areas for PM_{10} and NO_X? Were all contemporaneous increases and decreases in PM_{10} emissions at Units 1-7 accounted for in the significant impact modeling?

RESPONSE: The significant impact areas (SIAs) for PM_{10} and NO_X, when modeling only Unit 9, are 150 meters and 5000 meters, respectively. However, due to the absence of large sources nearby (interactive sources), maximum predicted impacts, when modeling all sources at the Marathon Generation Plant, are located well within the SIAs. The modeling runs that are included with this submittal have been revised to include receptors that extend out to the predicted SIAs. Final maximum predicted impacts and their locations have not changed from those that were previously submitted.

Figure A, which is attached to this submittal, depicts the receptor grid network out to 500 meters and the location of all NO_X impacts greater than 50 ug/m^3 or half of the NO_X annual standard (100 ug/m^3). The impact at each receptor was determined by taking the maximum concentration at each receptor when modeling all five years of meteorological data. All impacts at receptors greater than 500 meters from the site were equal to or less than 50 ug/m^3. As shown in Figure A, three maximum impacts are occurring on FKEC's property. Additionally, there is only one impact, slightly off the property boundary, that is greater than 100 ug/m^3. As explained in the *Application*, this impact can be reduced by 25 percent due to the ratio of NO_2 to NO_X in accordance with USEPA-approved practices and consistent with the modeling protocol. All PM_{10} annual and 24-hour impacts fall below 50 percent of each averaging interval's respective standard, 50 ug/m^3 and 150 ug/m^3.

Contemporaneous increases and decreases in PM_{10} emissions at Units 1 through 7 were not accounted for in the modeling. Since the maximum potential emission rate must be modeled to accurately predict the 24-hour concentration, the maximum emission rate was also utilized to determine the annual concentration. In reality, the emission rates for Units 1 through 7 should be multiplied by 50 percent (0.5) to account for the permitted restriction of annual operation (4,380 hours/year or 50 percent), which was part of the Operating Permit, issued March 17, 1999. This consideration was not included in the Application due to the already low predicted annual PM_{10} impact. However, we have remodeled PM_{10} to evaluate what the annual predicted impact would be when accounting for the permit restriction on Units 1 through 7. The maximum predicted annual PM_{10} concentration would be 3.3 ug/m^3 with the operation limitation, as opposed to 6.5 ug/m^3 without the limitation. These runs are included with this submittal on the attached diskette. The tables in Response #6 have also been revised to reflect the annual operating restriction on Units 1 through 7.

Additionally, the PM_{10} emission rates for Units 8 and 9 were calculated from emission factors found in AP-42. To be conservative, these same calculated emission rates were also used for Units 1 through 7. Since these seven units are smaller than Units 8 and 9, their actual emission rates would be lower. Therefore, the predicted annual (with and without the consideration of the operation limitation) and 24-hour concentrations are slightly higher than what would be predicted with actual emission rates.

6.

COMMENT: A background concentration for NO_2 and PM_{10} should be included in the NAAQS impact section of Table 4-2. A suggestion is to use the 1998 annual NO_2 value of 11 ug/m^3 from the Virginia Key monitor in Dade County for the annual NO_2 background value, and the values from a PM_{10} monitor in Dade for both the long-term and short-term PM_{10} background values.

RESPONSE: Ambient data for Dade County was obtained from the EPA Aerometric Information Retrieval System (AIRS). All NO_X and PM_{10} monitoring stations in Dade County are located in the vicinity of Miami. We are of the opinion that these stations do not accurately represent the ambient quality in the region surrounding the Marathon Plant for the following reasons:

- The monitoring stations are located relatively far away from the Plant;
- A larger population and a greater number of stationary and mobile sources are found in Miami, which would cause elevated ambient concentrations; and
- The prevailing winds on Vaca Key are out of the east and southeast bringing clean air off of the Atlantic Ocean.

However, since no data exists for the Florida Keys, we have included ambient data from the closest monitoring stations, which are both located in the vicinity of Miami.

Station	Location	Pollutant	Averaging Interval [1]	Year [2]	Concentration (ug/m^3)
Virginia Key	2 mi. south of Miami Beach; 96 mi. from Marathon	NO_X	Annual	1998	11
Homestead	27 mi. south of Miami; 69 mi. from Marathon	PM_{10}	Annual	1997	22
			24-Hour	1997	52

[1] The second high maximum monitored concentration was used for the 24-hour averaging interval.
[2] No data was available for the Homestead station in 1998.

The following tables, which were included in the *Application*, have been revised to include a background concentration. However, we believe that these values are conservative since they reflect the actual ambient air quality of Miami.

TABLE 4-2 [REVISED]
NAAQS AND PSD-CLASS II AIR QUALITY ANALYSIS
ANNUAL NO_x
MAXIMUM PREDICTED CONCENTRATIONS

Year	NAAQS[1]					PSD[2]		
	Maximum Concentration (ug/m^3)	Revised Concentration[3] (ug/m^3)	Background Concentration (ug/m^3)	Total Predicted Impact (ug/m^3)	Annual Standard (ug/m^3)	Maximum Concentration (ug/m^3)	Revised Concentration[3] (ug/m^3)	Annual Standard (ug/m^3)
1987	91.8	68.9	11.0 [4]	98.8	100.0	15.5	11.6	25.0
1988	112.1	84.1				12.9	9.7	
1989	111.3	83.5				16.2	12.2	
1990	102.7	77.0				16.6	12.5	
1991	117.0	87.8				17.4	13.1	

[1] The NAAQS analysis results include Units 1 through 9.
[2] The PSD-Class II analysis results include Units 8 and 9.
[3] The NO_x concentrations can be reduced by 25% due to the ratio of NO_2 to NO_x as outlined in Supplement C to EPA's *Guideline on Air Quality Models*, August 1995 (Attachment 2).
[4] The background concentration was obtained from data collected in 1998 at the monitoring station on Virginia Key, located approximately 96 miles from Marathon.

T20, receptors 50, 100, 150, 200, 300, 400, 500, 750, 1000, 1250, 1500, 1750
2000, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5

pmsic1.191

fkc1s.91.dta

TABLE 4-3 [REVISED]
NAAQS AND PSD-CLASS II AIR QUALITY ANALYSIS
ANNUAL AND 24-HOUR PM_{10}
MAXIMUM PREDICTED CONCENTRATIONS

Year	NAAQS[1,2]								PSD[3]			
	Annual				24-Hour				Annual		24-Hour	
	Maximum Concentration (ug/m^3)	Background Concentration (ug/m^3)	Total Predicted Impact (ug/m^3)	Standard (ug/m^3)	Second-High Concentration (ug/m^3)	Background Concentration (ug/m^3)	Total Predicted Impact (ug/m^3)	Standard (ug/m^3)	Maximum Concentration (ug/m^3)	Standard (ug/m^3)	Second-High Concentration (ug/m^3)	Standard (ug/m^3)
1987	2.52	22.0 [3]	25.3	50.0	55.20	52.0 [3]	117.6	150.0	0.39	17.0	6.56	30.0
1988	3.31				65.56				0.33		7.37	
1989	3.31				53.35				0.41		4.64	
1990	2.74				63.07				0.42		7.00	
1991	3.22				53.79				0.44		5.79	

(1) The NAAQS analysis results include Units 1 through 9. PM_{10} emission rates for Units 8 and 9 were calculated from emission factors found in AP-42. To be conservative, these calculated rates were also used for Units 1 through 7 (all seven units are smaller, and therefore would have lower actual emission rates, than Units 8 and 9). If actual emission rates were used for Units 1 through 7, the maximum impact concentrations would be lower than what is shown here.

(2) The PSD-Class II analysis results include Units 8 and 9.

(3) The background concentrations were obtained from data collected in 1997 at the monitoring station in Homestead, located approximately 69 miles from Marathon.

PM_{10}

		Ann	24-hr
CI	1987	0.00055	0.032

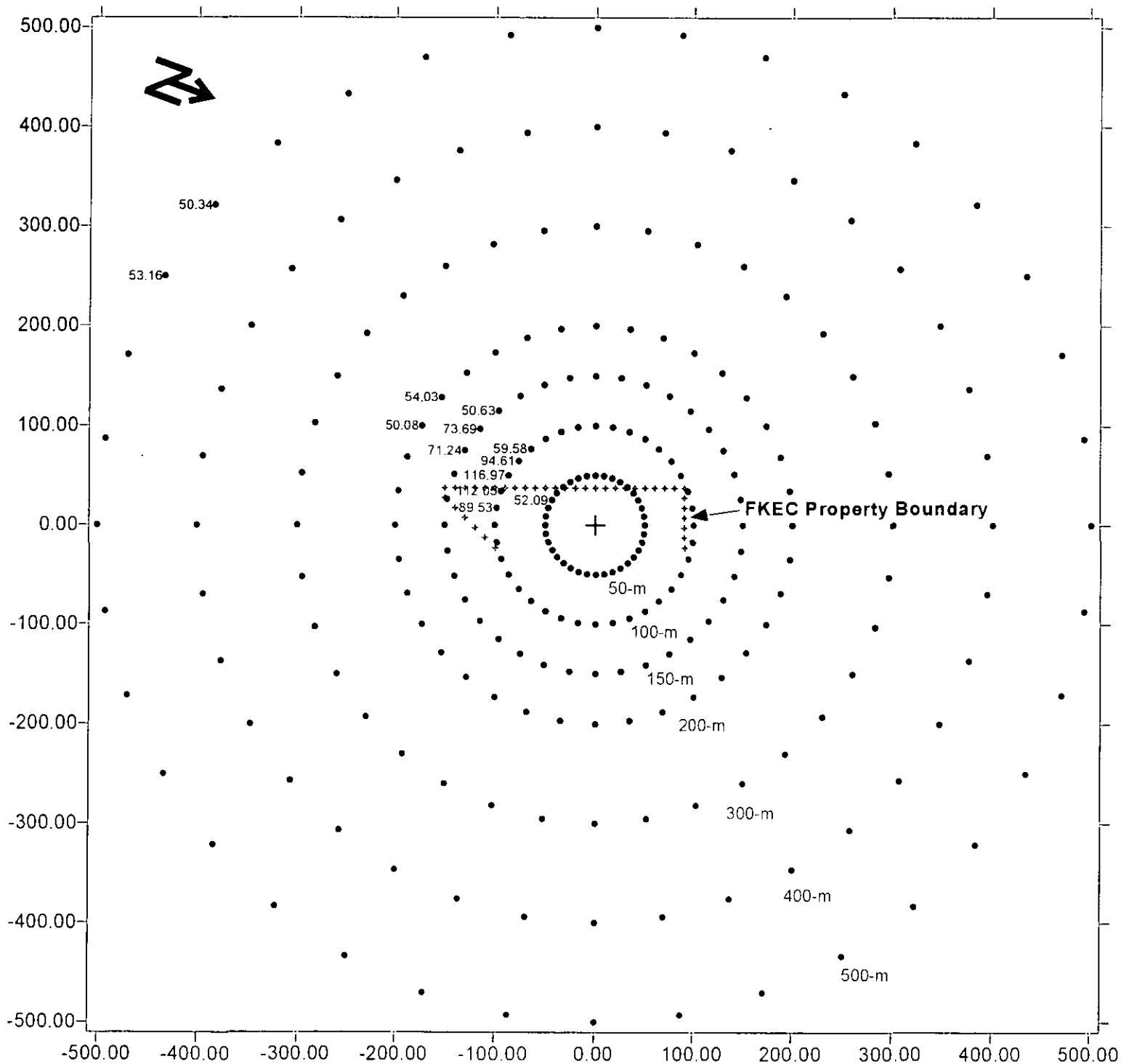

Figure A
NOx Impacts Greater Than 50 ug/m3

specified in Exhibit A to this Agreement, unless FPL, prior to the time the voltage at the Points of Delivery is changed, notifies FKEC in writing that the voltage will be changed to a specified higher voltage. FPL shall give FKEC reasonable advance notice of such change, and shall make such changes in accordance with Prudent Utility Practice. In such cases, it shall be FKEC's obligation at its own expense to construct or otherwise provide facilities on FKEC's side of the Points of Delivery to accommodate such higher voltage. Any other change in delivery voltage shall be made only by mutual agreement.

Section 3.3 - Control Area Regulation: As a part of this Agreement, FPL has agreed to include FKEC in FPL's Control Area and to provide to FKEC the same degree of Control Area regulation as it provides on its own system in similar circumstances. Because of the integrated nature of the services provided under this Agreement, the Parties have agreed that FKEC shall remain in and as a part of FPL's Control Area for the term of this Agreement.

ARTICLE IV

CAPACITY COMMITMENT, BASE DEMAND and ENERGY, and TRUE-UP DEMAND

Section 4.1 - Capacity Commitment: FPL agrees to sell and deliver to FKEC from FPL Production Resources and FKEC agrees to purchase and receive from FPL, commencing on the effective date of this Agreement and extending for the term specified in Section 2.1, all electric capacity and energy required to serve FKEC's Base Demand as established pursuant to Section 4.2.1. FPL shall have no responsibility to have available or to supply capacity and energy necessary to meet the portion of FKEC's Load that exceeds the Base Demand.

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

For any amount of Excluded FKEC Resources determined pursuant to this Section, FKEC shall select from among the FKEC-owned generating resources designated as FKEC Resources during both the current Billing Year and the prior Billing Year, generating unit(s) (or portions thereof) with a total capacity equal to the Excluded FKEC Resources amount. The generating unit(s) FKEC selects shall not be eligible for designation as FKEC Resources for the five year period which commences at the beginning of the subsequent year.

ARTICLE VI

ALTERNATE ECONOMIC ENERGY

Section 6.1 - Alternate Economic Energy: FKEC may request FPL to provide economic energy ("Alternate Economic Energy") to displace energy which would have been provided by FKEC Resources, provided further, the sum of Alternate Economic Energy, Unavailable FKEC Resources Energy and Deficient FKEC Resources Energy actually supplied to FKEC shall not exceed, for any clock hour period, the then-effective amount of FKEC Resources expressed on an hourly basis. FPL agrees to provide Alternate Economic Energy if in FPL's sole judgement, FPL has energy available on its system after meeting its own native load and other firm commitments and the provision of such service would not impair the economics or reliability of FPL's service to its native load customers and other firm commitments. FPL shall be the sole judge of its generating and transmission capacity available to supply Alternate Economic Energy hereto. If FPL is supplying Alternate Economic Energy to FKEC and, in FPL's sole judgement, determines that FPL can no longer continue the delivery of such Alternate Economic Energy to FKEC for any reason, then FKEC shall, within thirty (30) minutes, either supply such energy requirements from FKEC Resources and the failure to do so shall be treated in accordance with

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

FLORIDA KEYS ELECTRIC COOPERATIVE ASSOCIATION, INC. -FKEC
91605 OVERSEAS HIGHWAY P.O. BOX 377, TAVERNIER FL 33070-0377 PHONE (305) 852-2431 FAX: (305) 852-4794

September 28, 1999

Mr. Mario Villar, Manager
Wholesale Markets
Florida Power and Light
P. O. Box 029100
Miami, Florida 33102-9100

Dear Mr. Villar:

As required by Section 11.1 of the Long Term Agreement to Provide Capacity and Energy by Florida Power and Light to Florida Keys Electric Cooperative Association, Inc. (Long Term Agreement), FKEC is providing FPL, by this letter, its best forecast of peak demand for the years 2000 through 2004 and a listing of the specific resources available to meet FKEC load above the base demand amount.

For the years 2000 through 2004, FKEC's peak demands are forecasted to be as follows:

2000	138,121 kW
2001	141,919 kW
2002	145,822 kW
2003	149,832 kW
2004	153,953 kW

Subtracting the FKEC resources available to meet FKEC load above base demand, as shown on Attachment Two, results in the following estimated base demands for 2000 through 2004:

2000	104,821 kW
2001	105,119 kW
2002	109,022 kW
2003	113,032 kW
2004	117,153 kW

Attachments One and Two complete the requirements of Section 11.1 of the Long Term Agreement. Attachment One shows FKEC's best estimate of peak loads on a monthly basis for the years 2000 through 2004.

MEMORANDUM

RECEIVED
APR 17 2000
BUREAU OF AIR REGULATION

R·W·BECK

To: Mr. Al A. Linero ■ Florida Department of Environmental Protection

From: Amy Hacker

Subject: **Air Dispersion Modeling Diskette for FKEC's Permit Application**

Date: April 14, 2000

Attached is the air dispersion modeling diskette that is to accompany Florida Keys Electric Cooperative, Inc.'s (FKEC's) response to FDEP's Letter of Incompleteness, dated March 15, 2000. The diskette and response support FKEC's submittal, *Air Construction Permit Application for Unit 9 at the Marathon Generation Plant*. Please contact me at (303) 299-5219 if there are any questions or problems with the diskette.

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

March 15, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles A. Russell, CEO and General
Manager
Florida Keys Electric Cooperative
Association, Inc.
91605 Overseas Highway
Tavernier, Florida 33070

Re: DEP File No. 0870004-004-AC; PSD-FL-285
Unit 9, Marathon Generation Plant

Dear Mr. Russell:

The Department has received the application on February 17, 2000 for the construction of a 3.58 MW high-speed diesel engine electric generator at the above referenced facility in Monroe County. Based on our initial review of the proposed project, we have determined that additional information is needed in order to continue processing this application package. Please submit the information requested below to the Department's Bureau of Air Regulation:

1. Please provide the pertinent sections of the contract that Florida Keys Electric Cooperative Association, Inc. (FKEC) entered with Florida Power & Light requiring FKEC to maintain the capability of generating electricity in case FP&L fails to provide the contractual power.
2. Please provide the necessary sections of the contract that details the total capacity requirements for the Marathon Generation Plant. After the addition of the 9th unit, the total capacity of the facility will be 25.2 MW.
3. The Title V Operating Permit lists under the permit history that Unit 1 & 2 were retired on 01-88 and 02-88 respectively. The application states that those two units are still operational. Please explain the discrepancy.
4. Please provide all input/output modeling files in diskette format.
5. What are the modeled significant impact areas for PM_{10} and NO_x? Were all contemporaneous increases and decreases in PM_{10} emissions at Units 1-7 accounted for in the significant impact modeling?

6. A background concentration for NO_2 and PM_{10} should be included in the NAAQS impact section of Table 4-2. A suggestion is to use the 1998 annual NO_2 value of 11 ug/m^3 from the Virginia Key monitor in Dade County for the annual NO_2 background value, and values from a PM_{10} monitor in Dade for both the long-term and short-term PM_{10} background values.

Any additional comments from EPA and the U.S. Fish and Wildlife Service will be forwarded to you after we receive them.

The Department will resume processing this application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. A new certification statement by the authorized representative or responsible official must accompany any material changes to the application. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days.

We will be happy to meet and discuss the details with you and your staff. Mr. Syed Arif, P.E. is responsible for the technical review of the application. He may be contacted at 850/921-9528. You may discuss the modeling requirements with Mr. Cleve Holladay at 850/921-8689.

Sincerely,

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

AAL/sa

cc: Ivan Clark, R.W. Beck
Deborah Shaw, FKEC
Phil Barbaccia, DEP-SD
Gregg Worley, EPA Region IV
John Bunyak, NPS

Delivered — Consult postmaster for fee.

3. Article Addressed to:
Mr. Charles Russell
Fla. Keys Electric
91605 Overseas Hwy
Tavernier, Fl
33070

4a. Article Number
Z 031 391 881

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

7. Date of Delivery
3/17

5 Received By: (Print Name)
E. Bickus FKEC

6 Signature: (Addressee or Agent)

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

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt

PS Receipt

Z 031 391 881

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
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Sent to Charles Russell	
Street & Number Fla. Keys Elect.	
Post Office, State, & ZIP Code Tavernier Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	Unit 9
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 3-15-00	

PS Form 3800, April 1995

6E7CCC4-CC4-AC
PSD-FI-285

Department of
Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

February 22, 2000

Mr. John Bunyak, Chief
Policy, Planning & Permit Review Branch
NPS-Air Quality Division
Post Office Box 25287
Denver, CO 80225

Re: Florida Keys Electric Cooperative
Marathon Generation Plant Unit 9
0870004-004-AC, PSD-FL-285

Dear Mr. Bunyak:

Enclosed for your review and comment is an application for the above mentioned project. The proposed project is the construction of a new 3.58 MW diesel generator (Unit 9) at the Marathon Generation Plant. The generator will be fueled by No. 2 low sulfur (less than 0.05 percent sulfur by weight) fuel oil. Additionally, as part of the project, the stack height of the existing 3.58 MW diesel generator (Unit 8) will be increased from 38.7 to 45 feet.

Your comments can be forwarded to my attention at the letterhead address or faxed to me at (850)922-6979. If you have any questions, please contact Cleve Holladay at (850)921-8986.

Sincerely,

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

AAL/kt

Enclosures

cc: C. Holladay, BAR

Department of
Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

David B. Struhs
Secretary

February 22, 2000

Mr. Gregg Worley, Chief
Air, Radiation Technology Branch
Preconstruction/HAP Section
U.S. EPA – Region IV
61 Forsyth Street
Atlanta, Georgia 30303

Re: Florida Keys Electric Cooperative
Marathon Generation Plant Unit 9
0870004-004-AC, PSD-FL-285

Dear Mr. Worley:

Enclosed for your review and comment is an application for the above mentioned project. The proposed project is the construction of a new 3.58 MW diesel generator (Unit 9) at the Marathon Generation Plant. The generator will be fueled by No. 2 low sulfur (less than 0.05 percent sulfur by weight) fuel oil. Additionally, as part of the project, the stack height of the existing 3.58 MW diesel generator (Unit 8) will be increased from 38.7 to 45 feet.

Your comments can be forwarded to my attention at the letterhead address or faxed to me at (850)922-6979. If you have any questions, please contact Cleve Holladay at (850)921-8986.

Sincerely,

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

AAL/kt

Enclosures

cc: C. Holladay, BAR