

Check Sheet

Company Name: Key West City Electric
Permit Number: AC 44-152 197, -152 198
PSD Number: 135
Permit Engineer: _____

Application:

- Initial Application
- Incompleteness Letters
- Responses
- Waiver of Department Action
- Department Response
- Other

Cross References:

-
-
-

Intent:

- Intent to Issue
- Notice of Intent to Issue
- Technical Evaluation
- BACT Determination
- Unsigned Permit

Correspondence with:

- EPA
- Park Services
- Other
- Proof of Publication
 - Petitions - (Related to extensions, hearings, etc.)
 - Waiver of Department Action
 - Other

Final Determination:

- Final Determination
- Signed Permit
- BACT Determination
- Other

Post Permit Correspondence:

- Extensions/Amendments/Modifications
- Other

R.W. BECK
AND ASSOCIATES

Bank One Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615 ■ USA
Telephone (303) 299- 5200 ■ Fax (303) 297-2811

CC-5801-EG1-AF

July 20, 1993

Mr. Clair Fancy
Florida Department of Environmental Protection
2600 Blairstone Road
Tallahassee, Florida 32399

RECEIVED

JUL 26 1993

Division of Air
Resources Management

Subject: Impact Assessment for High Speed Diesels

Dear Mr. Fancy

R. W. Beck and Associates (Beck) has prepared a PSD application for the relocation of the gas turbine from the Key West power plant to Stock Island. During the preparation of the application, Beck modeled the Stock Island high speed diesels (HSD) which are used minimally for peak load demand. By including the effects of building downwash attributed to the recently-constructed building for the medium-speed diesels (MSD), it was determined that certain meteorological conditions could result in high ground-level concentrations from the HSDs.

In a letter dated May 6, 1993, Mr. Carl R. Jansen, Jr. of City Electric System (CES) notified you of this situation. The purpose of this letter is to clarify the situation, to demonstrate that the MSDs had minor impacts prior to the installation of the MSD building, and to present the alternatives available to CES to reduce the predicted ground-level concentrations to the prior levels. It should be noted that CES is currently operating the HSDs only between the hours of 9:00 a.m. and 5:00 p.m., which, as demonstrated below, is predicted to result in acceptable ambient air quality impacts.

The attached figure shows the location of the HSDs with respect to the MSD building. Dispersion modeling has been performed to predict the ground-level concentrations of sulfur dioxide from the facility without the MSD building. The receptor grid, meteorological data, and modeling methods are consistent with the analysis presented in the PSD application and the FDEP-approved modeling protocol used for the PSD application. The results are as follows:



Table 1		
Facility Impacts Without MSD Building Ground-Level Sulfur Dioxide Concentrations		
<u>Averaging Interval</u>	<u>Highest High</u>	<u>Highest Second-High</u>
3-hour	48	2
24-hour	8	0.3

We have considered three options for CES to operate the HSDs consistent with the impacts in Table 1. Those options are:

- (1) Operation of HSDs only between 9:00 a.m. and 5:00 p.m.;
- (2) Construction of a taller stack for the HSDs
- (3) Moving the HSDs out of the wake of the MSD building.

Note that our modeling evaluation of these options has not considered feasibility issues such as operating flexibility or site limitations. The dispersion modeling results are presented in tables 2 through 4.

Table 2		
High-Speed Diesels With MSD Building Ground-Level Sulfur Dioxide Concentrations Operation Restricted to 9:00 a.m. to 5:00 p.m.		
<u>Averaging Interval</u>	<u>Highest High</u>	<u>Highest Second-High</u>
3-hour	0	0
24-hour	0	0

Table 3		
High-Speed Diesels With MSD Building Ground-Level Sulfur Dioxide Concentrations New Stack - 50 Feet High		
<u>Averaging Interval</u>	<u>Highest High</u>	<u>Highest Second-High</u>
3-hour	24	17
24-hour	3	2

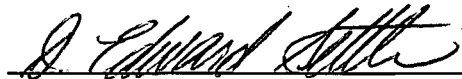
Table 4		
High-Speed Diesels With MSD Building Ground-Level Sulfur Dioxide Concentrations HSDs Out of MSD Building Wake		
<u>Averaging Interval</u>	<u>Highest High</u>	<u>Highest Second-High</u>
3-hour	40	2
24-hour	7	0.3

As the results show, either of the three scenarios results in impacts approximately equivalent to those prior to the installation of the MSD building. Until such time that a feasible option is selected, CES will be operating the HSDs only during the hours from 9:00 a.m. to 5:00 p.m. If necessary, permit modification will be sought at that time.

If you have any questions or comments related to the impacts of the HSDs, please call me at 303/299-5280.

Sincerely,

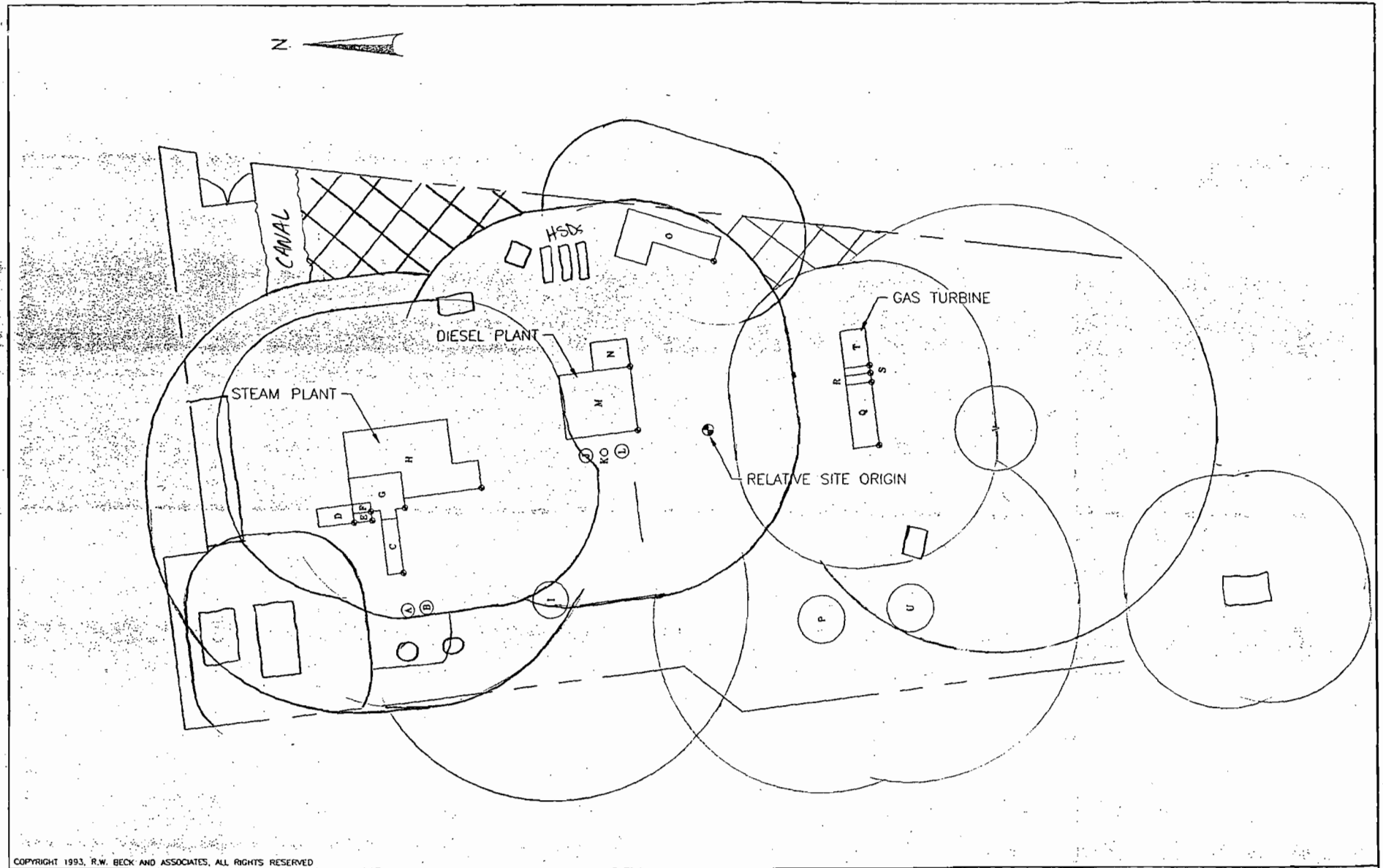
R. W. BECK AND ASSOCIATES



D. Edward Settle
Senior Engineer/Scientist

DES:tlh F:\CC5801.EG1\TLH005ES.LTR

c: Jim Greenshields
Diane Tremor
Skip Jansen
Mike Henderson



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REVISIONS	DATE	BY	CHKD.	APP.	APP.

DRAWN	
CHECKED	
APPROVED	
APPROVED	
DATE	

R.W. BECK
AND ASSOCIATES

STOCK ISLAND
GENERATING FACILITY

Figure 2-2
FACILITY STRUCTURES

SCALE	
NO.	
REV.	
3068-SK-2	

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100
May 6, 1993



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

RECEIVED
MAY 17 1993
Division of Air
Resources Management

Mr. Clair Fancy
Department of Environmental Regulations
Twin Towers Office Building
2600 Blainstone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

During the PSD application (PSD-FL-135) process for the Medium Speed Diesel Units (AC-44-152197) at the Stock Island Power Plant in 1988, R.W. Beck and Associates identified the peaking diesels at Stock Island (AO-44-175804). However, "R.W. Beck" failed to include them in the impact modeling since they were not considered a major source. It was felt that if they were modeled their impact would be insignificant.

Subsequent to preparation of the PSD application in connection with the relocation of the combustion turbine from the Key West Power Plant to the Stock Island Power Plant additional modeling was performed.

One part of the analysis, the downwash analysis, included modeling the effects of building wakes on stack emission impacts. Inclusion of the high speed diesels in the downwash analysis revealed the three hour and twenty-four hour impacts unacceptable. The significant impact of the emissions from the high speed diesels appears to be related to two major factors; the low stack configuration and the relative location of the high speed diesels to the medium speed diesel building and the No. 6 oil tank.

R. W. Beck's modeling indicates that an acceptable impact could be achieved by limiting operating hours on all Stock Island high speed diesels to the hours of 9:00 a.m. to 5:00 p.m. C.E.S. will implement this schedule and is currently exploring the costs associated with relocating the high speed diesels.

If I can be of further assistance, please do not hesitate to call.

Sincerely,

UTILITY BOARD - CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"
Robert R. Padron, General Manager

A handwritten signature in black ink, appearing to read "Carl R. Jansen, Jr.", is written over a horizontal line.

Carl R. Jansen, Jr.
Production Manager

CRJ/dh

cc:
R. Padron, General Manager
J. Greenshields, Environmental Supervisor
File (2)

UTILITY BOARD MEMBERS:

William T. Cates, Chairman • Marty Arnold, Vice-Chairman
Otha P. Cox, Member • Leonard H. Knowles, Member • John H. Robinson, Jr., Member

UTILITY BOARD OF THE CITY OF KEY WEST

Clair
2/23

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272
TELECOPIER: (305) 294-3685

February 16, 1993

Ms. Valerie Hall
Key West Citizen
3420 Northside Drive
Key West, Florida 33040

RE: Publication of DER's "Notice of Intent to Issue Permit"

Dear Ms. Hall:

In accordance with Florida Statutes', City Electric System is required to publish the Florida DER's "Notice of Intent to Issue Permit" in the legal ad section of a newspaper of general circulation in the area to be affected.

Please find attached a copy of this notice to be published at your earliest convenience.

If you have any questions, please do not hesitate to call.

Sincerely,

UTILITY BOARD-CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"
Robert R. Padron, Manager

Jim Greenshields
Environmental Services Supervisor

JG/me

cc:
R. Padron
C. Jansen, Jr.
D. Tremor, Rose, Sundstrom & Bentley
H. Rhodes, FDER-Tallahassee

File
Attachment

RECEIVED

FEB 19 1993

Division of Air
Resources Management

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT TO ISSUE PERMIT

The Department of Environmental Regulation gives notice of its intent to issue two air pollution permits to Key West City Electric System for its two diesel generators located at the Stock Island Power Plant on Stock Island in Monroe County. Permit number AC44-221256 will authorize a minor increase in the allowable emission rates. Permit number AO44-207419 will authorize continued operation of the diesel generators.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within 14 days of publication of this notice. Petitioner shall mail a copy of the petition at the time of filing to Mr. Robert R. Padron, Manager, Key West City Electric System, 1006 James Street, Key West, Florida 33041. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information; (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department 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 facts which petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application 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 the Department of Environmental Regulation, South District, 2295 Victoria Avenue, Suite 364, Fort Myers, Florida. It is also available at the South District Branch Office, 11400 Overseas Highway, Suite 123, Marathon, Florida 33050.

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in one of the file drawers labeled Supplementary Documents Drawer. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: Key West City Electric

Permit(s) Numbered:

AC	44	-	152197
AC	44	-	152198
PSD	FL	-	135

Period during
which document
was received:

		Detailed Description
APPLICATION 15 JULY 1988	1.	24"×36" BLUEPRINT: PLOT PLAN CITY ELECTRIC PROPERTY JAMES AND GRINNELL ST. (DRAWING NUMBER: M-46 A
15 JULY 1988	2.	24"×36" BLUEPRINT: DIESEL ENGINE GENERATING STATION PLOT PLAN DEVELOPMENT PLAN
15 JULY 1988	3.	24"×36" BLUEPRINT: MAP OF KEY WEST
24 AUG 1988	4.	MODELING DATA
20 SEP 1988	5.	MODELING DATA

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615 ■ USA
Telephone (303) 299-5200 ■ Fax (303) 297-2811

CC-5801-DB6-AB

January 29, 1993

Mr. Cleve Holladay
Florida DER
2600 Blair Stone Road
Tallahassee, Florida 32399

RECEIVED

FEB 08 1993

Subject: Ambient Air Monitoring Exemption

DIVISION OF AIR
RESOURCES MANAGEMENT

Dear Mr. Holladay:

This letter presents preliminary calculations to support a monitoring exemption for the relocation of the gas turbine from the Key West Power Plant to the Stock Island Power Plant. Under FAC 17-2.500(3)(e), FDER has the discretionary authority to waive the preconstruction monitoring requirements for a project which is subject to the provisions of Prevention of Significant Deterioration (PSD). The calculations herein are based on: (1) currently available exhaust parameters and emission rates representing full load and 2888.5 hours of operation per year, and (2) meteorological data collected in Miami from 1981 through 1985. Although the final air quality analysis supporting the PSD permit application will be more extensive than the analysis presented herein, we do not anticipate that the final analysis will affect the conclusions supporting the monitoring exemption.

The pollutants for which PSD will likely apply for this project on the basis of annual emissions are nitrogen oxides (NO_x), sulfur dioxide (SO₂), and particulate matter (PM₁₀) as shown in Table 1. The impacts for each of these pollutants and the appropriate averaging intervals are presented in Table 2 and compared to the PSD *de minimis* monitoring thresholds. As the table shows, the impacts from the gas turbine are predicted to be well within the *de minimis* concentrations and, therefore, this project should be granted a waiver from the preconstruction monitoring requirements.

It should be noted that the gas turbine is being relocated from a site approximately four miles from the Stock Island Power Plant. Therefore, it is expected that the impact from the gas turbine on the regional air quality will not be substantially different than its current impact. This further supports the conclusions that a monitoring exemption should be granted for this project.

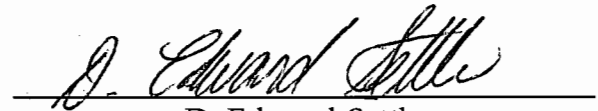
Mr. Cleve Holladay
Page 2

January 29, 1993

Based on the results presented herein, please issue a letter stating your concurrence with a monitoring exemption. Should you require further information to complete your determination, please call me at 303/299-5280.

Sincerely,

R. W. BECK AND ASSOCIATES



D. Edward Settle
Senior Scientist
Environmental Services

DES:lef (F:\CC5801.DB6\LEF002ES.LTR)

cc: M. Henderson
S. Jansen
J. Greenshields
D. Tremor

R.W. BECK
AND ASSOCIATES

Table 1

TURBINE EMISSIONS ESTIMATES

Pollutant	Significant Emission Rates (TPY)	Estimated Emission ⁽¹⁾ (TPY)
SO ₂ ⁽²⁾	40	250
NO _x	40	150
PM ⁽³⁾	25/15	20
CO	100	14
UHC ⁽⁴⁾	40	6

⁽¹⁾ Based on preliminary data and 2888.5 hours of full load operation.

⁽²⁾ Based on 0.5%S fuel oil.

⁽³⁾ All PM emissions assumed to be PM₁₀, significant rates for PM and PM₁₀ respectively.

⁽⁴⁾ UHC represents total hydrocarbons, whereas non-methane hydrocarbons are regulated.

Table 2

PREDICTED GAS TURBINE IMPACTS

Pollutant	Averaging Interval	<i>de minimis</i>⁽¹⁾ Concentration (µg/m³)	Turbine Impact (µg/m³)
SO ₂	24-hr	13	1.1
NO _x	Annual	14	0.1
PM	24-hr	10	0.1

⁽¹⁾ Source: Table 500-3, Florida Air Pollution Rules.

.2

called @ 8:59

**R.W. BECK
AND ASSOCIATES**

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615 ■ USA
Telephone (303) 299-5200 ■ Fax (303) 297-2811

FAX SHEET

WO #: 6 5801 DR6 AB

DATE: 1/29/93

TO: Cleve Holladay

PHONE #: 904/922-6979

FROM: Ed Settle

NUMBER OF PAGES (INCLUDING COVER): 5

MESSAGES: _____

Please call operator at (303)299-5200 if you have any problem receiving this transmission or did not receive the number of pages listed above.

BEST AVAILABLE COPY



Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615 ■ USA
Telephone (303) 299-5200 ■ Fax (303) 297-2811

Tom R's says OK to use 1981 to 1985 data

CC-5801-DB6-AB

January 29, 1993

Mr. Cleve Holladay
Florida DER
2600 Blair Stone Road
Tallahassee, Florida 32399

Subject: Ambient Air Monitoring Exemption

Dear Mr. Holladay:

This letter presents preliminary calculations to support a monitoring exemption for the relocation of the gas turbine from the Key West Power Plant to the Stock Island Power Plant. Under FAC 17-2.500(3)(e), FDER has the discretionary authority to waive the preconstruction monitoring requirements for a project which is subject to the provisions of Prevention of Significant Deterioration (PSD). The calculations herein are based on: (1) currently available exhaust parameters and emission rates representing full load and 2888.5 hours of operation per year, and (2) meteorological data collected in Miami from 1981 through 1985. Although the final air quality analysis supporting the PSD permit application will be more extensive than the analysis presented herein, we do not anticipate that the final analysis will affect the conclusions supporting the monitoring exemption.

The pollutants for which PSD will likely apply for this project on the basis of annual emissions are nitrogen oxides (NO_x), sulfur dioxide (SO₂), and particulate matter (PM₁₀) as shown in Table 1. The impacts for each of these pollutants and the appropriate averaging intervals are presented in Table 2 and compared to the PSD *de minimis* monitoring thresholds. As the table shows, the impacts from the gas turbine are predicted to be well within the *de minimis* concentrations and, therefore, this project should be granted a waiver from the preconstruction monitoring requirements.

It should be noted that the gas turbine is being relocated from a site approximately four miles from the Stock Island Power Plant. Therefore, it is expected that the impact from the gas turbine on the regional air quality will not be substantially different than its current impact. This further supports the conclusions that a monitoring exemption should be granted for this project.

Doug [unclear]
Have found letter to submit up for review.
M?

R.W. BECK
AND ASSOCIATES

January 11, 1993

FACSIMILE TRANSMISSION

TO: Diane Tremor
Cleve Holladay
Skip Jansen, Jim Greenshields
David Knowles

FAX #: 904/656-4029
904/922-6979
305/294-3685
813/332-6969

FROM: Ed Settle

TOTAL NUMBER OF PAGES: 4

CC-5801-DB6-AB

SUBJECT: Key West Gas Turbine
PSD Application

Following is the proposed outline for PSD application for relocation of the Key West Gas Turbine. Comments and questions are welcome. We should plan to discuss this at our meeting in early February at the DER offices in Tallahassee.

If you have any questions regarding this transmission, please contact Tricia Hinman at 303/299-5320.

**PREVENTION OF SIGNIFICANT DETERIORATION
PERMIT APPLICATION
COMBUSTION TURBINE RELOCATION
UTILITY BOARD OF THE CITY OF KEY WEST**

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1.2	Project Description	
1.3	Laws and Regulations	
1.4	Best Available Control Technology Summary	
1.5	Air Quality Analysis	
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PREVENTION OF SIGNIFICANT DETERIORATION
PERMIT APPLICATION
COMBUSTION TURBINE RELOCATION
UTILITY BOARD OF THE CITY OF KEY WEST

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**PREVENTION OF SIGNIFICANT DETERIORATION
 PERMIT APPLICATION
 COMBUSTION TURBINE RELOCATION
 UTILITY BOARD OF THE CITY OF KEY WEST**

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

RECEIVED

JAN 08 1993

DIVISION OF AIR
Resources Management

UTILITY BOARD OF THE CITY OF
KEY WEST (CITY ELECTRIC SYSTEM),

Petitioner,

vs.

OGC CASE NO. 92-1471

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION,

Respondent.

_____ /

ORDER GRANTING REQUEST FOR EXTENSION
OF TIME TO FILE PETITION FOR HEARING

This cause has come before the Florida Department of Environmental Regulation (Department) on receipt of a request made by Petitioner UTILITY BOARD OF THE CITY OF KEY WEST (CITY ELECTRIC SYSTEM), under Florida Administrative Code rule 17-103.070, to grant an extension of time to file a petition for an administrative hearing on Application No.A044-207419. See Exhibit 1 attached.

Counsel for Petitioner has discussed this request with counsel for Respondent State of Florida Department of Environmental Regulation, which has no objection to it. Therefore,

IT IS ORDERED:

The request for an extension of time to file a petition for administrative proceeding is granted. Petitioner shall have until February 4, 1993, to file a petition in this matter. Filing shall

Department of Environmental Regulation
Routing and Transmittal Slip

To: (Name, Office, Location)

1. Clair Fancy - TLH - Air Rm 306A
2. Quality
- 3.
- 4.

Remarks:

RECEIVED

JAN 08 1993

Division of Air
Resources Management

From

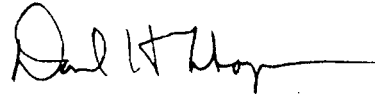
Date

Phone

be complete upon receipt by the Office of General Counsel,
Department of Environmental Regulation, 2600 Blair Stone Road,
Tallahassee, Florida 32399-2400.

DONE AND ORDERED on this 7th day of January, 1993 in
Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION



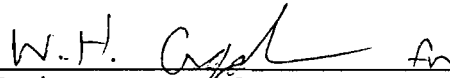
Daniel H. Thompson
General Counsel

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
Telephone: (904) 488-4805

CERTIFICATE OF SERVICE

I CERTIFY that a true copy of the foregoing was mailed to Diane
Tremor, attorney for Petitioner, Rose, Sundstrom & Bentley, 2548
Blairstone Pines Drive, Tallahassee, Florida 32301, on this 8th
day of January, 1993.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION



Claire E. Lardner
Assistant General Counsel

2600 Blair Stone Road
Tallahassee, FL 32399-2400
Telephone: (904) 488-9730

R.W. BECK

AND ASSOCIATES

Bank One Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615 ■ USA
Telephone (303) 299-5200 ■ Fax (303) 297-2811

CC-5801-DB6-AB

5 January 1993

Mr. Cleve Holladay
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399

Subject: Relocation of Key West Gas Turbine

Dear Mr. Holladay:

The City Electric System (CES) in Key West is planning to relocate a combustion turbine generator (CTG) from the Key West Power Plant to the Stock Island Power Plant. The CTG is currently operating under Permit Number AO44-55430 issued 13 May 1983. Based on a determination by Florida Department of Environmental Regulation (FDER), the relocation of the CTG to the Stock Island Plant will require review and approval under the requirements for Prevention of Significant Deterioration (PSD).

An integral part of the information required for a PSD application is the air quality assessment. Air quality impact modeling will be performed to verify compliance with ambient air quality standards (AAQS) and PSD increments during operation of the Plant. This letter describes the general procedures which we intend to follow to perform the air quality modeling and will serve as a modeling protocol. Please review our approach and let us know if you concur with our dispersion modeling methods as applied to the proposed project.

The modification will involve installation of the CTG which is a General Electric Frame 5 simple cycle turbine with a nominal generating capacity of 24 MW at ISO conditions and an hourly heat input of approximately 322 million Btu (MMBtu) at maximum continuous rated operation. Natural gas is not available at the Plant, and, therefore, the CTG will continue to burn No. 2 distillate fuel oil with a maximum sulfur content of 0.5 percent. The unit will also continue to operate as a peaking source limited to the current permit limit of approximately 2900 hours of operation per year.

The USEPA Air Quality Modeling Guidelines stipulate that the land use within the total area circumscribed by a 3-km radius about the source be classified using Auer's scheme of meteorological land use typing proposed in the *Journal of Applied Meteorology* (1976). A USGS 7.5-minute series topographical map was used to determine that more than 50 percent of the land use around the plant is classified as "A5: Water Surfaces". On this basis, rural dispersion coefficients will be used as an indicator of surface roughness.

The air quality analysis will include a discussion of conformance with good engineering practice (GEP) stack height considerations. Additionally, the effects of building

Mr. Cleve Holladay
Page 2

4 January 1993

downwash on the units at the plant will be included in the modeling through the appropriate downwash algorithms.

The modeling analysis will consist of three primary components:

- OK (1) A screening analysis of the CTG only to determine the unit's worst-case operating load and the significance of the ambient impacts,
- OK (2) A refined analysis of the CTG only to assess the area of significance and to define receptor grids for any applicable interactive analysis, and
- OK (3) An interactive analysis of those pollutants for which the CTG is predicted by the modeling to exceed the regulatory modeling levels of significance. The interactive analysis will assure compliance with AAQS and PSD increments.

EPA SCREEN will be used for the screening analysis to calculate one-hour concentration averages using "worst-case" meteorological assumptions and regulatory default options. The one-hour averages will be converted to averages representing other averaging intervals by using the following factors:

OK

Averaging Interval	Factor
1-hour	1.0
3-hour	0.9
8-hour	0.7
24-hour	0.4
Annual	0.1

OK ISCST2 will be used for the refined analysis and the interactive analysis. The terrain around the site is nearly flat, therefore, the use of a complex terrain model is not necessary and receptor elevations will not be included. The refined analyses will use real-time meteorological data collected in Miami in 1981 through 1985. This data was used in a previous analysis for the site (PSD review for two diesel engine generators approved 6 June 1989 as Permit Numbers AC 44-152197, PSD-FL-135) and is readily available for use. Regulatory default options will be selected, and the refined analyses will proceed from a coarse grid to a fine grid with a resolution of 100 meters.

OK Interactive analyses will be conducted if the CTG is predicted by the modeling to exceed the regulatory modeling levels of significance. If the impacts from the CTG are

Mr. Cleve Holladay
Page 3

4 January 1993

OK predicted to be below the levels of significance, the demonstration that the CTG will not cause or contribute to a violation of AAQS or PSD increments will be deemed complete and no further modeling will be conducted. Modeling parameters representing interactive sources will be obtained through FDER.

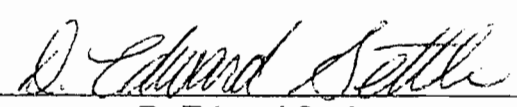
Impacts from the CTG on the Everglades National Park will be compared to the PSD Class I levels of significance (USEPA Memorandum, Calcagni to Maslany, September 10, 1991). If the CTG's impacts exceed the levels of significance, an interactive increment analysis will be conducted.

NPS

As we have discussed over the phone, we are tentatively planning on a meeting the morning of 19 January 1993 at the FDER offices in Tallahassee. Skip Jansen from City Electric System and Mike Henderson and I from Beck will attend the meeting. We hope to discuss the overall PSD application, the modeling protocol presented herein, the approach to the best available control technology determination, and a preconstruction monitoring exemption. Please call me (303/299-5280) or Mike Henderson (303/299-5234) if you have any questions or comments.

Very truly yours,

R. W. BECK AND ASSOCIATES



D. Edward Settle
Scientist
Environmental Services

DES:lef (F:\CC5801.D\B\LEF001ES.LTR)
cc: Skip Jansen
Mike Henderson

First week of February

Called MS @ 8:29

call back next week
Ed Settle to ^{to set up}
set up meeting ^{the} mty

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 @ 1125 Seventeenth Street @ Denver, Colorado 80202-3615 @ USA
Telephone (303) 299-5200 @ Fax (303) 297-2411

will send a table
of contents

FAX SHEET

WO #: CC 5801 DBL6 AB

DATE: 1/5/93

TO: Cleve Holladay

PHONE #: 904/922-6979

FROM: Ed Settle
303/299-5280

NUMBER OF PAGES (INCLUDING COVER): 4

MESSAGES: Cleve, Please call me to confirm we
can hold a meeting at your offices
the morning of Jan 19! Thanks,

Ed
If they have supply problem - they need letters

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

RECEIVED

DEC 29 1992

UTILITY BOARD OF THE CITY OF
KEY WEST (CITY ELECTRIC SYSTEM),

Dept. of Environmental Reg.
Office of General Counsel

Petitioner,

vs.

OGC CASE No. 92-1471

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION,

Respondent.

PETITIONER'S THIRD REQUEST FOR EXTENSION OF TIME

Pursuant to Rule 17-103.070, Florida Administrative Code, the Petitioner, UTILITY BOARD OF THE CITY OF KEY WEST (CITY ELECTRIC SYSTEM), by and through its undersigned counsel, requests a third extension of time to petition for an administrative hearing in connection with the Department of Environmental Regulation's Notice of Intent to issue a permit to operate two 100 MMBtu/hour heat input Fairbanks Morse diesel generators. In support of this third request for an extension of time, Petitioner states:

(1) By "Notice of Permit Issuance" dated August 6, 1992, filed August 7, 1992, and received by the Petitioner on August 11, 1992, the Department of Environmental Regulation notified Petitioner of its intent to issue Permit Number A044-207419 for the operation of two 100 MMBtu/hour heat input Fairbanks Morse diesel generators at the Stock Island Power Plant in Key West, Monroe County, Florida. The DER's Identification Number is 52FTM44000305. The DER's Permit/Certification Number is A044-207419 PSD-FL-135.

████████████████████

(2) The Petitioner disputes several of the emission limitations set forth in the Specific Conditions of the proposed permit. In order to discuss and resolve these issues with the appropriate personnel within the Department, Petitioner timely requested an extension of time to petition for hearing regarding the proposed permit. By Order filed on September 2, 1992, the request for extension of time until October 2, 1992, was granted.

(3) After discussions and correspondence with personnel within the Permitting and Standards Section of the Division of Air Resources Management, the Petitioner was advised by letter dated September 30, 1992, that the issues of concern could only be resolved through the submission of "a new application for permit to construct (modify)." While the Petitioner does not believe that the applicable rules require a modification to the construction permit in order to effectuate the requested changes in the operation permit, particularly in light of the documentation already contained within the Petitioner's application file, Petitioner did submit an application for a minor modification of its construction permit in order to reach an amicable resolution of the permit conditions.

(4) It was initially estimated by personnel within the Department's Bureau of Air Quality that the construction permit modification process would take approximately ninety (90) days to complete. Accordingly, Petitioner filed a Second Request for Extension of Time to file a Petition for Hearing until January 4, 1993. This request was granted by Order dated October 19, 1992.

(5) The undersigned counsel made inquiry of the status of the modification application to David Knowles with the South Florida District and was informed that the application had been assigned to Mr. Gary Maiers, who was then on vacation until January 4, 1993. Mr. Knowles was of the opinion that the matter would be acted upon shortly after Mr. Maiers' return, but certainly no later than thirty (30) days. The filing of this Third Request for Extension of Time was discussed with Mr. Knowles, and he agreed that the requested period of extension should be thirty (30) days. Petitioner does dispute the existing terms of the proposed operating permit and does not intend to waive its right to contest the proposed permit through the formal administrative hearing process should such action be necessary. At this time, however, a petition for formal administrative hearing would not serve the interests of either the Petitioner or the Department.

(5) The undersigned counsel has attempted to contact Claire Lardiner, counsel for the DER, but was unable to reach her to ascertain whether she concurred with this Third Request for Extension of Time to petition for an administrative hearing for a period of thirty (30) days, in order to provide an opportunity for the parties to resolve their differences.

WHEREFORE, the Petitioner, UTILITY BOARD OF THE CITY OF KEY WEST, requests an extension of time until February 3, 1993, in which to file its petition for a formal administrative hearing.

Respectfully submitted this 29th day of December, 1992.


ROSE, SUNDSTROM & BENTLEY
2548 Blairstone Pines Drive
Tallahassee, Florida 32301
(904) 877-6555



DIANE D. TREMOR

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished by Hand Delivery to the Clerk, Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; Daniel Thompson, Esquire, Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; Clair Lardiner, Esquire, Office of General Counsel, Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by U.S. Mail to Phil Edwards, Department of Environmental Regulation, South Florida District, 2295 Victoria Avenue, Fort Myers, Florida 33901, this 29th day of December, 1992.



DIANE D. TREMOR

Best Available Copy

**R.W. BECK
AND ASSOCIATES**

Denver National Bank Building, Suite 1900 @ 1125 Seventeenth Street @ Denver, Colorado 80202-2615 @ USA
Telephone (303) 299-5200 @ Fax (303) 297-3411

FAX SHEET

WO#: CC 5801 DB6 AB
TO: Cleve Holladay

DATE: 12/29/92
PHONE #: 904/922-6979

FROM: Ed Settle
303/299-5280 (direct)

NUMBER OF PAGES (INCLUDING COVER): 3

MESSAGE:

Please call your service provider if you have any problem receiving this transmission or did not receive the number of pages listed above.



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

October 28, 1992

Mr. R. Williams
Key West Electric System
1006 James Street
Key West, Florida 33041

Dear Mr. Williams:

The application processing fee for a plant modification that will increase air emissions by 5 or more tons per year, but less than 25 tons per year, of any single pollutant is \$1,000.00 per F.A.C. Rule 17-4.050(4).

Sincerely,

Willard Hanks

Willard Hanks
Air Permit Review Engineer

MESSAGE CONFIRMATION

OCT-29-1992 WED 11:28

TERM ID: DIV OF AIR RES MGMT F-9999

TEL NO: 904-933-8979

NO.	DATE	ST. TIME	TOTAL TIME	ID	DEPT CODE	OK	NG
981	10-28	11:27	00:00:43	3052942392		01	00



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

September 30, 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert R. Padron
Key West Electric System
1006 James Street
Key West, Florida 33041

Dear Mr. Padron:

Re: DER File Nos. AC44-152197/PSD-FL-135/AO44-207419
Rose, Sundstrom & Bentley File No. 20708.03

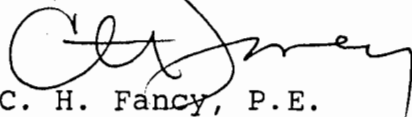
The Department has reviewed your attorney's August 26, 1992, letter requesting that the emission standards for NO_x, CO, and VOC in the proposed operation permit No. AO44-207419 for the two diesel engine electric generators near Key West be increased to adjust for the 97% generator efficiency. Approval of your request would result in an increase in the allowable emissions for these sources. An increase in allowable emissions is a modification by definition (F.A.C. Rule 17-2.100(136)) which requires a new construction permit. Regulations prohibit the emission standards in an operation permit from being less stringent than those in the applicable construction permit for the source (F.A.C. Rule 17-2.210(2)). Thus, the emission standards in the proposed operation permit cannot be relaxed unless the construction permits are modified.

If you desire and can justify higher allowable emission rates for these sources, please have your engineer submit a new application for permit to construct (modify) and another processing fee (based on the change in allowable emissions) to the Bureau of Air Regulation in Tallahassee. If the information is available, show where the 97% generator efficiency was noted in the original application and where the error was made in not using this efficiency in the evaluation.

If you would like additional information on this matter, please write to me or call Willard Hanks, review engineer, or Cleve Holladay, meteorologist.

Mr. Robert R. Padron
September 30, 1992
Page 2 of 2
Request to Increase Emission Standards

Sincerely,

A handwritten signature in black ink, appearing to read "C. H. Fancy". The signature is written in a cursive style with a large initial "C".

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

CHF/WH/plm

Attachment: Rose, Sundstrom & Bentley August 26, 1992, letter

cc: D. Knowles, SFD
B. Beals, EPA
C. Shaver, NPS
D. Trenor, Attorney

LAW OFFICES

ROSE, SUNDBSTROM & BENTLEY

A PARTNERSHIP INCLUDING PROFESSIONAL ASSOCIATIONS

2548 BLAIRSTONE PINES DRIVE

TALLAHASSEE, FLORIDA 32301

(904) 877-6555

ROBERT A. ANTISTA
CHRIS H. BENTLEY, PA
F. MARSHALL DETERDING
MARTIN S. FRIEDMAN, PA
JOHN R. JENKINS
ROBERT M. C. ROSE, PA
WILLIAM E. SUNDBSTROM, PA
DIANE D. TREMOR, PA
JOHN L. WHARTON

JOHN R. WODRASKA
SPECIAL COUNSEL
AND A MEMBER OF THE FLORIDA BARR

*Willard
Can you handle this?*

*2
Preston
8/27/92*

MAILING ADDRESS
POST OFFICE BOX 1567
TALLAHASSEE, FLORIDA 32302 1567
TELEPHONE: (904) 656-4029

August 26, 1992

VIA HAND DELIVERY

RECEIVED
AUG 26 1992

Division of Air
Resources Management

Mr. Preston Lewis
Department of Environmental Regulation
Division of Air Resources Management
Permitting and Standards Section
Twin Towers Office Building, 3rd Floor
2600 Blair Stone Road
Tallahassee, Florida 32399

*9-28-92
Greg Wozny, EPA,
said handle as
modification, EPA
would not require
OACT models to
revised. Woz*

Re: Key West Utility Board, Air Permit
DER's Permit/Cert. No.: A044-207419
Our File No. 20708.03

Dear Mr. Lewis:

Pursuant to our telephone conversation this morning, I am transmitting a copy of the DER's Notice of Intent to Issue Permit Number A044-207419; a letter dated July 8, 1992, from Michael Henderson, R.W. Beck and Associates, to Mr. Kenneth Tucker (DER, Ft. Myers); a follow-up letter dated July 10, 1992; correspondence dated August 28, 1991, from Coltec Industries to R. W. Beck; and a Request for Extension of Time filed on behalf of the Utility Board of the City of Key West.

As I explained, we are requesting that the maximum allowable emissions for NOx, CO and VOC, as contained within Specific Condition 4, page 6 of the proposed permit, be modified to reflect the three percent (3%) generator efficiency factor. The efficiency factor was mistakenly not accounted for during the construction permit process. We request that the "Maximum Allowable Per Engine" and the "Emissions Facility Total" figures for NOx, CO and VOC contained within proposed Specific Condition 4, be modified as follows:

Mr. Preston Lewis
August 26, 1992
Page 2

	Maximum Allowable Per Engine lb/hour	Emissions Facility Total TPY
NOx	161	301
CO	53.6	100
VOC	26.8	50

These modifications will correctly reflect the 97% generator efficiency in computing lb/hr, and the increases are not significant in terms of annual *de minimis* values under Rule 17-2.500, Florida Administrative Code.

Your assistance and cooperation in effectuating the above changes in the proposed permit are greatly appreciated. Please do not hesitate to contact me should you have any questions or concerns regarding this request for modification.

Very sincerely yours,



Diane D. Tremor
For the Firm

DDT:sn

Enclosures

cc: Robert Padron
Skip Jansen
Michael Henderson
David Knowles, DER, Ft. Myers

P 062 921 890



Receipt for Certified Mail

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

Sent to	
Robert Padron	
Street and No.	
Key West Elec. Sys	
City, State and ZIP Code	
Key West, FL	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	\$
Postmark or Date	9-30-92
AC 44-152197	
PSD-FL-135	
AO 44-207419	

PS Form 3800, June 1991

PS Form 3811, July 1983, 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN-TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. Show to whom, date and address of delivery.

2. Restricted Delivery.

3. Article Addressed to:
Robert R. Padron
Key West Electric Sys.
1006 James St.
Key West, FL 33041

4. Type of Service:	Article Number
<input type="checkbox"/> Registered	<input type="checkbox"/> Insured
<input checked="" type="checkbox"/> Certified	<input type="checkbox"/> COD
<input type="checkbox"/> Express Mail	P062 921 890

Always obtain signature of addressee or agent and **DATE DELIVERED.**

5. Signature - Addressee
X

6. Signature - Agent
X *[Signature]*

7. Date of Delivery

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

DOMESTIC RETURN RECEIPT



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

December 4, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert R. Padron, General Manager
Utility Board - City of Key West
City Electric System
Post Office Drawer 6100
Key West, Florida 33041-6100

Dear Mr. Padron:

Re: Expiration Date Extension for Construction Permit
AC 44-152197 (PSD-FL-135)

The Department has reviewed the above request contained in Ms. Diane D. Tremor's letters received October 30 and November 21, 1991, of which the latter included the appropriate processing fee. The request is acceptable and the following will be changed and added:

1. Expiration Date

From: December 31, 1991
To: May 1, 1992

2. Attachments to be Incorporated

- o Ms. Diane D. Tremor's letter received October 30, 1991.
- o Ms. Diane D. Tremor's letter and processing fee received November 21, 1991.

This letter must be attached to the construction permit, No. AC 44-152197 (PSD-FL-135), and shall become a part of the permit.

Sincerely,

STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

Mr. Robert R. Padron
Page Two

SS/BM/rbm

Attachments

cc: D. Knowles, SD
R. Helbling, SDBO
J. Harper, EPA
C. Shaver, NPS
D. Tremor, Esq., RS&B



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

TO: Steve Smallwood
FROM: Clair Fancy *CS*
DATE: December 4, 1991
SUBJ: Construction Permit Expiration Date Extension
Key West Utility - Stock Island Power Plant
AC 44-152197 (PSD-FL-135)

For your approval and signature is a letter containing an amendment that was prepared by the Bureau of Air Regulation to extend the expiration date of the above referenced construction permit. The facility is located in the City of Key West, Monroe County, Florida. There is no controversy associated with this action.

I recommend your approval and signature.

Attachment

SS/BM/rbm

P 617 884 130



Certified Mail Receipt

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

Sent to <i>Robert Padron</i>	
Street & No. <i>Utility Board - City of</i>	
P.O., State & ZIP Code <i>Key West, FL</i>	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	\$
Postmark or Date <i>12-16-91</i>	
<i>AC 44-152197</i>	
<i>PSD-FI-135</i>	

Key West

PS Form 3800, June 1990

LAW OFFICES
ROSE, SUNDBSTROM & BENTLEY
A PARTNERSHIP INCLUDING PROFESSIONAL ASSOCIATIONS
2548 BLAIRSTONE PINES DRIVE
TALLAHASSEE, FLORIDA 32301
(904) 877-6555

RECEIVED
DER - MAIL ROOM
1991 NOV 21 AM 11:00

ROBERT A. ANTISTA
CHRIS H. BENTLEY, P.A.
F. MARSHALL DETERDING
MARTIN S. FRIEDMAN, P.A.
JOHN R. JENKINS
ROBERT M. C. ROSE, P.A.
WILLIAM E. SUNDBSTROM, P.A.
DIANE D. TREMOR
JOHN L. WHARTON

MAILING ADDRESS
POST OFFICE BOX 1567
TALLAHASSEE, FLORIDA 32302-1567
TELECOPIER (904) 656-4029

November 20, 1991

JOHN R. WODRASKA
SPECIAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

Mr. Clair H. Fancy
Deputy Chief
Bureau of Air Quality Management
Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Key West Utility Board, Stock Island Power Plant;
Fee for Request for Extension of Permit Expiration Date
AC 44-152197 and PSD-FL-135

Dear Mr. Fancy:

In accordance with instructions from Patty Adams, I am enclosing a check in the amount of \$50.00 in connection with the request of Key West Utility Board, by correspondence dated October 30, 1991, for an extension of the expiration date of the referenced construction permit for the diesel generator project at the Stock Island Power Plant in Key West, Florida.

It is my understanding that, effective October 30, 1991, a \$50.00 fee is now required for requests for extension of permit expiration dates.

Please advise me if any further documentation is necessary in order to process our request for extension of the expiration date from December 31, 1991, to May 1, 1992.

Very sincerely yours,



Diane D. Tremor
For the Firm

DDT:sa
Enclosure
cc: Mr. Robert Padron
Mr. Robert Wallace
Bruce Mitchell, DER, Bureau of Air Quality

001023
1031

ROSE, SUNDSTROM & BENTLEY 04-87

7215

ATTORNEYS AT LAW
P. O. BOX 1567 PH. 877-6555
TALLAHASSEE, FL 32302-1567

November 20 19 91

63-66
631

PAY TO THE ORDER OF Department of Environmental Regulation

\$ *50.00*

Fifty and 00/100

DOLLARS

FIRST FLORIDA

FIRST FLORIDA BANK, N.A.
Downtown Tallahassee Office 901
215 South Monroe Street
Tallahassee, Florida 32301

FOR Key West Utility Board, Stock Island
Power Plant, AC 44-152197
PSD-FL-135

Maria Firdusa
Jeana C. Arce

SPECIAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

Mr. Clair H. Fancy
Deputy Chief
Bureau of Air Quality Management
Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Key West Utility Board, Stock Island Power Plant;
Fee for Request for Extension of Permit Expiration Date
AC 44-152197 and PSD-FL-135

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Very sincerely yours,

Diane D. Tremor

Diane D. Tremor
For the Firm

DDT:sa

Enclosure

cc: Mr. Robert Padron
Mr. Robert Wallace
Bruce Mitchell, DER, Bureau of Air Quality

001033
1031

BEST AVAILABLE COPY

LAW OFFICES

ROSE, SUNDSTROM & BENTLEY

A PARTNERSHIP INCLUDING PROFESSIONAL ASSOCIATIONS

2548 BLAIRSTONE PINES DRIVE

TALLAHASSEE, FLORIDA 32301

(904) 877-6555

RECEIVED

OCT 30 1991

Division of Air Resources Management

ROBERT A. ANTISTA
CHRIS H. BENTLEY, P.A.
F. MARSHALL DETERDING
MARTIN S. FRIEDMAN, P.A.
JOHN R. JENKINS
ROBERT M. C. ROSE, P.A.
WILLIAM E. SUNDSTROM, P.A.
DIANE D. TREMOR
JOHN L. WHARTON

MAILING ADDRESS
POST OFFICE BOX 1567
TALLAHASSEE, FLORIDA 32302-1567

TELECOPIER (904) 656-4029

October 30, 1991

JOHN R. WODRASKA
SPECIAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

Mr. Clair H. Fancy
Deputy Chief
Bureau of Air Quality Management
Department of Environmental
Regulation
2600 Blairstone Road
Tallahassee, Florida 32399-2400

*The permit
expire
12/31 & the
is timely,*

Re: Utility Board of the City of Key West
Extension of Permit Expiration Date
AC 44-152197 and PSD-FL-135

Dear Mr. Fancy:

Pursuant to our telephone conversation, this letter is to confirm the request of the Utility Board of the City of Key West for a further extension of the expiration date of the referenced construction permit for the diesel generator project at the Stock Island Power Plant. The requested extension is from December 31, 1991, to May 1, 1992.

The reason for this current request is our initial dissatisfaction with the results of the long-term performance testing conducted on behalf of the contractor. We do not believe it would be appropriate to apply for an operating permit until we are provided greater assurance that the diesel units will perform in full compliance with all applicable laws and regulations, and in accordance with the terms of our contract.

Testing to ensure that the diesel units meet all performance guarantees pursuant to the terms of our contract was conducted in August. While the results from the beginning portion (the first 100 hours) of the required 360-hour performance testing indicated compliance with our DER construction permit conditions, the results near the end of the 360-hour test period indicated increasing opacity or visual emissions from one of the units. We have discussed this situation with the contractor and it was agreed that additional testing will be performed during the first full week of

November, 1991. We intend to submit to the DER a new report containing the results of the upcoming compliance testing.

In order to meet the requirements of our construction permit with regard to the timely submission of an application for an operating permit, and to obtain assurance that the units will be in full compliance with all applicable regulations, we are requesting an extension of the expiration date of the construction permit to May 1, 1992. This should afford us sufficient time to complete whatever modifications may be required, complete the new testing and timely submit an application for an operating permit for this project. Within 45 days from the completion of any required modifications and successful compliance testing, or 90 days prior to the requested extended expiration date of the construction permit, whichever first occurs, the Utility Board will submit its operating permit application.

Your continued assistance and cooperation is greatly appreciated. Should you need additional information regarding this extension request, please feel free to contact me.

Very sincerely yours,



Diane D. Tremor
For the Firm

DDT:sa

cc: Mr. Robert Padron, General Manager, City Electric System
Mr. Robert W. Wallace, City Electric System
Mr. Marc K. Anderson, City Electric System
Mr. Skip Jansen, City Electric System
Mr. Dale Finigan, City Electric System
Ms. Becky Pattinson, R. W. Beck and Associates, Inc.
Mr. Garry Cornish, R. W. Beck and Associates, Inc.
Mr. R. J. Helbling, DER, Marathon office
Mr. D. M. Knowles, DER, Fort Myers

M. Baig
B. Mitchell



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400
Lawton Chiles, Governor Carol M. Browner, Secretary

July 19, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert R. Padron, General Manager
Utility Board - City of Key West
City Electric System
1006 James Street
P. O. Drawer 6100
Key West, Florida 33041-6100

Re: Permit Expiration Date Extension
Two Diesel Generators
AC 44-152197 and PSD-FL-135

Dear Mr. Padron:

The Department is in agreement with your request dated June 12, 1991, for an extension of the expiration date of the above permit. The following shall be changed and added to the permit:

Expiration Date:

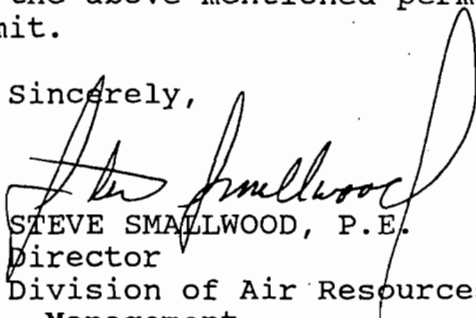
From: August 31, 1991
To: December 31, 1991

Attachment to be Added:

- Diane D. Tremor's letter received June 12, 1991.

This letter must be attached to the above mentioned permit and shall become a part of that permit.

Sincerely,


STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

SS/MB/plm

c: D. Knowles, SD



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

TO: Steve Smallwood
FROM: Clair Fancy *CF*
DATE: July 18, 1991
SUBJ: Amendment to Construction Permit AC 44-152197/PSD-FL-135
Key West City Electric System
Two Diesel Generators

Attached for your approval and signature is a letter extending the expiration dates for the above referenced construction permit.

The Bureau recommends approval of this amendment.

CF/MB/plm

Attachment

OK Thank you
for
7-29-91

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

- 1. Addressee's Address
- 2. Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Robert R. Padon, G.M.
 Utility Board - City of Key West
 1006 James St
 P.O. Drawer 6100
 Key West, Fl 33041-6100

4a. Article Number

P 832 539 829

4b. Service Type

- Registered
- Certified
- Express Mail
- Insured
- COD
- Return Receipt for Merchandise

7. Restricted Delivery

5. Signature (Addressee)

6. Signature (Agent)

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



PS Form 3811, October 1990

U.S. GPO: 1990-273-881

DOMESTIC RETURN RECEIPT

P 832 539 829



Certified Mail Receipt

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

Sent to	Robert Padon
Street & No.	Utility Board - City of Key West
P.O., State & ZIP Code	Key West, Fl
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	\$
Postmark or Date	7-26-91 AC 44-152197 PSD-FI-135

PS Form 3800, June 1990



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

June 25, 1991

Mr. L. T. Curry, Jr.
Utility Board of the City
of Key West
Post Office Drawer 6100
Key West, FL 33041-6100

Dear Mr. Curry:

Re: Relocation of Your General Electric Frame 5 (22 MW) Gas Turbine

This letter responds to your informal inquiry as to whether a construction permit is required to relocate your General Electric Frame 5 (22 MW) gas turbine from your Key West Power Plant to your Stock Island Power Plant. I concur with the oral opinion given to you by Cleve Holladay that the relocation of the turbine cannot be accomplished by amending the present air operating permit. Therefore, a construction permit is required.

Based on our calculations and information in our permitting files, the installation of the gas turbine at the Stock Island Plant would be a major modification as a result of significant net emission increases of SO₂ and NO_x. Based on information contained in our permit files, the Stock Island Plant is a major facility. Since the installation of the gas turbine is projected to be a major modification to a major facility, it would then be subject to Prevention of Significant Deterioration (PSD) requirements under Rule 17-2.500, F.A.C. In order to be exempt from the PSD rules, the turbine would have to be owned by the Utility Board and located on property contiguous or adjacent to the Stock Island Plant. Based on the information provided in your April 8, 1991 letter, the distance between the turbine's present location at the Key West Power Plant and the Stock Island Plant is approximately four miles and the facilities are not adjacent or contiguous.

For your convenience, I am enclosing copies of Chapter 17-2, F.A.C.; Chapter 17-4, F.A.C.; and a construction permit application. For PSD and BACT requirements, please refer to Rules 17-2.500 and 17-2.630, F.A.C. See Rule 17-4.050(4)(a), F.A.C., regarding our construction permit fees. It is expected that these fees will increase around November 1, 1991, so you should file your

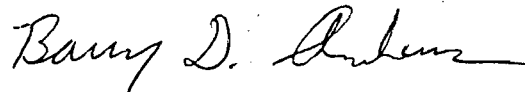
Mr. L. T. Curry, Jr.
Page Two
June 25, 1991

construction permit before that time. Please include all calculations, assumptions, and reference materials used in preparing the application and provide us six sets of the application. All required air dispersion modeling should be provided to us in both paper format and computer disk format. A professional engineer (PE) registered in Florida will have to seal the permit application and all technical information associated with it.

Because you did not seek a declaratory statement from the Department under Section 120.565, F.S. and Part III of Chapter 17-103, F.A.C., this opinion is not binding on you, the public, or the Department. Therefore, this letter does not constitute final agency action.

If you have any questions please call me or Cleve Holladay at (904)488-1344 or Gary Smallridge at (904)488-9730.

Sincerely,



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

CHF/CH/kt

enclosures

cc: D. Knowles, SF District
G. Smallridge, OGC

LAW OFFICES

ROSE, SUNDBSTROM & BENTLEY

A PARTNERSHIP INCLUDING PROFESSIONAL ASSOCIATIONS

2548 BLAIRSTONE PINES DRIVE

TALLAHASSEE, FLORIDA 32301

(904) 877-6555

ROBERT A. ANTISTA
CHRIS H. BENTLEY, P.A.
F. MARSHALL DETERDING
MARTIN S. FRIEDMAN, P.A.
JOHN R. JENKINS
ROBERT M. C. ROSE, P.A.
WILLIAM E. SUNDBSTROM, P.A.
DIANE D. TREMOR
JOHN L. WHARTON

MAILING ADDRESS
POST OFFICE BOX 1567
TALLAHASSEE, FLORIDA 32302-1567

TELECOPIER (904) 656-4029

June 12, 1991

RECEIVED

JUN 12 1991

Division of Air
Resources Management

Mr. Clair H. Fancy
Deputy Chief
Bureau of Air Quality Management
Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Utility Board of the City of Key West
Request for Permit Expiration Date Extension
Permit No. AC 44-152197 and PSD-FL-135

Dear Mr. Fancy:

On behalf of the Utility Board of the City of Key West, I am again requesting an extension of the expiration date of the referenced construction permit for the diesel generator project at the Stock Island Power Plant in Key West. The requested extension is from August 31, 1991, to December 31, 1991.

This request is necessary due to delays which have occurred on the part of the contractor and not as a result of the activities of the Utility Board of the City of Key West. You will recall that our last request for an extension resulted from contractor delays in deliveries of equipment and essential parts for the construction of our diesel units, and consequent delays in the scheduling of performance testing. Thereafter, an error in design resulted in a turbocharger bearing failure, again delaying performance testing. Approximately one week prior to the rescheduled performance testing in May, notice was received from the DER that the request submitted in February for approval of alternative test procedures had been denied. This caused yet another delay in the scheduled testing until the end of May and first of June.

Preliminary testing indicated that the cooling systems equipment will need to be modified in order to assure compliance with air quality limitations. The contractor anticipates that the modifications can be completed and performance testing conducted by the end of June, 1991. Our general consultant, R. W. Beck and Associates, Inc., has recommended that we request a 90-day extension on the construction permit to allow for completion of the equipment modifications and air quality and performance testing.

Mr. Clair H. Fancy
June 12, 1991
Page Two

While the Utility Board strongly desires to expeditiously complete the diesel generator project for the Stock Island Power Plant, in an abundance of caution and in order to avoid the necessity for any additional extension requests, an extension until December 31, 1991, for the expiration date of its construction permit is hereby requested. Should the modifications and successful performance testing occur as now scheduled, the Utility Board will submit its operating permit application to the DER within 45 days after the completion of compliance testing.

For the foregoing reasons, the Utility Board respectfully requests an extension of the expiration date of Permit No. AC 44-152197, PSD-FL-135, from August 31, 1991, to December 31, 1991.

Should you need additional information regarding this extension request, please do not hesitate to contact me.

Very sincerely yours,



Diane D. Tremor
For the Firm

DDT:sa

cc: Mr. Robert Padron, General Manager, City Electric System
Mr. Robert W. Wallace, City Electric System
Mr. Marc K. Anderson, City Electric System
Mr. Skip Jansen, City Electric System
Mr. Dale Finigan, City Electric System
Ms. Becky Pattinson, R. W. Beck and Associates, Inc.
Mr. Garry Cornish, R. W. Beck and Associates
Mr. Syed Arif, DER, Bureau of Air Quality
Mr. R. J. Helbling, DER, Marathon Office
Mr. D. M. Knowles, DER, Fort Myers

B. Anderson
M. King

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100

KEY WEST, FLORIDA 33041-6100

CERTIFIED MAIL
RETURN RECEIPT REQUESTED



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

APR 12 1991
DER-BAQM

April 08, 1991

Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Relocation of the General Electric Frame 5 (22 MW) Gas Turbine from the Key West Power Plant to the Stock Island Power Plant Facility

Dear Mr. Clair Fancy,

In accordance with our telephone conversation on Friday, April 05, 1991, this is to confirm our discussion on the above subject.

As discussed, it is our intention to relocate the Gas Turbine in an effort to facilitate the production operations of the City Electric System. As you are aware we are progressing in the process of decommissioning the Key West Power Plant Facility.

The plans are to move the Gas Turbine in late fall of 1991 or the winter of 1992. But it is necessary to build the foundation prior to the moving. Now, is the optimum time to install the foundation, due to the fact that we presently have a building expansion in progress to the Stock Island Steam Plant. As explained, all the facilities in that area have to be set on subterranean pile due to the soil conditions.

We plan to have a contractor on site in five (5) to seven (7) weeks to install piling for the Steam Plant expansion, at which time the piling for the Gas Turbine should also be installed. This would create a cost savings to the City Electric System as well as to our customers.

Also, as discussed there will be no change to the air operating permit.

The following is a list of attachments for your information:

1. Plan view of the Key West Facility showing the Gas Turbine in the existing location.
2. Plan view of the Stock Island Facility showing the Gas Turbine in the proposed

move 4 miles

Page 2 of 2

new location.

3. Plan view of the Island of Key West and Stock Island showing the over all distance of the move.
4. A copy of the existing air permit.

As we discussed it is hoped that this will be sufficient to satisfy the requirements necessary to execute this relocation move.

We are proceeding towards a May 10, 1991 date for the installation of the foundation of the Gas Turbine and would greatly appreciate your response prior to that time.

Thanking you in advance for your attention in this matter and if any other information is required, please let me know.

Very truly yours,

UTILITY BOARD-CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"
Robert R. Padron, Manager



L. T. Curry, Jr.
Special Projects Coordinator

LTC/me

cc:

R. Padron
C. Jansen
E. Baker
R. Wallace
Jim Greenshields, D.E.R.
David Knowles, D.E.R.

File

Attachments

Greg Wexley

operating as separate plants

Go through pre construction review

Look into PSD Rules
building structure, facility
SIC Code

not same or adjacent
probably have separate staffs

have 2 out of 3 but need all 3

substantial amount

↓
How long to disassemble
How long to reassemble
What would be specifications
vis a vis the old location

CF thinks there is a way but GS doesn't
think there is according to 17-103.152

to go for money

305-294-5272

X1403

old power plant

Please leave a message with person at switchboard

L.T. Curry

Decommission S

More gas turbine
no change to permit

help the air

moving in four sections
Accessory Comp
Generator
Turbine
Control Cops

Take them by barge and
put it on foundation

Adding on to Stock Island - ground out these
subterranean grout injection
34

October or November

Scout off foundation
Actual move

Can move any where up and down
Only building latitude to move almost to.
No.

Decommission
Whole Key West
to help air environment

very clean
can't pick up VE
on them
got all NOx anti
pollution equipment

L.T. Curry
exactly what
we want to
do next.

Air Quality
letter addressed
to either
write

April 30, 1971

Interoffice Memo

To: Clair Faray

From: Clark Holliday
720: Barry Lindquist

Subject: Relocation of the General Electric Frame 5
(22 MW) Gas Turbine from the Key West Power
Plant to the Stock Island Power Plant Facility

The applicant intends to relocate the gas turbine ^{to the Stock Island Power Plant} to the east of the Key West Power Plant, which is in the process of being decommissioned. I consulted with Gary Smallbridge of OGC about how to handle the proposed relocation. He and I both agree that the air permitting rules as we understand them do not allow a single amendment to the air operating permit. The proposed move would be a modification to an existing major facility (Stock Island Power Plant). Therefore, at the least, an ^{air} construction permit would be required under Rules 17-2.210(1) and 17-2.520. The applicant could also be subject to the PSD rules 17-2.500. Since the applicant is not proposing that this turbine would be in operation for less than two years, the applicant could not claim an exemption to the PSD rules via the relocatable facilities exemption (17-2.500(3)(a)).

another island

Doesn't fall within
Exemptions 15 17-4.040

17-4.030 states that any start
installation can't be operated w/o
permits

They The two details located there were
subject to PSD in 1988 (850-FL-155)

Talked
to Carol
for 18 min

Re notice

17-4.080 If it was not under this rule, by 17-2.100(125) it
could not increase actual

1st
notice
17-2.500
17-2.500

We would ^{notice} Dept's receipt of application to modify 17-103.150
They would presumably publish in newspaper in that area
notice would be published one time ^{the} complete application file

2nd
notice
17-2.500
17-2.500

Indicate whether to grant or deny
within

Reasonable assurances: 1) Em wouldn't go up
2) Not a substantial part of construction

ROSE, SUNDBSTROM & BENTLEY

A PARTNERSHIP INCLUDING PROFESSIONAL ASSOCIATIONS

2548 BLAIRSTONE PINES DRIVE
TALLAHASSEE, FLORIDA 32301

(904) 877-6555

MAILING ADDRESS
POST OFFICE BOX 1567
TALLAHASSEE, FLORIDA 32302-1567

TELECOPIER (904) 656-4029

CHRIS H. BENTLEY, P.A.
F. MARSHALL DETERDING
MARTIN S. FRIEDMAN, P.A.
JOHN R. JENKINS
ROBERT M. C. ROSE, P.A.
WILLIAM E. SUNDBSTROM, P.A.
DIANE D. TREMOR
JOHN L. WHARTON

February 11, 1991

RECEIVED

FEB 12 1991

DER-BAQM

Mr. Clair H. Fancy
Deputy Chief
Bureau of Air Quality Management
Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Utility Board of the City of Key West's Extension of Time for
Expiration Date of Construction Permit No. AC 44-152197, PSD-
FL-135 (Diesel Generator Project - Stock Island Power Plant)

Dear Mr. Fancy:

This letter will confirm our telephone conversation of this date regarding an extension of time for the expiration date of the construction permit for the two diesel generators at the existing Stock Island Power Plant in Key West, Monroe County, Florida.

The current expiration date of our construction permit is April 1, 1991. By letter dated December 27, 1990, a copy of which is attached, the Utility Board of the City of Key West requested a 60-day extension of the expiration date. That extension request was occasioned by delays in deliveries of equipment and essential parts on the part of our contractor for the construction of the diesel units. At the time we requested that 60-day extension, we were advised by the contractor that performance testing of the engines would occur between January 30 and February 19, 1991.

We have now been advised by our contractor that source testing is scheduled for the week of March 11, 1991. A copy of the Test Protocol has been previously forwarded to you by letter dated February 8, 1991. Provided this schedule is adhered to by the contractor and the testing firm, we believe that we would be in a position to submit our application for an operating permit within 45 days after the completion of compliance testing.

However, Specific Condition No. 9 of our current construction permit requires that the operating permit application be submitted to the DER at least 90 days prior to the expiration date of the construction permit, or within 45 days after completion of compliance testing, whichever occurs first. Accordingly, and in

Mr. Clair H. Fancy
February 11, 1991
Page Two

order to assure compliance with that condition, we respectfully request an additional 45-day extension of the construction permit to extend the expiration date to July 15, 1991.

It is the ongoing intention and strong desire of the Key West Utility Board to complete the diesel generator project for the Stock Island Power Plant in compliance with permit conditions. The delays which have occurred have been entirely beyond its control, and have resulted from changing schedules from the contractor.

Should you need additional information regarding this request for extension of the expiration date of our construction permit until July 15, 1991, please do not hesitate to contact me.

Very sincerely yours,



Diane D. Tremor
For the Firm

DDT:sa

Enclosure

cc: Mr. Robert Padron, General Manager, City Electric System
Mr. L.T. Curry, City Electric System
Mr. Robert W. Wallace, City Electric System
Mr. Marc K. Anderson, City Electric System
Mr. F. Donovan, R. W. Beck and Associates, Inc.
Mr. R. M. Pattinson, R. W. Beck and Associates, Inc.
Mr. Garry Cornish, R. W. Beck and Associates, Inc.
Mr. Syed Arif, DER, Bureau of Air Quality
Mr. R.J. Helbling, DER, Marathon Office
Mr. D. M. Knowles, DER, Fort Myers

BA/CHF 2-15-91 ARM



Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

February 14, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert R. Padron, General Manager
Utility Board - City of Key West
City Electric System
1006 James Street
P. O. Drawer 6100
Key West, Florida 33041-6100

Re: Permit Expiration Date Extension
Two Diesel Generators
AC 44-152197 and PSD-FL-135

Dear Mr. Padron:

The Department is in agreement with your request dated December 27, 1990, for an extension of the expiration date of the above permit. The following shall be changed and added to the permit:

Expiration Date:

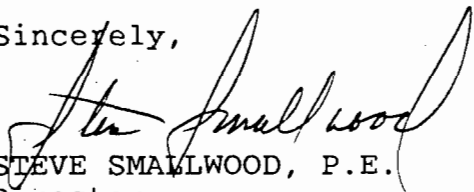
From: April 1, 1991
To: August 31, 1991

Attachment to be Added:

- Robert W. Wallace's letter received December 31, 1990.

This letter must be attached to the above mentioned permit and shall become a part of that permit.

Sincerely,


STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

SS/MB/plm

c: D. Knowles, SF District



State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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

Interoffice Memorandum

TO: Steve Smallwood
FROM: Clair Fancy *CF*
DATE: February 13, 1991
SUBJ: Amendment to Construction Permit AC 44-152197
and PSD-FL-135
Key West City Electric System
Two Diesel Generators

Attached for your approval and signature is a letter extending the expiration dates for the above referenced construction permit.

The Bureau recommends approval of this amendment.

CF/MB/plm

Attachment

OK / [Signature]

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100

KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RECEIVED

January 24, 1991

JAN 31 1991

DER - BAQM

Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Revised Schedule for Source Testing, Construction Permit No. AC
44-152197

RE: Our Letter, January 14, 1991

Dear Mr. Fancy,

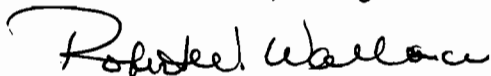
Due to delays in systems checkout by our Contractor, we are behind on our scheduled date for source testing of our new Diesels.

Currently we expect that first run of the Diesels can occur February 6 thru 10. We should be able to begin Source Testing on February 11, 1991.

If I maybe of further assistance regarding this matter, or additional information is required please call me.

Sincerely,

UTILITY BOARD-CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"
Robert R. Padron, Manager


Robert W. Wallace
Results Supervisor

RWW/me

cc:
R.R. Padron
L. T. Curry, Jr.
M. Anderson
T. Donovan, R. W. Beck and Associates
B. Pattinson, R. W. Beck and Associates
D. M. Knowles, FDER, Ft. Myers
R. J. Helbling, FDER, Marathon Office

File

BEST AVAILABLE COPY

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100

KEY WEST, FLORIDA 33041-6100

CERTIFIED MAIL
RETURN RECEIPT REQUESTED



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

RECEIVED
December 27, 1990
DEC 31 1990
DER-BAQM

Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Extension of time to expiration date for construction Permit
No. AC 44-152197, PSD-FL-135

Dear Mr. Fancy,

Our contractor for the above referenced permit is behind in his construction schedule. The contractor claims late deliveries of equipment and essential parts as the reason for an 8 week delay in the completion of his contract.

The expiration date of our construction permit is April 01, 1991. We would appreciate an extension of 60 days to the scheduled date of expiration on this permit to allow our contractor time to complete the job.

If I maybe of further assistance in this matter, or additional information is required please call me.

Sincerely,

UTILITY BOARD-CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"
Robert R. Padron, Manager


Robert W. Wallace
Results Supervisor

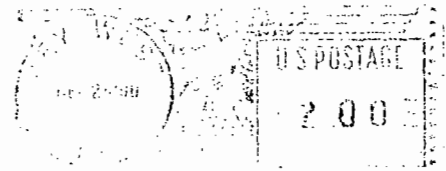
RWW/me

cc:
R.R. Padron
L. T. Curry, Jr.
M. Anderson
T. Donovan, R.W. Beck and Associates
B. Pattinson, R. W. Beck and Associates
D. M. Knowles, FDER, Ft. Myers
R. J. Helbling, FDER, Marathon Office

File

Q. Wright - EPO

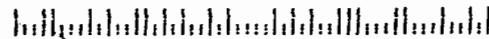
UTILITY BOARD  OF THE CITY OF
KEY WEST, FLORIDA
33041-6100



Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400



RETURN RECEIPT
REQUESTED





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

JUL 11 1990

4APT-AEB

Mr. Clair H. Fancy, P.E.
Division of Air Resources Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RECEIVED
JUL 16 1990
DER-BAQM

Re: Permit AC 44-152197, PSD-135
Key West City Electric System, Key West, Florida
Diesel Engine Generators

Dear Mr. Fancy:

By the July 2, 1990, letter (enclosed) from Mechanical Systems, Incorporated, to Paul Reinermann of my staff, we were requested to evaluate the proposed opacity CEM locations for the two diesel engine generators under construction by the Key West City Electric System. Since your agency has jurisdiction in this matter, we believe that you should respond to their request. However, the following comments on their proposal are provided for your consideration.

1. We believe that their proposal is reasonable and should be approved. The installation of one opacity CEM on the combined stack appears to be prohibitive due to the high stack gas temperature. In addition, the two opacity CEMs should better allow the source operator to determine which diesel engine is malfunctioning.
2. Their request to assume maximum flow rate when converting NO_x CEM data to an emission rate in lb/h is acceptable since it will result in a conservative estimate of NO_x emissions.

If you have any questions regarding this letter, please contact Paul Reinermann at 404/347-2904.

Sincerely,

Jewell A. Harper, for
Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides and Toxics
Management Division

Enclosure

C: S.A.M.

FAX (608) 249-7425

3610 LEXINGTON AVENUE (53714) • POST OFFICE BOX 7335 • MADISON, WISCONSIN 53707-7335 • PHONE (608) 249-6633

July 2, 1990

Environmental Protection Agency
Region IV
345 Courtland Street
Atlanta, Georgia 30365

Attn: Mr. Paul Reinermann
4th Floor Air Division

Re: Permit AC 44-152197, PSD-FL-135
Diesel Engine Generators
Key West City Electric System
Key West, Florida

Dear Mr. Reinermann:

Attached is a proposed layout of the opacity monitors and stack sample probes for the above referenced project. We would appreciate your review and comment.

We have tentatively planned to locate the instruments to monitor the diesel engine exhaust gases in the outlet tube on the inside of the mufflers. This unusual installation was a result of being unable to find any other satisfactory location that would guarantee accuracy and allow system accessibility for performing quarterly audits and routine maintenance. The manufacturer of the monitoring equipment refused to warranty the opacity monitors if the transmissometers and retroreflectors were located on the common stack. They believe from past experience that convective heat from the uninsulated stack operating at 750°F would damage the instruments in a short period of time. This could occur from heat rising from below on calm days or from being on the downstream side of the stack on windy days.

This heat would not only jeopardize the accuracy and operation of the instruments but would also make routine maintenance difficult if not impossible. Guaranteeing the safety of personnel attempting to reach the stack mounted instruments became an overriding issue. We found no satisfactory method to protect an individual attempting to climb the stack access ladder within one foot of the 750°F stack. Limiting access to the opacity monitors to times when the engines were not running was considered but was rejected as being unacceptable from a regulatory standpoint and impractical from an operational standpoint. Locating the monitoring instruments on the outside of the muffler heat shield as shown became the only viable option.

The decision to locate the monitoring equipment on the mufflers will require expensive field modification of the mufflers which are already onsite as well as the addition of four new access platforms to service the CEM equipment. Two new platforms will be supplied for each muffler as shown on the drawings. We have

Environmental Protection Agency
July 2, 1990
Page 2

indicated to the equipment supplier that unless another acceptable option is found, there would be no choice in the matter. Marginal installations of continuous emission monitoring equipment which cannot be serviced are not likely to be accepted or remain in compliance. If you see any other options that would help make the system operate better or be easier to service, please let us know.

We would appreciate your guidance on one item which we need to resolve as soon as possible. The permit for this facility requires reporting emissions on a time basis. Would it be acceptable to assume a maximum flow velocity for exhaust gas flow regardless of the actual velocity? This maximum flow rate will be established very precisely since the engines in question will be extensively shop tested prior to delivery to the site. We would use this value for all calculations. This would assume a worst case situation for all engine loads.

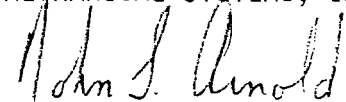
Shop testing will also accurately document fuel flow versus exhaust gas flow. As an alternate to assuming maximum exhaust flow at all times, we could use a fuel flow signal to accurately express variable exhaust gas flow rates. Please let us know which if either of these methods to generate flow signals is acceptable.

We have placed two test ports on each muffler at elevation 22'-3". This location is between the gas sample port at elevation 21'-7" and the opacity monitor at elevation 23'-6". We have also requested that the equipment supplier install an extra 4" sample port for future monitoring equipment at elevation 21'-0". Even though this additional sample port adds some expense at this time, the additional cost is relatively minor if all modifications to the muffler are made at one time. Given the uncertainty concerning future monitoring requirements, we would like to be safe and avoid additional muffler modifications. In this regard we would appreciate knowing if you believe other sample locations would be justified or beneficial.

Thank you for your cooperation on this project.

Sincerely,

MECHANICAL SYSTEMS, INC.

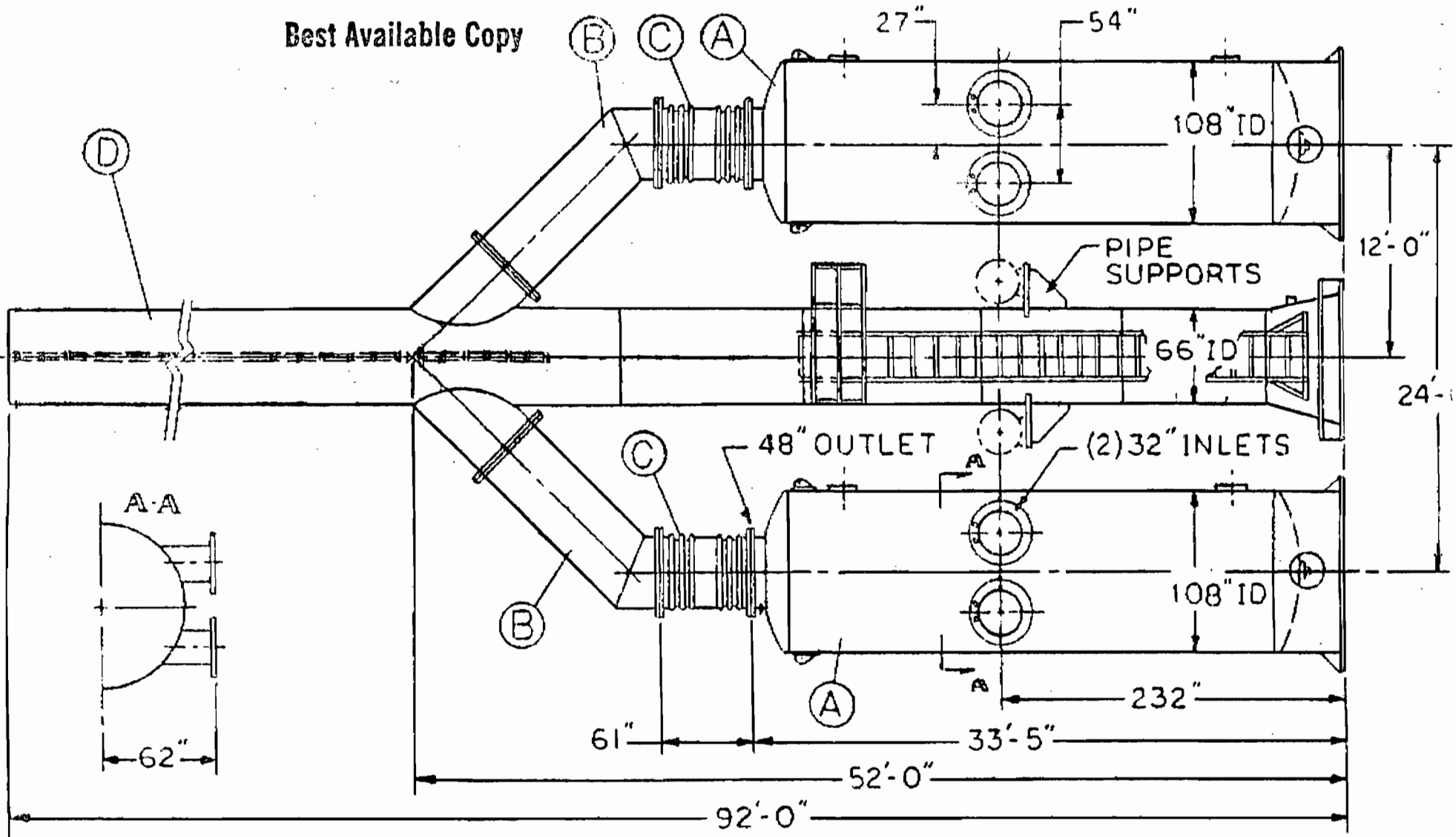


John L. Arnold

JLA/cs

cc: M. Weiss, Coltec
J. Wood, Coltec

Best Available Copy



REF. DRAWINGS
NOTED

DIMENSIONS ARE CERTIFIED
FOR COLT INDUSTRIES

P.O. NO. 928845-H

#COUNTING BRACKETS YES NO
INSPECTION PORT YES NO

NOTES

INSTALL IN VERTICAL POSITION
EXTERNAL FINISH GRAY PRIMER
SCALE 1/8" = 1'-0"

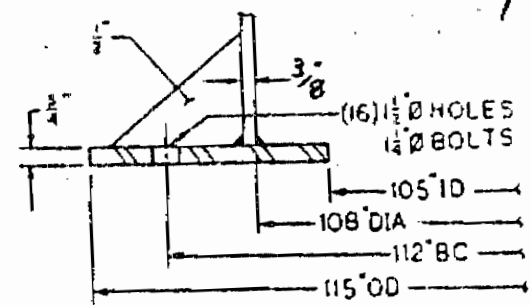
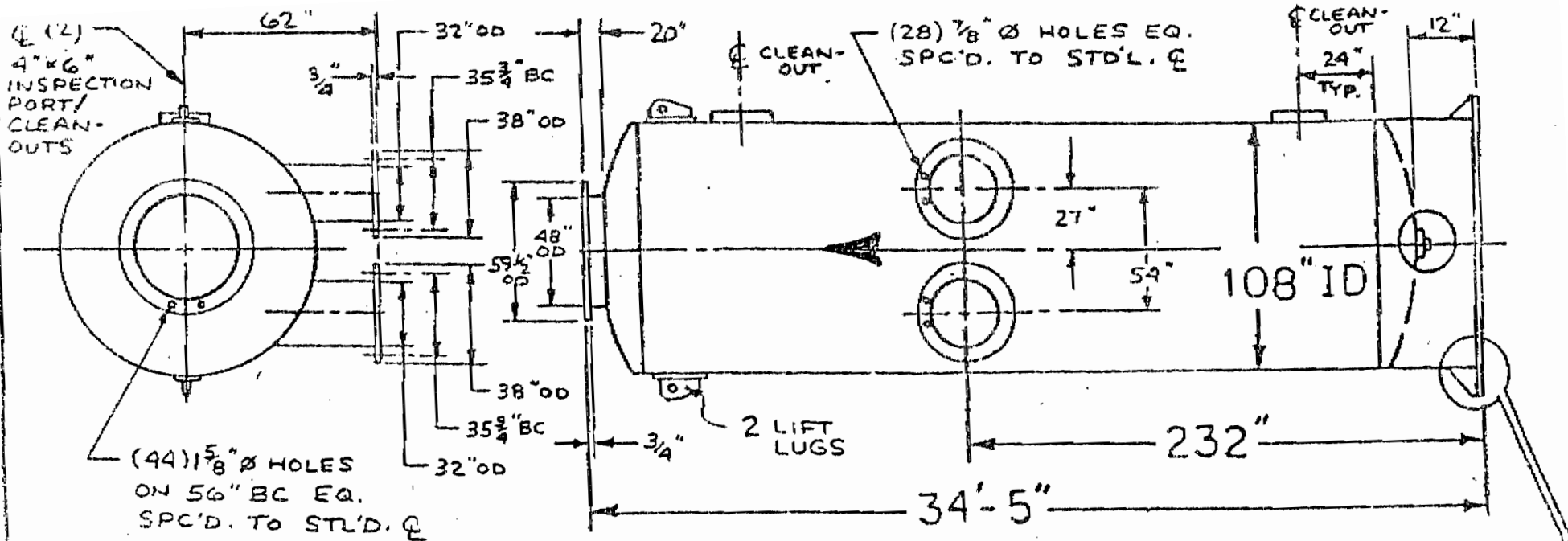
TOLERANCES SHOWN ARE MAX.
FLANGE TOLERANCES ARE AS FOLLOWS:
BOLT HOLE CIRCLE .0625
BOLT HOLE SPACING .0625
BOLT HOLE LOCATION W/RESPECT TO PART CENTER LINE .0625

2	REVISED PER CUST.	11/14 '89	E
1	REVISED PER CUST.	10/1 '89	TC



EXHAUST SILENCER
AND STACK ASS'Y.

DWN. TC	S.O. NO.
CK. <i>cmt</i>	68164-A
DATE 9-14-89	



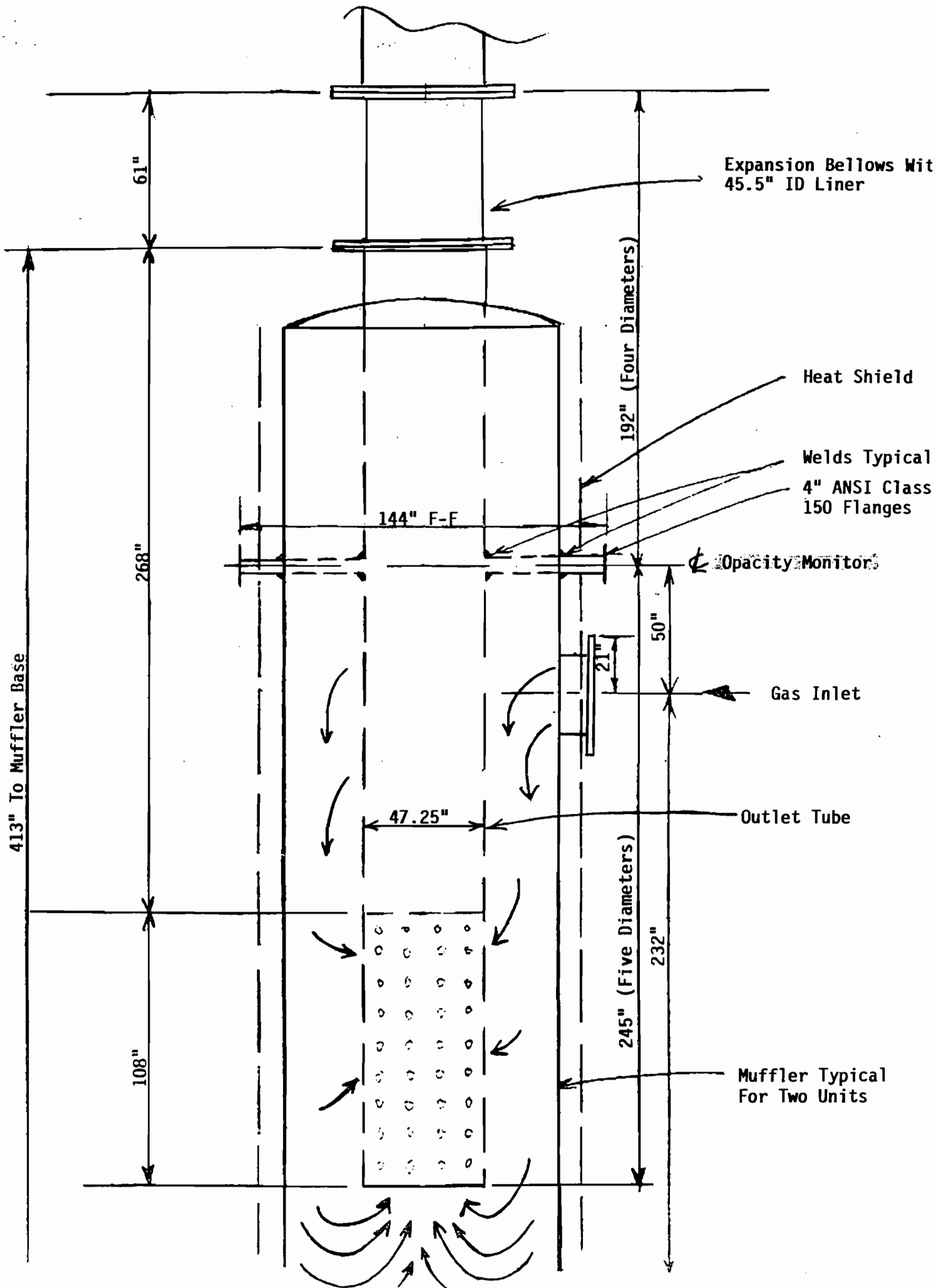
FLOW : 157,000 LBS/HR EXHAUST AIR
 TEMP : 745 F EXHAUST
 TOTAL EXHAUST SYSTEM PRESSURE DROP : 7.0" W.C.

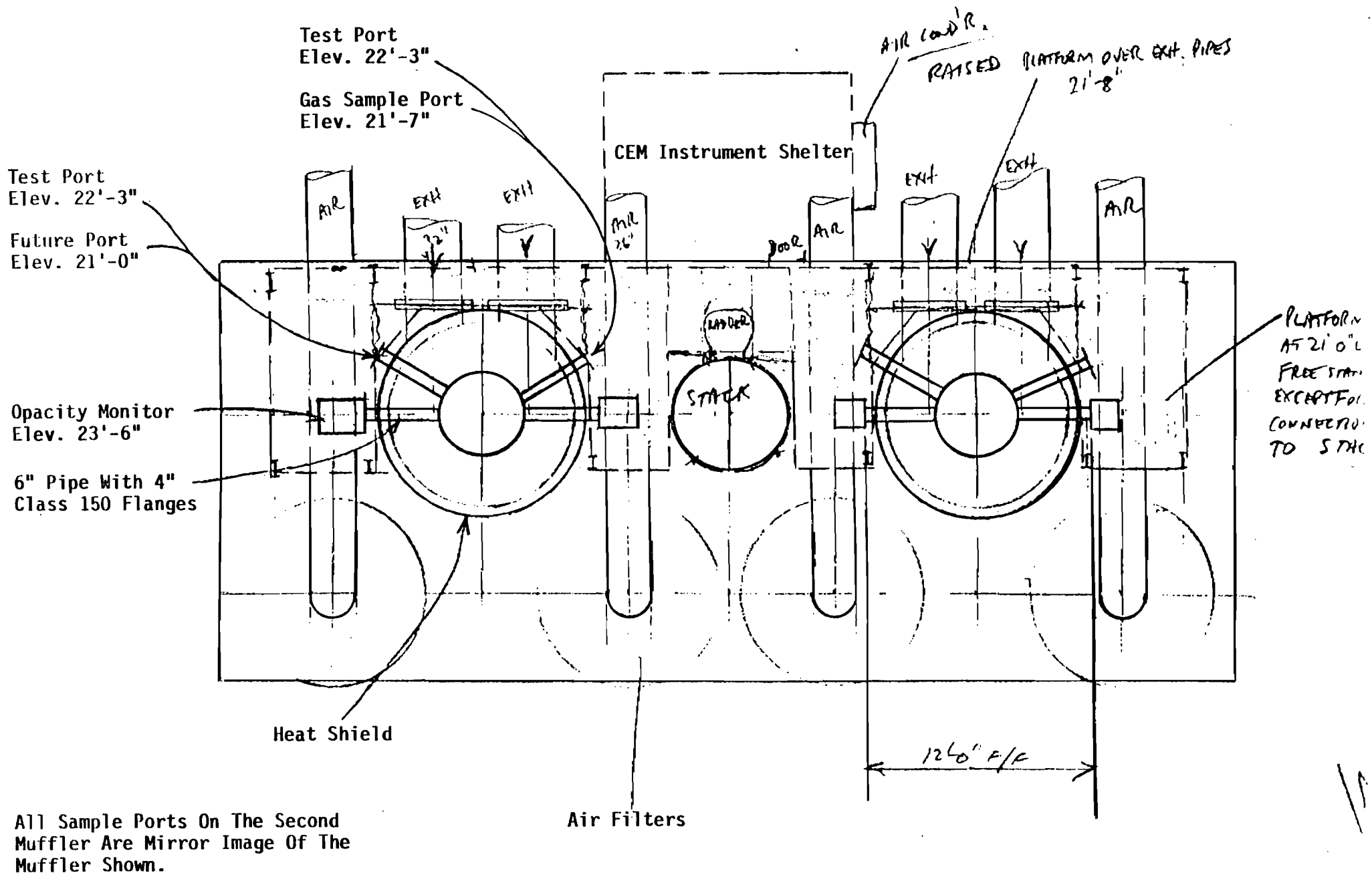
REF. DRAWINGS 10000-1104 5165-4248A-0 5101-4248A-0
DIMENSIONS ARE CERTIFIED
FOR COLT INDUSTRIES
P.O. NO. 928845-H
MOUNTING BRACKETS YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
INSPECTION PORT YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
DATE 10/6/89 BY TC

NOTES	
QTY. REQ'D. : TWO(2)	
INSTALL IN VERTICAL POSITION	
EXTERNAL FINISH SHOP GRAY PRIME	
EST. WT. 20,166# EA.	
TOLERANCES SHOWN ARE MAX.	
FLANGE TOLERANCES ARE AS FOLLOWS:	
BOLT HOLE CIRCLE	.0625
BOLT HOLE SPACING	.0625
BOLT HOLE LOCATION W/RESPECT TO PART CENTER LINE	.0625
FACE VARIATION TO INDICATED PLANE WITH A MAX. VARIATION OF 1/4"	± 1/2°

2	DAL WAS 33'-5"	3/90	TC
1	WERE (4) LIFT LUGS & CLEAN-OUTS ADDED	11.14 '89	TC
NO.	REVISION		

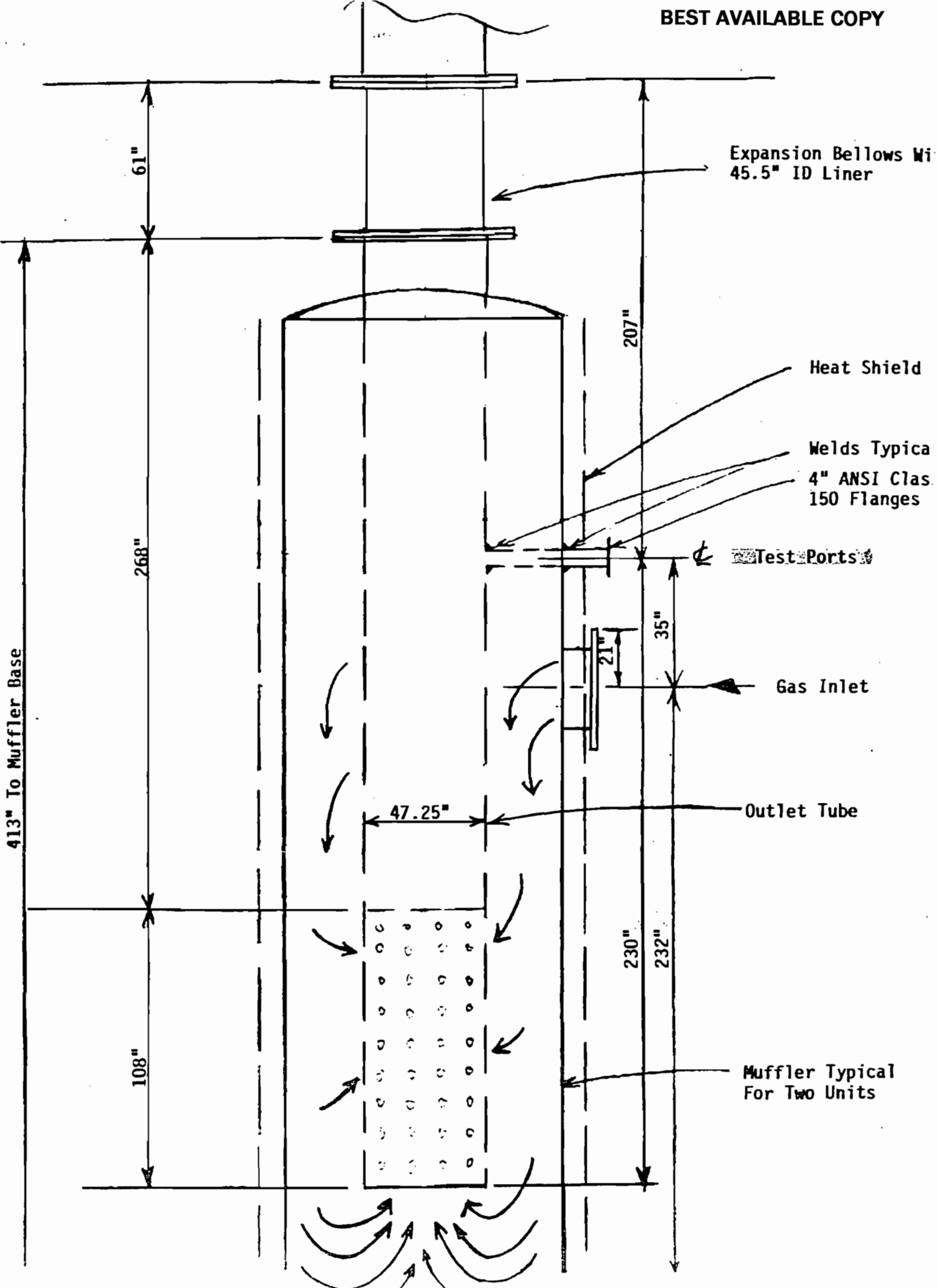
BURGESS-MANNING	
BMA-H-48 EXHAUST SILENCER - W/ SKIRT & DUAL 32" HI-SIDE INLETS	
DWN. TC	S.D.NO.
CK. ant	68164-
DATE 10/6/89	
PART NO.	MOD/F

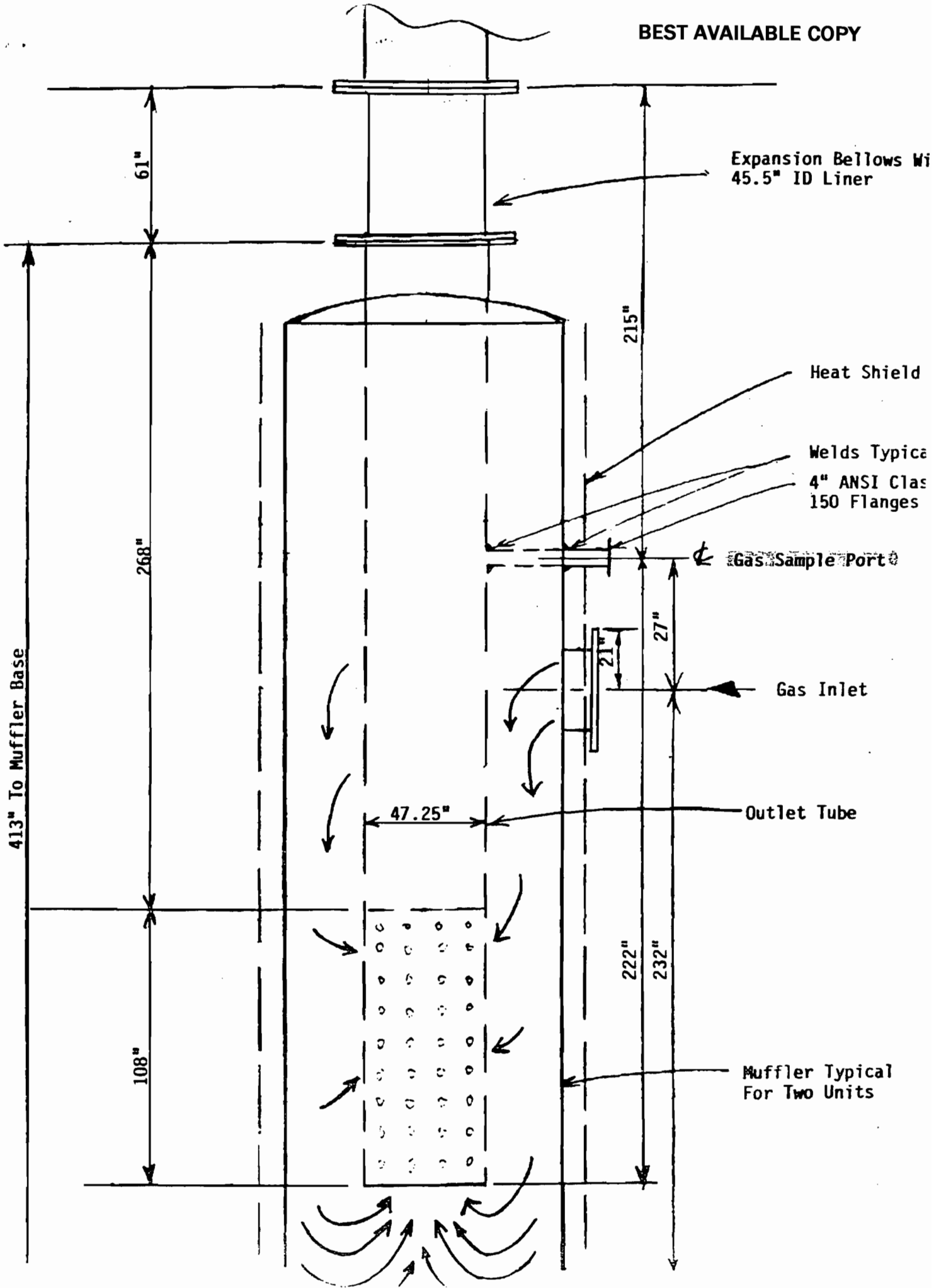


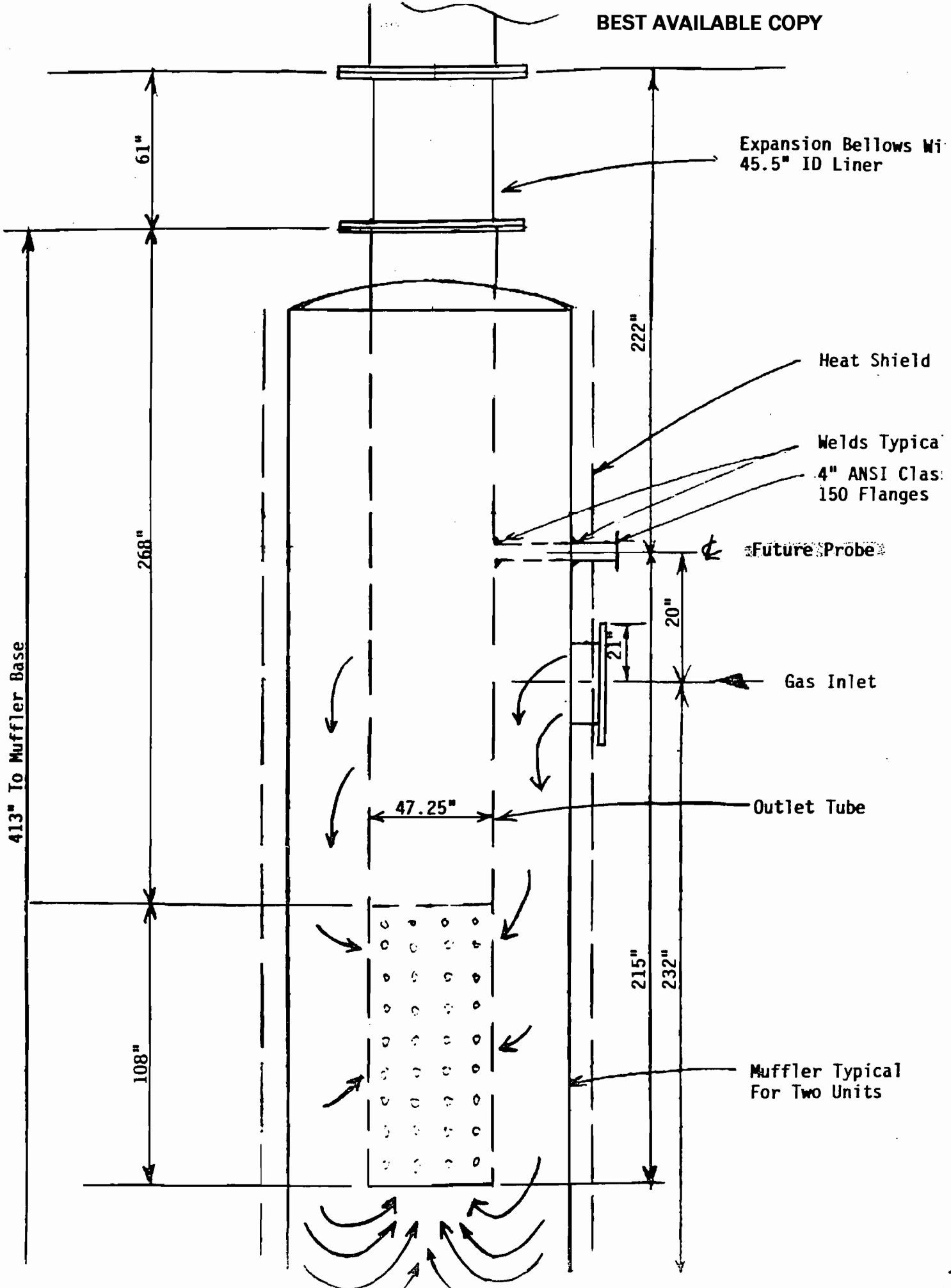


All Sample Ports On The Second Muffler Are Mirror Image Of The Muffler Shown.

J. G. Brown







June 22 1989



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

JUN 19 1989

4APT/APB-aes

Mr. C. H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RECEIVED

JUN 22 1989

DER-DAQM

Re: Key West Electric System (PSD-FL-135)

We have reviewed your June 6, 1989, letter containing the final determination and permit for the proposed construction of two diesel generators to be located at the Stock Island facility in Monroe County, Florida. We concur with Florida's evaluation of this project.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

cc: Mr. Robert R. Padron
Key West Electric System
1006 James Street
Key West, Florida 33041

copied to:
P. Raval
B. Andrews
S. Lee
S. P. ...
at lot

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE. \$300

AIR-4

Mr. C. H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400





Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

Mr. Robert R. Padron
Key West Electric System
1006 James Street
Key West, Florida 33041


June 6, 1989

Enclosed is permit No. AC 44-152197, PSD-FL-135, for the two diesel generator project to be located at the Stock Island facility in Monroe County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

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

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

Copy furnished to:

D. Knowles, SF District
W. Aronson, EPA
C. Shaver, NPS
D. Swann, P.E./ M. Henderson, R.W. Beck

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on June 6, 1989.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to
§120.52(9), Florida Statutes, with
the designated Department Clerk,
receipt of which is hereby
acknowledged.

Juis A. Littleton June 6, 1989
Clerk Date

Final Determination

Utility Board of the City of Key West
Key West, Monroe County, Florida

Diesel Engine Generating Station

Permit Numbers:

AC 44-152197

PSD-FL-135

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

June 2, 1989

Final Determination

Key West's permit application for the two diesel engine generator facility at the Stock Island Plant in Monroe County, Florida, has been reviewed by the Bureau of Air Quality Management. Comments were received in response to the Public Notice published in The Key West Citizen on April 19, 1989. The Public Notice was also published in The Florida Keys Keynoter, and The Reporter.

A comment was received from EPA (Attachment 16) requesting a re-evaluation of the BACT determination. EPA has since met with the applicant and DER to discuss and resolve the various BACT issues. The BACT determination will be amended to reflect consideration of EPA's comments.

Comments dated April 25 (Attachment 17) and May 24 (Attachment 18), 1989, were received from the City of Key West justifying the BACT determination and requesting that operational limits be put on a facility basis instead of each engine. The Department will reword Specific Condition Nos. 1 and 4 to reflect agreement with the comment on operational limits. Also the permit expiration date will be extended to allow adequate time for construction.

The final action of the Department will be to issue the permit as proposed in the Preliminary Determination with amended Specific Conditions Nos. 1 and 4, as mentioned above, and a revised expiration date.

Best Available Control Technology (BACT) Determination
Key West City Electric System
Monroe County

The applicant proposes to install two diesel generators at their Stock Island Plant at Key West, Monroe County, Florida. The generation facility will consist of two diesel engines with an electric generation capability of 9,605 kw each. The total heat input per engine is 100 MMBtu/hr.

The applicant has indicated the maximum total annual tonnage of regulated air pollutants emitted from the two engines based on 8,760 hours per year operation to be as follows:

Pollutant	Max. Potential Emissions (tons/yr)	PSD Significant Emission Rate tons/yr
NO _x	2,100	40
SO ₂	440	40
PM ₁₀	90	15
CO	520	100
VOC	260	40
Pb	0.05	0.6
Hg	0.01	0.1
Be	0.0005	0.0004

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

BACT Determination Requested by the Applicant

The BACT Determinations requested by the applicant on a pollutant by pollutant basis are given below:

Pollutant	Determination
NO _x	8.0 g/hp-hr
SO ₂	Low sulfur fuel (sulfur content of diesel will be limited to 0.5%)
PM ₁₀	0.1 lb/MMBtu
CO	2.0 g/hp-hr
VOC	1.0 g/hp-hr
Be	0.0005 tons per year

Date of Receipt of a BACT Application

September 23, 1988

Review Group Members

This determination was based upon comments received from the applicant and the Stationary Source Control Section.

BACT Determination Procedure:

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination will be based on the maximum degree of reduction of each pollutant emitted which the Department, on a case-by-case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination, the Department shall give consideration to:

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

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

BACT Analysis

A review of previous BACT determinations and control measures utilized for stationary large bore diesel engines indicates that

in general the emission rates proposed by the applicant do not represent BACT. The rationale for establishing BACT at a lower than proposed level for the applicable pollutants is presented as follows:

Nitrogen Oxides

The emission of nitrogen oxides from stationary large bore diesel engines has in recent years become a concern in the BACT decision making process. A review of the various technologies used to generate electricity indicates that large bore diesel engines are by far the greatest emitter of nitrogen oxides on a heat input basis. This is illustrated by comparing the proposed emission limit for the diesel engines to New Source Performance Standards or typical BACT determinations for the other common electrical power generating technologies as follows:

<u>Source</u>	<u>NO_x Emission Level (lb/MMBtu)</u>
Key West Diesels (Proposed BACT)	2.35
Steam Generating Units (Industrial-Commercial-Institutional)	0.20
Resource Recovery (uncontrolled)	0.5 - 0.65
Oil Fired Turbines	0.40
Electric Utility Steam Generating Units	0.30

Based on the comparison shown above, the BACT determination will concentrate on the economics and pragmatics of using the following four alternate power production/control strategies.

- 1) Oil Fired Turbines
- 2) Combined Cycle
- 3) Timing Retardation
- 4) Selective Catalytic Reduction

Turbines, like internal combustion engines, are capable of firing both gaseous and liquid fuels. This ability to fire liquid fuels is an important consideration since natural gas is not available on Key West. From an environmental standpoint the use of turbines is advantageous because the NO_x emissions can be controlled to levels much less than the proposed 8.0 g/hp-hr through the use of inexpensive control techniques such as steam injection.

Similar to the turbine is the combined cycle. A combined cycle configuration typically utilizes a gas turbine as the first means of producing electrical energy, then uses the heat energy of the turbine exhaust to produce steam which is then passed through a steam turbine/generator as the second means of generating electrical energy. The combined cycle, one of the newest and most common cogeneration configurations, is being used increasingly in the State of Florida.

With regard to the use of turbines and combined cycle configurations, the applicant has stated several disadvantages when compared to the proposed diesel engines.

Turbines and combined cycle configurations are typically sized larger than the largest stationary diesel engines and would require that only one unit (rather than two diesel units) be installed to supply the needed 20MW of generation requirement, thereby resulting in a lower reliability. Another disadvantage associated with the combined cycle is the steam cycle which requires more operating personnel to operate the equipment when compared to diesels which operate in an unattended mode. In addition, both the turbine and combined cycle operate at a higher heating rate to produce an equivalent amount of power as the diesel, thereby requiring more fuel on a per kilowatt basis. This increase in cost will be further evaluated in the economic section of this determination.

The emission of nitrogen oxides from stationary large bore diesel engines are minimized by the use of selective catalytic reduction (SCR). Until recently, SCR has not been judged to be a reasonable control technology for diesel engines due to problems encountered with catalyst poisoning. Although catalyst systems are currently under development and have been demonstrated for some applications (i.e, fuel-rich naturally aspirated gas engines, and gas turbines), there have not been any known demonstrations of their effectiveness as a control measure for the broad range of full-scale internal combustion engines manufactured. This has been particularly true of turbocharged engines, fuel-lean gas engines, and diesel engines.

A recent survey of permitting activities, however, indicates that SCR is now being used on stationary large bore diesel engines. This SCR installation (the first in the United States on a diesel engine) is currently operating on a 4.8 megawatt co-generation facility at a chemical plant in Adams, Massachusetts. This co-generation facility is scheduled to operate on a year round basis with dual fuel being used for 8 months per year and diesel for the remaining 4 months. Additional research indicates that although this SCR system is

being used for the first time in the United States, it has been used extensively in Europe. Background information indicates that this system has been used successfully since 1982, serving over 50 engines and gas turbines, operating on gas, dual fuel, diesel and heavy oil with up to 3.5% sulfur content.

Because the use of SCR has such a limited use at this time (especially in the United States) as a control technology for large stationary diesel engines, the Department has contacted the companies using SCR to obtain their impressions. In the case of the Massachusetts facility, the personnel responsible for operating the cogeneration equipment were very pleased with the SCR system, which has been operating for more than 1,500 hours on diesel fuel. These feelings were also expressed by a company in Germany which has recently submitted another order for a diesel engine with the same SCR technology. Based on these conversations, the Department believes that the SCR technology can be considered to proven on diesel applications.

The final alternative to be considered is the use of the additional timing retardation on the diesel engines. Timing retardation has been used extensively as the primary means of reducing NO_x emissions from diesel fueled engines. This reduction is achieved by essentially lowering the peak combustion temperatures, thereby limiting thermal NO_x formation. Depending on the amount of timing retard used, NO_x reductions can range up to 45 percent. Timing retardation does however result in the derating of the diesel, thereby increasing the cost to generate a given amount of power.

With regard to determining the cost effectiveness of air pollution control, the EPA has developed costing guidelines to obtain the highest reduction of emissions per dollars invested. This method of maximizing emission reductions per capital invested is a major factor when New Source Performance Standards (NSPS) are developed by the EPA. For NO_x emissions EPA has determined that a cost of up to \$1,000 per ton of emissions controlled (\$0.50/lb) is reasonable for NSPS. In accordance with these guidelines and the control alternatives discussed, the cost/benefits are illustrated in Table 1. A review of Table 1 indicates that when operating continuously, the use of SCR is by far the most economical means of control on a cost per ton basis. This cost of \$370.00 per ton is well within EPA's guidelines for NSPS purposes and is hence judged to be economically feasible as BACT for the Key West Facility.

With regard to SO₂, emissions the Department does not believe that the applicants proposal to limit diesel sulfur content to 0.5% is representative of BACT. A review of the latest (July 1988) BACT/LAER Clearinghouse indicates that BACT for SO₂

TABLE 1
Comparison of Alternates for NO_x Control

<u>NO_x Cases</u>	<u>Diesel</u>	<u>Gas Turbine</u>	<u>Diesel with Add. Timing Retardation</u>	<u>Combined Cycle</u>	<u>Diesel with SCR</u>
Capital Cost (\$/KW)	1250	675	1360	900	1400
Heat Rate (Btu/kWh)	8500	13,600	9500	10,800	8500
Part Load Heat Rate	base	higher	base	higher	base
Amount of Derating (MW)	none	none	1.6	none	none
Reliability	base	lower	base	lower	unknown
Response Time (minute)	10	20	10	90	10
Emission (gm/hp-hr)	8	1.3	6	1.0	0.8
Emission (T/yr)(2)	2100	340	1580	260	210
Increased Cost (\$/yr)(1)	base	2,540,000	820,000	980,000	700,000
Cost of Emission Reduction (\$/T)	base	1400	1560	530	370

(1) Capital cost amortized at nine percent annual rate; fuel cost of \$4/mm Btu, 100% capacity factor, SCR cost includes ammonia and maintenance.

(2) Based on 20 MW output.

emissions from diesel engines has previously been set at limiting sulfur content to 0.2%. This level appears to be the maximum control established and hence is evaluated using the "top down" BACT approach as follows:

Discussions with the applicant's fuel supplier indicate that the additional cost of reducing fuel sulfur content from the proposed level of 0.5% to 0.2% would be approximately 3 cents per gallon. At the maximum firing rate, the additional hourly cost of using the 0.2% sulfur content diesel instead of the proposed 0.5% sulfur content diesel would be \$42.00. The sulfur dioxide reductions from switching to the 0.2% sulfur content diesel are estimated to be 60 pounds per hour. Based on this reduction, the hourly cost per pound of sulfur dioxide removal is 70 cents which is less than the EPA NSPS guideline of up to \$1.00 per pound (\$2,000 per ton) for sulfur dioxide removal. As this is the case, BACT is judged to be represented by limiting the diesel's sulfur content to 0.20%.

With regard to PM₁₀ emissions, the Department does not agree with the applicant that the proposed emission level of 0.1 lb/MMBtu is representative of BACT. A recently permitted diesel generating facility proposed a PM₁₀ emissions level of 0.03 lb/MMBtu. This emission level (0.03 lb/MMBtu) is consistent with what most large stationary diesel engine manufacturers are guaranteeing for recent permit applications and is representative of NSPS for other types of similar sized fuel burning equipment, thereby being judged to be reasonable as BACT for this facility.

For internal combustion engines there exists a trade-off between the emissions of NO_x and the products of incomplete combustion (carbon monoxide (CO) and volatile organic compounds (VOCs)). Generally speaking, attempts to decrease the emissions of NO_x by means other than add-on controls (i.e., ignition timing retardation, air-to-fuel ratio changes, etc.) are accompanied by increases in CO and VOCs. Considering the timing retardation applied, the applicant's guaranteed emission levels of 2.0 and 1.0 grams per horsepower hour, respectively, may be representative of BACT.

Environmental Impact Analyses

A review of the ambient impacts associated with the diesel installation at the Key West Facility indicates that only the pollutants NO_x and SO₂ will contribute significantly when compared to the present background concentrations. Based on the applicant's proposal for BACT, the impacts associated with NO_x and SO₂ are estimated to be 5.8 (annual average) and 146 ug/m, (24 hour average) respectively.

For NO_x the impact is estimated to increase the total ambient concentration by approximately 25 percent resulting in a concentration which is 43.8% of the standard. For SO₂ the impact is estimated to increase the total ambient concentration by more than three times resulting in a concentration which is 81.2% of the standard.

Based on this impact review, the Department has determined that the Key West Facility has the potential to contribute moderately to the NO_x concentration and substantially to the SO₂ concentration in that area. As this is the case, the Department believes that its BACT determination which would reduce the proposed NO_x and SO₂ impacts by 85 and 60 percent, respectively is further justified.

In addition to the criteria pollutants, the impacts of toxic pollutants associated with the combustion of diesel have been evaluated. Three of the toxic pollutants (mercury, beryllium, and lead) have PSD significant levels with only beryllium being in exceedance. The other toxics (polyorganic matter, nickel, chromium, and arsenic) are expected to be emitted in minimal amounts, with the total emissions of all seven toxics combined to be less than one ton per year.

Although the emissions of the toxic pollutants could be controlled by particulate control devices such as a baghouse or scrubber, the amount of emission reductions would not warrant the added expense. As this is the case, the Department does not believe that the BACT determination would be affected by the emissions of the toxic pollutants associated with the firing of diesel.

Potentially Sensitive Concerns

With respect to the Key West Facility there are several sensitive concerns. Although the cost of using SCR was shown to be the most attractive on a cost per ton basis and well within the NSPS guidelines, the applicant is concerned that a requirement to use SCR will result in serious financial burdens.

Due to the large capital cost of the SCR system (approximately \$2.3 million) the applicant is concerned that additional bonding coverage would be needed which would require that electrical rates be increased. This would be burdensome to the people in the Key West area where electricity rates are currently among the highest in the State of Florida and have recently had a significant increase to finance the diesel project.

In addition to the cost considerations, the applicant has expressed concern that the experience with the SCR system

relative to diesel fueled generation is very limited and should only be considered in the demonstration category relative to technical risk, not having been proven commercially. The applicant also states that the addition of the SCR system will, in effect, void the Utility Board's existing performance guarantees and warranty on the diesel engine generator set, since the diesel manufacturer will not take any responsibility for the impact of the SCR equipment on the plant operation, performance, and reliability.

With regard to the low sulfur content requirement, the applicant has indicated that due to the size of the diesel facility, it is not likely that diesel fuel with a guaranteed sulfur content not to exceed 0.20% can be obtained. This is based on conversations with fuel suppliers which have indicated that the expected diesel usage is too large to be accommodated by the small shipments of low sulfur content diesel that are shipped in to fuel suppliers, but too small to receive a direct shipment on an ocean going barge.

Finally, the applicant is concerned that the Department's recommended BACT for PM₁₀ emissions may be difficult to achieve. Each of these concerns is largely based on the diesel units projected operating schedule which is not likely to exceed more than 2500-3000 hours per year each except in emergency cases.

BACT Determination by DER:

Discussion

Based on the information presented by the applicant, the Department believes that the costs associated with using SCR should be evaluated for various operating schedules. These costs are shown in Table 2.

A review of Table 2 indicates that the cost per ton of NO_x controlled when using SCR is very dependent upon the hours of operation. This variability in cost is attributed to the fixed cost using SCR which is independent of hours of operation. From Table 2, the cost per ton of NO_x removal can be expressed by the following relationship.

$$\text{Cost of NO}_x \text{ Removal} \quad = \quad \frac{460,000 + 25.64 X}{.204 X}$$

(\$/ton)

Where X = Number of hours operated

The cost analysis shown in Table 2 is useful in comparing other alternatives which can be employed to reduce NO_x emissions from large bore diesel engines.

TABLE 2
Economic Analysis of SCR for NO_x

Capital Costs

Direct Costs for SCR	\$2,300,000
Financing Costs	625,000
 Total	 \$2,925,000

Annual Operating Costs
for SCR (\$/yr)

<u>Equivalent Full Load</u>					
Hrs. of Operation (hrs/yr)	8,760	5,000	2,500	1,500	1,000
Net Generation (MWH(1))	168,192	96,000	48,000	28,000	19,200
 Net Debt Service (\$)(2)	 252,000	 252,000	 252,000	 252,000	 252,000
Maintenance (\$)(3)	215,000	215,000	215,000	215,000	215,000
NH3 Cost (\$)(4)	230,000	131,000	65,000	39,000	26,000
Total Cost	697,000	598,000	532,000	506,000	493,000
(cents/kWh)	.41	.62	1.11	1.76	2.57

NO_x Removal

Tons/Year (5)	1,814	1,036	518	311	207
\$/Ton	384	577	1,027	1,627	2,382

- 1) Based upon a combined net output for the diesel generators of 19.200 kw.
- 2) Based on assumed interest rate of 8.25% for municipal tax exempt debt and 25 year amortization period.
- 3) Average assumed cost for 10-year period based upon letter from SCR equipment supplier.
- 4) Based upon 90% NH3 removal, and usage of 220 lbs/hr at full load and cost of \$0.12/lb.
- 5) Based upon an uncontrolled emission of 8 gm/hp-hr.

At the maximum operation levels which are likely to occur as stated by the applicant (2,500 - 3,000 hours per year) the cost of using SCR is more comparable to using timing retardation on a cost per ton basis. The annual expense, however, of using timing retardation is much less than using SCR (\$176,000 vs \$532,000 at 2,500 hours of operation). This large difference in cost supports the applicant's concerns that SCR would be extremely costly for operating schedules which are much less than full time operation.

In accordance with this situation, it appears that a reasonable comparison would be to allow the applicant to use timing retardation providing the diesels would be operated at the level where the cost per ton of using either SCR or timing retardation are equivalent.

The cost of timing retardation at less than full time operation is only a function of additional fuel needed to produce an equivalent amount of power. For a given amount of power generated and the subsequent NO_x reductions achieved by timing retardation, the cost per ton of control is approximately \$1,333. When this cost is substituted into the cost equation for SCR, the hours of operation which yield the same cost per ton for both SCR and timing retardation is approximately 1,870.

The Department's finding with regard to the availability of low sulfur content (0.20%) diesel support the applicant's claims. Although other large stationary engines/turbines with diesel firing capability have been recently limited to using diesel with a sulfur content in the 0.2-0.3% range, it appears that the expected diesel consumption by the Key West diesels will not allow such a requirement.

Conversations with the diesel suppliers for the previously permitted facilities with the low sulfur content requirement have indicated that these facilities are only able to get this quality of fuel, which is not readily available, due to the relatively small needs for diesel in general. Each of these facilities is expected to use diesel only during periods of natural gas curtailment. As this is the case, the need for diesel is limited and the low sulfur content batches can be obtained.

With regard to Key West, natural gas is unavailable. This results in a need for diesel engines which are too large to be supplied by these low sulfur content shipments obtained by local suppliers, but too small to be serviced by a direct shipment via an ocean going barge which carries at least four times the amount of fuel that can be stored in the Key West facility's tanks.

Conclusion

In view of the sensitive concerns that have been identified by the applicant concerning this facility, the Department has concluded that at this time, BACT for nitrogen oxides is represented by using timing retardation and limiting the hours of operation. It should be noted that at levels of operation which are greater than the specified 1,870 hours, the use of SCR becomes less costly than timing retardation and should be re-evaluated as BACT for the facility.

With regard to the extent to which SCR has been demonstrated to be a proven technology on diesel applications, the Department feels that there has been sufficient operating experience to indicate that SCR is in fact a viable technology for some diesel applications. Although the Department's impressions with SCR's operating experience on the Massachusetts facility and other diesel facilities in Europe have been favorable, it may be premature to require that SCR be used on the Key West facility.

An in-depth comparison of the Adams, Massachusetts facility and the proposed Key West installation indicates that there are enough differences to question the transfer of the SCR technology from one facility to the other. The Adams, Massachusetts facility is designed primarily for dual fuel firing and is operated in a base loaded mode. This operating scheme differs from that proposed for Key West in which the units are designed for 100 percent diesel firing and will be operated on an "as-needed" mode, resulting in load fluctuations. Based on these differences it is expected that the SCR technology would be subjected to varied operating conditions resulting in a performance which could differ substantially from that demonstrated at the Massachusetts Facility.

In view of these considerations, the Department feels that the decision to require timing retardation in conjunction with limiting the hours of operation is further supported. As more SCR operating experience becomes available for existing facilities capable of firing diesel, and for other research and development programs, the Department will be in a better position to consider SCR as a BACT alternative for all diesel applications.

With regard to limiting diesel sulfur content to levels which are less than requested by the applicant, the Department has determined that such a restriction is not warranted in view of the situation. Although modeling indicated that the sulfur dioxide concentrations would increase by more than three times using the 0.5% diesel for full time operation, the hours of operation restriction imposed to limit NO_x emissions will lower these projections substantially.

With regard to PM₁₀ emissions, the Department has determined that the emissions of PM₁₀ as well as CO and VOC's can likely be influenced by the measures taken to reduce NO_x emissions. As this is the case, BACT for each of these pollutants will be established at the applicant's guaranteed levels, but will be subject to being adjusted to a lower level based on the stack testing results.

In accordance with this determination, the emission limits on a pollutant by pollutant basis are set as follows:

<u>Pollutant</u>	<u>Emission Limit</u>
NO _x *	6.0 g/hp-hr
SO ₂	Diesel sulfur content limited to 0.50%
PM ₁₀ **	0.10 lb/MMBtu
CO **	2.0 g/hp-hr
VOC **	1.0 g/hp-hr
Be	0.0005 tons per year

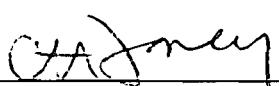
*Nitrogen oxides emission limitation is based on limiting hours of operation to 1,870 full load equivalent hours for the facility (total of 3,740 full load equivalent engine hours). If the applicant chooses to operate the facility in excess of 3,740 full load equivalent engine hours, BACT will be re-evaluated for nitrogen oxides. X

**PM₁₀, CO, and VOC emission limitations are maximum allowables and are subject to change based on stack testing results. The emission level of these pollutants is sensitive to the level of NO_x control and should be established in accordance with actual test results.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
 Department of Environmental Regulation
 Bureau of Air Quality Management
 2600 Blair Stone Road
 Tallahassee, Florida 32399-2400

Recommended by:

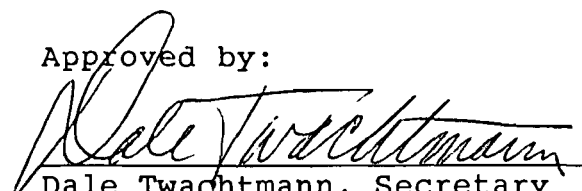


 C. H. Fancy, P.E.
 Deputy Bureau Chief, BAQM

June 5, 1989

 Date

Approved by:



 Dale Twachtmann, Secretary

5 June 89 1989

 Date



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

PERMITTEE:

Key West City Electric
System
1006 James Street
Key West, Florida 33041

Permit Number: AC 44-152197
PSD-FL-135

Expiration Date: April 1, 1991

County: Monroe

Latitude/Longitude: 24°33'49"N
81°44'03"W

Project: Two Diesel Generators

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

For the construction of two Fairbanks Morse diesel generators, each combusting about 700 gals/hr No. 2 fuel oil, 100 MMBtu/hr heat input, generating almost 10-MW of electricity, at the existing Stock Island plant in Monroe County, Florida.

The UTM coordinates of the facility are Zone 17, 425 km East and 2716 km North. The Source Classification Code for the diesel generators is 2-01-001-02.

Construction shall be in accordance with the permit application and plans, documents, and reference material submitted unless otherwise stated herein.

Attachments:

1. Key West's (KW) application received July 15, 1988.
2. DER's letter of incompleteness dated August 11, 1988.
3. RWB's letter received August 24, 1988.
4. RWB's letter received September 20, 1988.
5. DER's letter dated September 21, 1988.
6. RWB's letter received September 23, 1988.
7. EPA's letter dated September 29, 1988.
8. NPS's letter dated October 11, 1988.
9. KW's letter received November 22, 1988.
10. KW's letter received December 15, 1988.
11. RWB's letter received January 18, 1989.
12. RWB's letter received February 10, 1989.
13. RWB's letter received March 2, 1989.
14. RWB's letter received March 6, 1989.

PERMITTEE:

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Attachments continued:

15. DER's Preliminary Determination dated March 21, 1989.
16. EPA's letter dated April 19, 1989.
17. KW's letter dated April 25, 1989.
18. KW's letter dated May 24, 1989.
19. DER's Final Determination dated June 2, 1989.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

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

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor 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 does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

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

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, 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.

PERMITTEE:

Key West City Electric System

Permit Number: AC 44-152197
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GENERAL CONDITIONS:

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

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

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including exact 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.

PERMITTEE:

Key West City Electric System

Permit Number: AC 44-152197
PSD-FL-135

Expiration Date: April 1, 1991

GENERAL CONDITIONS:

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

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

(x) Determination of Best Available Control Technology
(BACT)

(x) Determination of Prevention of Significant
Deterioration (PSD)

() Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

PERMITTEE:

Key West City Electric System

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GENERAL CONDITIONS:

b. The permittee shall retain 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), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. The facility shall not operate for more than 1870 full load equivalent hours per year (total of 3740 full load equivalent engine hours). The BACT will be re-evaluated at the time the permittee requests an increase in or exceeds the permitted hours of operation (see Specific Condition 10). Selective Catalytic Reduction for NOx control will be required at a minimum for BACT if deemed technologically feasible. In no event shall the BACT control installation and compliance testing occur later than thirty (30) months from the date that the permittee requested or exceeded the permitted hours of operation.

2. Only No. 2 fuel oil with a maximum of 0.5% sulfur content shall be fired in the engines.

3. The maximum heat input to each engine shall not exceed 100 MMBtu/hr (approx. 700 gals/hr). The derated electrical output (with timing retardation) is expected to be about 8.8 MW for each unit.

PERMITTEE:

Key West City Electric System

Permit Number: AC 44-152197
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Expiration Date: April 1, 1991

SPECIFIC CONDITIONS:

4. The maximum allowable emissions from the project, in accordance with the attached BACT determination, shall not exceed:

Pollutant	Basis	Maximum Allowable Emissions	
		Per Engine lb/hr	Facility Total TPY
PM/PM ₁₀ *	0.10 lb/MMBtu	19.7	37.4
NOx	6 g/hp-hr	155	290
SO ₂	0.5% S oil	50.4	96
CO *	2 g/hp-hr	51.7	98
VOC *	1 g/hp-hr	25.8	50
Be	-	0.00054	0.001

* PM₁₀, CO, and VOC emission limitations are maximum allowables and are subject to change based on stack testing results.

The facility may fire up to 2.6 million gallons per year of diesel oil, or operate up to 1870 full load equivalent hours annually (total of 3740 full load equivalent engine hours), as long as the total NOx emissions do not exceed 290 TPY. The fuel usage, NOx emissions, and hours of operation will be based on a 365-day rolling average.

Visible emissions (VE) shall not exceed 20% opacity. This limit is subject to change after testing.

5. Initial (I) and annual (A) compliance tests shall be performed using EPA Methods in accordance with 40 CFR 60 Appendix A, 1987 version:

- a. EPA Method 5 for PM (I,A)
- b. EPA Method 6 for SO₂, or ASTM D 2880-71 for sulfur in oil (I,A)
- c. EPA Method 9 for VE (I,A)
- d. EPA Method 10 for CO (I)
- e. EPA Method 20 for NOx (I,A)
- f. EPA Method 25 for VOC (I)
- g. EPA Method 104 for Be, or EPA SW846 Method 3040, 7090/7091 (I)

Other DER approved test methods may be used only after Departmental approval.

Continuous emission monitors shall be installed, calibrated, maintained and operated for opacity and NOx.

6. The project shall comply with all the applicable requirements of Chapters 17-2 and 17-4 of the Florida Administrative Code (F.A.C.).

PERMITTEE:

Key West City Electric System

Permit Number: AC 44-152197
PSD-FL-135
Expiration Date: April 1, 1991

SPECIFIC CONDITIONS:

7. DER's South Florida District office shall be notified in writing a minimum of 15 days prior to source testing. Written reports of the test results shall be submitted to the district office within 45 days of test completion.

8. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the BAQM prior to 60 days before the expiration of the permit (F.A.C. 17-4.090).

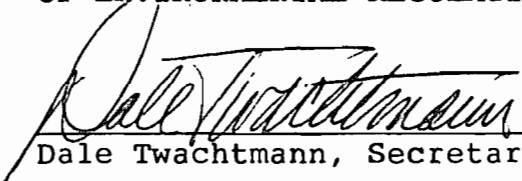
9. An application for an operation permit must be submitted to the South Florida District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. 17-4.220).

10. Any change in the method of operation, fuels, equipment or operating hours shall be submitted for approval to the South Florida District office.

11. The three existing 16.5 MW steam units at the Key West Plant shall be shut down and operation permits shall be surrendered for cancellation when operation permits are issued for the two new engines authorized by this permit.

Issued this 5 day
of June, 1989

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


Dale Twachtmann, Secretary

ATTACHMENTS AVAILABLE UPON REQUEST

THE KEY WEST CITIZEN

Published Daily

Key West, Monroe County, Florida 33040

STATE OF FLORIDA)

ss.

COUNTY OF MONROE)

Before the undersigned authority personally appeared.....

Ruth T. Peeples, who on oath says that she is
Advertising Manager of the Key West Citizen, a daily news-
paper published at Key West in Monroe County, Florida; that the
attached copy of advertisement, being a

legal

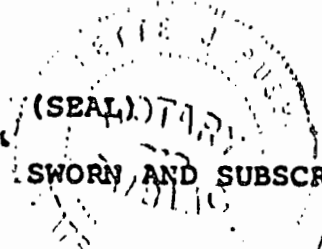
in the matter of

*State of Fla.
Envir. Regulation
notice of contents
to issue.*

was published in said newspaper in the issues of

3/29/89

Affiant further says that the said The Key West Citizen is
a newspaper published at Key West, in said Monroe County, Florida,
and that the said newspaper has heretofore been continuously pub-
lished in said Monroe County, Florida, each day (except Saturdays)
and has been entered as second class mail matter at the Post Office
in Key West, in said Monroe County, Florida, for a period of one
year next preceeding the first publication of the attached copy
of advertisement; and affiant further says that he has neither paid
nor promised any person, firm or corporation any discount, rebate,
commission or refund for the purpose of securing this advertisement
for publication in the said newspaper.



NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP JULY 27, 1991
BORNED THRU GENERAL INS. UND.

Ruth T. Peeples

SWORN AND SUBSCRIBED before me this

31 day of *March* 19 *89*.

Betty Lusk

COMMISSION EXPIRES: _____

NOTARY PUBLIC

**State of Florida
Department of
Environmental Regulation
Notice of Intent to Issue**

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Key West City Electric System, 1006 James Street, Key West, Florida, 33041, to construct two 10 MW diesel generators at the Stock Island plant in Monroe County, Florida. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

The project will involve the shut down of three 16.5 MW steam units located at the Key West Plant and the construction of two 10 MW diesel generators at the Stock Island plant.

A determination of Best Available Control Technology (BACT) was required. BACT review was conducted for nitrogen oxides, carbon monoxide, sulfur dioxide, particulates and volatile organic compounds. In determining the BACT, the Department has considered toxics and those air pollutants not regulated by the Clean Air Act. A discussion of how BACT was determined is included in the Department's preliminary determination.

The maximum degree of increment consumed is as follows:

Pollutant	Class I, A Consumed		Class II, A Consumed	
	1-hr	Annual	1-hr	Annual
SO ₂	-	-	77	51
TOP	-	-	-	25
NO ₂	-	-	-	22

The maximum combined pollutant concentrations from the two diesel engines and other sources in the area will be less than the National Ambient Air Quality Standards (NAAQS). The NAAQS are levels set by the EPA which identify the ambient concentration necessary to protect human health and welfare with an adequate margin of safety.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The petition shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department 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 facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application 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 Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee FL 32399-2400

Dept. of Environmental Regulation
South Florida District Office
2269 Bay Street
Fl. Myers FL 33901-2896

Dept. of Environmental Regulation
South Florida District Branch Office
11400 Overseas Hwy., Suite 219-224
Marathon FL 33050

Any person may send written comments or request a public hearing on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

The Reporter

SERVING THE UPPER KEYS

BOX 1197, TAVERNIER, FL. 33070

PROOF OF PUBLICATION

STATE OF FLORIDA)
COUNTY OF MONROE)

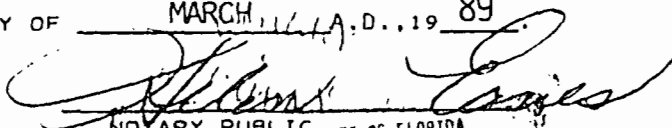
Before the undersigned authority personally appeared DAGNY WOLFF, who on oath, says that he is EDITOR & PUBLISHER of THE REPORTER, a weekly newspaper published at Tavernier, Monroe County, Florida; that the attached copy of advertisement, being a LEGAL NOTICE

IN THE MATTER OF NOTICE OF INTENT TO ISSUE
in the _____ Court, was published in said newspaper in the issues of MARCH 30TH, 1989

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 he 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 30TH
DAY OF MARCH, A.D., 1989


NOTARY PUBLIC
NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXPIRES: APR. 2, 1991
BONDED THROUGH FEDERAL INS. UND.

MY COMMISSION EXPIRES:

Best Available Copy

THE FLORIDA KEYS KEYNOTER
Published Twice Weekly
MARATHON, MONROE COUNTY, FLORIDA

RECEIVED

DER-BAQM

THE FLORIDA KEYS KEYNOTER
Sales Manager Charlotte Sikora
of THE FLORIDA KEYS KEYNOTER a twice weekly newspaper published at Marathon, in
Notice of Intent to Issue
2 diesel generators, Key West City Electric System
March 29, 1989

THE FLORIDA KEYS KEYNOTER is a newspaper published at MARATHON in said Monroe County, Florida, and has been continuously published in said Monroe County, Florida, twice each week for many years. The newspaper is published at the office of the publisher in Marathon, in said Monroe County, Florida, and is the only newspaper published in the Florida Keys. The newspaper is published at the office of the publisher in Marathon, in said Monroe County, Florida, and is the only newspaper published in the Florida Keys.

Charlotte Sikora
30
AD 19 87
NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP. SEPT. 26, 1992
BONDED THREE GENERAL RES. UND.

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Key West City Electric System, 1006 James Street, Key West, Florida, 33041, to construct two 10 MW diesel generators at the Stock Island plant in Monroe County, Florida. The Department is issuing this intent to issue for reasons stated in the Technical Evaluation and Preliminary Determination.

The project will involve the shut down of three 18.5 MW steam units located at Key West Plant and the construction of two 10 MW diesel generators at the 5th Island plant.

A determination of Best Available Control Technology (BACT) was required. BACT review was conducted for nitrogen oxides, carbon monoxide, sulfur dioxide, particulates and volatile organic compounds. In determining BACT, the Department has considered toxics and those air pollutants not regulated by the Clean Air Act. A discussion of how BACT was determined is included in the Department's preliminary determination.

The maximum depress of increment consumed is as follows:

Pollutant	Class I, % Consumed		Class II, % Consumed	
	3-hr	24-hr Annual	3-hr	24-hr Annual
SO ₂	—	—	23	31
TSP	—	—	—	1
NO _x	—	2	—	22

The maximum combined pollutant concentrations from the two diesel engines and other sources in the area will be less than the National Ambient Air Quality Standards (NAAQS). The NAAQS are levels set by the EPA which identify the ambient concentration necessary to protect human health and welfare with an adequate margin of safety.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received the 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 facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address. The Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application 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 Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Dept. of Environmental Regulation
South Florida District Office
2269 Bay Street
Ft. Myers, Florida 33901-2896
Dept. of Environmental Regulation
South Florida District Branch Office
11400 Overseas Hwy., Suites 219-224
Marathon, Florida 33050

Any person may send written comments or request a public hearing on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF INTENT TO ISSUE**

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Key West City Electric System, 1006 James Street, Key West, Florida, 38041; to construct two 10 MW diesel generators at the Stock Island plant in Monroe County, Florida. The Department is issuing this intent to issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

The project will involve the shut down of three 16.5 MW steam units located at the Key West Plant and the construction of two 10 MW diesel generators at the Stock Island plant.

A determination of Best Available Control Technology (BACT) was required. BACT review was conducted for nitrogen oxides, carbon monoxide, sulfur dioxide, particulates, and volatile organic compounds. In determining the BACT, the Department has considered toxics and those air pollutants not regulated by the Clean Air Act. A discussion of how BACT was determined is included in the Department's preliminary determination.

The maximum degree of increment consumed is as follows:

Pollutant	Class I		% Consumed Annual	Class II		% Consumed Annual
	3-hr	24-hr		3-hr	24-hr	
SO ₂				23	51	2
TSP					25	1
NO ₂			2			22

The maximum combined pollutant concentrations from the two diesel engines and other sources in the area will be less than the National Ambient Air Quality Standards (NAAQS). The NAAQS are levels set by the EPA which identify the ambient concentration necessary to protect human health and welfare with an adequate margin of safety.

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- (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 facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

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Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation
South Florida District Office
2269 Bay Street
Ft. Myers, Florida 33901-2896

Dept. of Environmental Regulation
South Florida District Branch office
11400 Overseas Hwy., Suites 219-224
Marathon, Florida 33050

Any person may send written comments or request a public hearing on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Published: 3/30/89
The Reporter
Tavernier, FL 33070

Gary Smallridge

Read New Permit Provision of CAA Amendment
some inclination on part of EPA to liberalize
and have flexible permits
20 pages of how they are thinking about doing it.

Need specifics

Tonnage
Transportation
Build up

Preliminarily can make decision to go on oral
representation.

Can anyone in state give us a fix
Geological Survey
Get a fix on geographics

I, Gary Smallridge will need sufficient particulars
to make a decision.
Need someone who can speak lingo from
engineering point of view.

Can Request a declaratory statement 17-103.
means by which a company gives precise
factual narration of what is to transpire. Descriptive
We can profess an opinion which would be binding
on them. They can show this to the public

#150 they could submit a letter more detailed than what they have.

Must clarify what to charge \$1500

→ Remind him that Cole stuck it to us after we ^{tried to} accommodate him.

Are we going to do it free

Ask Buck + Preston

Preston - Fuel and electrical would be charged

Estimate 150 to 175 Tons per year SO_2 at least
144 tons per year of NO_x
17 tons per year of PM

27 Apr

Can't get exemption based on 17-2.210(3) also doesn't meet criteria for relocatable facility since the duration of emissions at the facility would exceed two years

Can't get exemption as PSD facility from 17-2.500 (3)(a) 1. because this won't be a temporary facility not to exceed 2 yrs.

According 17-2.100(50) the owner must have all preconstruction permits approvals required before commencing construction. According to 17-2.100(55) "construction" includes the laying of foundations installation of foundation which in this case is the installation of a subterranean pile.

The ~~ap~~ Key West intends to move the turbine to a location approximately 4 miles to the east of the present position.

There are

27 Apr

Havent operated for last 3 years
Altho but have valid operation permit

Another source

One source

It is acknowledged
when they come
back on line will
have to have a review

904-377-5827

Conservative

Use



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

RECEIVED

4APT-APB-cdw
APR 19 1989

APR 21 1989

Mr. Clair Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

DER-BAQM

Re: Key West Diesel Engine Generating Station (PSD-FL-135)

Dear Mr. Fancy:

We have reviewed your March 21, 1989, letter containing the preliminary determination, public notice, and draft permit for the proposed construction of two 10MW diesel generators for the Key West City Electric System (Key West) at the Stock Island Plant, Monroe County, Florida. We offer the following comments which were discussed on April 10, 1989, during a telephone conversation between Mr. Pradeep Raval of your staff and Ms. Karrie-Jo Shell of my staff.

Best Available Control Technology (BACT) for Nitrogen Oxides (NO_x)

Using a diesel engine with an uncontrolled emission rate of 8 gm/hp-hr as the basis for the evaluation, four options considered in the "top-down" BACT approach were:

<u>Control Option</u>	<u>Emission Limit (gm/hp-hr)</u>
1. Diesel Engine with SCR	0.8
2. Combined Cycle Engine	1.0
3. Gas Turbine	1.3
4. Diesel Engine with Timing Retardation	6.0

Selective Catalytic Reduction (SCR) was rejected as BACT because of its large capital cost. In order to cover the \$2.3 million capital cost, the applicant claims they will need additional bonding coverage, which in turn would raise electrical rates in the Key West area. The increase in rates would allegedly result in financial burdens for the citizens of Key West, who recently experienced rate increases for water.

The use of a gas-fired turbine or a combined cycle engine was rejected because these units are typically sized larger than stationary diesel engines (only one unit of 20MW would be needed instead of the desired two 10MW units), which means one large unit would have a lower reliability than two smaller units. The fact that these units are typically sized larger than stationary diesel engines does not mean gas turbines or

pm
4-17-89
Atlanta, GA

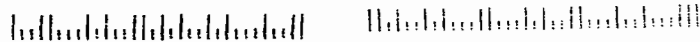
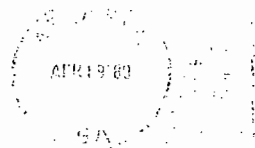
file copy?

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

AIR-4

Mr. Clair Eaney, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399



combined cycle engines are unattainable (there are several permitted gas-fired turbines under 10MW using water injection as a NO_x control). Nonetheless, this is not a major issue because SCR appears to be the best candidate for BACT for this source, as outlined later in this letter.

BACT was determined by DER to be timing retardation combined with limiting the hours of operation for each unit to 1870 hours per year. At levels of operation greater than 1870 hours per year (for each engine), SCR was determined to be BACT. 1870 hours of operation was chosen as the "transition point" because beyond 1870 hours, it becomes more economical for the applicant to use SCR rather than timing retardation.

We feel that SCR should be BACT even at the proposed operating rate of 1870 hours per year for two main reasons. Key West's consultant, R.W. Beck and Associates, states that certain conditions must be met before additional financing is granted above what has already been awarded. We understand that obtaining additional bond coverage may be difficult because cost estimates were made prior to any knowledge that SCR may be considered a viable control option for NO_x emissions from this diesel engine. However, the applicant has not demonstrated that obtaining more funding is impossible, nor should applicants be allowed to assume a specific BACT control option or cost for pollution controls prior to the actual BACT determination.

Secondly, the overall and incremental costs associated with SCR appear to be reasonable. The overall cost to operate the units with either SCR or timing retardation at 1870 hours is \$1,333 per ton of NO_x removed and the incremental cost associated with these options is \$1,186 per ton. As you can see, for the same amount of pollutant cost benefit the applicant has the option of using timing retardation, which will remove 110 TPY of NO_x, or SCR, which will remove 398 TPY of NO_x. The difference in the amount of NO_x removed is 288 TPY. As stated earlier, the applicant claims that SCR is economical only for hours of operation greater than 1870, but we believe SCR is still a viable option. For example, even if the applicant operated each unit less than 1870 hours per year the costs associated with SCR still appear reasonable, as estimated below:

<u>Hours of Operation</u>	<u>*Cost per ton of NO_x removed for SCR (\$/ton)</u>	<u>*Cost per ton of NO_x removed for TR (\$/ton)</u>	<u>*Incremental cost (\$)</u>
1,500	1,627	1,585	1,589
1,200	2,005	1,582	2,097

*cost for both units

Draft Permits

To be more sufficient the permit should specify that the 1870 full load equivalent hours per year limit for each unit will be based on a 12-month rolling average. Note that as previously stated, we believe that SCR should represent BACT for this facility and that this limit, as well as the 145 TPY NO_x emission limit, would be different as a result.

Please address our concerns prior to issuance of the final determination and permit so that any outstanding issues can be resolved. If you have any questions, please feel free to contact me or Karrie-Jo Shell of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

cc: Robert R. Padron
General Manager
Utility Board - City of Key West
P.O. Drawer 6100
Key West, Florida 33041-6100

*copied: P. Rawal
B. Andrews
S. Chen
D. Knowles, SF Dist.
R. Helling, EF Branch
E. Shawer, NPS
CHF/BT*

11/15/08

UTILITY BOARD



OF THE CITY OF

KEY WEST, FLORIDA

33041-6100



Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400



PM
4-26-89
Key West, FL

file copy

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

RECEIVED

April 25, 1989

APR 28 1989

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

DER - BAQM

SUBJECT: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

We have reviewed DER's March 21, 1989 Intent to Issue, Technical Evaluation and Preliminary Determination, draft Permit, and BACT Determination for the subject PSD application and offer the following comments. Our primary concern is that the numerical limits on operating hours, fuel consumption and NOx emission should be expressed on a per-plant, rather than per-unit basis, in order to allow CES operating flexibility. Otherwise, our comments are of an editorial nature.

We have no comment on the Intent to Issue or BACT Determination.

We have three comments on Tables I, II and III of the Technical Evaluation and Preliminary Determination. In Table I, footnote "(3)" should appear next to "173" under SO2 Emission. In Table II, the "9" under Actual Emission should be deleted and the following four values moved vertically upward. In Table III, the values "9.2, 0.2 and 5.8" should be inserted under Diesel Impact in vertically downward order.

We request that consideration be given to addressing numerical limits on a per-plant, rather than per-unit basis in the draft Permit in order to allow CES operating flexibility. Specific Condition 1 could be changed to "3740 hours" for the plant. Specific Condition 4 could be changed to "2.6 million gallons", "3740 hours" and "290 tons per year" for the plant.

Mr. Clair Fancy
Florida Department of Environmental Regulations
4/25/89
Page 2

We appreciate your consideration of this request prior to making a final determination on our application. We commend your staff on the thorough, accurate and diligent manner in which they have processed our application. Thank you for your assistance throughout the process.

Very truly yours,

UTILITY BOARD - CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"



Robert R. Padron
General Manager

RRP/sh

cc:

Leo Carey, Ass't. to the Manager
Ralph Garcia, Sr., Ass't. to the Manager
Larry J. Thompson, Operations Manager
Paul Esquinardo, Jr., Finance Manager
L. T. Curry, Jr., Production Manager
M. D. Henderson
B. Pattinson
K. Platte
N. Guarriello
T. J. Reder

copied:

A. Raval

B. Andrews

S. Chen

CHF/BT

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

RECEIVED

May 24, 1988

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

MAY 30 1989

DER-BA/1

SUBJECT: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

As discussed at our meeting in Atlanta on May 19, 1989, Fairbanks Morse has prepared a position paper relative to the commercial status of SCR technology for large stationary diesel engines. The position paper is attached. We would appreciate your review prior to our scheduled conference call on May 25, 1988.

Thanking you in advance for your consideration to this matter, I remain,

Very truly yours,

UTILITY BOARD - CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"

Robert R. Padron
General Manager

RRP/sh

cc:

Leo Carey, Ass't. to the Manager
Ralph Garcia, Sr., Ass't. to the Manager
Larry J. Thompson, Operations Manager
Paul Esquinaldo, Jr., Finance Manager
L T. Curry, Jr., Production Manager
Wayne Aronson, EPA, Atlanta, GA.
M. D. Henderson, R. W. Beck & Assoc.
B. Pattinson, R. W. Beck & Assoc.
K. Platte, R. W. Beck & Assoc.
N. Guarriello, R. W. Beck & Assoc.
T. J. Reder, Faibanks Morse

Colt Industries

**Fairbanks Morse
Engine Division**
701 Lawton Avenue
Beloit, Wisconsin 53611-5492
Telephone: 608/364-8228
Telecopier: 608/364-0382

VIA FAX #305/294-3685

Paul R. Danyluk
Vice President — Engineering

May 24, 1989

Mr. Robert Padron, Manager
Utility Board, City of Key West
1001 James Street
P. O. Drawer 6100
Key West, FL 33041-6100

Dear Mr. Padron:

During our meeting in Atlanta we were asked to again document our position on the commercial status of SCR technology. This was driven by the belief on the part of the EPA that SCR technology is commercially proven for large stationary diesel engines. We, at Fairbanks Morse, do not believe that the technology is commercially available for the Key West application for the following reasons:

1. The Pfizer application in Adams, Massachusetts referred to is quite different from the Key West application. The Pfizer engine is a dual fuel engine and not a diesel. Because the Pfizer engine is dual fuel, it is inherently low BMEP (200 vs. 322 psi). The Pfizer engine is optimized for gas operation and not diesel and employs 1950's diesel technology.
2. The Pfizer engine is dual fuel because the preferred fuel is gas. It only operates on diesel when gas is not available. The Pfizer SCR catalyst is reported to have approximately 2000 hours of diesel operation intermixed with as many hours operation in gas mode. The engine in diesel mode is very low in BMEP rating and the gas operation serves to clean the catalyst because of the different nature of the hydrocarbon emission in gas versus diesel mode.
3. The Pfizer engine is a baseload cogeneration application providing most of the electrical and thermal needs for the plant. As a result, it runs all the time at high load levels. Engine exhaust temperatures and flows remain fairly constant as compared to the 1870 hours per year start and stop Key West application.
4. Controls are required with the SCR unit in order to add ammonia on about a one-to-one basis with NO_x , which requires a NO_x sensor and safety controls. In the Key West application with start and stop operation and load following during emergencies it is conceivable the exhaust temperatures could reduce below efficient and/or safe levels of catalyst operation whereby the conversion efficiency would greatly reduce or other compounds like highly explosive ammonium nitrate would form.

Utility Board, City of Key West
May 24, 1989 - Page 2

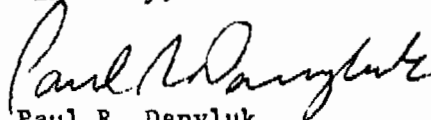
5. NH_3 controls require NO_x sensors which are lab type instruments. This entails reference gases^x for calibration and zeroing. Operating and maintaining instrumentation of this type for ammonia control in an SCR application is much more critical than for simple NO_x monitors and require calibration very frequently because the instrument is being used in an absolute mode.
6. Two thousand (2000) hours of low BMEP diesel operation does not establish commerciality. Commercialization in the large engine industry requires many thousands of hours followed by technical publications subjected to peer review, not proclamation by the manufacturer.
7. Very little is known about light load operation of SCR catalysts behind engines in either diesel or gas mode. In diesel mode at light load (under 10%) unburned fuel will heavily coat the catalyst. Such prolonged light load operation could drown the catalyst in liquid fuel which burns off when the conditions become right, potentially harming the catalyst.
8. On dual fuel engines like at Pfizer or Peissenberg, cylinders can completely cease firing in gas mode of operation. These upsets are not uncommon and could be due to a failed injector or a burned valve. Under these upset conditions, all gas flow to the cylinder ends up in the exhaust and SCR system. Natural gas, like ammonia, is a reducing agent and could over-heat the reactor and explode in the exhaust system. Nothing is known about this, or any other normal engine upset conditions, with regard to the catalyst in the limited number of dual fuel applications and limited time they have been operating.
9. The Key West units have quick start capability and are expected to start and stop often. Thermal cycling environments are known to be extremely difficult on exhaust systems. Experience with catalysts in extreme thermal cycling environments are unknown. Both the Peissenberg and Pfizer SCR applications are steady load and not cycling applications.
10. There are immediate hazards associated with storage and use of ammonia which must be considered. Ammonia, being a reducing chemical compound, is explosive in certain combinations with oxygen. An undetected leak into the exhaust system during shut-down periods could result in an explosion during engine start-up. Ammonia is toxic to humans in minor concentrations, exposure results in blindness and death. The Stock Island plant is located on a peninsula in the Atlantic Ocean. The atmosphere is humid and salt-laden. Circulating water is drawn from deep wells in the coral structure and releases hydrogen sulfide to the air. With this combination of corrosive atmospheric contaminants, almost all common construction metals are subject to severe corrosion. The ammonia must be stored in an above ground tank because of the high water table. A leak could potentially result in serious disability or loss of human life. The immediate hazards to life and health far outweigh the long term consequences associated with NO_x emissions.
11. Colt has an active diesel NO_x reduction development program ongoing with its lab engines. BACT techniques have been developed using these lab resources. In 1988 a joint R & D program was developed with a major catalyst supplier. Upon completion of the development program, results will be jointly published via ASME, etc., for peer review to establish and resolve outstanding issues.

Utility Board, City of Key West
May 24, 1989 - Page 3

In conclusion, Fairbanks Morse feels strongly that the application of SCR technology for Key West is premature and not commercially viable. As a leader in large engine development we are knowledgeable about the available technology and currently are testing methods of emissions reductions, including SCR.

If and when SCR or other methods of emissions reductions become proven technology through thorough lab engine testing and significant operational experience, we would consider offering them as a NO_x control option along with our then current proven BACT control technology.

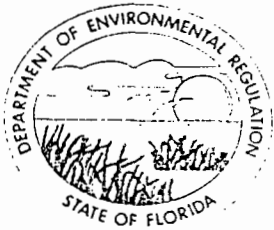
Sincerely,



Paul R. Danyluk
Vice President-Engineering

PRD/jc

cc: Nicholas Guarriello, R. W. Beck
Michael Henderson, R. W. Beck
John Robinson, CES, Key West
Harold Kleinschrodt, Colt



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

March 21, 1989

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

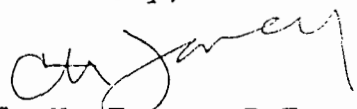
Mr. Robert R. Padron
Key West City Electric System
1006 James Street
Key West, Florida 33041

Dear Mr. Padron:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Key West City Electric System to construct two 10 MW diesel generators at the existing Stock Island Plant, in Monroe County, Florida.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,


C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/ks

Attachments

cc: D. Knowles
W. Aronson, EPA
C. Shaver, NPS
D. Swann, P.E./M. Henderson, R.W. Beck

INTENT PUBLISHED 3-29-89

RECEIVED
MAR 24 1989
D E R
SOUTH FLORIDA DISTRICT

Department of Environmental Regulation
Routing and Transmittal Slip

To: (Name, Office, Location)

1.

Cleve Holladay

2.

Air Resources Management

3.

Bureau of Air Regulation

4.

Tallahassee

Remarks:

RECEIVED

NOV 12 1993

Division of Air
Resources Management

From David Knowles
South District

Date

11/10/93

Phone

SC 748-6975

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permits by:

Key West City Electric System
1006 James Street
Key West, Florida 33041

DER File Nos. AC 44-152197
PSD-FL-135

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Key West City Electric System applied on July 18, 1988 to the Department of Environmental Regulation for a permit to construct two 10 MW diesel generators at the Stock Island plant, near Key West, Monroe County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit is required for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "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. The applicant shall provide proof of publication to the Department, at the address specified within 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 permits.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department 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 facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

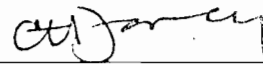
(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the applicant have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office in General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such

person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION



C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

Copies furnished to:

D. Knowles, SF District
W. Aronson, EPA
C. Shaver, NPS
D. Swann, P.E., RW Beck

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 3-21-89.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to
§120.52(9), Florida Statutes, with
the designated Department Clerk,
receipt of which is hereby
acknowledged.

Martha Wise 3-21-89
Clerk Date

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Key West City Electric System, 1006 James Street, Key West, Florida, 33041, to construct two .10 MW diesel generators at the Stock Island plant in Monroe County, Florida. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

The project will involve the shut down of three 16.5 MW steam units located at the Key West Plant and the construction of two 10 MW diesel generators at the Stock Island plant.

A determination of Best Available Control Technology (BACT) was required. BACT review was conducted for nitrogen oxides, carbon monoxide, sulfur dioxide, particulates and volatile organic compounds. In determining the BACT, the Department has considered toxics and those air pollutants not regulated by the Clean Air Act. A discussion of how BACT was determined is included in the Department's preliminary determination.

The maximum degree of increment consumed is as follows:

Pollutant	Class I, % Consumed			Class II, % Consumed		
	3-hr	24-hr	Annual	3-hr	24-hr	Annual
SO ₂	-	-	-	23	51	2
TSP	-	-	-	-	25	1
NO ₂	-	-	2	-	-	22

The maximum combined pollutant concentrations from the two diesel engines and other sources in the area will be less than the National Ambient Air Quality Standards (NAAQS). The NAAQS are levels set by the EPA which identify the ambient concentration necessary to protect human health and welfare with an adequate margin of safety.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

- (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department 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 facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application 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 Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation
South Florida District Office
2269 Bay Street
Ft. Myers, Florida 33901-2896

Dept. of Environmental Regulation
South Florida District Branch Office
11400 Overseas Hwy., Suites 219-224
Marathon, Florida 33050

Any person may send written comments or request a public hearing on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

Technical Evaluation
and
Preliminary Determination

Utility Board of the City of Key West
Key West, Monroe County, Florida

Diesel Engine Generating Station

Permit Numbers:
AC 44-152197

PSD-FL-135

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

March 21, 1989

I. Application

A. Applicant

Key West City Electric System
1006 James Street
Key West, Florida 33041

B. Project and Location

The applicant proposes to add two 10 MW diesel generators to their existing Stock Island Plant, while simultaneously shutting down three existing 16.5 MW steam units at the Key West Plant. The project will result in emissions of nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), particulate matter (PM), and volatile organic compounds (VOCs).

The UTM coordinates of this facility are Zone 17, 425 km East and 2716 km North.

C. Facility Category

The Key West diesel generator station is classified in accordance with the Standard Industrial Classification (SIC) Code as Group No. 49, Electric, Gas and Sanitary Services; Industry No. 4931, Electric Services. In accordance with the NEDs Source Classification Code (SCC) the source is classified as 2-01-001-01, Internal Combustion Engine, Electric Generation.

Key West's application was received on July 18, 1988, and was deemed complete on February 10, 1989.

II. Project Description

The two diesel generators proposed for the Stock Island plant will utilize No. 2 fuel oil and will generate 10 MW each. The facility currently has one 37 MW steam unit and three 2 MW diesel peaking units. This project also includes the shut down of three 16.5 MW steam units which are located at another facility, the Key West Plant. Two 500,000 gallon oil storage tanks will be installed. There is currently a 2,000,000 gallon No. 6 fuel oil storage tank and a 69 kv switchyard at the facility. To make room for the new units, a certain amount of demolition, pond cleaning, and utility rerouting will be necessary.

No add on air pollution control equipment has been proposed for the diesel engines.

This project will result in a significant increase in emissions of PM/PM₁₀, CO, NO_x, SO₂, and VOCs. PM₁₀ represents particulates 10 microns or less.

III. Rule Applicability

The proposed project will emit the pollutants PM/PM₁₀, CO, NO_x, SO₂, and VOCs and is subject to a preconstruction review in accordance with Chapters 17-2 and 17-4 of the Florida Administrative Code (F.A.C.) and Chapter 403 of the Florida Statutes.

The Stock Island facility is located in an area designated as attainment for all the criteria pollutants in accordance with F.A.C. Rule 17-2.420. The facility is within 100 km of a Class I area, the Everglades National Park, in accordance with F.A.C. Rule 17-2.440(1)(b).

The proposed project is subject to Prevention of Significant Deterioration (PSD) Review Requirements, since there will be a significant increase in the emissions of PM/PM₁₀, CO, NO_x, SO₂, and VOCs in accordance with F.A.C. Rule 17-2.500(2)(d)4.

The proposed project will be subject to a Best Available Control Technology (BACT) determination in accordance with F.A.C. Rule 17-2.630.

The proposed project is subject to compliance testing and reporting requirements in accordance with F.A.C. Rule 17-2.700. The compliance tests will be conducted using the following test methods in accordance with the 1987 version of 40 CFR 60 Appendix A:

- a. EPA Method 5 for PM
- b. EPA Method 9 for VE (visible emissions)
- c. EPA Method 6/8 for SO₂, or oil analysis using ASTM D 2880-71
- d. EPA Method 7 for NO_x
- e. EPA Method 10 for CO
- f. EPA Method 25 for VOCs
- g. EPA Method 104 for Be, or EPA SW 846 Method 3040 and 7090/7091

IV. Source Impact Analysis

A. Emission Limitations

As addressed in the attached BACT analysis, the expected emissions from each engine is 19.7 lb/hr for PM/PM₁₀, 155 lb/hr for NO_x, 50.4 lb/hr for SO₂, 51.7 lb/hr for CO, 25.8 lb/hr for VOC, and 0.00054 lb/hr for Be. The annual emission limits are obtained by multiplying hourly emissions by 1870 hours per year.

B. Air Quality Impact Analysis

The project proposed by the Utility Board of Key West (CES) to add two 10-MW diesel generators to the Stock Island plant with the concurrent retirement of three existing 16.5-MW steam units at the Key West plant located approximately 6.5 km west of the Stock

Island site has been reviewed. Although the proposed project should result in a net decrease in area emissions, the addition of the two 10-MW diesel generators to the Stock Island plant will result in a significant emissions increase locally in carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur dioxide (SO₂), volatile organic compounds (VOC), and total suspended particulate matter (TSP). An air quality analysis is required for the above pollutants. This analysis consists of:

- o An analysis of existing air quality;
- o A PSD increment analysis;
- o A National and Florida Ambient Air Quality Standards (AAQS) analysis;
- o An analysis of impacts on soils, vegetation, and visibility and growth-related air quality impact; and
- o A "Good Engineering Practice" (GEP) stack height evaluation.

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

Based on these required analyses, the Department has reasonable assurance that the proposed project, as described in herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard. A discussion of the modeling methodology and required analyses follows.

Modeling Methodology

The latest version of the EPA-approved Industrial Source Complex Short Term (ISCST) air quality model (UNAMAP 6, change 7) was used by the applicant to predict ambient ground-level concentrations of these pollutants. This model is appropriate for use in areas of flat or gently rolling terrain. The model incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. It also allows for the separation of sources, directional building wake downwash, and various other input and output features. Both screening and refined modeling were performed.

Five years of sequential hourly meteorological data were used to complete the modeling. Both the surface and the upper air data were National Weather Service (NWS) data collected in Miami during the period 1981-1985. For the short-term air quality impacts, the highest second-highest predicted concentrations were compared with appropriate ambient standards and PSD increments. For the annual averages, the highest predicted yearly averages were compared to the standards.

Table I
Source Parameters

Source	SO ₂ Emission (lbs/hr)	Height (ft)	Stack Temp. (°F)	Velocity (ft/sec)	Diameter (ft)	UTM Coordinates (km E) (km N)	
New SI Diesels (1)	100	100	600	100	4	425.7	2716.6
<i>will be shut down</i> KW Steam #3	408 (2)	150	284	16	8	419.1	2716.6
KW Steam #4	350	150	252	15	8	419.1	2716.6
KW Steam #5	325	150	282	28	8	419.1	2716.6
KW Gas Turbine (1)	173	35	910	150	12	419.1	2716.6
SI Steam Unit	1195 (4)	104	369	147	5	425.7	2716.7

(1) Increment consuming source

(2) SO₂ at 2.75 lb/MMBtu, TSP at 0.1 lb/MMBtu, NOx at 0.7 lb/MMBtu

(3) SO₂ at 0.5 lb/MMBtu, TSP at 0.04 lb/MMBtu, NOx at 0.3 lb/MMBtu

(4) SO₂ at 2.75 lb/MMBtu, TSP at 0.1 lb/MMBtu, NOx at 0.7 lb/MMBtu

The stack and emission rate data used for all sources are summarized in Table I. Only SO₂ emissions were modeled; however, the impacts of other pollutants were determined, as required, by adjusting the SO₂ impacts by the ratio of the emissions of the other pollutants to the emissions of SO₂. Although the stack height of the two proposed 10-MW diesel generators is equal to the calculated good-engineering-practice (GEP) height, the nearby Stock Island steam unit has a stack less than the calculated GEP height. Thus, the directional building wake downwash was considered in the modeling to estimate the combined effects.

The applicant first determined the general area surrounding the facility where the highest predicted concentrations would be expected. The ISCST model was run using complete meteorology and a coarse receptor grid (with receptors spaced from 250 meters to 2000 meters) to determine annual-average impacts, and then, using selected meteorology with a refined (increments of 0.1 km) receptor grid, to determine short-term-worst-case impacts. Six discrete receptors (directions 10 to 60 degrees) were also placed in the Everglades National Park Class I area to quantify the impact there.

The maximum increases in ambient concentrations for both SO₂ and NO_x are above the significant impact levels defined in Section 17-2.100. Except for the gas turbine of the Key West plant, which is located approximately 6.5 km to the west of the proposed diesel generators, the locations of maximum impact under expected meteorological conditions for all six sources are in the range from 0.5 to 2.0 km from the Stock Island plant. Thus, compliance with AAQS was based on interaction between the diesel generators and the steam unit in the Stock Island plant. Compliance with PSD increments was, however, based on interaction between the diesel generators and the Key West sources.

Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring may be required for all pollutants subject to PSD review. In general, one year of quality assured data using an EPA-reference, or the equivalent, monitor must be submitted. In some cases, less than one year of data, but not less than four months, may be accepted when Department approval is given.

An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined through air quality modeling, is less than a pollutant-specific de minimus concentration. In addition, if current monitoring data already exist and these data are representative of the proposed source area, then, at the discretion of the Department, these data may be used.

The predicted maximum air quality impacts of the proposed facility for these pollutants subject to PSD review are given in Table II. None of the pollutants is predicted to increase in concentration by an amount greater than its defined de minimus level. Therefore, specific preconstruction monitoring is not required for any pollutant.

PSD Increment Analysis

The PSD increments are the amounts that new sources may increase the ambient ground-level concentrations of SO₂, NO_x, and particulate matter. The purpose of these increment limitations is to prevent less polluted areas from being degraded all the way to the level of the ambient air quality standards. Three types of areas are distinguished according to the amount of additional air pollution that is to be allowed. Class I areas allow the least amount of degradation, Class II a moderate amount, and Class III allows the greatest amount of air degradation, although in no case can increased emissions cause or contribute to an exceedance of an air quality standard. Four Class I areas have been designated in the state: Everglades National Park, Chassahowitzka National Wildlife Refuge, St. Marks National Wilderness Area, and Bradwell Bay National Wilderness Area. All other parts of the state are designated as Class II areas; there are no Class III areas.

The proposed CES facility is located in a Class II area and must meet the increments defined for this class. The facility is also approximately 92 kilometers from the Everglades National Park Class I area and must meet the more restrictive increments in that area.

In general, all SO₂ emission increases occurring after the baseline date (December 27, 1977) will consume PSD increment. In addition, all SO₂ emission increases associated with construction or modification at major facilities which occurred after January 6, 1975, will also consume increment.

Atmospheric dispersion modeling, as previously described, was performed to quantify the amount of PSD increment consumed. The results are summarized in Table III. The results indicate that the concentration increases are well below the allowable limits. Based on this analysis the Department has reasonable assurance that no exceedance of a PSD increment will occur as a result of the increased emissions by the CES facility.

Ambient Air Quality Standards (AAQS) Analysis

Of the pollutants subject to review, only the criteria pollutants have AAQS which are not to be exceeded. In general, the total ambient air quality impacts are determined by adding the predicted modeled concentrations to an estimated background

concentration for each pollutant. In the calculation of the CES facility's total impact on ambient air quality, 1986 monitoring data from the closest county were used to estimate the background levels. Since the highest concentrations of the monitoring data were used, the background concentrations are expected to be very conservative estimations. The results (Table IV) indicate that all pollutants are expected to be in compliance with AAQS.

Additional Analyses on Soils and Vegetation

The total ground-level concentrations of the criteria pollutants are predicted to be well below all applicable AAQS including the national secondary standards developed to protect public welfare-related values. As such, these pollutants are not expected to have a harmful impact on soils and vegetation.

Impact on Visibility in the Class I Area

A level-1 visibility screening analysis was performed by the applicant for impact on the Everglades National Park. The results indicate that no impact on visibility is expected in this area as a result of the increased emissions at the CES facility.

Growth-Related Air Quality Impacts

The proposed facility is not expected to significantly change employment, population, housing or commercial/industrial development in the area to the extent that an air quality impact will result.

GEP Stack Height Determination

Good Engineering Practice (GEP) stack height means the greater of: (1) 65 meters or (2) the maximum nearby building height plus 1.5 times the building height or width, whichever is less. For the proposed project a stack height is well below the GEP limit of 65 meters.

Although the proposed stack height of the CES facility is equal to the calculated GEP height, considering the building dimensions, the stack height of the nearby steam unit is less than the calculated GEP height. Therefore, the potential for building wake downwash was included in the modeling for source interactions.

V. Conclusion

Based on the information provided by the applicant, the Department has reasonable assurance that the two 10 MW diesel generator project as described in this evaluation and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

John Thomas
03/21/89

Table II

Modeling Results and De Minimus Impacts

Modeling Results at 100 lbs/hr

	<u>Averaging Time (hr)</u>		<u>Impact (ug/m³)</u>	
	1		34	
	3		27	
	24		9.5	
	8,760		1.2	
	<u>De Minimus</u>		<u>Actual</u>	
<u>Pollutant</u>	<u>Impact (ug/m³)</u>	<u>Avg. Time (hr)</u>	<u>Emission (lb/hr)</u>	<u>Impact (ug/m³)</u>
NOx	14	8,760	9	5.6
CO	575	8	479	32 (3)
SO ₂	13	24	118.7	9.5
TSP	10	24	100.5 20.5	2

(3) Conservative value actually for 3-hour impact.

Table III
Compliance with PSD Increments

Pollutant	Averaging Time (hr)	Class II Standard (ug/m ³)	Two 10-MW Diesel Impact (ug/m ³)	Key West Gas Turbine Impact (ug/m ³)	Key West Steam Impact (ug/m ³)	Total (ug/m ³) (1)
SO ₂	3	512	117 (2)	0	0	117
	24	91	46 (2)	0	0	46
	8,760	20	1.2	0	0.8	0.4
TSP	24	37		0	0	9.2
	8,760	19		0	0	0.2
NO ₂	8,760	25		0	0.2	5.6

Pollutant	Averaging Time (hr)	Class I Standard (ug/m ³)	Two 10-MW Diesel Impact (ug/m ³)	Key West Gas Turbine Impact (ug/m ³)	Key West Steam Impact (ug/m ³)	Total (ug/m ³) (1)
SO ₂	3	25	2.0	0.9	10.8	0
	24	5	0.3	0.3	2.4	0
	8,760	2	0.010	0.008	0.092	0
TSP	24	10	0.04	0.02	0.09	0
	8,760	5	0.002	0.001	0.003	0
NO ₂	8,760	2.5	0.05	0.005	0.02	0.04

(1) Value equal to diesel impact + gas turbine impact - steam impact and negative numbers set equal to zero.

(2) Includes downwash impact due to Stock Island steam building.

Table IV
Compliance With AAQS

Pollutant	Averaging Time (hr)	Standard (ug/m ³)	Background (ug/m ³) (1)	Two 10-MW Diesel Impact (ug/m ³)	Total (ug/m ³)
CO	8	10,000	5,500	31. (4)	5,531
	1	40,000	11,000	39	11,039
Pb	2,190	1.5	0.15	0.0001 (5)	0.15
NO ₂	8,760	100	35	5.8	43.8
O ₃	1	250	210 (2)	20 (6)	230
SO ₂	8,760	60	15	1.2	25 (7)
	24	260	65	146 (9)	211
	3	1,300	325	458 (9)	783
TSP (8)	8,760	50	41 (3)	0.2	41.2
	24	150	99 (3)	1.9	100.9

(1) Values for state-wide background level from:

State of Florida Department of Environmental Regulation
Bureau of Air Quality Management, November 1987, "Ambient Air Quality in Florida 1986."

(2) Value from Lee County.

(3) Value from Monore County.

(4) Conservative value actually for 3-hour impact.

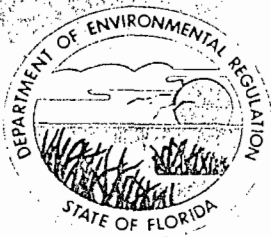
(5) Value actually for annual-average impact.

(6) Conservative value actually for VOC, O₃ indeterminate.

(7) Includes interaction with Stock Island steam unit.

(8) Standard revised July 1, 1987, to consider only particles less than or equal to 10 um size.

(9) Includes combined downwash impacts from Stock Island steam unit.



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

PERMITTEE:
Key West City Electric
System
1006 James Street
Key West, Florida 33041

Permit Number: AC 44-152197
Expiration Date: September 1, 1990
County: Monroe
Latitude/Longitude: 24°33'49"N
81°44'03"W
Project: Two Diesel Generators

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

For the construction of two Fairbanks Morse diesel generators, each combusting about 700 gals/hr No. 2 fuel oil, 100 MMBtu/hr heat input, generating almost 10-MW of electricity. The project will be located at the existing Stock Island plant in Monroe County, Florida. This project is also PSD-FL-135.

The UTM coordinates of the facility are Zone 17, 425 km East and 2716 km North. The Source Classification Code for the diesel generators is 2-01-001-02.

Construction shall be in accordance with the permit application and plans, documents, and reference material submitted unless otherwise stated herein.

Attachments:

1. Key West's (KW) application received July 15, 1988.
2. DER's letter of incompleteness dated August 11, 1988.
3. RWB's letter received August 24, 1988.
4. RWB's letter received September 20, 1988.
5. DER's letter dated September 21, 1988.
6. RWB's letter received September 23, 1988.
7. EPA's letter dated September 29, 1988.
8. NPS's letter dated October 11, 1988.
9. KW's letter received November 22, 1988.
10. KW's letter received December 15, 1988.
11. RWB's letter received January 18, 1989.
12. RWB's letter received February 10, 1989.
13. RWB's letter received March 2, 1989.
14. RWB's letter received March 6, 1989.
15. DER's Preliminary Determination dated March 21, 1989.

PERMITTEE:
Key West City Electric System

Permit Number: AC 44-152197
Expiration Date: 9/1/90

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor 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 does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, 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.

PERMITTEE:
Key West City Electric System

Permit Number: AC 44-152197
Expiration Date: 9/1/90

GENERAL CONDITIONS:

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

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

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

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

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including exact 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.

PERMITTEE:
Key West City Electric System

Permit Number: AC 44-152197
Expiration Date: 9/1/90

GENERAL CONDITIONS:

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

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

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

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

PERMITTEE:
Key West City Electric System

Permit Number: AC 44-152197
Expiration Date: 9/1/90

GENERAL CONDITIONS:

b. The permittee shall retain 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), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

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

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

SPECIFIC CONDITIONS:

1. Each diesel engine may operate up to 1870 full load equivalent hours per year. Selective catalytic reduction (SCR) technology shall be used for NOx control should the permittee choose to operate beyond permitted hours of operation.

2. Only No. 2 fuel oil with a maximum of 0.5% sulfur content shall be fired in the engines.

3. The maximum heat input to each engine shall not exceed 100 MMBtu/hr (approx. 700 gals/hr). The derated electrical output (with timing retardation) is expected to be about 8.8 MW for each unit.

PERMITTEE:
Key West City Electric System

Permit Number: AC 44-152197
Expiration Date: 9/1/90

SPECIFIC CONDITIONS:

4. The maximum allowable emissions from the project, in accordance with the attached BACT determination, shall not exceed:

Pollutant	Basis	Maximum Allowable Emissions		
		Per Unit	2 Units	
		lb/hr	TPY	TPY
PM/PM ₁₀ *	0.10 lb/MMBtu	19.7	18.7	37.4
NOx	6 g/hp-hr	155	145	290
SO ₂	0.5% S oil	50.4	48	96
CO *	2 g/hp-hr	51.7	49	98
VOC *	1 g/hp-hr	25.8	25	50
Be	-	0.00054	0.0005	0.001

* PM₁₀, CO, and VOC emission limitations are maximum allowables and are subject to change based on stack testing results.

Each engine may fire up to 1.3 million gallons per year of diesel oil, or operate up to 1870 full load equivalent hours annually, as long as the NOx emissions do not exceed 145 TPY based on a 12 month rolling average.

Visible emissions (VE) shall not exceed 20% opacity (mfrs. guarantee). This limit is subject to change after testing.

5. Initial (I) and annual (A) compliance tests shall be performed using EPA Methods in accordance with 40 CFR 60 Appendix A, 1987 version:

- EPA Method 5 for PM (I,A)
- EPA Method 6 for SO₂, or ASTM D 2880-71 for sulfur in oil (I,A)
- EPA Method 9 for VE (I,A)
- EPA Method 10 for CO (I)
- EPA Method 20 for NOx (I,A)
- EPA Method 25 for VOC (I)
- EPA Method 104 for Be, or EPA SW846 Method 3040, 7090/7091 (I)

Other DER approved test methods may be used only after Departmental approval.

Continuous emission monitors shall be installed, calibrated, maintained and operated for opacity and NOx.

6. The project shall comply with all the applicable requirements of Chapters 17-2 and 17-4 of the Florida Administrative Code (F.A.C.).

7. DER's South Florida District office shall be notified in writing a minimum of 15 days prior to source testing. Written reports of the test results shall be submitted to the district office within 45 days of test completion.

PERMITTEE:
Key West City Electric System

Permit Number: AC 44-152197
Expiration Date: 9/1/90

SPECIFIC CONDITIONS:

8. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the BAQM prior to 60 days before the expiration of the permit (F.A.C. 17-4.090).

9. An application for an operation permit must be submitted to the South Florida District office at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. 17-4.220).

10. Any change in the method of operation, fuels, equipment or operating hours shall be submitted for approval to the South Florida District office.

11. The three existing 16.5 MW steam units at the Key West Plant shall be shut down and operation permits shall be surrendered for cancellation when operation permits are issued for the two new engines authorized by this permit.

Issued this _____ day
of _____, 1989

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Dale Twachtmann, Secretary

Best Available Control Technology (BACT) Determination
Key West City Electric System
Monroe County

The applicant proposes to install two diesel generators at their Stock Island Plant at Key West, Monroe County, Florida. The generation facility will consist of two diesel engines with an electric generation capability of 9,605 kw each. The total heat input per engine is 100 MMBtu/hr.

The applicant has indicated the maximum total annual tonnage of regulated air pollutants emitted from the two engines based on 8,760 hours per year operation to be as follows:

Pollutant	Max. Potential Emissions (tons/yr)	PSD Significant Emission Rate tons/yr
NO _x	2,100	40
SO ₂	440	40
PM ₁₀	90	15
CO	520	100
VOC	260	40
Pb	0.05	0.6
Hg	0.01	0.1
Be	0.0005	0.0004

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

BACT Determination Requested by the Applicant

The BACT Determinations requested by the applicant on a pollutant by pollutant basis are given below:

Pollutant	Determination
NO _x	8.0 g/hp-hr
SO ₂	Low sulfur fuel (sulfur content of diesel will be limited to 0.5%)
PM ₁₀	0.1 lb/MMBtu
CO	2.0 g/hp-hr
VOC	1.0 g/hp-hr
Be	0.0005 tons per year

Date of Receipt of a BACT Application

September 23, 1988

Review Group Members

This determination was based upon comments received from the applicant and the Stationary Source Control Section.

BACT Determination Procedure:

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination will be based on the maximum degree of reduction of each pollutant emitted which the Department, on a case-by-case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination, the Department shall give consideration to:

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

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

BACT Analysis

A review of previous BACT determinations and control measures utilized for stationary large bore diesel engines indicates that

in general the emission rates proposed by the applicant do not represent BACT. The rationale for establishing BACT at a lower than proposed level for the applicable pollutants is presented as follows:

Nitrogen Oxides

The emission of nitrogen oxides from stationary large bore diesel engines has in recent years become a concern in the BACT decision making process. A review of the various technologies used to generate electricity indicates that large bore diesel engines are by far the greatest emitter of nitrogen oxides on a heat input basis. This is illustrated by comparing the proposed emission limit for the diesel engines to New Source Performance Standards or typical BACT determinations for the other common electrical power generating technologies as follows:

<u>Source</u>	<u>NO_x Emission Level (lb/MMBtu)</u>
Key West Diesels (Proposed BACT)	2.35
Steam Generating Units (Industrial-Commercial-Institutional)	0.20
Resource Recovery (uncontrolled)	0.5 - 0.65
Oil Fired Turbines	0.40
Electric Utility Steam Generating Units	0.30

Based on the comparison shown above, the BACT determination will concentrate on the economics and pragmatics of using the following four alternate power production/control strategies.

- 1) Oil Fired Turbines
- 2) Combined Cycle
- 3) Timing Retardation
- 4) Selective Catalytic Reduction

Turbines, like internal combustion engines, are capable of firing both gaseous and liquid fuels. This ability to fire liquid fuels is an important consideration since natural gas is not available on Key West. From an environmental standpoint the use of turbines is advantageous because the NO_x emissions can be controlled to levels much less than the proposed 8.0 g/hp-hr through the use of inexpensive control techniques such as steam injection.

Similar to the turbine is the combined cycle. A combined cycle configuration typically utilizes a gas turbine as the first means of producing electrical energy, then uses the heat energy of the turbine's exhaust to produce steam which is then passed through a steam turbine/generator as the second means of generating electrical energy. The combined cycle, one of the newest and most common cogeneration configurations, is being used increasingly in the State of Florida.

With regard to the use of turbines and combined cycle configurations, the applicant has stated several disadvantages when compared to the proposed diesel engines.

Turbines and combined cycle configurations are typically sized larger than the largest stationary diesel engines and would require that only one unit (rather than two diesel units) be installed to supply the needed 20MW of generation requirement, thereby resulting in a lower reliability. Another disadvantage associated with the combined cycle is the steam cycle which requires more operating personnel to operate the equipment when compared to diesels which operate in an unattended mode. In addition, both the turbine and combined cycle operate at a higher heating rate to produce an equivalent amount of power as the diesel, thereby requiring more fuel on a per kilowatt basis. This increase in cost will be further evaluated in the economic section of this determination.

The emission of nitrogen oxides from stationary large bore diesel engines are minimized by the use of selective catalytic reduction (SCR). Until recently, SCR has not been judged to be a reasonable control technology for diesel engines due to problems encountered with catalyst poisoning. Although catalyst systems are currently under development and have been demonstrated for some applications (i.e., fuel-rich naturally aspirated gas engines, and gas turbines), there have not been any known demonstrations of their effectiveness as a control measure for the broad range of full-scale internal combustion engines manufactured. This has been particularly true of turbocharged engines, fuel-lean gas engines, and diesel engines.

A recent survey of permitting activities, however, indicates that SCR is now being used on stationary large bore diesel engines. This SCR installation (the first in the United States on a diesel engine) is currently operating on a 4.8 megawatt co-generation facility at a chemical plant in Adams, Massachusetts. This co-generation facility is scheduled to operate on a year round basis with dual fuel being used for 8 months per year and diesel for the remaining 4 months. Additional research indicates that although this SCR system is

being used for the first time in the United States, it has been used extensively in Europe. Background information indicates that this system has been used successfully since 1982, serving over 50 engines and gas turbines, operating on gas, dual fuel, diesel and heavy oil with up to 3.5% sulfur content.

Because the use of SCR has such a limited use at this time (especially in the United States) as a control technology for large stationary diesel engines, the Department has contacted the companies using SCR to obtain their impressions. In the case of the Massachusetts facility, the personnel responsible for operating the cogeneration equipment were very pleased with the SCR system, which has been operating for more than 1,500 hours on diesel fuel. These feelings were also expressed by a company in Germany which has recently submitted another order for a diesel engine with the same SCR technology. Based on these conversations, the Department believes that the SCR technology can be considered to proven on diesel applications.

The final alternative to be considered is the use of the additional timing retardation on the diesel engines. Timing retardation has been used extensively as the primary means of reducing NO_x emissions from diesel fueled engines. This reduction is achieved by essentially lowering the peak combustion temperatures, thereby limiting thermal NO_x formation. Depending on the amount of timing retard used, NO_x reductions can range up to 45 percent. Timing retardation does however result in the derating of the diesel, thereby increasing the cost to generate a given amount of power.

With regard to determining the cost effectiveness of air pollution control, the EPA has developed costing guidelines to obtain the highest reduction of emissions per dollars invested. This method of maximizing emission reductions per capital invested is a major factor when New Source Performance Standards (NSPS) are developed by the EPA. For NO_x emissions EPA has determined that a cost of up to \$1,000 per ton of emissions controlled (\$0.50/lb) is reasonable for NSPS. In accordance with these guidelines and the control alternatives discussed the cost/benefits are illustrated in Table 1. A review of Table 1 indicates that when operating continuously, the use of SCR is by far the most economical means of control on a cost per ton basis. This cost of \$370.00 per ton is well within EPA's guidelines for NSPS purposes and is hence judged to be economically feasible as BACT for the Key West Facility.

With regard to SO₂ emissions the Department does not believe that the applicants proposal to limit diesel sulfur content to 0.5% is representative of BACT. A review of the latest (July 1988) BACT/LAER Clearinghouse indicates that BACT for SO₂

TABLE 1
Comparison of Alternates for NO_x Control

<u>NO_x Cases</u>	<u>Diesel</u>	<u>Gas Turbine</u>	<u>Diesel with Add. Timing Retardation</u>	<u>Combined Cycle</u>	<u>Diesel with SCR</u>
Capital Cost (\$/KW)	1250	675	1360	900	1400
Heat Rate (Btu/kWh)	8500	13,600	9500	10,800	8500
Part Load Heat Rate	base	higher	base	higher	base
Amount of Derating (MW)	none	none	1.6	none	none
Reliability	base	lower	base	lower	unknown
Response Time (minute)	10	20	10	90	10
Emission (gm/hp-hr)	8	1.3	6	1.0	0.8
Emission (T/yr)(2)	2100	340	1580	260	210
Increased Cost (\$/yr)(1)	base	2,540,000	820,000	980,000	700,000
Cost of Emission Reduction (\$/T)	base	1400	1560	530	370

(1) Capital cost amortized at nine percent annual rate; fuel cost of \$4/mm Btu, 100% capacity factor, SCR cost includes ammonia and maintenance.

(2) Based on 20 MW output.

emissions from diesel engines has previously been set at limiting sulfur content to 0.2%. This level appears to be the maximum control established and hence is evaluated using the "top down" BACT approach as follows:

Discussions with the applicant's fuel supplier indicate that the additional cost of reducing fuel sulfur content from the proposed level of 0.5% to 0.2% would be approximately 3 cents per gallon. At the maximum firing rate, the additional hourly cost of using the 0.2% sulfur content diesel instead of the proposed 0.5% sulfur content diesel would be \$42.00. The sulfur dioxide reductions from switching to the 0.2% sulfur content diesel are estimated to be 60 pounds per hour. Based on this reduction, the hourly cost per pound of sulfur dioxide removal is 70 cents which is less than the EPA NSPS guideline of up to \$1.00 per pound (\$2,000 per ton) for sulfur dioxide removal. As this is the case, BACT is judged to be represented by limiting the diesel's sulfur content to 0.20%.

With regard to PM₁₀ emissions, the Department does not agree with the applicant that the proposed emission level of 0.1 lb/MMBtu is representative of BACT. A recently permitted diesel generating facility proposed a PM₁₀ emissions level of 0.03 lb/MMBtu. This emission level (0.03 lb/MMBtu) is consistent with what most large stationary diesel engine manufacturers are guaranteeing for recent permit applications and is representative of NSPS for other types of similar sized fuel burning equipment, thereby being judged to be reasonable as BACT for this facility.

For internal combustion engines there exists a trade-off between the emissions of NO_x and the products of incomplete combustion (carbon monoxide (CO) and volatile organic compounds (VOCs)). Generally speaking, attempts to decrease the emissions of NO_x by means other than add-on controls (i.e., ignition timing retardation, air-to-fuel ratio changes, etc.) are accompanied by increases in CO and VOCs. Considering the timing retardation applied, the applicant's guaranteed emission levels of 2.0 and 1.0 grams per horsepower hour, respectively, may be representative of BACT.

Environmental Impact Analyses

A review of the ambient impacts associated with the diesel installation at the Key West Facility indicates that only the pollutants NO_x and SO₂ will contribute significantly when compared to the present background concentrations. Based on the applicant's proposal for BACT, the impacts associated with NO_x and SO₂ are estimated to be 5.8 (annual average) and 146 ug/m, (24 hour average) respectively.

For NO_x the impact is estimated to increase the total ambient concentration by approximately 25 percent resulting in a concentration which is 43.8% of the standard. For SO₂ the impact is estimated to increase the total ambient concentration by more than three times resulting in a concentration which is 81.2% of the standard.

Based on this impact review, the Department has determined that the Key West Facility has the potential to contribute moderately to the NO_x concentration and substantially to the SO₂ concentration in that area. As this is the case, the Department believes that its BACT determination which would reduce the proposed NO_x and SO₂ impacts by 85 and 60 percent, respectively is further justified.

In addition to the criteria pollutants, the impacts of toxic pollutants associated with the combustion of diesel have been evaluated. Three of the toxic pollutants (mercury, beryllium, and lead) have PSD significant levels with only beryllium being in exceedance. The other toxics (polyorganic matter, nickel, chromium, and arsenic) are expected to be emitted in minimal amounts, with the total emissions of all seven toxics combined to be less than one ton per year.

Although the emissions of the toxic pollutants could be controlled by particulate control devices such as a baghouse or scrubber, the amount of emission reductions would not warrant the added expense. As this is the case, the Department does not believe that the BACT determination would be effected by the emissions of the toxic pollutants associated with the firing of diesel.

Potentially Sensitive Concerns

With respect to the Key West Facility there are several sensitive concerns. Although the cost of using SCR was shown to be the most attractive on a cost per ton basis and well within the NSPS guidelines, the applicant is concerned that a requirement to use SCR will result in serious financial burdens.

Due to the large capital cost of the SCR system (approximately \$2.3 million) the applicant is concerned that additional bonding coverage would be needed which would require that electrical rates be increased. This would be burdensome to the people in the Key West area where electricity rates are currently among the highest in the State of Florida and have recently had a significant increase to finance the diesel project.

In addition to the cost considerations, the applicant has expressed concern that the experience with the SCR system

TABLE 2
Economic Analysis of SCR for NO_x

<u>Capital Costs</u>					
Direct Costs for SCR	\$2,300,000				
Financing Costs	625,000				
Total	\$2,925,000				
<u>Annual Operating Costs</u> <u>for SCR (\$/yr)</u>					
Equivalent Full Load					
Hrs. of Operation (hrs/yr)	8,760	5,000	2,500	1,500	1,000
Net Generation (MWH(1))	168,192	96,000	48,000	28,000	19,200
Net Debt Service (\$)(2)	252,000	252,000	252,000	252,000	252,000
Maintenance (\$)(3)	215,000	215,000	215,000	215,000	215,000
NH3 Cost (\$)(4)	230,000	131,000	65,000	39,000	26,000
Total Cost	697,000	598,000	532,000	506,000	493,000
(cents/kWh)	.41	.62	1.11	1.76	2.57
<u>NO_x Removal</u>					
Tons/Year (5)	1,814	1,036	518	311	207
\$/Ton	384	577	1,027	1,627	2,382

- 1) Based upon a combined net output for the diesel generators of 19.200 kw.
- 2) Based on assumed interest rate of 8.25% for municipal tax exempt debt and 25 year amortization period.
- 3) Average assumed cost for 10-year period based upon letter from SCR equipment supplier.
- 4) Based upon 90% NH3 removal, and usage of 220 lbs/hr at full load and cost of \$0.12/lb.
- 5) Based upon an uncontrolled emission of 8 gm/hp-hr.

relative to diesel fueled generation is very limited and should only be considered in the demonstration category relative to technical risk, not having been proven commercially. The applicant also states that the addition of the SCR system will, in effect, void the Utility Board's existing performance guarantees and warranty on the diesel engine generator set, since the diesel manufacturer will not take any responsibility for the impact of the SCR equipment on the plant operation, performance, and reliability.

With regard to the low sulfur content requirement, the applicant has indicated that due to the size of the diesel facility, it is not likely that diesel fuel with a guaranteed sulfur content not to exceed 0.20% can be obtained. This is based on conversations with fuel suppliers which have indicated that the expected diesel usage is to large to be accomodated by the small shipments of low sulfur content diesel that are shipped in to fuel suppliers, but to small to receive a direct shipment on an ocean going barge.

Finally, the applicant is concerned that the Department's recommended BACT for PM₁₀ emissions may be difficult to achieve. Each of these concerns is largely based on the diesel units projected operating schedule which is not likely to exceed more than 2500-3000 hours per year each except in emergency cases.

BACT Determination by DER:

Discussion

Based on the information presented by the applicant, the Department believes that the costs associated with using SCR should be evaluated for various operating schedules. These costs are shown in Table 2.

A review of Table 2 indicates that the cost per ton of NO_x controlled when using SCR is very dependent upon the hours of operation. This variability in cost is attributed to the fixed cost using SCR which is independent of hours of operation. From Table 2, the cost per ton of NO_x removal can be expressed by the following relationship.

$$\text{Cost of NO}_x \text{ Removal} \quad = \quad \frac{460,000 + 25.64 X}{.204 X}$$

(\$/ton)

Where X = Number of hours operated

The cost analysis shown in Table 2 is useful in comparing other alternatives which can be employed to reduce NO_x emissions from large bore diesel engines.

At the maximum operation levels which are likely to occur as stated by the applicant (2,500 - 3,000 hours per year) the cost of using SCR is more comparable to using timing retardation on a cost per ton basis. The annual expense, however, of using timing retardation is much less than using SCR (\$176,000 vs \$532,000 at 2,500 hours of operation). This large difference in cost supports the applicant's concerns that SCR would be extremely costly for operating schedules which are much less than full time operation.

In accordance with this situation, it appears that a reasonable comparison would be to allow the applicant to use timing retardation providing the diesels would be operated at the level where the cost per ton of using either SCR or timing retardation are equivalent.

The cost of timing retardation at less than full time operation is only a function of additional fuel needed to produce an equivalent amount of power. For a given amount of power generated and the subsequent NO_x reductions achieved by timing retardation, the cost per ton of control is approximately \$1,333. When this cost is substituted into the cost equation for SCR, the hours of operation which yield the same cost per ton for both SCR and timing retardation is approximately 1,870.

The Department's finding with regard to the availability of low sulfur content (0.20%) diesel support the applicant's claims. Although other large stationary engines/turbines with diesel firing capability have been recently limited to using diesel with a sulfur content in the 0.2-0.3% range, it appears that the expected diesel consumption by the Key West diesels will not allow such a requirement.

Conversations with the diesel suppliers for the previously permitted facilities with the low sulfur content requirement have indicated that these facilities are only able to get this quality of fuel, which is not readily available, due to the relatively small needs for diesel in general. Each of these facilities is expected to use diesel only during periods of natural gas curtailment. As this is the case, the need for diesel is limited and the low sulfur content batches can be obtained.

With regard to Key West, natural gas is unavailable. This results in a need for diesel engines which are too large to be supplied by these low sulfur content shipments obtained by local suppliers, but too small to be serviced by a direct shipment via an ocean going barge which carry at least four times the amount of fuel that can be stored in the Key West facility's tanks.

Conclusion

In view of the sensitive concerns that have been identified by the applicant concerning this facility, the Department has concluded that at this time, BACT for nitrogen oxides is represented by using timing retardation and limiting the hours of operation. It should be noted that at levels of operation which are greater than the specified 1,870 hours, the use of SCR becomes less costly than timing retardation and should be considered BACT for the facility.

With regard to the extent to which SCR has been demonstrated to be a proven technology on diesel applications, the Department feels that there has been sufficient operating experience to indicate that SCR is in fact a viable technology for diesel applications. It should be noted that the hours of diesel operation for the existing SCR systems addressed in this determination have been restricted in fact by the price of fuel. Discussions with large stationary internal combustion engine operators both in the United States and Europe have indicated that the preference to operate on natural gas is based on its cheaper cost per a given amount of heating value. The only time diesel is used is during periods of natural gas curtailment which has resulted in not having comparable amounts of operating experience for both diesel and natural gas.

With regard to limiting diesel sulfur content to levels which are less than requested by the applicant, the Department has determined that such a restriction is not warranted in view of the situation. Although modeling indicated that the sulfur dioxide concentrations would increase by more than three times using the 0.5% diesel for full time operation, the hours of operation restriction imposed to limit NO_x emissions will lower these projections substantially.

With regard to PM₁₀ emissions, the Department has determined that the emissions of PM₁₀ as well as CO and VOC's can likely be influenced by the measures taken to reduce NO_x emissions. As this is the case, BACT for each of these pollutants will be established at the applicants guaranteed levels, but will be subject to being adjusted to a lower level based on the stack testing results.

In accordance with this determination, the emission limits on a pollutant by pollutant basis are set as follows:

<u>Pollutant</u>	<u>Emission Limit</u>
NO _x *	6.0 g/hp-hr
SO ₂	Diesel sulfur content limited to 0.50%
PM ₁₀ **	0.10 lb/MMBtu
CO**	2.0 g/hp-hr
VOC**	1.0 g/hp-hr
Be	0.0005 tons per year

*Nitrogen oxides emission limitation is based on limiting hours of operation to 1,870 full load equivalent hours for the facility (total of 3,740 full load equivalent engine hours). For operating schedules which are in excess of 1,870 full load equivalent hours the use of SCR has been justified as representing BACT for the facility.

**PM₁₀, CO, and VOC emission limitations are maximum allowables and are subject to change based on stack testing results. The emission level of these pollutants is sensitive to the level of NO_x control and should be established in accordance with actual test results.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
 Department of Environmental Regulation
 Bureau of Air Quality Management
 2600 Blairstone Road
 Tallahassee, Florida 32399-2400

Recommended by:

 C. H. Fancy, P.E.
 Deputy Bureau Chief, BAQM

_____ 1989
 Date

Approved by:

 Dale Twachtmann, Secretary

_____ 1989
 Date

R. W. BECK AND ASSOCIATES

ENGINEERS AND CONSULTANTS

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MAR 6 1989

PLANNING
DESIGN
RATES
ENVIRONMENTAL
ECONOMICS
MANAGEMENT

DENVER NATIONAL BANK BUILDING
SUITE 1900
1125 SEVENTEENTH STREET
DENVER, COLORADO 80202
TEL: 303-295-6900

DER - BAQM

GENERAL OFFICE
SEATTLE WASHINGTON
Telephone: 206-441-7500
Telex: 4990402 BECKSEA
Denver, CO Telescopier:
303-297-2811

TELECOPY MESSAGE

TO: Barry Andrews

PHONE NUMBER: (904) 488-6579

FROM: Mike Henderson

DATE: 3/6/89

TIME: 2:30

WORK ORDER NUMBER: FC-5801-CA1-CA

NUMBER OF PAGES (Including This Cover Page): 2

OPERATOR: _____

R. W. BECK AND ASSOCIATES TELECOPY NUMBER: (303) 297-2811

MESSAGE: Here is information discussed on Friday.
Engine capacity was approximately 6300 KW
in referenced proposal.

PLEASE CALL OPERATOR AT (303) 295-6900 IF YOU HAVE ANY PROBLEM RECEIVING THIS TRANSMISSION OR YOU DID NOT RECEIVE THE NUMBER OF PAGES LISTED ABOVE.

Colt Industries



Fairbanks Morse
Engine Division
701 Lawton Avenue
Beloit, Wisconsin 53511-5492
Telephone: 608/364-4411
Telecopier: 608/364-0382

March 6, 1989

R.W. Beck and Associates
Denver National Bank Building
Suite 1900
1125 Seventeenth Street
Denver, CO. 80202

Attention: Mr. Mike Henderson

Subject: Colt Proposal HK7-02-SS
Dual Fuel Generator Sets
Combustion Engineering
ITB 3971-110-01 Pratt-Whitney Project

Dear Mike:

Our proposal for the subject project which was submitted on Purchaser's Proposal data sheets did not contain exhaust emission data for particulate matter since it was not requested.

We were subsequently provided a copy of the environmental permit issued by the State of Florida for our review and confirmation that our bid met all permit requirements.

In regard to the Particulate, PM, we indicated we could meet the stated requirement for the proposed PC2.3 dual fuel engine operating in the dual fuel mode. Specifically we stated "Assuming that the values for particulates, PM, should be 4.03 and 8.06 Tons per year in the dual fuel and diesel modes respectively (1 #/HR x 8060 HR/2000 = 4.03 Tons). The engines proposed by Colt will meet the Tons/Year limitations listed in the dual fuel mode. PM values for Colt engines are calculated based on correlation between smoke meter measurements and soot weight rather than collected and measured." This was on a per engine basis.

This dual fuel information is not applicable to the Key West 18 Cylinder PC2.6 diesel engine.

Very truly yours,

J.M. Moriarty
Manager, Marketing

JMM/jl
cc: J. Clark
P. Danyluk
G. Kasel
T. Reder
M. Weiss

cc: P. Rival
K. J. Lewis
S. H. Lee
C. Knowles, Filter
S. M. ...
C. Stone DPS
...PT

In effort to preserve these documents. I wrote over the original fax ~~copy~~ sheets. which had faded. It is my desire to preserve the information not the typing. No copies were made at the time the fax was rec'd.

AC 44-152197
AC 44-152198
PSPCL-135

[Handwritten Signature]
Kanan,

R. W. BECK
AND ASSOCIATES

R. W. Beck and Associates
Denver Office
Telecopy Message

Page 1 of 4
Date 2/25/89
Time 8:30

TO Barry Andrews
PSA # FC-5801-DA3 AB
Project Key West Diesels
from Mike Henderson

FAX Tele No. (904)
488-6579

(303) 297-2811 Denver Office Telecopier

Message: Attached is information we discussed
Please call when you have reviewed

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MAR 2 1989
DER-BAQM

R.W. BECK

HAND ASSOCIATES

Denver National Bank Building, Suite 1900 • 1125 Seventeenth Street • Denver, Colorado 80202-2615
Telephone (303) 295-6900 • Fax (303) 297-3811

PC-5801-DA3-AB

MEMORANDUM

February 28, 1989

TO: Files
FROM: BECKY PATTINSON
SUBJECT: No. 2 Diesel Fuel Availability

I have contacted the following suppliers of No. 2 diesel fuel. I requested they supply written confirmation of the availability and cost of No. 2 fuel with a sulfur content not to exceed 0.2%. The letters I received are attached to this memo. A summary of the responses is listed below.

1. Belcher Oil Company
Port Everglades, FL
D. W. Carlton
(800) 327-3495

Belcher Oil cannot supply 0.2% sulfur content No. 2 diesel fuel. Letter is attached.

2. Dion Oil Company
Key West, FL
Larry Dion
(305) 296-2000

Dion Oil cannot supply 0.2% sulfur content No. 2 diesel fuel.

3. Chevron USA
Atlanta, GA
Hal Goodwin
(404) 984-3029

Chevron cannot supply 0.2% sulfur content No. 2 diesel fuel. Their guarantee minimum is 0.5%. They are unable to deliver by barge to Key West.

4. Blayloc Oil Company
Homestead, FL
R. D. Jackson
(305) 247-7249

Blayloc will only guarantee 0.5% sulfur content No. 2 diesel fuel. They are a distributor for Texaco and do not produce their own fuels.

Memorandum to:
Files

February 28, 1989

5. Amoco Oil Company
Atlanta, GA
Ken Jahde
(404) 634-8072

Amoco does not currently supply 0.2% sulfur content No. 2 diesel fuel to Florida. It is available from Texas City, Texas in ocean going barge quantities (100,000+ bbls). Amoco does not currently have the ability to deliver in small barge quantities.

6. Apex Oil Company
Richmond Heights, MO
Mark Turner
(314) 889-9600

Apex cannot supply fuel in Florida

- Ranco Oil Company
Miami, FL
Rex Benson
(305) 836-0152

Ranco Oil buys their fuel from Chevron Oil Company. The average sulfur content for No. 2 diesel fuel ranges from 0.5% sulfur. They cannot supply 0.2% sulfur content fuel and cannot guarantee sulfur content below 0.5%.

8. Sinclair Oil Company
Denver, CO

Sinclair does not distribute fuel in the Southeastern United States.

9. Western Fuels
Don Van Sickle
(813) 247-5063

Western Fuels has gone out of business and sold their terminal

10. Central Oil
Dale Robinson
(813) 248-2105

Central Oil cannot supply the Key West area

Becky Patterson

MDH/BP:ehh/291
Attachment

cc) Nick Guarriello, Orlando
Keith Platte
Mike Henderson
Tom Donovan

CC Praval
B. Andrews
S.H. Chen
D Knowles, SF Dist
W. Aronson, EPA
M. Flores, NPS



Belcher Oil Company
A SUBSIDIARY OF THE CRISTAL CORPORATION

The Energy People

D. W. Carlton
SENIOR VICE PRESIDENT
MARKETING

February 23, 1989

Ms. Becky Pattinson
Supervising Engineer
R. W. Beck & Associates
1125 17th Street
Suite 1900
Denver, CO 80202

Dear Ms. Pattinson:

Confirming our telephone conversation of this date, Belcher finds itself in the position of not being able to guarantee .2% or .3% maximum sulfur diesel fuel based on the low market requirements in the South Florida area for these low sulfur grades of diesel fuel and the estimated maximum consumption for the new units at the City of Key West.

Please let us know if there is any other information or assistance you require.

Sincerely,

BELCHER OIL COMPANY

D. W. Carlton
Senior Vice President
Marketing

DWC/mec

cc: R. R. Padron, Manager
City of Key West

Ord. Exp. F2425646296
2-4-89
Denver, CO

file copy

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615
Telephone (303) 295-6900 ■ Fax (303) 297-2811

FF-5801-CA1-AA

February 8, 1989

Mr. Barry Andrews, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RECEIVED

FEB 10 1989

DER-BAQM

Dear Barry:

This letter is to follow up on telephone conversations over the last week with Mr. Clair Fancy, Bill Thomas and yourself. Previously you proposed that a BACT determination could be recommended on the basis that equal costs per ton of NO_x removal would allow use of additional timing retardation (6 gm/hp-hr) and limited operation (less than 8760 equivalent full load hours per year for the two engines) rather than use of the Steuler SCR equipment on the exhaust. The reasoning as we understand from the conversation is that since the SCR system is technologically risky and would be difficult for CES to finance at this time, CES should be required to reduce emission by a combination of limited hours and timing retardation on its engines such that the cost per ton of NO_x removal would be similar to the cost with the SCR system. CES and its Consulting Engineer requested time to review this concept and the methodology upon which it was based and provide comments.

We believe the concerns raised in our December 14, 1988 and January 17, 1989 letters support the position that "on a case by case basis, taking into account energy, environmental and economic impacts, and other costs" the best available control technology for NO_x emissions is the proposed 8 gm/hp-hr as requested in our application. The only currently available method for CES to reduce emissions from the diesel engines and still receive performance guarantees from the diesel manufacturer would be additional timing retardation to 6 gm/hp-hr, although this method represents a substantial economic penalty to CES's customers. Based on the projected economics of these units, it is unlikely that each of these units would be operated more than 2500-3000 hours per year each except in emergency cases. In the interest of minimizing emissions, CES could agree with the general concept that the use of timing retardation on its engines at some agreed level of operation represents the best available control technology for NO_x removal for CES's diesel engines since (i) the SCR system is not a reasonable or technically demonstrated alternative, and (ii) the financing of the SCR system would be difficult for CES as explained later in this letter.

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23501 2425646296		Date 2-9-89		RECIPIENT'S COPY													
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Company R W BECK & ASSOCIATES		Department/Floor No.		Bureau of Air Quality Florida Dept. of Environ. Regulations													
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FEDERAL EXPRESS USE: Base Charges Declared Value Charge Other 1 Other 2 Total Charges		<table border="1"> <thead> <tr> <th>PACKAGES</th> <th>WEIGHT IN POUNDS ONLY</th> <th>YOUR DECLARED VALUE</th> <th>OVER SIZE</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>Total</td> <td>Total</td> <td></td> </tr> </tbody> </table> Received At: 1 <input type="checkbox"/> Regular Stop 2 <input type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Box 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station FEDEX Corp. Employee No. 5260 Date/Time for FEDEX Use: 1/1/89		PACKAGES	WEIGHT IN POUNDS ONLY	YOUR DECLARED VALUE	OVER SIZE					Total	Total	Total		Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom. Release Signature:	
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February 8, 1989

We believe that the restriction that you have calculated of 3,000 hrs per year for both units is a substantial restriction on the operation of these units and does not as was intended under your proposed methodology accurately represent the level of operation at which the cost of NO_x removal with timing retardation is equal to the cost of NO_x removal with the SCR. This level of operation should be approximately 4500 hours as our calculations that follow will indicate.

The cost estimates and other information presented in our letter dated January 17, 1989 were prepared on a preliminary basis to provide the information you requested in a timely manner. We have reviewed this data and believe that certain corrections should be made for purposes of determining the proposed level of operation for the diesel units. The cost of NO_x removal utilizing the SCR system and with additional timing retardation were based on diesel units of 10 MW size each. To simplify the comparison, the size of the units in each case was assumed to be the same. Based on the current guarantees, the size of the units should more precisely be 19.2 MW (2 x 9.6) without additional timing retardation, and 17.6 MW (2 x 8.8) with additional timing retardation. When these corrections are made the cost of NO_x removal with the Steuler system is represented by the following:

Cost of NO_x Removal (\$/ton)

$$\frac{467,000 + 26.4 X}{.204X}$$

Where: X = Number of hours

The cost of NO_x removal with additional timing retardation is represented by the following:

$$\text{Total Annual Cost (Assuming 8760 hours)} = 820,000 \times \frac{17.6}{20.0}$$

$$= \$722,000$$

$$\begin{aligned} \text{Emission with base case timing retardation (tons/year)} &= 2100 \times \frac{19.2}{20} \\ &= 2016 \end{aligned}$$

$$\begin{aligned} \text{Emission with additional timing retardation (tons/year)} &= 1580 \times \frac{17.6}{20} \\ &= 1390 \end{aligned}$$

February 8, 1989

$$\begin{aligned} \text{Average Cost of NO}_x \text{ removal (\$/ton)} &= \frac{\$722,000}{2016-1390} \\ &= \$1,153 \end{aligned}$$

Allowable hours of operation:

$$\begin{aligned} \text{Cost of NO}_x \text{ removal (Steuler)} &= \text{Cost of NO}_x \text{ removal (Additional Timing Retardation)} \\ \frac{467,000 + 26.4 X}{.204X} &= 1,153 \end{aligned}$$

$$\begin{aligned} X &= 2,236 \text{ hours} \\ \text{Rounded} &- 2250 \text{ hours} \end{aligned}$$

Thus, the permit would restrict the use of the diesels to a total for both units of 4500 equivalent full load hours per year. We also request that DER allow for the upward adjustment in the allowable hours of operation should performance tests indicate that either the heat rate penalty associated with the additional timing retardation (guaranteed heat rate penalty differential of a 1000 Btu/kWh) or the actual emission (guaranteed to be 6 gm/hp-hr) is less than expected.

It is noted that the exhaust opacity is expected to exceed 20 percent with the additional timing retardation. As indicated in the original PSD application, section 17.2.610(2) allows such operation when operating practices to minimize opacity are being utilized.

With regard to CES's ability to finance additional capital expenditures, CES's current bond resolution requires that certain conditions be met prior to issuing additional parity debt. Among other conditions, CES must obtain a statement of an independent certified public accountant setting forth the amount of net revenues for a 12-month consecutive period within the last 18 months and stating that the net revenues for such preceding 12-month period, as adjusted for (i) changes made in rates or other changes prior to issuance of the additional parity obligation, and (ii) changes caused by new projects of the system having been placed into service and operation subsequent to the date of commencement of the 12-month period, will equal at least 120 percent of the maximum debt service requirements on (i) the bonds then outstanding, and (ii) the additional parity obligation with respect to which such statement is made.

Because of this additional bond coverage requirement, the financing of the capital expenditure for the Steuler SCR system would require an increase in rates to meet the historical coverage requirement on maximum debt service. As we have discussed previously, the Utility Board's rates are

Mr. Barry Andrews
Florida Department of
Environmental Regulation

-4-

February 8, 1989

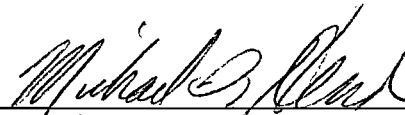
currently among the highest in the State and its customers have just recently had a significant rate increase to finance the diesel project.

The size of the expenditure for the Steuler SCR system is estimated to be approximately \$2,300,000. The financing costs for this level of expenditure as a percent of the amount financed is expected to be relatively large compared to larger financings because certain issuance expenses are not proportional to the size of the issue. There could also be an interest rate penalty associated with an issue of this small size.

We trust this information will assist you in completing the Preliminary Determination. If you have any further questions, please direct them to the author. CES appreciates your diligence in handling this permit application and anticipates your further best effort.

Sincerely,

R. W. BECK AND ASSOCIATES



Michael D. Henderson
Principal Engineer

MDH:(key64/1529T)

cc: Mr. Clair Fancy
Mr. Bill Thomas
Mr. Bobby Padron, General Manager
Mr. Nick Guarriello
Mr. Paul Arsuaga
Mr. Leo Carey, Asst. to the Manager
Mr. Ralph Garcia, Sr. Asst. to the Manager
Mr. Larry J. Thompson, Operations Manager
Mr. Paul Esquinaldo, Jr., Finance Manager
Mr. L. T. Curry, Jr., Production Manager
Ms. B. Pattinson
Mr. K. Platte
Mr. T. J. Reder

*copied: Pradeep Rawal
Shao-Hong Chen
Wayne Bronson, EPA
Chris Shauer, WPS
David Knowles, SF Dept*

Bul. No. = 2939106112

1-10-89
Denver, CO**R.W. BECK**
AND ASSOCIATESDenver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615
Telephone (303) 297-6900 ■ Fax (303) 297-2811

FC-5801-CA1-AB

January 17, 1989

RECEIVEDMr. Clair Fancy
Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

JAN 18 1989

DER-BAQM

Subject: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198, and PSD-FL-135

Dear Mr. Fancy:

We write this letter to follow up a meeting held with your staff on January 11, 1989. At that time, several issues were discussed regarding use of an SCR system for NO_x control on the proposed diesel generators. In a letter dated December 14, 1988, City Electric System ("CES") provided information on Steuler experience and equipment costs, and Fairbanks-Morse' engine performance guarantees. The conclusions in that letter were stated as follows:

- 1) The Steuler SCR technology has not been commercially proven since there is little operating experience in the oil-only diesel engines. The technology should be considered in the development and demonstration category.
- 2) Fairbanks-Morse has stated that they will cancel their engine performance guarantees and warranty if installation of the SCR equipment changes the operating conditions of the engine.
- 3) The increased costs imposed on CES' customers is excessively burdensome since their electric costs are already high relative to other utilities' customers in the state. The environmental impact of the equipment will be minimal, even if the installation were successful, because of the low planned capacity factor for the generators.

Our recent meeting provided the opportunity to informally present the information in the December letter and to discuss other concerns with the staff. The staff has requested we provide additional information relative to alternates considered for NO_x and SO₂ control, and information regarding Key

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Company W. BECK & ASSOCIATES			Department/Floor No.		Recipient's Phone Number (Very Important)
Street Address 1125 17TH ST STE 1900			Company Florida Department of Environmental Bureau of Air Quality Management		
City DENVER			State CO		ZIP Required 80202
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West's current rates and its customers' ability to pay as compared to customers of utilities in other areas in the state. The following paragraphs discuss the requested information relating to alternates of NO_x and SO₂ control and economic statistics for CES' customers. Tables 1 and 2 summarize data on the alternates for NO_x and SO₂ removal.

NO_x Control Alternates

The proposed diesels and four alternatives were considered relative to NO_x emissions. NSPS guidelines consider costs prohibitive for NO_x control when the next incremental reduction of emissions costs more than \$1000/ton. CES believes that the proposed emission rate of 8 gm/hp-hr represents BACT "on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs." The base case and its alternates are discussed further here. Quantitative information for the five cases is given in Table 1. For each alternate in Table 1, the additional costs associated with incremental emission reduction is shown on an annual dollar basis and on a dollar per ton basis.

Alternate 1

The gas turbine alternate has lower estimated capital costs. Because of the higher heat rate at all loads, fuel costs are much higher and operating costs are increased. The reliability of the equipment is inherently lower as well because one unit (rather than two diesel units) would have been installed for the required generation capacity. As shown in Table 1, this alternate exceeds the NSPS guidelines.

Alternate 2

The second alternate, use of the diesels with additional timing retardation, results in NO_x emissions of 6 gm/hp-hr. Emissions of CO, HC, and opacity are increased in this case. Engine performance also changes; the heat rate increases and the gross output of the unit decreases. The result is higher capital and operating costs. This alternate also exceeds NSPS guidelines.

Alternate 3

The combined-cycle alternate is also lower in capital cost than the base case. Among other disadvantages, the heat rate of this type of unit is higher and its reliability is lower because it is a single unit. Since the unit uses a steam cycle, more operating personnel are required for the equipment when compared to the diesels which operate in an unattended mode. Because the smallest industrial generation equipment available for this option comes in increments of about 30 MW, the actual installation would be larger than Key West generation needs of 20 MW. The result is additional capital costs to the CES' customers.

Alternate 4

Because of limited operating history of SCR equipment on oil-only fired diesel engines, CES believes it is premature to take on the technical and financial risks related to adding SCR to their generating equipment. CES initial investigation is presented in their letter of December 14. This opinion is further supported by information recently received by Fairbanks-Morse following their inquiry of the German engine supplier (Blohm-Voss) responsible for the Piessenberg installation we visited in December. The Blohm-Voss letter is attached.

According to Blohm-Voss, the unit experienced reduced availability because the SCR catalysts fouled and the ammonia pumps have "been troublesome." Ammonia consumption is 50% greater than design. Blohm-Voss stated the fouling increases back-pressure on the engine, reducing engine performance. In an attempt to solve the existing problems, "there has been permanent attention of the Steuler guarantee engineer" during the one year of operation. Steuler has proposed to increase the catalyst volume 30% above original design and intends to change the ammonia pumps. It is apparent the Piessenberg unit is undergoing research and development to achieve its intended design parameters.

SO₂ Control

Table 2 provides additional information regarding the use of 0.3% sulfur fuel rather than 0.5%. The lower sulfur fuel is not currently available commercially in the Florida market and would require specifications be written to secure the lower sulfur fuel.

Economics

The increased costs for the alternates considered range from \$200,000 to \$2,500,000 per year or 1.2 to 14.6 mills/kWh for the diesel generation equipment. The economic impact of this increase is further emphasized when the relative rates of the Utility Board's customers and their ability to pay as approximated by per capita income is considered. Based on a report by the Florida Municipal Electric Association, the cost of power in May 1988 in Key West for a residential customer using 1,000 kWh per month was 85 mills/kWh, the seventh highest among the total 33 Florida municipal utilities and higher than costs to customers of all investor-owned utilities in the State. In March of 1987, prior to the interconnection of CES with other state utilities which allowed, among other things, the purchase of economy power, the Utility Board had the fourth highest rates in the State at 89 mills/kWh. With respect to personal income of its customers, the per capita income of residents of Monroe County is \$11,300 as compared to an average of \$12,733 for the State, based on the 1987 Florida Statistical Abstract. This statistic, which approximates personal income and ability to pay, indicates that, while the Utility Board's customers' rates are among the highest in the State, their ability to pay is below the average for the State.

TABLE 1
Comparison of Alternates for NO_x Control

<u>NO_x Cases</u>					
	<u>Diesel</u>	<u>Gas Turbine</u>	<u>Diesel with Additional Timing Retardation</u>	<u>Combined Cycle</u>	<u>Diesel with Steuler SCR</u>
Capital Cost (\$/kW)	1250	675	1360	900	1400
Heat Rate (Btu/kWh)	8500	13,600	9500	10,800	8500 (2)
Part Load Heat Rate	base	higher	base	higher	base (2)
Amount of Derating (MW)	none	none	1.6	none	none
Reliability	base	lower	base	lower	unknown
Response Time (minute)	10	20	10	90	10
Emission (gm/hp-hr)	8	1.3	6	1.0	0.8
Emission (T/yr) (3)	2100	340	1580	260	210
Increased Cost (\$/yr) (1)	base	2,540,000	820,000	980,000	700,000
Cost of Emission Reduction (\$/T)	base	1440	1560	530	370

(1) Capital cost amortized at nine percent annual rate, fuel cost of \$4/mm Btu, 100% capacity factor, Steuler SCR cost includes ammonia and maintenance.

(2) If Steuler SCR is installed and operating conditions change, engine performance guarantees will be void.

(3) Based on 20 MW output.

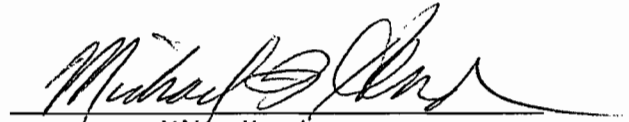
TABLE 2
Comparison of Alternates for SO₂ Control

<u>Cases</u>	<u>0.5% S</u>	<u>0.3% S</u>
Fuel Cost (\$/mm Btu)	4.00	4.13
Emission (lb/mm Btu)	0.5	0.3
Emission (T/yr)	440	260
Increased Cost (\$/yr)	base	200,000
Cost of Emission Reduction (\$/T)	base	1110

We trust this information will assist your staff in completing the Preliminary Determination. If you have any further questions please direct them to the author. CES appreciates your diligence in handling this permit application and anticipates your further best efforts.

Sincerely,

R. W. BECK AND ASSOCIATES



Mike Henderson
Principal Engineer

RMP/MDH:kam (104)

cc: Robert Padron, City Electric Service
Ralph Garcia, City Electric Service
Robert Wallace, City Electric Service
Raymond Rodriguez, City Electric Service
Becky Pattinson, R. W. Beck and Associates
Nicholas Guarriello, R. W. Beck and Associates
Keith Platte, R. W. Beck and Associates
Tom Donovan, R. W. Beck and Associates

*copied: Pradeep Raval, BAQM
Barry Andrews, BAQM
Shao-Hong Chu, BAQM
David Knowles, SF Dist.
Karyne Cronson, EPA
Miguel Inlora, NPS
CHF/BT*


 Blohm+Voss

Blohm + Voss AG · Postfach 100720 · 2000 Hamburg 1

 Mr. V. T. Stonehocker, PE
 c/o COLT INDUSTRIES INC.
 Fairbanks Morse Engine Division
 701, Lawton Avenue,

Beloit, Wisconsin 53511-5492

U. S. A.

 Hermann-Blohm-Straße 3
 2000 Hamburg 11

Fernruf Hamburg (0 40) 31 19-0

 Telegramm-Adresse
 Blohmwerk Hamburg

 Fernschreiben
 2 11 047-0 bv d
 2 11 047-30 bv d (Schiffreparatur)
 2 11 047-42 bv d (Maschinenbau)
 2 11 047-80 bv d (Anlagenplanung)

Fernkopie (0 40) 3 19 37 37

 Registergericht
 Amtsgericht Hamburg
 66 HR B 8121

Ihre Zeichen	Ihre Nachricht	Unsere Zeichen	Telefondurchwahl	Hamburg, den
	Nov. 15, 88	ME 56/Gbe/Ho	(0 40) 31 19- 519	December 15th, 1988

Subj.: SCR unit at Peißenberg
 Ref.: Your letter dtd. Nov. 15th, 1988.

Dear Mr. Stonehocker,

Thank you for your letter, which, unfortunately, reached me with some delay since I was out.

Our experience with SCR, of course, is restricted to this one unit at Peißenberg fitted downstream of a 14 PC 2-5 V DF.C engine with 5980 kW alternator output. The engine has accumulated now 4500 hrs, thereof abt. 800 hrs on gasoil, the remainder in dual fuel mode.

I will try to answer your many questions as follows:

1) Does it do what was intended ?

 Guaranteed emission after SCR is 500 mg/m^3 of NO_x (calculated as NO_2 , related to dry exhaust gases with 5 % oxygen, as per stipulation of German law), which corresponds to

165 ppm in dual fuel mode

135 " " diesel "

(in your terms: abt. 0,95 g/KPhr).

 The limit fixed by the authorities is well above, i.e. 1000 mg/m^3 .
 The emission of the engine is

ard. 800 ppm in dual fuel mode

" 1400 " " diesel "

 In dual fuel mode guaranteed and official limits are still reached, whereas in diesel mode only 230 ppm were reached now at increased NH_3 consumption and carryover.

2)

3 of 3

Blohm+Voss AG

Seite -2)

zum Schreiben vom Dec. 15th, 88 an Mr. V. T. Stonehooker, PE
 c/o COLT INDUSTRIES INC.
 Fairbanks Morse Engine Division
Beloit, Wisc.

Subj.: SCR unit at Peißenberg
Ref.: Your letter dtd. Nov. 15th, 1988.

2) Is it operating without fouling ?

This question cannot yet be answered. Steuler is claiming loss of efficiency due to layer of soot and is presently checking some ceramic moduls taken out recently.

We observed an increasing exhaust back pressure during the last two months, which could be caused by deposits.

3) Is it necessary to clean the unit ?

Neither necessity nor method or schedule are known yet. In general, maintenance and replacement costs of the SCR units are unknown yet. Our to-day's estimation is abt. 2 US-\$/MWh.

4) Which control system for ammonia addition ?

Ammonia injection control is based on the downstream measurement of NO_x .

5) Performance of control system ?

There has been permanent attention of the Steuler guarantee engineer. Acc. to their explanations, the main problem was that the ammonia consumption at diesel mode was about 50 % higher than anticipated (due to higher emission of the engine, appr. 30 % more NO_x had to be taken out by the unit).

6) Who furnished the system ?

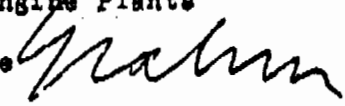
The system was completely furnished by Steuler.

To solve existing problems it is planned to fit an additional layer of ceramic moduls, thus increasing the active volume by abt. 30 %. Furthermore, new ammonia pumps will replace the existing, quite troublesome ones.

As a summary, in dual fuel mode the performance is quite stable, whereas th results in diesel mode leave some doubts concerning the suitability of the SCR system. However, we just received the order for a second engine at Peißenberg. Furthermore, a total energy plant with 2 x 12 PC2-5V DF.C is under construction at Geleenkirchen, also to be fitted with Steuler units.

Hoping that the above information may be useful for you and wishing you full success for the anticipated orders,

Sincerely yours,
 with Season greetings,
 B L O H M + V O S S A G
 Diesel Engine Plants

D. Grabbe 

Remark:
 All figures are given
 for full load.

12-14-88 KEY WEST, FL # 071174 288
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UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272
TELECOPIER: (305) 294-3685

December 14, 1988

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DEC 15 1988

DER-BAQM

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

SUBJECT: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

As indicated in our letter of November 21, 1988, we have investigated the potential use of the Steuler International Corporation ("Steuler") "CER-NOx" Selective Catalytic Reduction ("SCR") system to be installed on the diesel engine generating units proposed to be constructed by the Utility Board of the City of Key West, Florida (the "Utility Board"). The results of this investigation which are outlined below, indicate (i) that the experience with the Steuler SCR system relative to diesel fueled generation is very limited and this system should be considered in the demonstration category relative to technical risk, not having been proven commercially; (ii) the addition of the Steuler SCR system will, in effect, void the Utility Board's existing performance guarantees and warranty on the diesel engine generator set, since Fairbanks Morse will not take any responsibility for the impact of the SCR equipment on the plant operation, performance and reliability; and (iii) the additional cost of this SCR system is excessively burdensome on the Utility Board's customers, which already have high electric rates as compared to customers of other electric utilities in the State, since, even if successful, it would result in a minimal benefit to the environment, based on the expected usage of this equipment, at a very high cost to the community for such benefit.



QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL NUMBER

6717749651

73387

6717749651

Date 12/14/88		To (Recipient's Name) Please Print Mr. Clair Fancy, Central Air Permitting		Recipient's Phone Number (Very Important)	
From (Your Name) Please Print Robert R. Padron, Manager		Your Phone Number (Very Important)		Company Bureau of Air Quality	
Company UTILITY BOARD OF KEY WEST		Department/Floor No.		Department/Floor No. Florida Department of Environmental Regulations	
Street Address 1001 JAMES STREET		Exact Street Address (Use of P.O. Boxes or P.O. Zip Codes Will Delay Delivery And Result in Extra Charge.) Twin Towers Office Building			
City KEY WEST FL		State FL		State Florida	
ZIP Required For Correct Invoicing 33040		City Tallahassee		ZIP Street Address Zip Required 32399	

YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.)

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SERVICES CHECK ONLY ONE BOX		DELIVERY AND SPECIAL HANDLING CHECK SERVICES REQUIRED		PACKAGES	WEIGHT	YOUR DECLARED VALUE	OVER SIZE
1	<input type="checkbox"/> PRIORITY 1 Overnight Delivery Using Your Packaging	1	<input type="checkbox"/> HOLD FOR PICK-UP (Fill in Section H at right)		1.045		
6	<input checked="" type="checkbox"/> OVERNIGHT LETTER* (Our Packaging) 9 1/2" x 12 1/2"	2	<input checked="" type="checkbox"/> DELIVER WEEKDAY		1.970		
2	<input type="checkbox"/> Courier-Pak Overnight Envelope* 12" x 15 1/2"	3	<input type="checkbox"/> DELIVER SATURDAY (Extra charge)		1.100		
3	<input type="checkbox"/> Overnight Box 12 1/2" x 17 1/2" x 3"	4	<input type="checkbox"/> DANGEROUS GOODS (P-1 and Standard Air Packages only Extra charge)		1.100		
4	<input type="checkbox"/> Overnight Tube 38" x 6" x 6" x 6"	5	<input type="checkbox"/> CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Do Not Complete Section 5)	Total	Total	Total	
*Declared Value Limit \$100.		6	<input type="checkbox"/> DRY ICE _____ Lbs.				
STANDARD AIR Delivery not later than second business day		7	<input type="checkbox"/> OTHER SPECIAL SERVICE _____				
SERVICE COMMITMENT PRIORITY 1 - Delivery is scheduled early next business morning in most locations. It may take two or more business days if the destination is outside our primary service areas. STANDARD AIR - Delivery is generally next business day or not later than second business day. It may take three or more business days if the destination is outside our primary service areas.		8	<input type="checkbox"/>	Received At 1 <input type="checkbox"/> Regular Stop 2 <input checked="" type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Box 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station			
Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom.		9	<input type="checkbox"/> SATURDAY PICK-UP (Extra charge)	Federal Express Corp. Employee No. 3011			
Release Signature: _____		10	<input type="checkbox"/>	Date/Time For Federal Express Use 12/14/88			

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Declared Value Charge

Origin Agent Charge

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Cash Received
 Return Shipment
 Third Party Chg. To Del. Chg. To Hold

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City _____ State _____ Zip _____ Total Charges _____

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Date/Time Received _____ FedEx Employee Number _____

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Steuler Experience

Although Steuler has installed the SCR system in various applications in several European countries for approximately five years, there are very few applications similar to the one proposed for Key West, that is, on a diesel engine which utilized only diesel fuel. There is only one installation in the United States on a diesel unit, located in Adams, Massachusetts, which could possibly be considered pertinent to the Key West installation. This unit is a dual-fueled unit which utilizes gas and oil and is presently still in the start-up phase. There is no operating data on the use of this SCR system on any diesel generating unit that would operate only on diesel fuel as the Key West units.

For purposes of reviewing the process, our consulting engineer visited an engine installation in Peisenburg, West Germany in the company of Steuler's process engineer. The diesel engine that was visited was a smaller engine (6 MW) and was utilized in a different application, being part of the district heating system, than the Key West application. The diesel engine had been in operation for less than one year and had only operated for approximately 500 hours on diesel oil, the fuel which is to be utilized exclusively on the Key West units. At the time of the visit the engine was down for turbocharger repairs, and had previously required repairs to the SCR ammonia pump. Based on a review of the operating records, it was reported that the SCR system had achieved a 90% removal of NOx emissions when operated on diesel oil, but because of the limited amount of data (500 hours), our consulting engineer was unable to judge the probability of the continued effective operation of the Steuler SCR system nor the potential impact of the Steuler SCR system on the generating equipment's performance and reliability.

From a physical standpoint, the Steuler SCR system consists primarily of the SCR compartment, aqueous NH₃ tank, control cabinet, metering pumps and condenser. The SCR unit occupied approximately 50% of the floor space required for the entire diesel units. The SCR system requires the use of large amounts of ammonia (NH₃), and for the

Mr. Clair Fancy
Florida Department of Environmental Regulations
SUBJECT: PSD Application for Two 10-MW Diesel Generators at Key West, Florida
12/14/88
Page 3

application in Key West would require approximately 220 lbs. per operating hour. The aqueous ammonia is mixed on site.

With the limited experience on the Steuler SCR system, the Utility Board believes it would be taking an unwarranted technical and financial risk in installing such a system on its diesel engines. The Utility Board cannot install unproven technology for use on its electric system. In the view of Fairbanks Morse, and our consulting engineer the operation of the Steuler SCR system on diesel oil-fueled, diesel generating units has not been adequately demonstrated. Without an adequate demonstration of successful commercial use for this technology, the Utility Board cannot risk utilizing this unproven technology on generating units which comprise approximately 25% of its generating resources. The diesel generating units were selected by the Utility Board, after screening approximately 12 potential options, because of their quick start capability, fuel efficiency over a wide range of outputs, proven dependability, and the unavailability of natural gas as a fuel option. Certain resources which were considered, such as conventional combustion turbines, have significantly lower fuel efficiency especially at less than full load, are less reliable, and require twice the response time. The more advanced "aircraft derivative" combustion turbines, although promising better performance than the conventional combustion turbines, are just becoming available for utility use and are not considered at this time as commercially proven technologies for the Utility Board's next increment of generation in 1990. In evaluating various power supply alternatives, the Utility Board has chosen not to select alternatives which represented technology in the demonstration stage, since with its relatively small size, the Utility Board has determined that it needed to install generating resources that were based on proven mature technologies which could be depended upon to operate reliably. The addition of the Steuler SCR system to the Utility Board's diesel generators would place these units in the same high technical risk category which the Utility Board has sought to avoid.

Fairbanks Morse Contract

We have requested that Fairbanks Morse, the selected diesel unit vendor respond with its opinion on the feasibility of installing the Steuler SCR System on its diesels, and inform us of the contractual terms under which it would maintain heat rate and output guarantees with the Steuler SCR system installed in its exhaust system. The response, which is attached, states that Fairbanks Morse is unable to take any responsibility for the impact, if any, on plant operation, performance and reliability of its equipment, including the heat rate and kilowatt output, that may result from the addition of the Steuler SCR system and therefore, would find it necessary to withdraw its existing guarantees and void its existing warranty on the equipment if the SCR system were installed. In making this decision, Fairbanks Morse states that the current experience on the Steuler SCR system is insufficient at this time to consider this system a full commercial proposition, citing the lack of experience relating to the use of the Steuler SCR system to reduce NOx emissions from engines burning diesel fuel. Fairbanks Morse further states that the inclusion of the Steuler SCR system will alter the building design and engine layout and that any additional costs of delays in the construction schedule would have to be borne by the City. Since it is very unlikely that Steuler will provide any warranties on the Fairbanks Morse equipment, the Utility Board would in effect be left without the existing warranty coverage and performance guarantees on its diesel engines.

Economic Impact

The additional costs to the Utility Board associated with the SCR system installation on the proposed diesel units are summarized on Table 1. As this table indicates, the initial cost for the Steuler SCR system is estimated to be approximately \$2,925,000 including financing costs, which costs were not included in the bond issue for the diesel units. Such initial cost is excluding any additional costs due to changes in the building

design and engine layout or due to delays in the start-up of the diesels as a result of adding the SCR equipment. Assuming this investment is financed by the issuance of additional bonds, it is estimated that the Utility Board's annual debt service would increase by approximately \$252,000. The other major operating costs would include additional annual maintenance costs estimated to be approximately \$215,000 and the cost of ammonia which would vary according to the use of the generating facility and could be as high as \$230,000 in the first full year of operation. As shown on Table 1, these additional costs are estimated to total approximately \$697,000 in the first full year of operation assuming continuous full load operation, and are estimated to total approximately \$532,000 assuming 2,500 hours of equivalent full load operation.

It is expected that, on the average, the diesel generating units would be operated approximately 2,500 hours per year of equivalent full load operation. Based on this level of operation, it is estimated that the Steuler SCR system, if operating successfully, would remove approximately 510 tons of NOx emissions per year, which would cost the Utility Board's customers over a \$1,000 per ton. This additional SCR system cost also represents an increase of over one cent per kilowatt hour to the cost of electricity produced by the diesel generators. This increase in cost would require an immediate rate increase for the Utility board's customers that would be additionally burdensome to Utility Board's customer which have had the highest electric rates in the State in recent years and have just recently had a significant rate increase to finance the construction of the diesel generating units.

One of the principal reasons for installing these additional diesel generating units was to replace the older Key West steam units for various environmental reasons. With the installation of the Steuler SCR system, the Utility Board's customers are being penalized for taking actions which are aimed at improving the community's environment. Another factor which should be considered is the potential for a detrimental impact on the environment and on personnel safety resulting from handling the large quantities of ammonia associated with the operation of the Steuler SCR system which could offset the minimal benefits of the reduced NOx emission. Our

consulting engineer believes that when the Steuler SCR system is used for load following applications, emissions of NOx and ammonia will vary. When load is increased, NOx output is likely to exceed permitted levels. During the previously mentioned site visit, these excursions during start-up were reported in the operating records. During decreases of load, the Steuler SCR system will likely allow release of ammonia because of its inherently slow response time. No determinations have been made as to the regulatory and safety requirements associated with ammonia storage, handling, and stack emissions, but in the Key West environment and with the reduced solubility of ammonia at high ambient temperatures, these concerns are expected to be significant.

In summary, due to the technical risk the Steuler SCR system adds to the Utility Board's diesel generating units associated with potential impacts on performance and reliability, the detrimental effect on the Utility Board's existing performance guarantees and warranty with Fairbanks Morse for the diesel engine generators, the burdensome cost to the Utility Board's customers associated with the addition and operation of the Steuler SCR system, and the minimal benefit to the environment associated with such equipment, the Utility Board is of the opinion that the addition of the Steuler SCR system is not a reasonable nor technically feasible alternative. We believe these concerns support the position that "on a case-by-case basis, taking into account energy, environmental and economic impacts, and other costs", the best available control technology for NOx emissions is the proposed 8 gm/hp-hr as requested in our application.

Table 1

Economic Analysis of SCR for NOx

Capital Costs

Direct Costs for SCR	\$2,300,000
Financing Costs	<u>625,000</u>
Total	\$2,925,000

Annual Operating Costs
for SCR (\$/yr)

Equivalent Full Load		
Hours of Operation (hrs/year)	8,760	2,500
Net Generation (MWH (1))	168,192	48,000
Net Debt Service (\$) (2)	252,000	252,000
Maintenance (\$) (3)	215,000	215,000
NH3 Cost (\$) (4)	<u>230,000</u>	<u>65,000</u>
Total Cost	697,000	532,000
(cents/kWh)	- .41	1.11

NOx Removal

Tons/Year (5)	1,790	510
\$/Ton	389	1,043

(1) Based upon a combined net output for the diesel generators of 19,200 kw.

(2) Based on assumed interest rate of 8.25% for municipal tax exempt debt and 25 year amortization period.

(3) Average assumed cost for 10-year period based upon letter from Steuler Industrierwerke.

(4) Based upon 90% NH3 removal, and usage of 220 lbs/hr of full load and cost of \$0.12/lb.

(5) Based upon an uncontrolled emission of 8 gm/hp-hr

Mr. Clair Fancy
Florida Department of Environmental Regulations
SUBJECT: PSD Application for Two 10-MW Diesel Generators at Key West, Florida
12/14/88
Page 7

We appreciate your consideration of this new information prior to making a preliminary determination on our application. We would also appreciate notification when this information has been determined to be complete based on your review. Thank you for placing the application on hold while we have developed this information.

Very truly yours,

UTILITY BOARD - CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"



Robert R. Padron
General Manager

RRP/sh

cc:

Leo Carey, Ass't. to the Manager
Ralph Garcia, Sr., Ass't. to the Manager
Larry J. Thompson, Operations Manager
Paul Esquinaldo, Jr., Finance Manager
L. T. Curry, Jr., Production Manager
M. D. Henderson
B. Pattinson
K. Platte
N. Guarriello
T. J. Reder

copied: P. Paval
B. Andrews
S. W. Carr
A. Aronson, EPA
K. Guarriello, SF Dist.
CHF/BT

Colt Industries



December 7, 1988

R. W. Beck & Associates
Denver National Bank Building
Suite 1900
1125 Seventeenth Street
Denver, CO 80202

Attention: Mr. Keith Platte

Subject: NOx Abatement System For Key West Project

Gentlemen:

As we indicated in our proposal back in June, exhaust gas post treatment via SCR catalyst technology did not have sufficient commercial experience for us to provide a commercial warranty acceptable to yourselves or the City of Key West.

We have reviewed the Steuler International Corporation proposal and would agree their molecular - sieve technology is promising and that the level of experience worldwide is growing, however, essentially all of their experience is overseas and on dual fuel engines. Gas turbines and engines firing on natural gas are easier applications in which to reduce emissions than are engines burning diesel fuel with higher sulfur content. We do not believe the experience in Europe is necessarily transferable across the border and therefore is insufficient at this time to consider SCR a fully commercial proposition. There are none of this type of SCR system currently operating in the U.S. on large bore diesel engines of which we are aware.

If it is decided that a Steuler system be utilized with our engines we would prefer the purchase, installation, warranty, etc. be handled by the City since we have no experience with this equipment on our engines we are unable to take responsibility for the impact, if any, on the plant operation, performance, or reliability of our equipment. Further, we cannot provide the KW output or heat rate guarantees listed in our proposal nor extend the warranty on our equipment as proposed.

It should be emphasized that the Steuler proposal is a budget proposal and represents equipment FOB Mertztown, PA. If Colt were to purchase this equipment, deliver it to the site, and install it in "available" space at the site, an estimated minimum price increase to the contract in the range of 2.3 million dollars would be necessary.

In addition to the above capital costs, if we understand Steuler's proposal, the operating costs for ammonia could be at least \$60/engine/operating hour and replacement catalyst costs (after the initial cycle) \$175,000 - \$200,000/year based on their guarantee period.

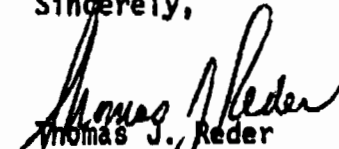
Fairbanks Morse
Engine Division
701 Lawton Avenue
Beloit, Wisconsin 53511

Thomas J. Reder
Vice President
Sales & Marketing
Phone: 608/364-8173
Fax: 608/364-0382
Telex: 260007 COLTFMOFF BELT

A division of Colt Industries Inc

The inclusion of this equipment will alter the building design and engine layout, and thus, any additional cost or delays in the start up as a result of this expanded scope would be borne by the City.

Sincerely,


Thomas J. Reder
Vice President
Sales & Marketing

TJR/ems

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272
TELECOPIER: (305) 294-3685

November 21, 1988

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DER - BAQM

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SUBJECT: PSD APPLICATION FOR TWO 10-MW DIESEL GENERATORS
AT KEY WEST, FLORIDA
Permit Nos. AC44-152197, AC44-152198 & PSD-FL-135

Dear Mr. Fancy:

It has recently come to our attention that German technology for Selective Catalytic Reduction ("SCR") of NOx emissions from small dual-fueled gas/oil-fired engines has been installed in the U.S. and will be tested in the near future. The applicability of this new SCR technology to the proposed Key West diesel units is contingent on resolving numerous questions that are specific to the Key West situation, such as its proven technical capabilities, its impact on unit performance and vendor guarantees, and its economic impact on the citizens of Key West. In order to develop information relative to the engineering and economic aspects of such equipment, which are pertinent to your BACT analysis for the proposed Key West diesels, we are planning to meet with the vendor and our selected contractor, Fairbanks Morse.

In recognition of your statutory requirement to make a determination within 90 days of receipt of a complete application (less 30 days for public comment on a preliminary determination) and your indicated intent to issue a preliminary determination by November 23, 1988, we hereby request that you place our application on hold at this time, pending our submission of further additional pertinent information. We are making

an expedited effort to gather information since we have our contractor on hold, and there is an indicated need to retire three existing steam units (for which the proposed diesels will provide replacement power) by February 1990.

Very truly yours,

UTILITY BOARD - CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"



Robert R. Padron
General Manager

/sh

cc:

Leo Carey, Ass't. to the Manager
Ralph Garcia, Sr., Ass't. to the Manager
Larry J. Thompson, Operations Manager
Paul Esquinaldo, Jr., Finance Manager
L. T. Curry, Jr., Production Manager
Mike Henderson
Becky Pattinson
K. Platte
Nick Guarriello

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IN REPLY REFER TO:
NL6 (SER-CDN)

PM
10-12-88
Atlanta

United States Department of the Interior

NATIONAL PARK SERVICE
SOUTHEAST REGIONAL OFFICE

75 Spring Street, S.W.
Atlanta, Georgia 30303

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OCT 14 1988

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OCT 11 1988

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

We appreciate the opportunity to review and comment on the Prevention of Significant Deterioration (PSD) permit application submitted by the Utility Board of the City of Key West, Florida, to add two 10-MW, Fairbanks Morse (model unspecified) diesel generators to their Stock Island plant. Concurrent with the startup of the two 10-MW diesel generators at the Stock Island site will be the retirement of three existing 16.5-MW steam units located approximately 6.5 km west of the Stock Island site at the Key West Plant. We understand that as a result of the retirement of these three steam units, the proposed project should result in a net decrease in area emissions.

The Stock Island site is located 1 mile east of the city of Key West and approximately 100 km southwest of Everglades National Park, a class I air quality area, and approximately 5 km south of Great White Heron National Wildlife Refuge, a class II air quality area. Under a cooperative agreement with the U.S. Fish and Wildlife Service, the National Park Service provides technical review of PSD permit applications that affect areas administered by the Fish and Wildlife Service.

Based on the National Park Service's review of the information provided, the distance of the facility from Everglades National Park, South Florida climatology, and the projected net decreases in area emissions, the proposed project should not adversely impact the air quality or air quality related values of Everglades National Park. However, based on the lack of ambient air quality monitoring and research data available we cannot determine whether or not emissions from the Key West City Electric System facility will impact the air quality related values (especially slash pine) of the Great White Heron National Wildlife Refuge. We do have several comments regarding (1) the best available technology analysis for sulfur dioxide and nitrogen oxides, (2) the air quality analysis, and (3) the air quality related values analysis (see enclosure).

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
SOUTHEAST REGION
75 SPRING STREET, S.W.
ATLANTA, GEORGIA 30303

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PENALTY FOR PRIVATE USE, \$300

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OCT 14 1988

DER-BAQM

Mr. Claire Fancy, Central Air Permitting
Bureau of Air Quality Management
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400



We appreciate your continued early notification of permitting activities that have the potential to impact the air quality or air quality related values of National Park Service and Fish and Wildlife Service lands in Florida. Please consider the enclosed information for your permit review for the Key West City Electric System project. If you have any questions regarding these comments, please contact Wayne King of our Air Quality Division (303) 969-2072.

Sincerely,

C. W. Ogle

FOR Robert M. Baker
Regional Director
Southeast Region

Enclosure

*Copied: Pradeep Raval
Barry Andrews
Shao-Heng Chu
Dore Knowles, SF Dist
CHF/BT*

The following are comments furnished by the National Park Service regarding the Prevention of Significant Deterioration permit application submitted by the Utility Board of the City of Key West, Florida.

The emissions from the two 10-MW diesel engines are estimated as follows:

<u>Pollutant</u>	<u>Emission rate (Tons/year)</u>
Nitrogen oxides	2100
Carbon monoxide	520
Sulfur dioxide	440
Volatile Organic Compounds	260
Total suspended particulates	90

Based on our review of the information provided, we have several comments regarding (1) the best available control technology (BACT) analysis for sulfur dioxide (SO₂) and nitrogen oxides (NO_x), (2) the air quality analysis, and (3) the air quality related values analysis. The applicant, Key West City Electric System (CES), is proposing to fire No. 2 fuel oil (0.5% sulfur) in the two diesel engines as representative of BACT for controlling SO₂. A recent (August 5, 1988) PSD permit application submitted by CEC Energy Co., Inc. (CEC Energy) for the construction of a similar cogeneration facility for the Virgin Islands Water and Power Authority in St. Croix, U.S. Virgin Islands, was reviewed by National Park Service Air Quality Division personnel. CEC Energy is now proposing the firing of fuel oil with a 0.2% (rather than the 0.3% originally proposed) maximum sulfur content in three Stork-Werkspoon model 6 TM 620 diesel engines. Consistent with the Environmental Protection Agency's "top down" approach to BACT determinations, 0.2% (maximum 0.3%) sulfur content oil should be considered as BACT to minimize SO₂ emissions from the Fairbanks Morse diesel engines proposed by Key West CES, unless the applicant satisfactorily demonstrates that burning such fuel in the proposed engines is economically or technically infeasible.

Regarding NO_x controls, Key West CES has received information from potential vendors relative to NO_x reductions. The vendors evaluated the reductions achievable without additional equipment and with selective catalytic reduction. After reviewing the vendor information, Key West CES feels a NO_x limit of 8 gm/hp-hr (equivalent to approximately 4 degree timing retardation) represents BACT. Again referencing the CEC Energy PSD permit application, the diesel engine manufacturer, Stork-Werkspoon Diesel, underwent an extensive development and testing program to redesign the engine to use additional retard to decrease NO_x while at the same time maintain opacity at acceptable levels. This program included redesigning and testing the following:

- o fuel cam profile
- o fuel pump delivery valve
- o fuel pump discharge valve
- o fuel injector spray hole diameter
- o fuel injector spray hole number

- o fuel injector spray hole angle
- o fuel injector position in the cylinder head
- o fuel injection retard
- o turbocharger turbine wheel flow area
- o turbocharger turbine nozzle ring flow area
- o turbocharger compressor wheel flow area
- o turbocharger compressor wheel vane angle
- o turbocharger compressor diffuser flow area
- o turbocharger compressor diffuser vane angle

Based on the results of the engine testing and redesigning program, Stork-Werkspoon concluded that at full load, not only would it be possible to operate the CEC Energy engines at 8 degrees retard and obtain considerable reductions in NO_x (6 gm/hp-hr), but engine efficiency would be improved slightly from that previously obtained with 4 degrees retard.

Regarding the air quality and air quality related values analyses, Key West CES performed a level-1 visibility screening analysis for Everglades National Park. All three calculated parameters were well below the recommended Environmental Protection Agency's value of 0.10. Therefore, further analysis of potential visibility impacts to Everglades National Park is not necessary, and we would not expect emissions from the proposed engines to significantly impact visibility at the park.

In addition, the proposed project, in conjunction with the retirement of the three Key West steam units, should result in a net reduction in area emissions. Consequently, the net air quality impacts of the project should be minor.

To assist you in the review of future permit applications for projects proposed near Everglades National Park, we would like to take this opportunity to briefly describe some of the sensitive resources at the park and discuss the park's on-going research activities. There are numerous sensitive resources in Everglades National Park. Among these are: (1) slash pine, (2) lichens, (3) epiphytes (bromeliads and orchids), and (4) endangered and threatened species. The pine found in Everglades National Park and the Florida Keys is a variety of slash pine that is biologically distinct from the slash pine found in other parts of the southeastern United States. Originally extending throughout some 300,000 acres along a limestone ridge in southeast Florida, the species have been seriously cut back by urban development so that the only remaining population (approximately 20,000 acres) of this variety is in Everglades National Park. Smaller natural stands of slash pine are also known to occur as far south as Sugarloaf Key at Great White Heron National Wildlife Refuge. Currently there are four research projects on-going at Everglades National Park to determine the sensitivity of slash pine, bromeliads and lichens to ambient levels of O_3 and SO_2 . It is too early to determine if existing O_3 and/or SO_2

concentrations are impacting these air quality related values of Everglades National Park; however, slash pine is known to be sensitive to O_3 levels as low as 0.05 ppm for 18 weeks of exposure. The highest monthly mean recorded thus far at Everglades National Park has been 0.038 ppm (April 1987) and the second highest has been 0.037 ppm (April 1988). If future research results show that O_3 and/or SO_2 injury is affecting susceptible floristic resources within Everglades National Park or Great White Heron National Wildlife Refuge further ozone precursor and SO_2 reductions may be necessary in order to protect these resources.

In conclusion, based on the most recent information available, firing of 0.2% sulfur fuel oil in the Fairbanks Morse diesel engines represents BACT to minimize SO_2 emissions, and 8 degree timing retardation (a NO_x limit of 6 gm/hp-hr) represents BACT to minimize NO_x emissions from the proposed engines, unless it can be shown such measures are technically or economically infeasible. Also, based on the distance of the facility from Everglades National Park, South Florida climatology, and the projected net decrease in area emissions, the proposed project should not adversely impact the air quality or air quality related values of Everglades National Park. However, based on the lack of ambient air quality monitoring and research data available we can not determine whether or not emissions from the Key West CES facility will impact the air quality related values (especially slash pine) of Great White Heron National Wildlife Refuge.

We ask that you consider the above information in conducting your permit review for the Key West CES project. If you have any questions regarding these comments, please contact Wayne King of our Air Quality Division at (303) 969-2072.



PM
9-29-88
Atlanta, GA

file copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

SEP 29 1988

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OCT 4 1988

DER-BAQM

Mr. Clair H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

Re: Key West Diesel Engine Generating Station

Dear Mr. Fancy:

We have reviewed the permit application, ~~preliminary determination and draft permit~~ for the construction of the Key West Diesel Generating Station. The permit was reviewed under the Region IV Overview of State Programs Policy. We offer the following comments:

RR 10-4-88

Emission Limits

As you know, EPA now requires that PM₁₀ emissions be addressed in air permits (ref: Federal Register (52 FR 24634)); therefore, an emission limit for PM₁₀ should be included in the discussion of the projected pollutant emissions for this facility.

Compliance Testing

To be more sufficient, the permit must include test methods to be used in compliance testing for each pollutant. When designating each test method, include which version of the 40 CFR Parts 60 and 61 to be used. Also, for pollutants not subject to testing provisions contained in 40 CFR Parts 60 or 61, include a testing protocol, specifying each pollutant's sample volume, sample time and the number of test runs for each test method specified.

Air Quality Analysis

The summary of the downwash modeling did not explain why a downwash analysis for the diesel generator was done for the Prevention of Significant Deterioration (PSD) increment analysis but was not done for the Ambient Air Quality Analysis. Also, it was not explained why the Key West gas turbine was eliminated from the downwash analysis.

Concerning the modeling for the steam unit, it was not clear whether both diesel generators are vented through the same stack and if the steam unit also exits through that same stack.

Thank you for the opportunity to provide you with our comments. If you have any questions or comments, please contact me or Karrie-Jo Shell of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics,
Management Division

cc: R.W. Beck and Associates
City of Key West, Florida

*Copied: Pradeep Ranaal
Barry Andrews
Shao-Hong Chu
David Knowles, SF Dist.
CHF/BT*

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615
Telephone (303) 295-6900 ■ Fax (303) 297-2811

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FC-5801-CA1-CA

SEP 26 1988

September 22, 1988

DER - BAQM

Mr. Clair Fancy
Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

The purpose of this letter is to correct the September 19, 1988 presentation of downwash impact calculations for the Stock Island Steam unit and the proposed diesel generators. The ISCST model outputs attached to the September 19, 1988 letter include separate impacts from the steam unit and the diesel generators, and have been utilized for the correction. Table 13, 9 and 10 as revised on September 19, 1988 consider the impacts separately. Corrections are hereby made (and Tables 13 and 9 revised accordingly) which consider the combined impacts of the sources on a short-term basis for the five years of analysis and for comparison to AAQS. For comparison to PSD increments in Table 10, no revision is necessary since only the downwash impact of the diesel generators (per Table 13 revised September 19, 1988) was assumed.

As the values in both Tables 9 and 10 indicate, compliance with AAQS and PSD Class II increments is achieved.

It is further noted that on July 1, 1987 EPA set the significant emission limit for PM-10 at 15 TPY, above which BACT analysis is required. The particulate matter emissions for the proposed diesel generators are conservatively expected to be 100% PM-10 and to exceed 15 TPY. However, as indicated in the July 14, 1988 application there are no known particulate collection installations on diesel engines and consequently no BACT analysis has been done.

If you have any questions relative to this information please contact the undersigned. CES appreciates the diligence directed to this permit application thus far and anticipates expeditious development of a preliminary determination.

Sincerely,

R. W. BECK AND ASSOCIATES



Michael D. Henderson
Principal Engineer

MDH:c1 (0973W)
Enclosures

cc: R. Padron
R. Wallace
R. Garcia
R. Rodriguez
B. Pattinson

copied : Pradeep Raval
Barry Andrews
Shao-Hang Chiu
David Knowler, SF Dist.
Stacye Aronson, EPA
Miguel Flores, NPS
CHF/BT

TABLE 9

COMPLIANCE WITH AAQS

Revised September 22, 1988

<u>Pollutant</u>	<u>Average Time (hr)</u>	<u>Standard (ug/m³)</u>	<u>Background (ug/m³) (1)</u>	<u>Two 10-MW Diesel Impact (ug/m³)</u>	<u>Total (ug/m³)</u>
CO	8	10,000	5,500)	31 (4)	5,531
	1	40,000	11,000	39	11,039
Pb	2,190	1.5	0.15	0.0001 (5)	0.15
NO ₂	8,760	100	35	5.8	43.8
O ₃	1	250	210 (2)	20 (6)	230
SO ₂	8,760	60	15	1.2	25 (7)
	24	260	65	146 (9)	211
	3	1,300	325	458 (9)	783
TSP (8)	8,760	50	41 (3)	0.2	41.2
	24	150	99 (3)	1.9	100.9

(1) Values for state-wide background level from:

State of Florida Department of Environmental Regulations
Bureau of Air Quality Management, November, 1987 "Ambient Air Quality
in Florida 1986."

(2) Value from Lee County.

(3) Value from Monroe County.

(4) Conservative value actually for 3-hour impact.

(5) Value actually for annual-average impact.

(6) Conservative value actually for HC, O₃ indeterminate.

(7) Includes interaction with Stock Island steam unit.

(8) Standard revised July 1, 1987 to consider only particles less than or equal to 10 um size.

(9) Includes combined downwash impacts from Stock Island steam unit.

TABLE 10

COMPLIANCE WITH PSD INCREMENTS

Revised September 19, 1988

<u>Pollutant</u>	<u>Average Time</u> (hr)	<u>Class II Standard</u> (ug/m ³)	<u>Two 10-MW Diesel Impact</u> (ug/m ³)	<u>Key West Gas Turbine Impact</u> (ug/m ³)	<u>Key West Steam Impact</u> (ug/m ³)	<u>Total</u> (ug/m ³) (1)
SO ₂	3	512	117 (2)	0	0	117
	24	91	46 (2)	0	0	46
	8,760	20	1.2	0	0.8	0.4
TSP	24	37	9.2 (2)	0	0	9.2
	8,760	19	0.2	0	0	0.2
NO ₂	8,760	25	5.8	0	0.2	5.6

<u>Pollutant</u>	<u>Average Time</u> (hr)	<u>Class I Standard</u> (ug/m ³)	<u>Two 10-MW Diesel Impact</u> (ug/m ³)	<u>Key West Gas Turbine Impact</u> (ug/m ³)	<u>Key West Steam Impact</u> (ug/m ³)	<u>Total</u> (ug/m ³) (1)
SO ₂	3	25	2.0	0.9	10.8	0
	24	5	0.3	0.3	2.4	0
	8,760	2	0.010	0.008	0.092	0
TSP	24	10	0.04	0.02	0.09	0
	8,760	5	0.002	0.001	0.003	0
NO ₂	8,760	2.5	0.05	0.005	0.02	0.04

(1) Value equal to diesel impact + gas turbine impact - steam impact and negative numbers set equal to zero.

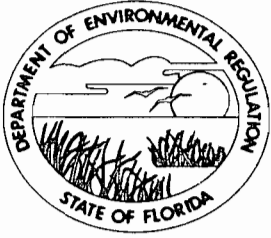
(2) Includes downwash impact due to Stock Island steam building.

TABLE 13

DOWNWASH at STOCK ISLAND
COMBINED SO₂ IMPACT with 70 FOOT BUILDING

Revised September 22, 1988

	<u>Year</u>	<u>Second High 3-Hour Steam and Diesel</u>	<u>Second High 24-Hour Steam and Diesel</u>
Impact (ug/m ³)	1981	364	104
Direction		120	130
Distance		0.35	0.4
Day		78	78
Impact (ug/m ³)	1982	353	72
Direction		240	250
Distance		0.4	0.45
Day		125	125
Impact (ug/m ³)	1983	411	62
Direction		290	50
Distance		0.35	0.35
Day		20	59
Impact (ug/m ³)	1984	350	55
Direction		20	270
Distance		0.4	0.5
Day		88	362
Impact (ug/m ³)	1985	458	146
Direction		230	230
Distance		0.35	0.4
Day		323	322



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtman, Secretary

John Shearer, Assistant Secretary

September 21, 1988

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Michael D. Henderson
Principal Engineer
R. W. Beck and Associates
Denver National Bank Building, Suite 1900
1125 Seventeenth Street
Denver, Colorado

Dear Mr. Henderson:

This letter is to inform you that on September 20, 1988, the Bureau received the ISCST Model outputs and the corresponding impact summary for the two 10-MW diesel generators at Key West, Florida. The Bureau is now in the process of determining if this most recent submittal is sufficient to complete the application.

If you have any questions, please call Shao-Hang Chu (modeling), Barry Andrews (BACT), or Pradeep Raval (permitting), at (904)488-1344, or write to me at the above address.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/BA/a

cc: D. Knowles, SF District
W. Aronson, EPA
M. Flores, NPS

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615
Telephone (303) 295-6900 ■ Fax (303) 297-2811

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FC-5801-CA1-CA

SEP 20 1988

September 19, 1988

DER-BAQM

Mr. Clair Fancy
Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

The purpose of this letter is to respond to your staff's informal request for downwash analysis of the Stock Island steam unit and the proposed diesel generators, with consideration of direction-dependent building dimensions. Prior information submitted on August 23, 1988 used a single set of building dimensions and should be disregarded. In order to perform this analysis, direction dependent projected widths have been calculated for the combination of the two buildings, as indicated in the modeling input listing. The ISCST model utilizes the Schulman-Scire downwash procedure when the regulation default option is specified and the physical stack height is less than the building height plus one-half the lesser of building height or width. At Stock Island the direction dependent projected building widths are all less than the building height. Consequently, a conservative building height of 70 feet (approximate distance between top of elevator shaft and ground level as indicated in elevation views of the Stock Island steam building enclosed with August 23, 1988 submittal) was utilized to permit use of the Schulman-Scire procedure.

Complete analyses with five years of meteorological data were made of downwash at the steam unit and diesel generators in 36 wind directions and 9 downwind distances. These results are submitted in enclosed Table 13 (complete ISCST outputs for the years 1981, 1982, 1983, 1984 and 1985 for the diesel generators are also enclosed) and incorporated into enclosed Tables 9 and 10. For comparison to AAQS, the downwash impact of the Stock Island steam

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RECIPIENT'S COPY

From (Your Name) Please Print Mike Henderson		Your Phone Number (Very Important) (303) 295-6900		To (Recipient's Name) Please Print Mr. Clair Fancy		Recipient's Phone Number (Very Important) ()	
Company W BECK & ASSOCIATES		Department/Floor No.		Company Bureau of Air Quality Management		Department/Floor No.	
Street Address 125 IYTR - STE 1000		City TALLAHASSEE		State FLORIDA		ZIP Required 32399-2400	
YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE) FC-5501-CA1-CA		IF HOLD FOR PICK-UP, Print FEDEX Address Here Street Address City State ZIP Required		Exact Street Address (We Cannot Deliver to P.O. Boxes or P.D. Zip Codes.) Twin Towers Office Building 2600 Blair Stone Road		City Tallahassee	
PAYMENT <input type="checkbox"/> Bill Sender <input type="checkbox"/> Bill Recipient's FedEx Acct No. <input type="checkbox"/> Bill 3rd Party FedEx Acct No. <input type="checkbox"/> Bill Credit Card <input type="checkbox"/> Cash		SERVICES		DELIVERY AND SPECIAL HANDLING		PACKAGES WEIGHT YOUR DECLARED VALUE OVER SIZE	
1 <input type="checkbox"/> PRIORITY 1 Overnight Delivery 6 <input type="checkbox"/> OVERNIGHT LETTER*		1 <input type="checkbox"/> HOLD FOR PICK-UP (Fill in Box H)		1 <input type="checkbox"/> DELIVER WEEKDAY		Emp. No. Date	
2 <input type="checkbox"/> COURIER-PAK OVERNIGHT ENVELOPE*		2 <input checked="" type="checkbox"/> DELIVER SATURDAY (Extra charge)		3 <input type="checkbox"/> DANGEROUS GOODS (Extra charge)		Federal Express Use <input type="checkbox"/> Cash Received	
3 <input type="checkbox"/> OVERNIGHT BOX		4 <input type="checkbox"/> CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable)		5 <input type="checkbox"/> OTHER SPECIAL SERVICE		<input type="checkbox"/> Return Shipment	
4 <input type="checkbox"/> OVERNIGHT TUBE		6 <input type="checkbox"/> SATURDAY PICK-UP (Extra charge)		7 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)		<input type="checkbox"/> Third Party <input type="checkbox"/> Chg. To Del. <input type="checkbox"/> Chg. To Hold	
5 <input type="checkbox"/> STANDARD AIR Delivery not later than second business day *Declared Value Limit \$100		8 <input type="checkbox"/> DRY ICE Lbs.		9 <input type="checkbox"/> SATURDAY PICK-UP (if offered)		Street Address	
		10 <input type="checkbox"/> OTHER SPECIAL SERVICE		11 <input type="checkbox"/> SATURDAY PICK-UP (if offered)		City State Zip	
		12 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)		12 <input type="checkbox"/> SATURDAY PICK-UP (if offered)		Received By:	
		Total Total Total		Received At 1 <input type="checkbox"/> Regular Stop 2 <input type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Bbx 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station		Date/Time Received FedEx Employee Number	
		Total Total Total		Received At 1 <input type="checkbox"/> Regular Stop 2 <input type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Bbx 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station		Total Charges	
		Total Total Total		Received At 1 <input type="checkbox"/> Regular Stop 2 <input type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Bbx 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station		PART #111800 REVISION DATE 1/88 PRINTED IN U.S.A. NCREC	
		Total Total Total		Received At 1 <input type="checkbox"/> Regular Stop 2 <input type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Bbx 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station		009 © 1988 F.E.C.	
		Total Total Total		Received At 1 <input type="checkbox"/> Regular Stop 2 <input type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Bbx 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station		Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom.	
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unit was considered with the non-downwash impact of the diesel generators. For comparison to PSD increments, the downwash impact of the diesel generators was assumed.

As the values in both Tables indicate, compliance with AAQS and PSD Class II increments is achieved.

If you have any questions relative to this information please contact the undersigned. CES appreciates the diligence directed to this permit application thus far and anticipates expeditious development of a preliminary determination.

Sincerely,

R. W. BECK AND ASSOCIATES



Michael D. Henderson
Principal Engineer

MDH:lef (1486F)
Enclosures (5 copies of modeling results)

cc; R. Padron
R. Wallace
R. Garcia (w/o modeling results)
R. Rodriguez (w/o modeling results)
B. Pattinson (w/o modeling results)

*copied: Pradeep Koyal
Barry Andrews
Shao-Hong Chu
David Knowles, SF Dist.
Stayne Bronson, EPA
Miguel Garcia, NPS
CFF/BT*

TABLE 9

COMPLIANCE WITH AAQS

Revised September 19, 1988

<u>Pollutant</u>	<u>Average Time (hr)</u>	<u>Standard (ug/m³)</u>	<u>Background (ug/m³) (1)</u>	<u>Two 10-MW Diesel Impact (ug/m³)</u>	<u>Total (ug/m³)</u>
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	1	40,000	11,000	39	11,039
Pb	2,190	1.5	0.15	0.0001 (5)	0.15
NO ₂	8,760	100	35	5.8	43.8
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SO ₂	8,760	60	15	1.2	25 (7)
	24	260	65	9.5	175 (9)
	3	1,300	325	27	710 (9)
TSP (8)	8,760	50	41 (3)	0.2	41.2
	24	150	99 (3)	1.9	100.9

(1) Values for state-wide background level from:

State of Florida Department of Environmental Regulations
Bureau of Air Quality Management, November, 1987 "Ambient Air Quality
in Florida 1986."

(2) Value from Lee County.

(3) Value from Monroe County.

(4) Conservative value actually for 3-hour impact.

(5) Value actually for annual-average impact.

(6) Conservative value actually for HC, O₃ indeterminate.

(7) Includes interaction with Stock Island steam unit.

(8) Standard revised July 1, 1987 to consider only particles less than or equal to 10 um size.

(9) Includes downwash impacts from Stock Island steam unit.

TABLE 10

COMPLIANCE WITH PSD INCREMENTS

Revised September 19, 1988

<u>Pollutant</u>	<u>Average Time</u> (hr)	<u>Class II Standard</u> (ug/m ³)	<u>Two 10-MW Diesel Impact</u> (ug/m ³)	<u>Key West Gas Turbine Impact</u> (ug/m ³)	<u>Key West Steam Impact</u> (ug/m ³)	<u>Total</u> (ug/m ³) (1)
SO ₂	3	512	117 (2)	0	0	117
	24	91	46 (2)	0	0	46
	8,760	20	1.2	0	0.8	0.4
TSP	24	37	9.2 (2)	0	0	9.2
	8,760	19	0.2	0	0	0.2
NO ₂	8,760	25	5.8	0	0.2	5.6

<u>Pollutant</u>	<u>Average Time</u> (hr)	<u>Class I Standard</u> (ug/m ³)	<u>Two 10-MW Diesel Impact</u> (ug/m ³)	<u>Key West Gas Turbine Impact</u> (ug/m ³)	<u>Key West Steam Impact</u> (ug/m ³)	<u>Total</u> (ug/m ³) (1)
SO ₂	3	25	2.0	0.9	10.8	0
	24	5	0.3	0.3	2.4	0
	8,760	2	0.010	0.008	0.092	0
TSP	24	10	0.04	0.02	0.09	0
	8,760	5	0.002	0.001	0.003	0
NO ₂	8,760	2.5	0.05	0.005	0.02	0.04

(1) Value equal to diesel impact + gas turbine impact - steam impact and negative numbers set equal to zero.

(2) Includes downwash impact due to Stock Island steam building.

TABLE 13
 DOWNWASH at STOCK ISLAND
SO₂ IMPACT with 70 FOOT BUILDING

Revised September 19, 1988

	<u>Year</u>	<u>Second High Diesel</u>	<u>3-Hour Steam</u>	<u>Second High Diesel</u>	<u>24-Hour Steam</u>
Impact (ug/m ³)	1981	96	272	45	65
Direction		240	120	240	130
Distance		0.25	0.35	0.25	0.35
Day		45	78	97	75
Impact (ug/m ³)	1982	89	252	30	46
Direction		280	240	280	250
Distance		0.25	0.4	0.25	0.45
Day		30	125	337	125
Impact (ug/m ³)	1983	86	281	32	37
Direction		290	290	170	50
Distance		0.25	0.35	0.25	0.35
Day		20	20	365	59
Impact (ug/m ³)	1984	86	224	27	28
Direction		280	20	270	270
Distance		0.25	0.4	0.25	0.5
Day		266	88	362	362
Impact (ug/m ³)	1985	117	358	46	100
Direction		230	230	230	230
Distance		0.25	0.35	0.25	0.4
Day		322	323	322	322

Shoa Hang Chu

Mr Chu please find attached the following

ISC runs:

1981

1982

1985.

RECEIVED

SEP 15 1988

DER-BAQM

For each year I have included the ISC output and input data set.

The ISC runs were made using a polar grid

with receptors @ 100, 150, 200, 250, 300, 350, 400, 450 and 500 meters

in 36 directions covering 360° in 10° increments. I

36 Direction specific projected widths were entered,

a building height of 21.34 meters was used for all directions

as a maximum worst case, and a stack of 31.7 meters

was used for Stock Island Steam.

Please feel free to call me @ 303-295-6900

with any questions regarding the above

Ken H. Stewart

ISCST (DATED 88207)
AN AIR QUALITY DISPERSION MODEL IN
SECTION 1. GUIDELINE MODELS
IN UNAMAP (VERSION 6) JUNE 88.
SOURCE: UNAMAP FILE ON EPA'S UNIVAC AT RTP, NC.

IBM-PC VERSION (1.62)
(C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.
SERIAL NUMBER 5503 SOLD TO R. W. BECK & ASSOC.
RUN BEGAN ON 09-13-88 AT 07:28:56

Key West

81

360° @ 10° inc.

Direction Specific Scenario

CALCULATE (CONCENTRATION=1,DEPOSITION=2)	ISW(1) = 1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)	ISW(2) = 2
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)	ISW(3) = 1
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)	ISW(4) = 0
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)	ISW(5) = 0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)	ISW(6) = 1
COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)	
WITH THE FOLLOWING TIME PERIODS:	
HOURLY (YES=1,NO=0)	ISW(7) = 1
2-HOUR (YES=1,NO=0)	ISW(8) = 0
3-HOUR (YES=1,NO=0)	ISW(9) = 1
4-HOUR (YES=1,NO=0)	ISW(10) = 0
6-HOUR (YES=1,NO=0)	ISW(11) = 0
8-HOUR (YES=1,NO=0)	ISW(12) = 0
12-HOUR (YES=1,NO=0)	ISW(13) = 0
24-HOUR (YES=1,NO=0)	ISW(14) = 1
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)	ISW(15) = 0
PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE SPECIFIED BY ISW(7) THROUGH ISW(14):	
DAILY TABLES (YES=1,NO=0)	ISW(16) = 0
HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)	ISW(17) = 1
MAXIMUM 50 TABLES (YES=1,NO=0)	ISW(18) = 1
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)	ISW(19) = 1
RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)	ISW(20) = 0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(21) = 1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(22) = 1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)	ISW(23) = 0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)	ISW(24) = 1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)	ISW(25) = 2
PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)	ISW(26) = 1
CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)	ISW(27) = 1
REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)	ISW(28) = 1
TYPE OF POLLUTANT TO BE MODELLED (1=S02,2=OTHER)	ISW(29) = 1
DEBUG OPTION CHOSEN (YES=1,NO=2)	ISW(30) = 2
ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)	ISW(31) = 0
NUMBER OF INPUT SOURCES	NSOURC = 2
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)	NGROUP = 2
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)	IPERD = 0
NUMBER OF X (RANGE) GRID VALUES	NXPNTS = 9
NUMBER OF Y (THETA) GRID VALUES	NYPNTS = 36
NUMBER OF DISCRETE RECEPTORS	NXWYPT = 0
SOURCE EMISSION RATE UNITS CONVERSION FACTOR	TK = .10000E+07
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED	ZR = 7.00 METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA	IMET = 9
DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION	DECAY = .000000E+00
SURFACE STATION NO.	ISS = 12839
YEAR OF SURFACE DATA	ISY = 81
UPPER AIR STATION NO.	IUS = 12844
YEAR OF UPPER AIR DATA	IUY = 81
ALLOCATED DATA STORAGE	LIMIT = 43500 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN	MIMIT = 12193 WORDS

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY					
	1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** RANGES OF POLAR GRID SYSTEM ***
(METERS)

100.0, 150.0, 200.0, 250.0, 300.0, 350.0, 400.0, 450.0, 500.0,

*** RADIAL ANGLES OF POLAR GRID SYSTEM ***
(DEGREES)

10.0, 20.0, 30.0, 40.0, 50.0, 60.0, 70.0, 80.0, 90.0, 100.0,
110.0, 120.0, 130.0, 140.0, 150.0, 160.0, 170.0, 180.0, 190.0, 200.0,
210.0, 220.0, 230.0, 240.0, 250.0, 260.0, 270.0, 280.0, 290.0, 300.0,
310.0, 320.0, 330.0, 340.0, 350.0, 360.0,

*** SOURCE DATA ***

SOURCE NUMBER	PK	PART.	EMISSION RATE TYPE=0,1 (GRAMS/SEC)	X	Y	BASE ELEV.	HEIGHT	TEMP.	EXIT VEL.			BLDG. HEIGHT	BLDG. LENGTH	BLDG. WIDTH
								(DEG.K);	(M/SEC);	DIAMETER	TYPE=0			
EA	EE	CATS.	*PER METER**2	(METERS)	(METERS)	(METERS)	(METERS)	TYPE=1	TYPE=1,2	TYPE=0	TYPE=0	TYPE=0	TYPE=0	TYPE=0
1	0	0	.12600E+02	.0	.0	.0	30.48	589.00 ✓	30.00 ✓	1.20 ✓	-21.34	29.71	29.71	
2	0	0	.15059E+03	.0	.0	.0	31.70	460.00	44.81	1.52	-21.34	29.71	29.71	

*Diesel
SI
steam*

* CALM HOURS (=1) FOR DAY 302 * 0 0 0 0 1 0
* CALM HOURS (=1) FOR DAY 322 * 0 1 0
* CALM HOURS (=1) FOR DAY 323 * 0 1
* CALM HOURS (=1) FOR DAY 328 * 0 0 1 1 1 1 0
* CALM HOURS (=1) FOR DAY 332 * 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 341 * 0 1 1
* CALM HOURS (=1) FOR DAY 342 * 0 0 1 1 0
* CALM HOURS (=1) FOR DAY 347 * 0 0 0 0 1 0
* CALM HOURS (=1) FOR DAY 348 * 1 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 352 * 0 0 1 0 1 0
* CALM HOURS (=1) FOR DAY 359 * 0 1
* CALM HOURS (=1) FOR DAY 362 * 1 0 0 1 0

File copy

Permit # 905 3635 414

6-27-88
8/24/88

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615
Telephone (303) 295-6900 ■ Fax (303) 297-2811

FC-5801-CA1-CA

August 23, 1988

Mr. Clair Fancy
Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RECEIVED
AUG 24 1988
DER-BAQM

Subject: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

The purpose of this letter is to respond to your request for additional information in order to complete the subject application. The items are addressed below in the order of your letter of August 11, 1988. We appreciate the assistance of your staff in bringing these matters to our attention in an expeditious matter and providing feedback during preparation of our response.

1. Plot Plan and Downwash Modeling

Enclosed herewith is a marked-up version of the plot plan included in the application. The Stock Island site is approximately 450 m in the N-S direction, tapers from 250 m in the E-W direction at the inland end to 100 m at the seaward end. The existing steam unit stack is approximately 50 m and 150 m from the W and E property lines, respectively. The site of the proposed diesel generators is approximately 50 m southeast of the steam unit building and 100 m and 150 m from the SE and NW property lines, respectively.

Also pertinent to the downwash modeling is an input revision which has been made to the height of the Stock Island steam building. Enclosed herewith are elevation views of the building. We had previously considered the top of the elevator shaft (elevation 77 feet) relative to ground level (elevation 8 feet) in determining a building height of 70 feet for model input.

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From (Your Name) Please Print Mike Henderson		Your Phone Number (Very Important) 303 295 0900		To (Recipient's Name) Please Print Mr. Clair Fancy		Recipient's Phone Number (Very Important) ()			
Company DELTA & ASSOCIATES		Department/Floor No.		Company Florida Department of Environmental Rea		Department/Floor No.			
Street Address 17TH ST STE 1900				Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.) 2600 Blair Stone Road					
City AVON		State OH		City Tallahassee,		State FL			
ZIP Required 430200		ZIP Required 32399							
YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.) FC-5801-CA1-CA				IF HOLD FOR PICK-UP, Print FEDEX Address Here Street Address City State ZIP Required					
PAYMENT: <input checked="" type="checkbox"/> Bill Sender <input type="checkbox"/> Bill Recipient's FedEx Acct No. <input type="checkbox"/> Bill 3rd Party FedEx Acct. No. <input type="checkbox"/> Bill Credit Card <input type="checkbox"/> Cash									
SERVICES		DELIVERY AND SPECIAL HANDLING		PACKAGES WEIGHT YOUR DECLARED VALUE OVER SIZE		Emp. No. Date <input type="checkbox"/> Cash Received <input type="checkbox"/> Return Shipment <input type="checkbox"/> Third Party <input type="checkbox"/> Chg. To Del. <input type="checkbox"/> Chg. To Hold Street Address City State Zip Received By: X Date/Time Received FedEx Employee Number			
1 <input type="checkbox"/> PRIORITY 1 Overnight Delivery 2 <input type="checkbox"/> COURIER-PAK OVERNIGHT ENVELOPE* 3 <input type="checkbox"/> OVERNIGHT BOX 4 <input type="checkbox"/> OVERNIGHT TUBE 5 <input type="checkbox"/> STANDARD AIR Delivery not later than second business day *Declared Value Limit \$100.		6 <input type="checkbox"/> OVERNIGHT LETTER* 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/> 12 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)		1 <input type="checkbox"/> HOLD FOR PICK-UP (Fill in Box H) 2 <input checked="" type="checkbox"/> DELIVER WEEKDAY 3 <input type="checkbox"/> DELIVER SATURDAY (Extra charge) 4 <input type="checkbox"/> DAINGERUS GOODS (Extra charge) 5 <input type="checkbox"/> CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable) 6 <input type="checkbox"/> DRY ICE Lbs 7 <input type="checkbox"/> OTHER SPECIAL SERVICE 8 <input type="checkbox"/> 9 <input type="checkbox"/> SATURDAY PICK-UP (Extra charge) 10 <input type="checkbox"/> 11 <input type="checkbox"/> 12 <input type="checkbox"/>		Total Total Total Received At: 111 Regular Stop 211 On-Call Stop 311 Drop Box 411 B.S.C. 511 Station FEDEX Corp. Employee No. 5150 Date/Time for FEDEX Use		Federal Express User Base Charges Declared Value Charge Other 1 Other 2 Total Charges PART #111800 REVISION DATE 1/88 PRINTED IN U.S.A. NCREC 009 © 1988 F.E.C.	
				Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom. Release Signature:					

Further review indicates that a more reasonable datum is the roof (elevation 67 feet) due to the substantially open nature of the building above the operating floor (elevation 34 feet). Consequently, we have revised the building height to 60 feet for downwash calculations. It should also be noted that the Key West gas turbine (located some 6.6 km to the west) was included in past source lists for downwash analysis, but has been eliminated from consideration herein.

Subsequent to duplicating the DER downwash screening analysis, a further screening analysis was conducted to determine the effect of the reduced building height. The maximum one hour impact was reduced from 1396 $\mu\text{g}/\text{m}^3$ to 1113 $\mu\text{g}/\text{m}^3$ and the meteorology responsible for impacts greater than those predicted by PTPLU was limited to stability class 4 with wind speeds greater than 8 m/sec and stability class 3 with wind speeds greater than 10 m/sec.

Finally, two five-year analyses were made of downwash at the steam unit and diesel generators in the appropriate wind directions. Those results are presented in enclosed Table 13 (the 1984 and 1985 outputs for the steam unit and the 1983 and 1985 outputs for the diesel generators are also enclosed). These results have been incorporated into enclosed revised Tables 9 and 10. For comparison to AAQS, the downwash impact of the Stock Island steam unit was considered with the non-downwash impact of the diesel generators. For comparison to PSD increments, the downwash impact of the diesel generators was assumed.

As the values in both Tables indicate, compliance with AAQS and PSD Class II increments is achieved.

2. Stock Island Steam Unit Screening Modeling

In order to demonstrate the adequacy of the 0.1 km spacing grids utilized to determine final impacts from the diesel generators, the results of five-year screening analyses for the Stock Island Steam unit are presented in enclosed Table 14. As expected, the 0.1 km spacing grids used to determine final impacts for the diesel generators generally encompassed the maximum impact locations for the steam unit. However, two runs were re-made to include meteorology days which had not been identified for the diesel generators. The maximum second-high three-hour impact is 203 $\mu\text{g}/\text{m}^3$ at -0.6 km E, 0.5 km N on day 204, hours 10-12, 1982. The maximum second-high 24-hour impact is 68 $\mu\text{g}/\text{m}^3$ at -1.9 km E, 1.1 km N on day 146, 1981. These values are somewhat greater than those in the application, but less than those produced in the downwash analysis especially for the three-hour impact.

Concurrently with this effort it was discovered that the W grid used for final impact modeling of the diesel generators was improperly located too close to the source. This revision is incorporated in the enclosed revised Table 8.

3. ISCST Version

The current version of the model used herein is that supplied by Trinity Consultants pursuant to Letter Change 5 (D. Bruce Turner to Unamap 6 Users, dated June 28, 1988). This letter change incorporates correction to an earlier version of the downwash algorithm. As indicated above, the DER downwash screening analysis was duplicated with the current version of the model.

4a. Emulsified Fuel

Some information is available relative to NO_x reductions achievable via a combination of timing retardation and use of emulsified No. 2 fuel oil. The emulsified fuel serves to delay combustion, lower flame temperature and dilute flame zone oxygen. Limited pilot testing has been conducted with emulsion ranging from 10 to 50 percent water. Resulting emission reductions have ranged from less than 20 to 45 percent. No long term testing has been performed nor has fuel system optimization occurred. In light of the lack of guaranteed performance with emulsified fuel, CES believes that BACT for NO_x is the proposed 8 gm/hp-hr.

4b. Ceramic Coating

Some testing has been done on ceramic coating for wear parts on the Sebring slow-speed diesels. The purpose thereof was related more towards efficiency improvements in marine applications than to reduction in NO_x emissions. However, in conjunction with use of timing retardation and emulsified fuel, the ceramic coatings have resulted in NO_x reductions even though higher temperature operation was achieved. At present, the developers are trying to patent the process and will not discuss details. There is currently no commercial application available.

5. Combined Cycle

Another option considered in CES' power supply study was a combined-cycle (gas turbine/waste heat recovery boiler/steam turbine) of somewhat greater capacity than the diesel generators. The combined-cycle option has a lower capital cost (\$900/kW versus \$1250/kW), higher full-load heat rate (10,500 Btu/kWh versus 8500 Btu/kWh), greater increase in heat rate at part-load, less reliability of a single unit (compared to two diesel generators), and greater personnel requirement for operation (compared to unattended diesel operation) than the selected diesel generators. However, it is recognized that the combined-cycle option without supplemental firing would have an NSPS NO_x emission rate of approximately 1.0 gm/hp-hr. An economic analysis for the combined-cycle system would result in similar results to those for SCR installation on the diesel generators. The incremental cost of NO_x control is not as persuasive as the operating considerations in not selecting the combined-cycle option as BACT.

6. 0.3% S Fuel Oil

We have contacted CES' fuel oil supplier relative to the cost and availability of 0.3% S fuel oil. The price differential is approximately \$0.75/B or approximately \$.13/mm Btu. In order to obtain this fuel, CES would have to re-bid their fuel supply contract. Relative to the decrease in sulfur emissions, the extra cost of this fuel is approximately \$1300/T. The annual cost of CES generation at 100% capacity factor would increase approximately \$200,000 with this fuel. In light of these economic constraints, CES believes that BACT for SO₂ is the use of 0.5% S fuel oil.

If you or your staff have any questions relative to this information please contact the undersigned. CES appreciates the diligence directed to this permit application thus far and anticipates expeditious development of a preliminary determination.

Sincerely,

R. W. BECK AND ASSOCIATES



Michael D. Henderson
Principal Engineer

MDH:ehh (0283G)
Enclosures

cc: R. Padron
R. Wallace
R. Garcia (w/o modding results)
R. Rodriguez (w/o modding results)
B. Pattinson (w/o modding results)

*Copied: Pradeep Raval
Barry Andrew
Shao Hong Chen
David Knowles, SF District
Stacye Dawson, EPA
Miguel Flores, NPS
CHF/BT*

TABLE 8

CLASS II IMPACTS OF DIESEL GENERATORS
 WITH 100 LB/HR EMISSION RATE
 (continued)

Revised August 19, 1988

3-Hour

Year	Grid	2nd/High Impact	Location		Meterology		Stability	Wind Speed (m/sec)	Persistence (hr)
			E (km)	N (km)	Day	Hour			
1981	N	25	-0.3	0.9	239	10-12	3	7	2
1982		--	--	--	--	--	--	--	--
1983		--	--	--	--	--	--	--	--
1984		--	--	--	--	--	--	--	--
1985		--	--	--	--	--	--	--	--
1981	W	23	-1.0	0.2	176	10-12	3	5	2
1982		26	-1.1	-0.4	113	13-15	3	8	3
1983		27	-1.1	0.2	292	13-15	3	5	3
1984		26	-1.1	-0.4	261	10-12	3	5	3
1985		26	-0.9	0.3	233	13-15	2	4.5	3
1981	NW	23	-1.0	0.6	253	10-12	2	3	3
1982		27	-0.6	0.8	164	13-15	2	4.5	3
1983		26	-0.9	0.5	261	10-12	3	4.5	3
1984		25	-0.7	0.8	202	10-12	3	6	2
1985		25	-0.5	0.9	90	10-12	3	5	2

24-Hour

1981	W	8.6	-1.5	0.2	101	--	4	7.5	12
1982		9.3	-1.6	0.5	360	--	4	6.5	13
1983		8.2	-1.2	0.2	185	--	4	4	11
1984		7.8	-1.9	0.0	292	--	4	6	15
1985		8.5	-1.3	0.5	237	--	4	6	15
1981	NW	9.5	-1.4	0.8	146	--	4	7.5	10
1982		7.8	-1.8	0.9	33	--	4	7.5	9
1983		7.5	-1.0	0.6	141	--	3	4.5	9
1984		7.5	-0.9	0.5	141	--	4	4	10
1985		7.6	-1.6	1.4	161	--	4	6	12

TABLE 9

COMPLIANCE WITH AAQS

Revised August 19, 1988

<u>Pollutant</u>	<u>Average Time (hr)</u>	<u>Standard (ug/m³)</u>	<u>Background (ug/m³) (1)</u>	<u>Two 10-MW Diesel Impact (ug/m³)</u>	<u>Total (ug/m³)</u>
CO	8	10,000	5,500 (1)	31 (4)	5,531
	1	40,000	11,000	39	11,039
Pb	2,190	1.5	0.15	0.0001 (5)	0.15
NO ₂	8,760	100	35	5.8	43.8
O ₃	1	250	210 (2)	20 (6)	230
SO ₂	8,760	60	15	1.2	25 (7)
	24	260	65	9.5	144.5 (7)
	3	1,300	325	27	794 (7)
TSP (8)	8,76	50	41 (3)	0.2	41.2
	24	150	99 (3)	1.9	100.9

(1) Values for state-wide background level from:

State of Florida Department of Environmental Regulations
Bureau of Air Quality Management, November, 1987 "Ambient Air Quality
in Florida 1986."

(2) Value from Lee County.

(3) Value from Monroe County.

(4) Conservative value actually for 3-hour impact.

(5) Value actually for annual-average impact.

(6) Conservative value actually for HC, O₃ indeterminate.

(7) Includes downwash impacts from Stock Island steam unit.

(8) Standard revised July 1, 1987 to consider only particles less than or equal to 10 um size.

TABLE 10
COMPLIANCE WITH PSD INCREMENTS

Revised August 19, 1988

<u>Pollutant</u>	<u>Average</u>	<u>Class II</u> <u>Standard</u> (ug/m ³)	<u>Two 10-MW</u> <u>Diesel Impact</u> (ug/m ³)	<u>Key West</u>	<u>Key West</u> <u>Steam Impact</u> (ug/m ³)	<u>Total</u> (ug/m ³) (1)
	<u>Time</u> (hr)			<u>Gas Turbine</u> <u>Impact</u> (ug/m ³)		
SO ₂	3	512	73 (2)	0	0	73
	24	91	35 (2)	0	0	35
	8,760	20	1.2	0	0.8	0.4
TSP	24	37	7 (2)	0	0	7
	8,760	19	0.2	0	0	0.2
NO ₂	8,760	25	5.8	0	0.2	0.6

<u>Pollutant</u>	<u>Average</u>	<u>Class I</u> <u>Standard</u> (ug/m ³)	<u>Two 10-MW</u> <u>Diesel Impact</u> (ug/m ³)	<u>Key West</u>	<u>Key West</u> <u>Steam Impact</u> (ug/m ³)	<u>Total</u> (ug/m ³) (1)
	<u>Time</u> (hr)			<u>Gas Turbine</u> <u>Impact</u> (ug/m ³)		
SO ₂	3	25	2.0	0.9	10.8	0
	24	5	0.3	0.3	2.4	0
	8,760	2	0.010	0.008	0.092	0
TSP	24	10	0.04	0.02	0.09	0
	8,760	5	0.002	0.001	0.003	0
NO ₂	8,760	2.5	0.05	0.005	0.02	0.04

(1) Value equal to diesel impact + gas turbine impact - steam impact and negative numbers set equal to zero.

(2) Includes downwash impact due to Stock Island steam building.

TABLE 13

DOWNWASH at STOCK ISLAND
SO₂ IMPACT with 60 FOOT BUILDING

	<u>Year</u>	<u>2nd-High Direct</u>	<u>3-Hour Impact Steam</u>	<u>2nd-High Diesel</u>	<u>24-Hour Impact Steam</u>
Impact (ug/m ³)	1981	73	279	27	51
Direction (deg)		315	90	315	180
Distance (km)		0.2	0.2	0.2	0.2
Day		95	231	41	343
Impact (ug/m ³)	1982	65	326	23	42
Direction (deg)		315	90	315	90
Distance (km)		0.2	0.2	0.2	0.2
Day		31	96	47	96
Impact (ug/m ³)	1983	61	261	33	58
Direction (deg)		315	90	315	90
Distance (km)		0.2	0.2	0.2	0.2
Day		63	77	32	77
Impact (ug/m ³)	1984	59	442	19	65
Direction (deg)		135	180	315	180
Distance (km)		0.2	0.2	0.2	0.2
Day		59	327	113	342
Impact (ug/m ³)	1985	73	373	35	70
Direction (deg)		315	90	315	90
Distance (km)		0.2	0.2	0.2	0.2
Day		43	137	166	305

TABLE 14

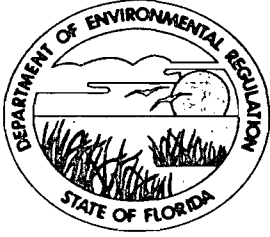
DOWNWASH at STOCK ISLAND
SO₂ SCREENING IMPACTS
STOCK ISLAND STEAM

3-Hour

	<u>Year</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
2nd-High Impact (ug/m ³)		178	189	188	179	181
Direction (deg)/Grid		340 N	290 NW	310 NW	310 NW	290 W
Distance (km)		1.0	1.0	1.0	1.0	1.0
Day		239	194	142	258	233
1st-High Impact (ug/m ³)		208	210	219	214	197
Direction (deg)/Grid		330 N	320 NW	340 NW	300 NW	240 W
Distance (km)		1.0	1.0	1.0	1.0	1.0
Day		195	164	123	135	182

24-Hour

	<u>Year</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
2nd-High Impact (ug/m ³)		66	60	54	53	61
Direction (deg)/Grid		300 NW	280 W	270 W	270 W	290 W
Distance (km)		2.0	2.0	2.0	2.0	2.0
Day		146	30	185	292	237
1st-High Impact (ug/m ³)		74	65	70	63	107
Direction (deg)/Grid		240 W	290 W	170 S	300 NW	230 W
Distance (km)		2.0	2.0	2.0	1.0	2.0
Day		305	46	359	119	258



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

August 11, 1988

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert R. Padron
Key West City Electric System
1006 James Street
Key West, Florida 33041

Dear Mr. Padron:

Re: Completeness Review, Two Diesel Generators, Permit
Nos. AC44-152197, AC44-152198, and PSD-FL-135

The Department has reviewed the above referenced application package dated July 14, 1988. The application has been deemed incomplete. Please submit the following information needed to complete the application:

I. Modeling

1. Please state the distances between the sources (buildings) modeled, for downwash considerations. Also enclose a plot plan showing distances from the sources to the facility boundary line (which precludes public access).
2. Please model all the sources in the facility at 360°, not just the proposed sources, to evaluate short term impacts. The sector approach is acceptable only for long term impacts.
3. Use the latest version of ISCST model, UNAMAP 6 (change 7 is the most recent), for evaluating short term impacts.

II. BACT Analysis

4. In addition to techniques addressed by you for nitrogen oxides (NO_x) reduction, please evaluate:
 - a. The use of emulsified or homogenized mixtures of water and No. 2 diesel fuel.
 - b. The use of ceramic coatings on cylinder heads, piston crowns, and valves.

Mr. Robert R. Padron
Page 2
August 11, 1988

5. Please evaluate, as an alternative control measure, the use of a combined cycle configuration since it is a power production option that should be comparative in cost to the proposed diesel engine.
6. With regard to sulfur dioxide (SO₂) emissions, the use of 0.3% sulfur content No. 2 fuel oil has recently been judged to be BACT for another project. Please evaluate the economics of using 0.3% sulfur content fuel oil instead of the proposed 0.5%, for your project.

If you have any questions please call Shao-Hang Chu (modeling), Barry Andrews (BACT), or Pradeep Raval (permitting), at (904) 488-1344, or write to me at the above address.

Sincerely,



C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CF/PR/plm

cc. D. Knowles, SF District
W. Aronson, EPA
M. Flores, NPS
D. Swann, P.E., RW Beck
M. Henderson, RW Beck

● **SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. Show to whom delivered, date, and addressee's address. 2. Restricted Delivery
↑(Extra charge)↑ ↑(Extra charge)↑

3. Article Addressed to: Mr. Robert R. Padron Key West City Electric System 1006 James Street Key West, FL 33041	4. Article Number P 702 177 475 Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input checked="" type="checkbox"/> COD <input type="checkbox"/> Express Mail Always obtain signature of addressee or agent and DATE DELIVERED.
5. Signature - Addressee X	8. Addressee's Address (ONLY if requested and fee paid)
6. Signature - Agent X <i>Wanda Custillo</i>	
7. Date of Delivery <i>8-15-88</i>	

PS Form 3811, Mar. 1987

* U.S.G.P.O. 1987-178-268

DOMESTIC RETURN RECEIPT

P 702 177 475
RECEIPT FOR CERTIFIED MAIL
 NO INSURANCE COVERAGE PROVIDED
 NOT FOR INTERNATIONAL MAIL
 (See Reverse)

Sent to Mr. Robert R. Padron, Key West	
Street and No. City Elec. 1006 James St.	
P.O., State and ZIP Code Key West, FL 33041	
Postage	S
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	S
Postmark or Date Mailed: 8-12-88 Permit: AC 44-152197, -98 PSD-FL-135	

PS Form 3800, June 1985

UTILITY BOARD OF THE CITY OF KEY WEST

RECEIVED
DER - MAIL ROOM

1988 JUL 15 PM 12:36

POST OFFICE DRAWER 6100

KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

July 14, 1988

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

VIA OVERNIGHT EXPRESS MAIL

RECEIVED

JUL 15 1988

DER - BAQM
1031

Subject: PSD Application for
Two 10-MW Diesel Generators
at Key West, Florida

Dear Mr. Fancy:

The Utility Board of the City of Key West, Florida ("CES") is planning to add two 10-MW diesel generators to their Stock Island plant. Our environmental engineer, R. W. Beck and Associates, has prepared the enclosed application for a construction permit and New Source Review. Original representative and engineer signature pages 1 and 2 from DER 17-1.202(1) are attached to the letter along with a \$2000 check payable to DER for the processing fee. Four comb-bound copies of the application (including test, tables, figures and forms) and one comb-bound copy of the modeling printouts and experience information have been forwarded separately.

Mr. Michael D. Henderson of R. W. Beck and Associates had a pre-application meeting with your staff on June 30, 1988 to review the contents of the application on a preliminary basis and to identify additional issues requiring analysis to complete the application. Those items have been addressed in the application. It is understood that a fast-track process is available whereby any additional information required by DER could be requested via telephone. It is also understood that Mr. Barry Andrews is primarily responsible for BACT determination and will be leaving for a month's vacation on July 20, 1988. We have decided to not give our selected contract, Fairbanks Morse, notice to proceed until an indication of BACT is provided by DER. Should selective catalytic reduction ("SCR") be determined as BACT for emission of NOx, additional negotiations will be required with the contractor and CES may have to re-evaluate the decision to supply power with No. 2 oil-fired diesel generators.

Mr. Clair Fancy
Page 2
July 14, 1988

In light of the need to retire three existing 16.5-MW steam units at the Key West plant by February , 1990 due to expiration of an extended variance from DER requirements for dissolved oxygen in the cooling water discharges and our contractors' schedule of beginning construction by November 1, 1988, we appreciate your assistance in expediting the review process. Any technical questions with regard to the application should be referred to Mr. Henderson.

Very truly yours,

UTILITY BOARD - CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"



Robert R. Padron
General Manager

RRP/sh

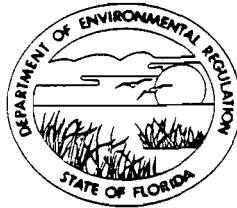
cc:

Leo Carey, Ass't. to the Manager
Ralph Garcia, Sr., Ass't. to the Manager
Larry J. Thompson, Operations Manager
Paul Esquinaldo, Jr., Finance Manager
L. T. Curry, Jr., Production Manager
M. D. Henderson (1208F)
B. Pattinson

Enclosure

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

BEST AVAILABLE COPY



SOUTH FLORIDA DISTRICT
2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896
(813)332-2667.

BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY
PHILIP R. EDWARDS
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Diesel Engine Generating Station [X] New¹ [] Existing¹

APPLICATION TYPE: [X] Construction [] Operation [] Modification

COMPANY NAME: Key West City Electric System COUNTY: Monroe

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) two diesel generators

SOURCE LOCATION: Street Front Street extended City Key West

UTM: East 425 North 2716

Latitude 24 ° 33 ' 49 "N Longitude 81 ° 44 ' 03 "W

APPLICANT NAME AND TITLE: Robert R. Padron, Manager

APPLICANT ADDRESS: 1006 James Street Key West, Florida 33041

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of City Electric System

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: *Robert R. Padron*

Robert R. Padron, Manager

Name and Title (Please Type)

Date: 7/12/88 Telephone No. (303) 294-5272

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

¹ See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed D. R. Swann

Dennis R. Swann

Name (Please Type)

R. W. Beck and Associates

Company Name (Please Type)

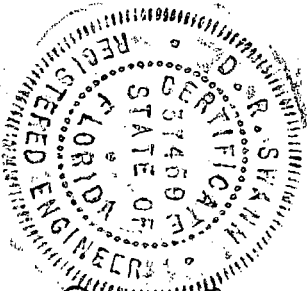
1125 17th Street, Ste. 1900 Denver, CO 80202

Mailing Address (Please Type)

Florida Registration No. 37459

Date: 7/7/88

Telephone No. (303) 295-6900



SECTION II: GENERAL PROJECT INFORMATION

- A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

The Utility Board of the City of Key West, Florida is planning to add two 10-MW diesel generators to their Stock Island plant, with an in-service date of February 1, 1990. Concurrent with this new source of generation will be the retirement of three existing 16.5-MW steam units at the Key West plant.

- B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction 11/1/88 Completion of Construction 2/1/90

- C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

No post-combustion pollution control equipment is included with the diesel engines in the proposed BACT configuration.

- D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Not Applicable

RECEIVED

JUL 15 1988

DER - BAQM

THE UTILITY BOARD
OF THE
CITY OF KEY WEST, FLORIDA
DIESEL ENGINE GENERATING STATION

APPLICATION FOR CONSTRUCTION PERMIT AND
NEW SOURCE REVIEW

SUBMITTED TO: FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Prepared by:

R. W. Beck and Associates
Denver, Colorado

July, 1988

INTRODUCTION

The Utility Board of the City of Key West, Florida ("CES") is planning to add two 10-MW diesel generators to their Stock Island plant, with an in-service date of February 1, 1990. Concurrent with this new source of generation will be the retirement of three existing 16.5-MW steam units at the Key West plant. The retirement of these steam units is necessary due to expiration of an extended variance from the Florida Department of Environmental Regulations ("DER") requirements for dissolved oxygen in the cooling water discharge.

The diesel generators will burn No. 2 fuel oil with a maximum sulfur content of 0.5 percent, and are expected to service the intermediate-load requirements of CES with the capability of going from standby to full load in 10 minutes. Two 500,000 gallon oil storage tanks will also be installed and provide fuel for approximately one month of operation at full load. The site currently houses one 37-MW steam unit and three 2-MW diesel peaking units, along with a 2,000,000 gallon storage tank for No. 6 fuel oil and a 69-KV switchyard. To make room for the new diesel generator, miscellaneous demolition, pond cleaning and utility rerouting will be required.

The Stock Island site comprises approximately 50 acres and is located approximately one mile east of the City of Key West on a peninsula which borders on Safe Harbor. A map of the vicinity and plot plan are shown in the attachments. The diesel generators will be installed to the south of the steam unit and west of the peaking diesel units. The diesel generators will be housed in a 80' x 80' x 40' (high) building with exhausts to separate 100 foot stacks. Existing docking facilities will be used for fuel unloading. A new No. 2 fuel oil unloading station will be installed adjacent to the existing No. 6 fuel oil unloading station, with the capability of unloading a 12,000 barrel barge in eight hours. Once-through cooling will be used with makeup from on-site wells and discharge to the existing discharge flume. The service water will be heat exchanged with the demineralized water used in a closed loop for engine cooling, starting air and lube oil systems. Power generated will be stepped up from 13.8-69 kV in a single transformer of 20,000 kVA capacity. The diesel generators will be capable of unattended operation.

The main issue associated with the application are Best Available Control Technology ("BACT") and air quality impacts. Contacts have been made with various DER personnel in the Marathon field office, Ft. Myers district office and the Tallahassee main office relative to other major sources in the area, meteorological data for use in calculating impacts, considerations in BACT review and Class I issues, and general procedures. These issues are discussed below and details are presented in the attachments and DER Form 17-1.202.

REGULATIONS

The Florida Department of Environmental Regulation ("DER") requirements for New Source Review and construction permit are spelled out in Chapters 17-2 and 17-4. Construction permits are required prior to beginning construction, and operating permits are issued for five years subsequent to construction and compliance testing (17-2.210(1,2) and 17-2.500(5)). Applications are to be made on designated forms, submitted in quadruplicate, signed by a professional engineer registered in Florida and accompanied by the appropriate fee, \$1000 for a source of more than 100 TPY of any pollutant (17-4.050(1-4)). DER has up to 30 days to request additional information (17-4.055(1)), has to provide notice 14 days after completion of the application (17-2.220(2)), make a preliminary determination within 60 days (17-2.500(5)) and provide the public a 30-day comment period on the preliminary determination (17-2.500(1)). A construction permit is to specify a time period for construction, startup and testing (17-4.210 (3)).

New Source Review includes the following requirements (17-2.500(1-5)) for sources emitting more than 250 TPY of any pollutant. Combined impacts must be less than ambient air quality standards and baseline plus PSD increments; all pollutants emitted in "significant" quantities are subject to BACT review and impact analysis; an exemption from ambient monitoring is allowed if impacts are "de minimus"; ambient impact analysis must be performed; impacts on visibility, growth, soils and vegetation must be analyzed; applications must include information on the nature, location, design capacity, operating schedule, construction schedule, BACT, and impacts calculations with associated input values; copies of the application must be sent to EPA and the Federal Land Manager for sources within 100 km of a Class I area.

The DER regulations are not specific on emissions of individual pollutants from diesel generators. All sources are required to limit plume opacity to 20 percent, unless the source is incapable of meeting the limit while operating so as to minimize opacity and comply with any applicable particulate standard (17-2.610(2)). DER is to make a BACT determination considering EPA determinations, available information, determinations made by other states, and social and economic impacts (17-2.630(1)). Federal New Source Performance Standards ("NSPS") are incorporated by reference. EPA proposed an NSPS (40 CFR Part 60 Subpart FF) for diesel generators on July 23, 1979, but has not promulgated the standard. The only pollutant which is regulated by the proposed standard is NO_x with a limit of 600 ppm, and 15 percent oxygen on a dry basis (this value corresponds to approximately 8 gm/hp-hr), with the limit adjusted upwards for engines with thermal efficiencies greater than 35 percent. The containment provisions of the NSPS for petroleum liquid storage vessels constructed after July 23, 1984 (40 CFR Part 60 Subpart Kb) only applies to vessels with capacity greater than 151 cubic meters (40,000 gallons) storing liquid with a maximum true vapor pressure greater than 3.5 kPa, which does not apply to No. 2 fuel oil. Thus, the fixed roof storage tanks which, based on AP-42 emission factors, are expected to have hydrocarbon emissions of approximately 14 TPY are not subject

to further regulation. Compliance testing requirements for sources are to be specified in BACT determination (17-2.700, Table 1)), with the test procedures specified in 17-2.700 (1-7).

Among the other provisions of the DER regulations are two others which have specific notability to this application. During startup, shutdown and malfunctions, excess emissions are allowed for less than 2 hours out of 24, if best operational practices are utilized (17-2.250(1)). Changes in allowable PSD increments are associated with changes in actual emissions after a baseline date (initial PSD application in an area) (17-2.500(4)).

BACT ANALYSIS

In accordance with DER requirements, BACT has been reviewed for those pollutants emitted by the diesel generators in greater than significant quantities, taking into account other determinations, technical information and economic impacts. As indicated in Table 1, the emission of CO, NO_x, SO₂, HC and TSP are significant. For a number of reasons NO_x has been signaled out as the only pollutant reviewed in detail. Only potential reductions in emission must be considered under BACT. The SO₂ emissions are already reduced as much as practical with the use of 0.5% S No. 2 fuel oil rather than a higher S content fuel. Reductions in SO₂ or TSP emissions typically require post-combustion control equipment. There are no known acid gas scrubber or particulate collection installation on diesel engines. A review of BACT Clearinghouse determinations indicates that the expected CO and HC emissions are typical for diesel engines. In particular, the values are equal to those for Sebring, Florida. Three determinations in California and Texas were lower but are expected since natural gas was the fuel.

In 1979 EPA proposed NSPS for NO_x emissions from diesel engines at a level of 8 gm/hp-hr, corresponding to approximately a 40 percent decrease from uncontrolled emissions. Excerpts from the NSPS document (attached) are particularly enlightening: A reduction in NO_x emissions is expected to be accompanied by an increase in CO and HC emissions, but could be achieved with design specifications rather than add-on equipment. NO_x emissions are high priority and relatively large from diesel engines. In general, NO_x emissions reductions are harder to achieve than CO and HC emission reductions, which can better be achieved from other sources. Timing retardation results in an increase in smoke and fuel consumption. Timing retardation works by decreasing the air-to-fuel ratio, lowering the flame temperature, which reduces NO_x formation. Oxidizing catalysts for CO and HC emission reductions were considered unreasonably expensive, while reducing catalysts for NO_x reductions were both unproven and expensive relative to techniques of engine adjustment.

An EPA assessment of combustion modifications in 1982 (attached) indicates that operation adjustment has been demonstrated and both combustion system redesign and catalytic reduction has only been done at laboratory scale. Among the operation adjustments, ignition retardation has no serious

drawbacks other than a fuel use penalty, exhaust gas recirculation requires new components with additional maintenance, and water injection can cause severe maintenance problems.

Information has been received from potential vendors relative to further NO_x reduction beyond that of the proposed NSPS, both without additional equipment and with selective catalytic reduction ("SCR"). CES has insisted that only guaranteed values be represented in this application which are expected to be 6 gm/hp-hr with additional timing retardation and 3 gm/hp-hr with SCR. Table 2 has been prepared to evaluate the economic consequences of these two levels at an assumed 8760 hours per year level of operations. At the level of 6 gm/hp-hr, additional annual expense of \$820,000 is expected to compensate for heat rate and capacity derate penalties. In addition, an opacity in excess of 20 percent is anticipated. The incremental cost of capital is \$1,580/T, well in excess of established criteria for BACT. At the level of 3 gm/hp-hr, additional annual expense of \$800,000 is expected to amortize equipment, replace catalyst, provide ammonia and replacement power during catalyst cleaning. In addition, SCR is only proven on gas-fired engines, catalyst poisoning could potentially greatly increase the replacement cost, an ammonia plume is possible and the SCR unit must be bypassed for approximately 10 minutes at startup and shutdown. The incremental cost of control is \$610/T, which is not as persuasive as the operating considerations in not selecting SCR as BACT. DER, in its Intent to Issue the variance extension for the Key West Steam Units, agreed that \$200,000 in construction costs and \$47,000 per year in operation and maintenance costs are an unreasonable hardship for the people of Key West.

In light of these economic and other constraints relative to the further reduced NO_x emissions levels, CES believes that BACT for NO_x is 8 gm/hp-hr.

Two other considerations are necessary for the BACT analysis; i.e. other potential source types with lower NO_x emissions and unregulated pollutants which should be accounted for in deciding if BACT for regulated pollutants is appropriate as mandated by the June 3, 1987 North County remand. CES' power supply study considered 12 options of which the second choice in terms of lowest cumulative percent value cost was an equivalent-sized gas turbine. The primary difference between the gas turbine and the selected diesel generators were lower capital cost (\$675/kW versus \$1250/kW), higher full-load heat rate (13,600 Btu/kWh versus 8,500 Btu/kWh), greater increase in heat-rate at part-load, and less reliability of a single unit (compared to two diesel generators). However, it is recognized that the gas turbine option would have an NSPS emission rate of approximately 1.3 gm/hp-hr. An economic analysis for the gas turbine system would result in similar results to those for additional timing retardation on the diesel generators. For these reasons, CES believes that consideration of the gas turbine option has no effect on the proposed BACT.

Table 13 was prepared from reference information on emission inventories and control technologies for toxic pollutants. Of the 16 pollutants associated with the SIC category for electric utilities, only seven have identified emission rates for oil-firing. None of the three pollutants for which significant emission rates have been identified have significant emissions requiring BACT review for the diesel generators. For the various categories of pollutants, control technologies and associated problems have been identified. For organic vapors, thermal incineration is possible which requires auxiliary fuel. For inorganic vapors, carbon adsorption is possible which is not effective at low toxic concentrations in the flue gas. For both organic and inorganic particulate, venturi scrubbing is possible which entails substantial pressure drop and plume cooling. Since none of the control techniques has been implemented as diesel generators, CES believes that consideration of unregulated pollutants has no effect on the proposed BACT.

IMPACT ANALYSIS

The air quality impact of the diesel generator is related to the emission rate of various pollutants, the stack parameters (including height, flow rate and temperature), meteorology and size of the site. Greater impacts are associated with greater emission rate, smaller stacks, lower flow rates and temperatures, more unstable atmospheric conditions and smaller sites. Because of the small size of the Stock Island site, accountable impacts can occur as close as 0.1 km from the source.

Meteorological data from Miami was supplied by DER and consisted of hourly data from 1981-1985 for wind direction, wind speed, mixing height, temperature and atmospheric stability. Wind rose statistics have been computed from the information and are presented in Table 3. As can be seen from the data, prevailing winds are from the ENE through SE, which results in impacts to the west and northwest. It is also noted that extremely unstable conditions, stability class A are relatively infrequent.

A contract was awarded to Fairbanks Morse Engine Division on June 23, 1988. Relative to actual vendor data (see attachments to DER Form 17-1.(202)(1)), conservative values for stack and emission parameters based on fuel characteristics, capacity and heat rate have been used for impacts analysis and are presented in Table 4. Values for excess air of 100 percent and exhaust temperature of 600°F have been utilized in the modeling, while emissions have been based on a heat input of 100 MMBtu/hr. The stack height was set at 100 feet, equal to that of the Stock Island steam unit and 2.5 times the expected building height. It is noted that approximately 200 percent excess air results in the standard conditions of the proposed NSPS and, at that flow rate, the NO_x concentration is approximately 600 ppm.

Value of stack and emission parameters for the other major sources in Key West are presented in Table 5, along with their relative locations (refer to attached figure with 5 km grid). In addition to source locations on Key West, discrete receptors have been identified in Everglades National Park (refer to attached Figure with 100 km grid).

The modeling protocol is outlined in Table 6. The PTPLU model which analyzes an entire range of hypothetical meteorology was run as an initial step in determining the approximate magnitude and location of peak 1-hour impacts. Two other purposes have been to identify the expected locations of maximum interaction (downwind from sources with maximum impact) and the adequacy of background monitoring data. The ISCST model was utilized with real meteorology to predict ground level concentrations for specified averaging time and to accumulate information on worst case meteorology. An increasingly sophisticated modeling approach was defined. The four-step procedure involved the use of complete meteorology with a coarse receptor grid to identify possible worst-case locations and meteorology (20 highest impact days and grid locations used for each short-term averaging period), limited polar grid and complete meteorology to determine annual-average impacts, selected meteorology with a refined (increments of 0.1 km) receptor grid to determine short-term worst-case impacts and selected receptors in the Class I area and complete meteorology to determine worst-case impacts. Step One utilized a polar grid with receptors at 10° intervals and geometric downwind distances of 0.25, 0.5, 1.0, 2.0, and 4.0 km. Step Two utilized a polar grid (directions 280° to 300° and distances of 1.0 and 2.0 km). In Step Three, three grids were selected for short-term impact prediction based on typical locations in Step One. For 1- and 3-hour concentrations these were 1.0 km on a side, with the W grid centered at -1.5, 0.0, the NW grid centered at -1.0, 1.0 and the N grid centered at 0.0, 1.0. For 24-hour concentrations, the W and N grids were 1.0 km on a side centered at -1.5, 0.0 and 0.0, 1.5, respectively, while the NW grid was 1.5 km on a side centered at -1.5, 1.5. Step Four utilized six discrete receptors (directions 10° to 60°) in Everglades National Park.

Table 7 indicates the PTPLU results for the six sources which were analyzed. With the exception of the gas turbine, all the locations of maximum impact for expected meteorological condition contributing to both short-term and annual-average impact (stabilities A to D) in the local area are in the range from 0.5 to 2.0 km. The impacts from the gas turbine are also relatively insignificant compared to those of the other sources. The various sources were taken into consideration in order of their maximum impact, to determine the modeling strategy. The three Key West steam units have the largest impact but, due to their retirement concurrent with startup of the diesel generator, are not expected to be accountable in terms of compliance with NAAQS. Next is the Stock Island steam unit which has maximum impact locations and conditions very similar to those of the diesel generators. Evaluating the Stock Island steam unit impacts relative to background values it is apparent that the only substantial impact which needs to be accounted in tracking compliance with NAAQS is that for SO₂. Thus compliance with NAAQS was based on interaction between the diesel generators and the Stock Island steam unit. Compliance with PSD increments was based on interaction between the diesel generators and the Key West sources, although only annual-average Class II interaction was anticipated, while both short-term and annual-average Class I interaction was anticipated.

Table 8 presents the results of Step Two and Step Four modeling for the diesel generators with indication of responsible meteorology and variability over the 5-year data set. The highest of the second-high values were utilized directly in the compliance analysis for SO₂ and pro-rated on the basis of emissions for other parameters. Maximum impacts were assured at locations not on the edge of respective grids. As expected all maximum impact directions correspond with prevailing wind directions and meteorology for maximum short-term impacts has a frequency of occurrence on the order of 1 percent.

Table 11 presents the results of Step Five modeling for the diesel generators with indication of responsible meteorology and variability over the 5-year data set. The highest of the second-high values were utilized directly in the compliance analysis for SO₂ and pro-rated on the basis of emissions for other parameters. The location of the Class I area and the downwind distance have predetermined that maximum impacts will be associated with stable meteorology and will not be as high as those in the prevailing wind direction. As expected, the responsible wind speeds have the predominate frequency of occurrence on the order of 0.5 percent.

Table 9 presents the combination of background air quality, impact of diesel generators and SO₂ interaction with the Stock Island steam unit. As the values indicate, compliance with NAAQS is achieved for all the criteria pollutants.

It is noted that EPA finalized the PM-10 standard for TSP on July 1, 1987 which reduced the NAAQS values to 150 and 50 ug/m³ on a 24-hour and annual average basis, respectively, and considers only particulate in the size range equal to or less than 10 ppm.

Table 10 presents the increment consumption of the diesel generators and Key West gas turbine, and increment expansion at that location due to the retirement of the Key West steam units. Both Class II (nearby) and Class I (Everglades National Park) increment consumption are within allowable standards. DER staff has indicated that consideration of Class I interaction with sources from other Florida locations is not necessary.

The currently available version of the ISCST model was also run with EPA-suggested meteorology (20 hours of various stability and windspeed conditions) in the building downwash analysis mode using dimensions of the various buildings (80' x 80' x 40' high for the diesel generators, 110' x 80' x 70' high for the Stock Island steam unit and 280' x 110' x 60' high for the Key West steam units and gas turbine). The downwash results for a 1-hour peak impact were no greater than those in Step One for the diesel generators and Key West steam units. For the Key West gas turbine values were substantially higher under three different meteorological scenarios: stability class 4 and 10 m/sec windspeed, stability class 4 and 20 m/sec windspeed, and stability class 3 and 10 m/sec windspeed. None of these conditions is expected to play a role in impact analysis relative to Class II short-term standards due to their very low probability of occurrence. For the Stock Island steam unit

values were higher under six different meteorological scenarios: stability class 4 and 10 m/sec windspeed, stability Class 6 and 5 m/sec windspeed, stability class 4 and 20 m/sec windspeed, stability class 5 and 5 m/sec windspeed, stability class 3 and 10 m/sec windspeed, and stability class 1 and 1 m/sec windspeed. None of these conditions are expected to play a role in impact analysis relative to Class II short-term standards due to their very low probability of occurrence.

AMBIENT MONITORING

If predicted impacts from a new source are large and if no other representative data are available, pre-application ambient monitoring is required. DER regulations specify de minimus levels of impacts, below which no ambient monitoring is required. As indicated in Table 1, the diesel generators have de minimus impacts.

OTHER IMPACTS

The diesel generators are replacing steam units at the Key West plant which are being retired due to environmental considerations. The net reduction in capacity is being offset by a new 50-MW capable tie-line to the mainland, which will supply base-load power for Key West. No additional population growth is expected related to the diesel generators.

No specific analyses have been performed relative to impact on soils and vegetation. It is expected that compliance with NAAQS also protects these resources. Analysis has been performed, however, of the visibility impact on the Everglades National Parks.

LEVEL-1 VISIBILITY ANALYSIS

A level-1 visibility screening analysis is designed to evaluate three contrast parameters: (i) plume contrast against the sky, (ii) plume contrast against terrain and (iii) change in sky/terrain contrast caused by primary and secondary aerosol. If the absolute value of each contrast parameter is less than 0.10 the emission source passes the level-1 visibility screening test and no further analysis is required.

The first two parameters, plume contrast against the sky and plume contrast against terrain, deal primarily with the impacts from particulate and NO_x emissions. Due to the fact that visual impact from particulate and NO_x emissions are greatest when plume material is concentrated, light-wind conditions with a 12-hour transport time to the closest Class I area were assumed. Calculated values for sky/plume and terrain/plume contrast were 0.0037 and 0.00011 respectively. Change in sky/terrain contrast caused by primary and secondary aerosol involves consideration of both particulate and SO_2 conversion to sulfate. Since sulfate forms slowly in the atmosphere, the maximum impact does not occur close to the source. Thus, for the level-1 analysis, sulfate impacts were evaluated at a distance of 350 km from the

source, the equivalent of two days transport time at an assumed 2 m/s wind speed. The value calculated for contrast reduction caused by sulfate aerosol and particulate emissions during a stagnation episode was 0.00026.

Since each of the three calculations produced results less than 0.10, further analysis of potential visibility impacts were unnecessary. The input parameters and calculations are shown in Table 12.

(1159F)

REFERENCES

- U.S. Environmental Protection Agency, July 23, 1979. "Proposed Rules, Stationary Internal Combustion Engines; Standards of Performance for New Stationary Sources."
- U.S. Environmental Protection Agency, November 1980. "Workbook for Estimating Visibility Impairment."
- U.S. Environmental Protection Agency, July, 1982. "Project Summary, Environmental Assessment of Combustion Modification Controls for Stationary Internal Combustion Engines" (attached).
- U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions Standards and Engineering Division, June, 1985. "BACT/LAER Clearinghouse -- A Compilation of Control Technology Determinations."
- U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Monitoring and Data Analysis Division, July, 1986. "Compiling Air Toxics Emission Inventories."
- U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions Standards and Engineering Division, May, 1986. "BACT/LAER Clearinghouse -- A Compilation of Control Technology Determinations." First Supplement to 1985 Edition.
- U.S. Environmental Protection Agency, Office of Research and Development, September 1986. "Handbook of Control Technologies for Hazardous Air Pollutants."
- U.S. Environmental Protection Agency, office of Air Quality Planning and Standards, Emission Standards and Engineering Division, June, 1987. "BACT/LAER Clearinghouse - "A Compilation of Control Technology Determinations, Second Supplement to 1985 Edition."
- U.S. Environmental Protection Agency, February 8, 1988. "Proposed Rule, Prevention of Significant Deterioration for Nitrogen Oxides."
- Robert W. Cooper, June, 1988. "The Cost Impacts of Environmental Regulations on Gas Turbine and Internal Combustion Engine Based Cogenerators." Paper presented at the 1988 Cogeneratin Congress (attached).

TABLE 1
SIGNIFICANT EMISSIONS, MODELING RESULTS AND DE MINIMUS IMPACTS

<u>Pollutant</u>	<u>Significant Emission</u> (TPY)	<u>Actual Emission</u> (TPY)
CO	100	520
NO _x	40	2,100
SO ₂	40	440
O ₃	40 (1)	260 (2)
TSP	25	90

(1) Value actually for HC.

(2) Additional amount from two 500,000 storage tanks = 14.

Modeling Results at 100 lb/hr

<u>Averaging Time</u> (hr)	<u>Impact</u> (ug/m ³)
1	34
3	27
24	9.5
8,760	1.2

<u>Pollutant</u>	<u>De Minimus</u>		<u>Actual</u>	
	<u>Impact</u> (ug/m ³)	<u>Average Time</u> (hr)	<u>Emission</u> (lb/hr)	<u>Impact</u> (ug/m ³)
NO _x	14	8,760	470 ⁹	5.6
CO	575	8	120 ⁴⁷⁹	32 (3)
SO ₂	13	24	100 ^{118.7}	9.5
TSP	10	24	20 ^{100.5}	2

(3) Conservative value actually for 3-hour impact.

TABLE 2

BACT ECONOMIC ANALYSIS FOR NO_x

Emission (gm/hp-hr)	8	6	3
Total Annual Cost (\$)	base	820,000	800,000
Annual Emission (TPY)	2,100	1,580	790
Incremental Emission Reduction (TPY)	base	520	1,310
Incremental Cost (\$/T)	base	1,580	610
Heat Rate Penalty (Btu/kWh)	base	1,000	0
Annual Cost (\$)	base	700,000	0
Capacity Derate Penalty (MW)	base	1.6	0
- Annual Cost (\$)	base	120,000	0
Additional Equipment Cost (\$)	0	0	2,000,000
- Annual Cost (\$)	0	0	180,000
Catalyst Replacement (%/yr)	0	0	20
- Annual Cost (\$)	0	0	400,000
Ammonia Use (lb/NH ₃ /lb NO _x removed)	0	0	0.6
- Annual Cost (\$)	0	0	160,000
Downtime (hr/mo)	0	0	24
- Annual Cost (\$)	0	0	60,000
Total Annual Cost (\$)	0	820,000	800,000

Assumptions:

- 1- 6 gm/hp-hr emission achieved with timing retardation.
- 2- 3 gm/hp-hr emission achieved with Selective Catalytic Reduction.
- 3- 10 Percent heat rate penalty associated with timing retardation.
- 4 - Fuel cost of \$4/MMBtu in 1988.
- 5- 8 Percent derate penalty associated with timing retardation.
- 6 - Capital cost of \$800/kW amortized at 9% per year.
- 7 - SCR capital cost of \$75/hp amortized at 9% per year.
- 8 - SCR catalyst replacement proportional to capital cost.
- 9 - Ammonia cost of \$200/T.
- 10 - Power replacement at incremental heat rate of 2500 Btu/kWh and fuel cost of \$4/MMBtu in 1988.

TABLE 3

 MIAMI
 FIVE YEAR WINDROSE
 1981 - 1985

STABILITY CLASS 1		.43%														
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
SPEED	.02	.01	.02	.01	.01	.04	.07	.06	.06	.01	.02	.01	.02	.04	.03	.02
ws<=1	.00	.00	.00	.00	.00	.00	.01	.00	.01	.01	.00	.00	.00	.01	.00	.00
1> ws< 3	.01	.01	.02	.01	.01	.04	.07	.05	.05	.00	.02	.01	.01	.03	.02	.01
3>=ws> 5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5>=ws> 7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
STABILITY CLASS 2		5.77%														
SPEED	.26	.21	.21	.36	.46	.80	1.00	.67	.30	.15	.20	.18	.18	.18	.31	.29
ws<=1	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
1> ws< 3	.10	.07	.07	.07	.08	.14	.15	.15	.09	.06	.10	.08	.08	.08	.11	.09
3>=ws> 5	.15	.14	.13	.29	.37	.65	.83	.51	.21	.09	.10	.10	.09	.10	.20	.20
5>=ws> 7	.00	.00	.00	.00	.01	.01	.02	.01	.00	.00	.00	.00	.00	.00	.00	.00
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
STABILITY CLASS 3		15.41%														
SPEED	.87	.55	.63	1.31	1.76	2.30	2.69	1.57	.67	.33	.32	.26	.35	.38	.62	.80
ws<=1	.02	.02	.00	.00	.00	.00	.01	.00	.00	.01	.01	.00	.00	.01	.00	.02
1> ws< 3	.14	.13	.08	.10	.12	.15	.18	.20	.13	.07	.08	.08	.08	.11	.13	.13
3>=ws> 5	.55	.27	.31	.50	.73	.98	1.15	.79	.31	.15	.14	.11	.14	.16	.32	.47
5>=ws> 7	.16	.12	.20	.60	.76	1.02	1.26	.53	.21	.09	.07	.06	.10	.09	.15	.18
7>=ws> 9	.00	.01	.02	.08	.13	.12	.08	.04	.01	.00	.01	.01	.02	.01	.01	.00
9>=ws> 999	.00	.00	.02	.02	.01	.01	.01	.00	.01	.01	.01	.00	.01	.00	.01	.00
STABILITY CLASS 4		38.43%														
SPEED	2.71	1.21	2.59	4.84	5.41	5.45	4.29	2.29	1.26	.79	.85	.72	.79	.91	1.62	2.69
ws<=1	.01	.02	.00	.00	.01	.01	.02	.00	.01	.00	.01	.01	.01	.01	.03	.04
1> ws< 3	.41	.21	.18	.16	.19	.26	.22	.29	.20	.10	.11	.09	.08	.13	.22	.29
3>=ws> 5	.94	.46	.51	1.01	1.23	1.31	1.12	.78	.53	.27	.26	.18	.22	.26	.45	.78
5>=ws> 7	.93	.40	1.15	2.16	2.56	2.53	2.04	.90	.41	.25	.28	.22	.26	.25	.58	1.03
7>=ws> 9	.39	.11	.61	1.28	1.20	1.13	.80	.26	.09	.12	.12	.16	.13	.15	.24	.46
9>=ws> 999	.03	.02	.15	.23	.22	.22	.09	.05	.03	.05	.08	.06	.08	.11	.10	.09
STABILITY CLASS 5		18.87%														
SPEED	1.87	.81	1.05	1.81	2.54	2.52	1.56	1.04	.68	.50	.46	.41	.45	.61	.81	1.74
ws<=1	.05	.02	.01	.02	.02	.02	.01	.01	.00	.02	.01	.01	.02	.01	.04	.05
1> ws< 3	.69	.38	.26	.34	.51	.54	.47	.44	.32	.24	.21	.18	.19	.19	.34	.70
3>=ws> 5	.97	.38	.63	1.20	1.64	1.63	.92	.54	.34	.22	.21	.20	.21	.36	.36	.83
5>=ws> 7	.15	.04	.15	.24	.38	.33	.15	.05	.02	.03	.02	.02	.03	.05	.08	.16
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
STABILITY CLASS 6		15.97%														
SPEED	1.79	.84	.68	.90	1.58	1.90	.97	.87	.73	.49	.65	.50	.58	.56	1.10	1.82
ws<=1	.11	.03	.03	.04	.04	.05	.04	.03	.03	.03	.04	.04	.05	.03	.06	.07
1> ws< 3	1.31	.63	.46	.58	1.05	1.31	.70	.68	.55	.36	.49	.38	.42	.40	.83	1.41
3>=ws> 5	.37	.18	.18	.28	.48	.53	.23	.16	.14	.10	.13	.09	.10	.13	.21	.34
5>=ws> 7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
STABILITY CLASS 7		5.12%														
SPEED	.63	.21	.10	.13	.41	.37	.32	.36	.26	.21	.23	.22	.27	.22	.46	.72
ws<=1	.17	.06	.02	.03	.09	.11	.08	.10	.07	.07	.06	.05	.10	.04	.14	.17
1> ws< 3	.46	.16	.08	.10	.31	.26	.24	.25	.19	.14	.17	.16	.17	.18	.32	.55
3>=ws> 5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5>=ws> 7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
TOTAL	8.13	3.85	5.29	9.36	12.17	13.38	10.91	6.85	3.96	2.48	2.74	2.31	2.63	2.90	4.95	8.08
SPEED																
ws<=1	2.82	.00														
1> ws< 3	28.27	.57														
3>=ws> 5	35.83	1.43														
5>=ws> 7	23.52	1.41														
7>=ws> 9	7.83	.63														
9>=ws> 999	1.73	.17														
	100.00	4.21	average													

Total number of hours = 43824.

TABLE 4

KEY WEST 10MW DIESEL
AIR QUALITY IMPACT ANALYSIS PARAMETERS

		Flue Gas		100		200	
		(moles)	(%EA) (%/ppm)	(moles)	(%EA) (%/ppm)	(moles)	(%EA) (%/ppm)
Data from RFP		H2O	6.50	12	6.50	6	6.50
-----		CO2	7.17	13	7.17	7	7.17
No. 2 Fuel Oil		O2	0.00	0	10.42	10	20.83
Composition	(%)	N2	41.67	75	83.33	78	125.00
Carbon	86	-----					
Hydrogen	13	SO2	0.02	282	0.02	145	0.02
Sulfur	0.5						
			55.35		107.43		159.52
	99.5	(per 100 lb No. 2 Fuel Oil)					
HHV(Btu/lb)	19500						

Stack Parameters

Capacity (MW)	10
Heat Rate (Btu/Kwh)	10000
Heat input (mmBtu/h)	100
Excess Air(%)	100
Flue Gas Temp(F)	600
FlueGas Flow(acfm)	70427
Stack Height(ft)	100
Stack Velocity(ft/sec)	100
Stack Diameter(ft)	4

Emission Parameters

	(lb/hr)	
TSP (lb/mmBtu)	0.1	10
SO2 (lb/mmBtu)	0.5	50
CO (gm/hphr)	2	59
NOx (gm/hphr)	8	235
HC (gm/hphr)	1	29

TABLE 5

SOURCE PARAMETERS AND EVERGLADES RECEPTOR COORDINATES

Source	SO ₂		Stack Temperature (°F)	Velocity (ft/sec)	Diameter (ft)	UTM Coordinates		Receptor Designation	UTM Coordinates		SI Distance (km)
	Emission (lb/hr)	Height (ft)				(km E)	(km N)		(km E)	(km N)	
New Diesels	100	100	600	100	4	425.7	2716.6	Everglades at 10°	448	2862	148 147
KW Steam #3	408 (1)	150	284	16	8	419.1	2716.6	Everglades at 20°	472	2848	140 141.6
KW Steam #4	350 (1)	150	252	15	8	419.1	2716.6	Everglades at 30°	486	2822	122 124.8
KW Steam #5	325 (1)	150	282	28	8	419.1	2716.6	Everglades at 40°	486	2794	99 102.3
KW Gas Turbine	173 (2)	35	910	150	12	419.1	2716.6	Everglades at 50°	500	2782	100 104
SI Steam	1195 (3)	104	369	147	5	425.7	2716.7	Everglades at 60°	504	2764	92 91.5

(1) SO₂ at 2.75 lb/MMBtu, TSP at 0.1 lb/MMBtu, NO_x at 0.7 lb/MMBtu.

(2) SO₂ at 0.5 lb/MMBtu, TSP at 0.04 lb/MMBtu, NO_x at 0.3 lb/MMBtu.

(3) SO₂ at 2.75 lb/MMBtu, TSP at 0.1 lb/MMBtu, NO_x at 0.7 lb/MMBtu.

TABLE 6

MODELING PROTOCOL

<u>Step</u>	<u>Model</u>	<u>Sources</u>	<u>Receptors</u>	<u>Meteorology</u>	<u>Results</u>
1	PTPLU	Diesels KW Steam KW Gas Turbine SI Steam	-- -- -- --	-- -- -- --	Location of maximum impact, maximum interaction, adequacy of background.
2	ISCST	Diesels	Polar grid, Geometric Spacing	81-85 hourly	Potential Class II worst-case receptor areas and meteorology.
3	ISCST	Diesels KW Steam KW Gas Turbine SI Steam	Limited polar grid	81-85 hourly	Class II annual-average impacts, AAQS interaction, CLASS II increment expansion, CLASS II interaction.
4	ISCST	Diesels SI Steam KW Steam KW Gas Turbine	Rectangular grid, 0.1 km spacing	Selected 81-85	Class II short-term impacts, AAQS interaction, Class II increment expansion, Class II interaction.
5	ISCST	Diesels KW Steam KW Gas Turbine	Everglades	81-85 hourly	Class I impacts, Class I increment expansion, Class I interaction

TABLE 7

PTPLU RESULTS

Maximum Impacts Windspeed and Location
for Various Stability

<u>Source</u>	<u>SO₂ Emission (lb/hr)</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>D</u>		<u>E</u>		<u>F</u>	
		(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)	(ug/m ³) (m/sec) (km)		
Diesel Generators	100	35	31	34	26	20	15						
		3.0	5.0	12.	20.	2.0	2.0						
		0.6	0.7	0.7	1.0	5	10						
KW Steam #3	408	258	209	203	138	86	58						
		2.0	3.0	5.0	7.0	2.0	2.0						
		0.5	0.7	0.9	1.5	5	9						
KW Steam #4	350	253	207	197	134	81	55						
		1.5	3.0	4.0	5.0	2.0	2.0						
		0.5	0.7	0.9	1.7	5	9						
KW Steam #5	325	135	110	105	71	51	32						
		3.0	5.0	7.0	10	2.0	2.0						
		0.5	0.7	0.9	1.5	6	12						
KW Gas Turbine	173	5.9	4.0	7.8	5.7	6.1	4.4						
		3.0	5.0	15.	20.	2.0	2.0						
		1.2	2.7	1.8	3.2	20	15						
SI Steam	1195	279	237	285	211	163	119						
		3.0	5.0	15	20	2.0	2.0						
		0.6	0.9	0.7	1.2	7	13						

TABLE 8

CLASS II IMPACTS OF DIESEL GENERATORS
WITH 100 LB/HR EMISSION RATE

Annual Average

Year	Impact (ug/m ³)	Location	
		Distance (km)	Direction (deg)
1981	1.0	2	300
1982	1.2	2	300
1983	1.2	1	300
1984	1.0	1	300
1985	0.8	2	280

1-Hour

Year	Grid	2nd/High Impact (ug/m ³)	Location		Meterology		Stability	Wind Speed (m/sec)	Persistence (hr)
			E (km)	N (km)	Day	Hour			
	N								
1981		33	-0.3	0.9	151	13	3	7	1
1982		30	0.0	1.0	174	11	2	3.5	1
1983		--	--	--	--	--	--	--	--
1984		--	--	--	--	--	--	--	--
1985		--	--	--	--	--	--	--	--
	W								
1981		34	-0.8	-0.3	168	13	3	7	1
1982		32	-0.9	-0.3	113	13	3	6.5	1
1983		33	-0.9	0.0	103	11	3	7	1
1984		33	-0.9	-0.4	75	13	3	7.5	1
1985		32	-1.0	0.2	251	13	3	6.5	1
	NW								
1981		33	-0.9	0.5	165	13	3	7	1
1982		32	-0.9	0.5	155	13	3	6.5	1
1983		32	-0.9	0.5	182	14	3	7	1
1984		33	-0.6	0.7	202	12	3	6.5	1
1985		33	-0.6	0.7	152	14	3	7	1

TABLE 8

CLASS II IMPACTS OF DIESEL GENERATORS
 WITH 100 LB/HR EMISSION RATE
 (continued)

3-Hour

Year	Grid	2nd/High Impact	Location		Meterology		Stability	Wind Speed (m/sec)	Persistence (hr)
			E (km)	N (km)	Day	Hour			
1981	N	25	-0.3	0.9	239	10-12	3	7	2
1982		--	--	--	--	--	--	--	--
1983		--	--	--	--	--	--	--	--
1984		--	--	--	--	--	--	--	--
1985		--	--	--	--	--	--	--	--
1981	W	23	-1.0	0.2	176	10-12	3	5	2
1982		25	-1.1	-0.4	173	13-15	3	8	3
1983		27	-1.1	0.2	292	13-15	3	5	3
1984		26	-1.1	-0.4	261	10-12	3	5	3
1985		26	-0.9	0.3	233	13-15	2	4.5	3
1981	NW	23	-1.0	0.6	253	10-12	2	3	3
1982		27	-0.6	0.8	164	13-15	2	4.5	3
1983		26	-0.9	0.5	261	10-12	3	4.5	3
1984		25	-0.7	0.8	202	10-12	3	6	2
1985		25	-0.5	0.9	90	10-12	3	5	2

24-Hour

1981	W	8.5	-1.4	0.2	101	--	4	7.5	12
1982		8.5	-1.4	0.4	360	--	4	6.5	13
1983		8.1	-1.2	0.2	185	--	4	4	11
1984		6.1	-1.4	0.1	266	--	4	8.5	6
1985		7.6	-1.4	0.6	1	--	4	7.5	9
1981	NW	9.5	-1.4	0.8	146	--	4	7.5	10
1982		7.8	-1.8	0.9	33	--	4	7.5	9
1983		7.5	-1.0	0.6	141	--	3	4.5	9
1984		7.5	-0.9	0.5	141	--	4	4	10
1985		7.6	-1.6	1.4	161	--	4	6	12

TABLE 9
COMPLIANCE WITH AAQS

<u>Pollutant</u>	<u>Average Time (hr)</u>	<u>Standard (ug/m³)</u>	<u>Background (ug/m³) (1)</u>	<u>Two 10-MW Diesel Impact (ug/m³)</u>	<u>Total (ug/m³)</u>
CO	8	10,000	5,500 (1)	31 (4)	5,531
	1	40,000	11,000	39 40	11,039
Pb	2,190	1.5	0.15	0.0001 (5)	0.15
NO ₂	8,760	100	35	5.8	43.8
O ₃	1	250	210 (2)	20 (6)	230
SO ₂	8,760	60	15	1.2	25 (7)
	24	260	65	9.5	133.5 (7)
	3	1,300	325	27	545 (7)
TSP (8)	8,760	50	41 (3)	0.2 .24	41.2
	24	150	99 (3)	1.9	100.9

(1) Values for state-wide background level from:

State of Florida Department of Environmental Regulations
Bureau of Air Quality Management, November, 1987 "Ambient Air Quality
in Florida 1986."

(2) Value from Lee County.

(3) Value from Monroe County.

(4) Conservative value actually for 3-hour impact.

(5) Value actually for annual-average impact.

(6) Conservative value actually for HC, O₃ indeterminate.

(7) Includes interaction with Stock Island steam unit.

(8) Standard revised July 1, 1987 to consider only particles less than or equal to 10 um size.

TABLE 10

COMPLIANCE WITH PSD INCREMENTS

<u>Pollutant</u>	<u>Average Time</u> (hr)	<u>Class II Standard</u> (ug/m ³)	<u>Two 10-MW Diesel Impact</u> (ug/m ³)	<u>Key West Gas Turbine Impact</u> (ug/m ³)	<u>Key West Steam Impact</u> (ug/m ³)	<u>Total</u> (ug/m ³) (1)
SO ₂	3	512	27	0	0	27
	24	91	9.5	0	0	9.5
	8,760	20	1.2	0	0.8	0.4
TSP	24	37	1.9	0	0	1.9
	8,760	19	0.2	0	0	0.2
NO ₂	8,760	25	5.8	0	0.2	0.6

<u>Pollutant</u>	<u>Average Time</u> (hr)	<u>Class I Standard</u> (ug/m ³)	<u>Two 10-MW Diesel Impact</u> (ug/m ³)	<u>Key West Gas Turbine Impact</u> (ug/m ³)	<u>Key West Steam Impact</u> (ug/m ³)	<u>Total</u> (ug/m ³) (1)
SO ₂	3	25	2.0	0.9	10.8	0
	24	5	0.3	0.3	2.4	0
	8,760	2	0.010	0.008	0.092	0
TSP	24	10	0.04	0.02	0.09	0
	8,760	5	0.002	0.001	0.003	0
NO ₂	8,760	2.5	0.05	0.005	0.02	0.04

(1) Value equal to diesel impact + gas turbine impact - steam impact and negative numbers set equal to zero.

TABLE 11

CLASS I IMPACTS OF DIESEL GENERATORS
WITH 100 LB/HR EMISSION RATE

Annual Average

<u>Year</u>	<u>Impact</u> (ug/m ³)	<u>UTM Coordinates</u>	
		(km E)	(km N)
1981	.008	486	2794
1982	.008	500	2782
1983	.009	500	2782
1984	.008	486	2794
1985	.010	504	2764

1-Hour

<u>Year</u>	<u>2nd/High</u> <u>Impact</u> (ug/m ³)	<u>UTM Coordinates</u>		<u>Meteorology</u>		<u>Stability</u>	<u>Wind Speed</u> (m/sec)	<u>Persistence</u> (hr)
		<u>E</u> (km E)	<u>N</u> (km N)	<u>Day</u>	<u>Hour</u>			
1981	4.7	504	2764	283	5	7	1.5	1
1982	3.7	500	2782	175	24	7	1.5	1
1983	3.7	500	2282	242	6	7	1.5	1
1984	4.7	504	2764	308	2476	1.5	1	1
1985	4.7	504	2764	141	23	6	1	1

3-Hour

1981	1.4	500	2782	28	1-3	6	1.5	1
1982	1.9	486	2794	94	4-6	6	2.5	2
1983	1.6	500	2282	109	1-3	6	2.5	3
1984	2.0	486	2794	254	1-3	6	2	2
1985	1.9	500	2782	60	22-24	6	1.5	2

24-Hour

1981	.24	500	2782	15	--	7	1.5	2
1982	.26	486	2794	93	--	6	2.5	2
1983	.27	500	2782	109	--	6	3.5	5
1984	.26	486	2794	254	--	5	2.5	3
1985	.29	500	2782	60	--	6	1.5	2

Table 12

Level-1 Visibility Analysis Calculations

TSP emission	= 90 TPY = 0.22 metric ton/day
NO _x	2100 5.2
SO ₂	440 1.1

x = 90 km distance from Key West to Everglades

Gz = 90 m

r_{vd} = 40 km background visual range

$$p = \frac{2 \times 10^8}{Gz \times x} = \frac{2 \times 10^8}{90 \times 90} = 2.5 \times 10^4 \quad \text{plume dispersion parameter}$$

$$T_{TSP} = 10 \times 10^{-7} p Q_{TSP} = 10 \times 10^{-7} \times 2.5 \times 10^4 \times 0.22 = 5.5 \times 10^{-3}$$

$$T_{NOx} = 1.7 \times 10^{-7} p Q_{NOx} = 1.7 \times 10^{-7} \times 2.5 \times 10^4 \times 5.2 = 2.2 \times 10^{-2}$$

$$T_{aerosol} = 1.06 \times 10^{-5} r_{vd} (Q_{TSP} + 1.31 Q_{SO_2})$$

$$= 1.06 \times 10^{-5} \times 40 \times (0.22 + 1.31 \times 1.1) = 7.0 \times 10^{-4}$$

$$C_1 = \frac{T_{NOx}}{T_{TSP} + T_{NOx}} \left[1 - e^{-(T_{TSP} + T_{NOx})} \right] \left(e^{-1.78 \frac{x}{r_{vd}}} \right)$$

$$= \frac{2.2 \times 10^{-2}}{(5.5 \times 10^{-3} + 2.2 \times 10^{-2})} \left[1 - e^{-(5.5 \times 10^{-3} + 2.2 \times 10^{-2})} \right] \left(e^{-1.78 \times \left(\frac{90}{40}\right)} \right) = 3.7 \times 10^{-3}$$

$$C_2 = \left(1 - \frac{1}{C_1 + 1} \right) e^{-(T_{TSP} + T_{NO_2})} \left(e^{-1.56 \frac{x}{r_{vd}}} \right)$$

$$= \left(1 - \frac{1}{3.7 \times 10^{-3} + 1} \right) e^{-(5.5 \times 10^{-3} + 2.2 \times 10^{-2})} \left(e^{-1.56 \frac{90}{40}} \right) = 1.1 \times 10^{-4}$$

$$C_3 = .368 \left[1 - e^{-(T_{aerosol})} \right] = .368 \left[1 - e^{-(7.0 \times 10^{-4})} \right] = 2.6 \times 10^{-4}$$

Reference: EPA Wkpk for Estimating Visibility Impairment EPA 450/4-80-031

TABLE 13

BACT ANALYSIS FOR AIR TOXICS

<u>Pollutant</u>	<u>Type</u> (4)	<u>Emissions</u> <u>Factor</u>	<u>Significant</u> <u>Emission</u> (TPY)	<u>Actual</u> <u>Emission</u> (TPY)	<u>Possible</u> <u>Control</u> (5)	<u>Comment</u> (6)
Formaldehyde	0v	--	--	--	ti	af
Acetaldehyde	0v	--	--	--	ti	af
Benzo (a) Pyrene	0v	--	--	--	ti	af
PAH	0p	--	--	--	v	pd,pc
PCB	0v	--	--	--	ti	af
Benzene	0v	--	--	--	ti	af
POM	0p	0.000175(1)	---	0.001	v	pd,pc
Cd	ip	--	--	--	v	pd,pc
Hg	iv	0.002(1)	0.1	0.01	a	lc
Be	ip	0.000009(1)(3)	0.0004	0.0005	v	pd,pc
Mn	ip	--	--	--	v	pd,pc
Ni	ip	446 (2)	--	0.8	v	pd,pc
Cr	ip	55 (2)	--	0.1	v	pd,pc
As	ip	0.0007(1)(3)	--	0.004	v	pd,pc
Cu	ip	--	--	--	v	pd,pc
Pb	ip	0.008(1)(3)	0.6	0.05	v	pd,pc

(1) Value in lb/10³ gal.

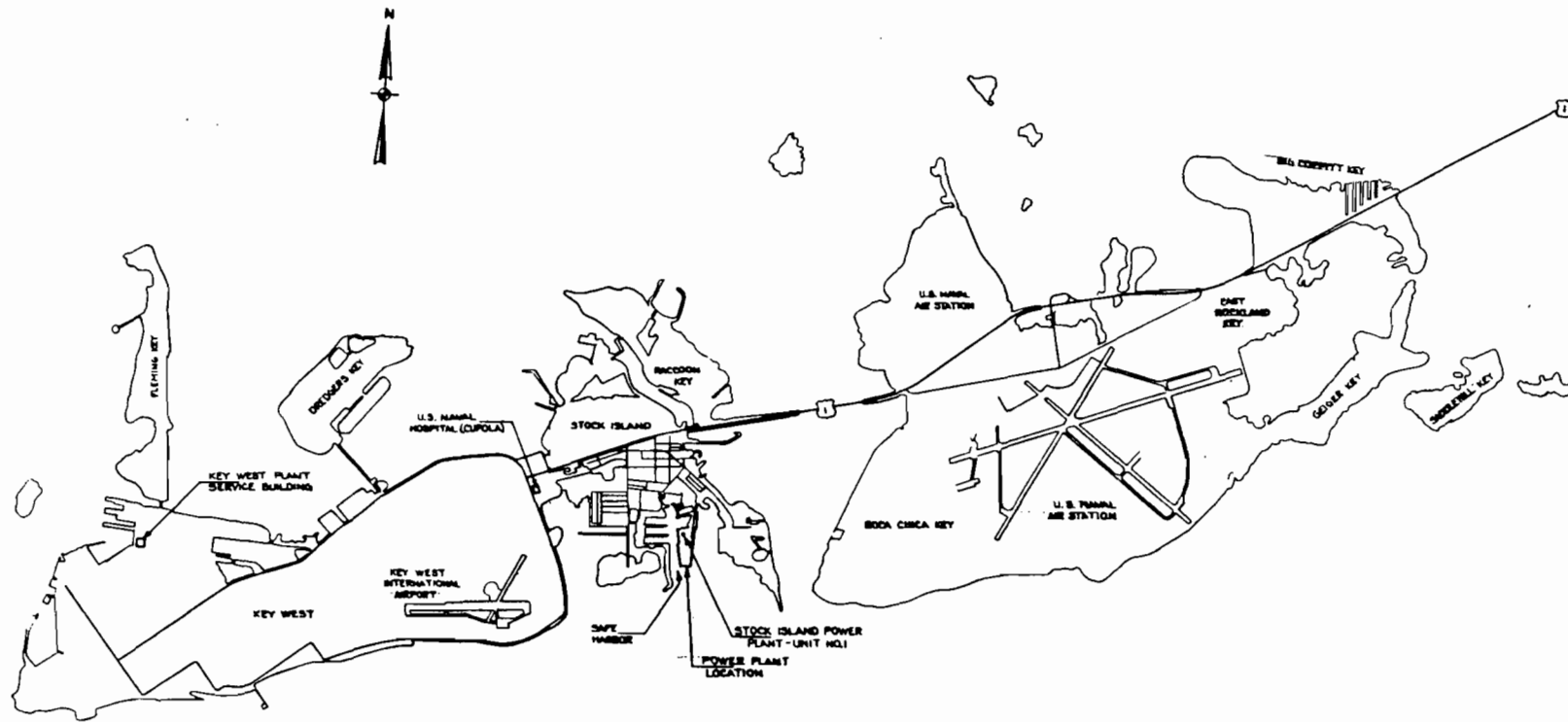
(2) Value in pg/J.

(3) Factor from PW Ventures determination.

(4) ov is organic vapor, op is organic particulate, iv is inorganic vapor,
ip is inorganic particulate.

(5) ti is thermal incineration, a is carbon adsorption, v is venturi scrubber.

(6) af is auxiliary fuel, pd is pressure drop, pc is plume cooling,
lc is low concentration of air toxic.



No.	Date	Description
REVISIONS		



R. W. BECK AND ASSOCIATES
ENGINEERS AND ARCHITECTS

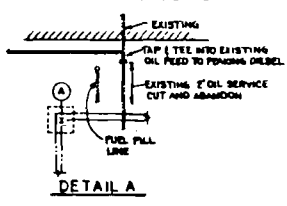
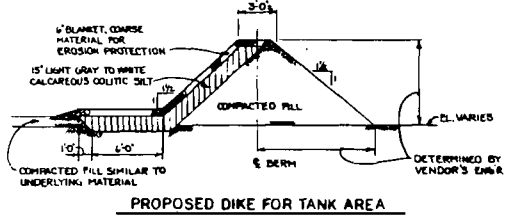
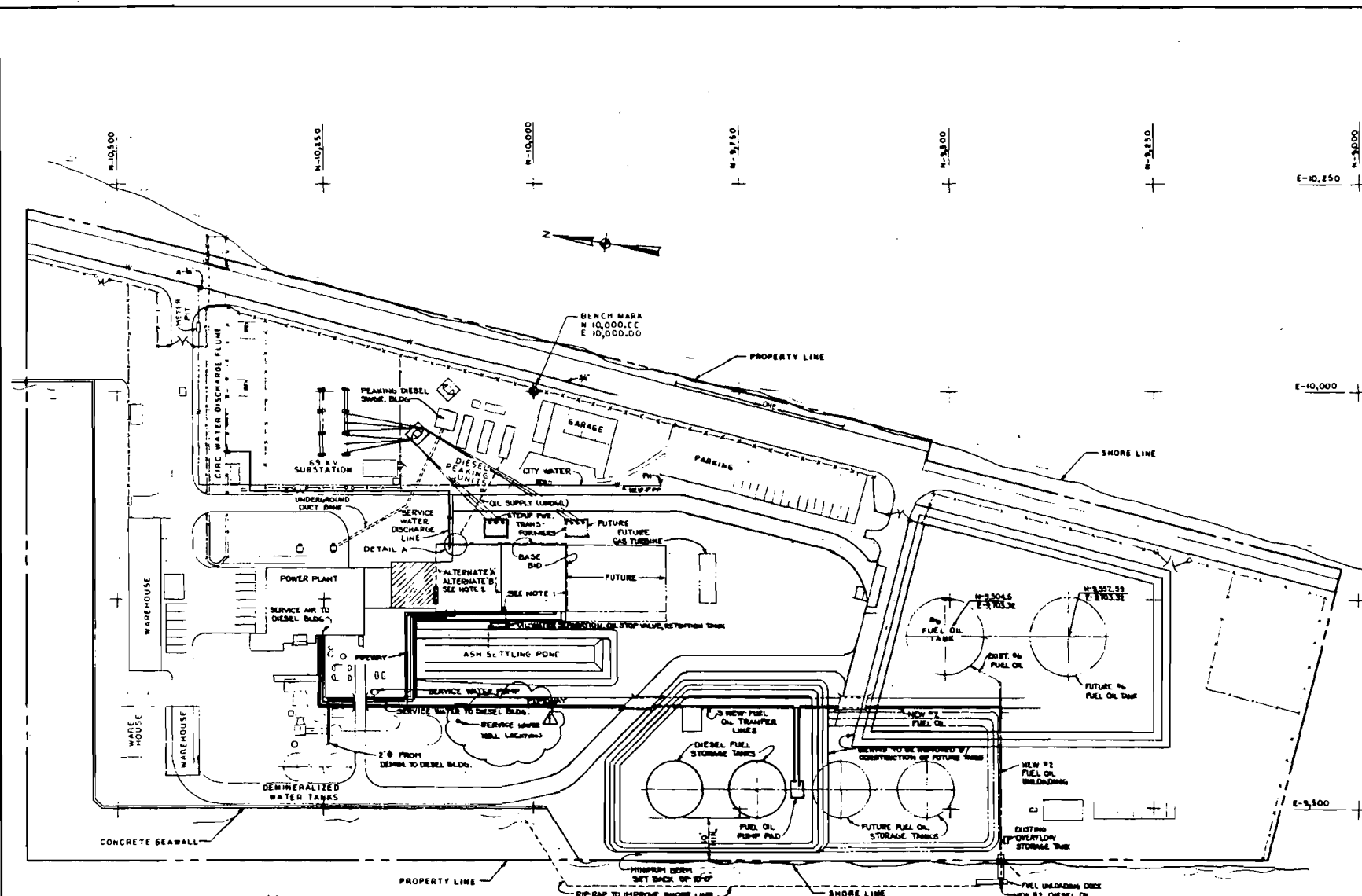
UTILITY BOARD OF THE CITY OF KEY WEST
KEY WEST, FLORIDA
**STOCK ISLAND DIESEL
GENERATING PLANT**
VICINITY LOCATION MAP

Rev. 01	1/28/75	Issue	Rev. 02	2/28/75	Issue
Rev. 02	3/28/75	Issue	Rev. 03	4/28/75	Issue

2875-C-102.0

NOTES

1. --- EXTENT OF AREA AVAILABLE FOR DIESEL PLANT BUILDING AND DIESEL DAY TANKS OR BARGE BLD.
2. --- EXTENT OF AREA AVAILABLE FOR DIESEL PLANT BUILDING AND DIESEL DAY TANKS FOR ALTERNATE AND ALTERNATE B.
3. FOR INFORMATION ONLY, CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES.
4. FURNISH AND INSTALL UNDERGROUND DUCT BANKS BETWEEN DIESEL PLANT AND PEAKING DIESEL IS BY SWITCHGEAR BUILDING, AND ANY OTHER LOCATIONS AS REQUIRED.



NO.	DATE	BY	DESCRIPTION
1	5/14/68	RWB	REVISED PER OWNER'S REQUEST

REVISIONS



R. W. BECK AND ASSOCIATES
ENGINEERS AND ARCHITECTS

UTILITY BOARD OF THE CITY OF KEY WEST
KEY WEST, FLORIDA
STOCK ISLAND DIESEL GENERATING PLANT
PROPOSED SITE PLAN AND UNDERGROUND UTILITIES

FOR GENERAL INFORMATION
NOT FOR CONSTRUCTION

Best Available Copy

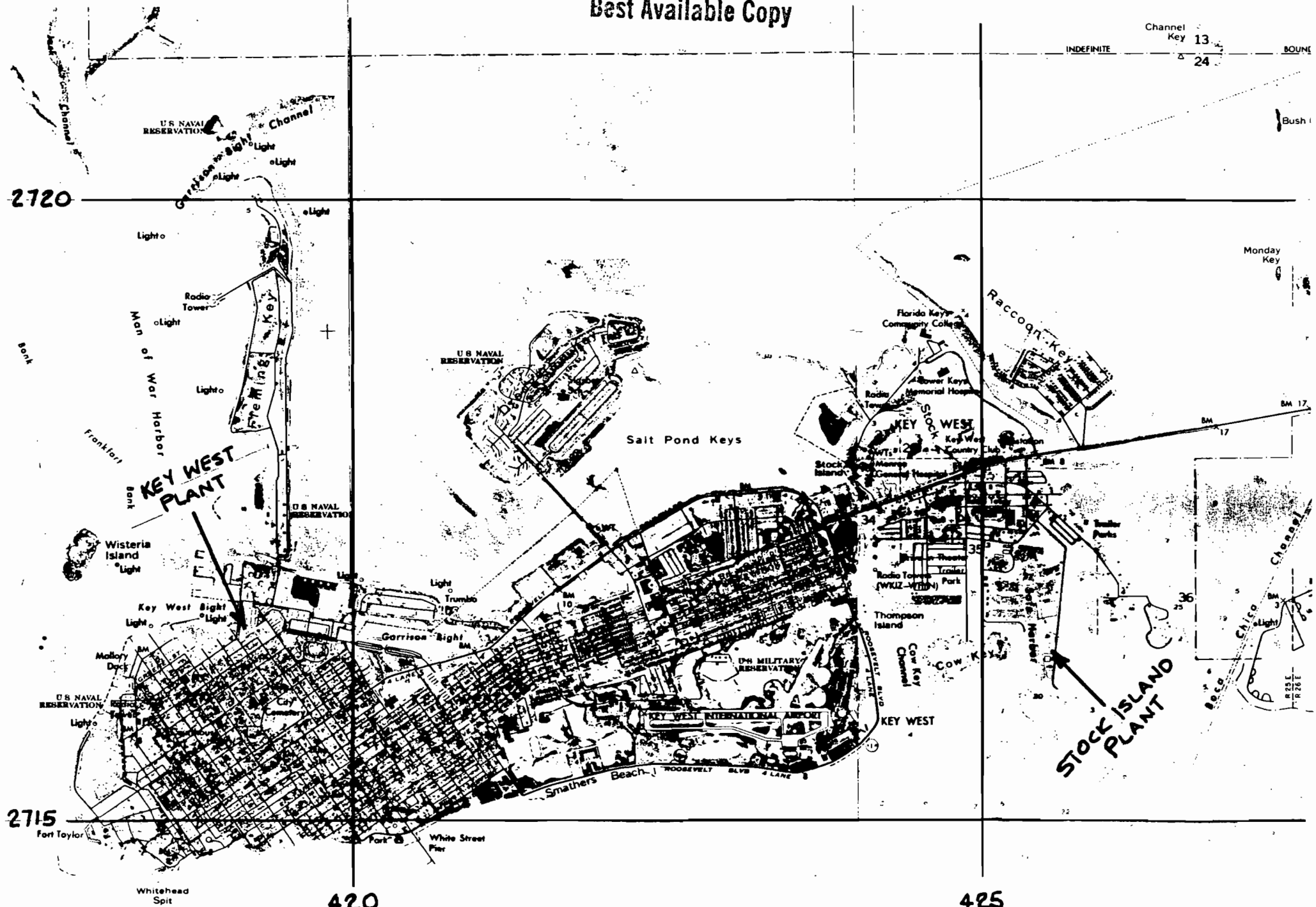
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INDEFINITE
24
BOUND

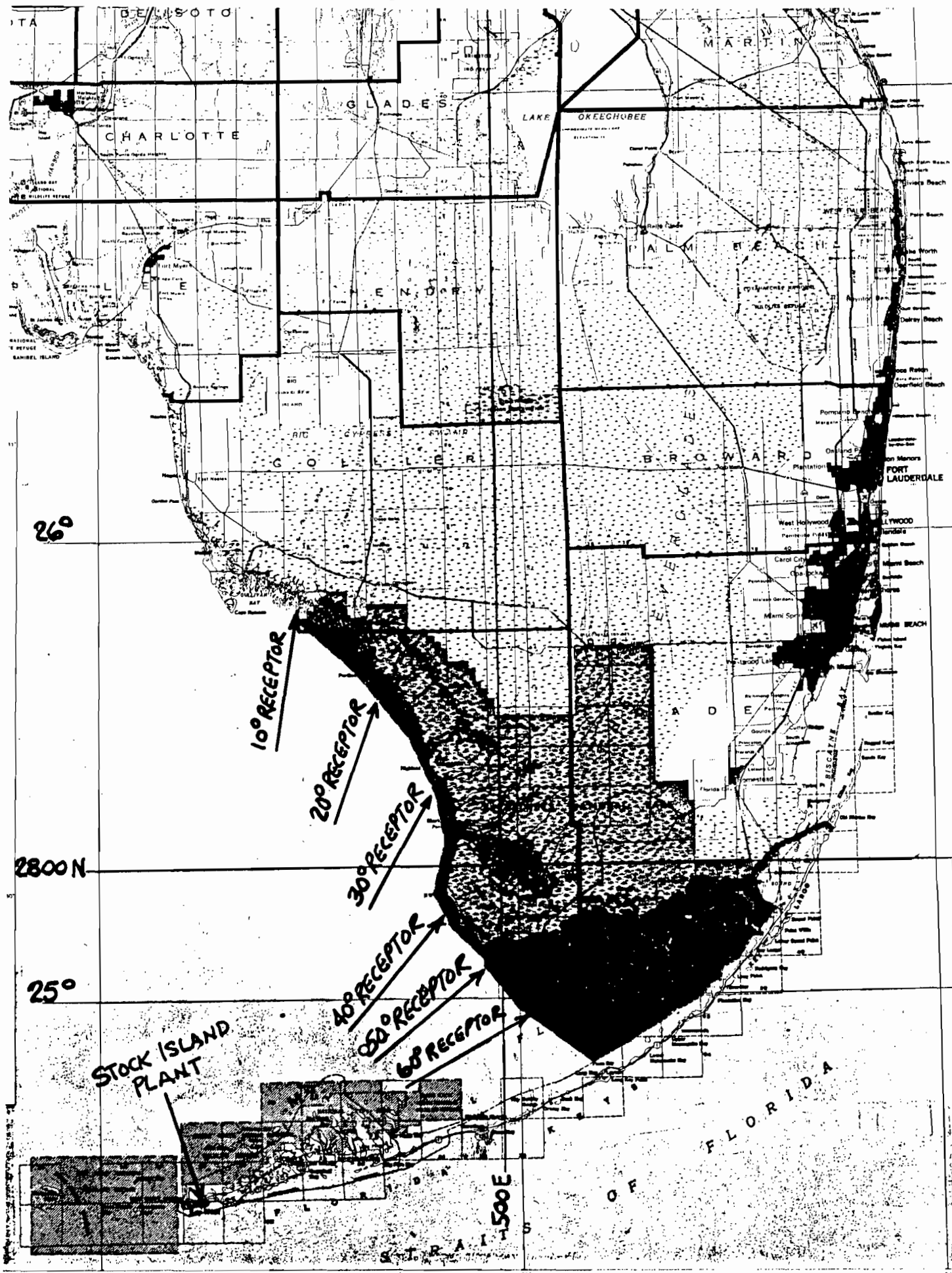
2720

2715

420

425





26°

2800 N

25°

STOCK ISLAND PLANT

10° RECEPTOR

20° RECEPTOR

30° RECEPTOR

40° RECEPTOR

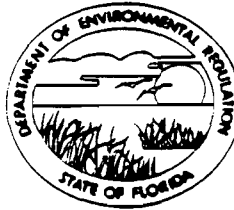
50° RECEPTOR

60° RECEPTOR

10 0 10 20 30 40 50 KM

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION \$2000 pd.
BEST AVAILABLE COPY 7-15-88

SOUTH FLORIDA DISTRICT
2269 BAY STREET
FORT MYERS, FLORIDA 33901-2898
(813)332-2667



AC 44-152197
AC 44-152198

BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY
PHILIP R. EDWARDS
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Diesel Engine Generating Station [X] New¹ [] Existing¹

APPLICATION TYPE: [X] Construction [] Operation [] Modification

COMPANY NAME: Key West City Electric System COUNTY: Monroe

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) two diesel generators

SOURCE LOCATION: Street Front Street extended City Key West

UTM: East 425 North 2716

Latitude 24 ° 33 ' 49 " N Longitude 81 ° 44 ' 03 " W

APPLICANT NAME AND TITLE: Robert R. Padron, Manager

APPLICANT ADDRESS: 1006 James Street Key West, Florida 33041

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of City Electric System

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: Robert R. Padron

Robert R. Padron, Manager
Name and Title (Please Type)

Date: 7/12/88 Telephone No. (303) 294-5272

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

¹ See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed D. R. Swann

Dennis R. Swann

Name (Please Type)

R. W. Beck and Associates

Company Name (Please Type)

1125 17th Street, Ste. 1900 Denver, CO 80202

Mailing Address (Please Type)

Florida Registration No. 37459 Date: 7/7/88 Telephone No. (303) 295-6900

7/7/88

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

The Utility Board of the City of Key West, Florida is planning to add two 10-MW diesel generators to their Stock Island plant, with an in-service date of February 1, 1990. Concurrent with this new source of generation will be the retirement of three existing 16.5-MW steam units at the Key West plant.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction 11/1/88 Completion of Construction 2/1/90

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

No post-combustion pollution control equipment is included with the diesel engines in the proposed BACT configuration.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

Not Applicable

E. Requested permitted equipment operating time: hrs/day 24; days/wk 7; wks/yr 52; if power plant, hrs/yr 8760; if seasonal, describe: _____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? NO
 - a. If yes, has "offset" been applied? _____
 - b. If yes, has "Lowest Achievable Emission Rate" been applied? _____
 - c. If yes, list non-attainment pollutants. _____
 2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. YES
 3. Does the State "Prevention of Significant Deterioration" (PSD) requirement apply to this source? If yes, see Sections VI and VII. YES
 4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? NO
 5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO
- H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO
- a. If yes, for what pollutants? _____
 - b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

2. See attachment labeled "BACT Analysis"
3. See attachment labeled "Impact Analysis"

PART 1 - PROCEDURES AND LEGAL

SECTION 103.05 - CONTRACT

THIS CONTRACT, executed this 23 day of JUNE 1988 by and between the **UTILITY BOARD OF THE CITY OF KEY WEST**, Key West, Florida hereinafter called **BUYER**, and **FAIRBANKS, MORSE ENGINE DIVISION, DIVISION OF COLT INDUSTRIES INC.** a business operating in Beloit, Wisconsin herein called **COLT INDUSTRIES**.

WITNESSETH:

That for the consideration and under the provisions hereinafter stated and referred to moving from each to the other of said parties respectively, it is mutually understood and agreed as follows:

1. That **COLT INDUSTRIES** is the lowest and best responsible bidder for supplying the requirements of **DIESEL ENGINE GENERATING STATION** for the City Electric System.


2. **COLT INDUSTRIES**, agrees to perform all aspects of this Contract set out by the **BUYER** in its **SPECIFICATIONS FOR DIESEL ENGINE GENERATING STATION** (Attached hereto and made part hereof as Exhibit A) and **PROPOSAL OF JUNE 7, 1988** (Attached hereto and made part hereof as Exhibit B) **AND MODIFICATION OF COLT INDUSTRIES BID DEVIATIONS** (Attached hereto and made a part hereof as Exhibit C).

2b. Wherever and whenever the provisions of this Document or attachments hereto conflict with the **SPECIFICATIONS OF BUYER FOR DIESEL ENGINE GENERATING STATION** (Exhibit A), **THE PROVISIONS OF SPECIFICATIONS OF BUYER FOR DIESEL ENGINE GENERATING STATION** (Exhibit A) SHALL CONTROL.


3. On the faithful performance of this Contract by **COLT INDUSTRIES**, **BUYER** will pay **COLT INDUSTRIES** in accordance with the terms and conditions stated in said proposal, award, specifications, and the Contract Documents hereinbefore specifically referred to and, by reference made a part hereof.

IN WITNESS WHEREOF, the parties hereto have duly executed this Contract in duplicate, the day and year first above written.

ATTEST:

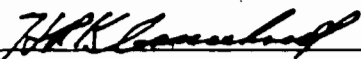


UTILITY BOARD OF THE CITY OF
KEY WEST, FLORIDA

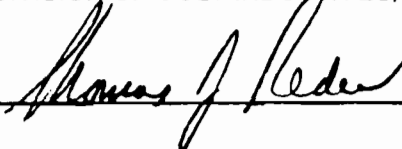


(Chairman)

ATTEST:



FAIRBANKS MORSE ENGINE DIVISION
DIVISION OF COLT INDUSTRIES, INC.



DIVISION 1, SECTION 01020 - GUARANTEES

Delete Section 01020.02, Paragraph a. and replace with the following Paragraph a.:

"a. Guarantee the following performance:

- (1)
 - (a) Net Electric Power Output, as stated by the Contractor in the Proposal.
 - (b) Net plant heat rate, as stated by the Contractor in the Proposal.
 - (c) Air Emissions:
 - 1 Opacity: 20 percent
 - 2 TSP: 0.1 lb/MMBtu
 - 3 SO₂: 0.5 lb/MMBtu
 - 4 NO_x: 8.0 gm/hp-hr
 - 5 CO: 2.0 gm/hp-hr
 - 6 HC: 1.0 gm/hp-hr
 - (d) Water:
 - 1 Oil and Grease: 5 mg/l (daily maximum)
 - 2 TSS: 30 mg/l (daily average),
100 mg/l (daily maximum)
 - 3 Copper: 0.015 mg/l
 - 4 Iron: 0.3 mg/l
 - 5 pH: 6.5 to 8.5
 - (e) Noise emission: 55 dBA at L10 and 60 dBA at LMAX at the property line. Reference Monroe County Code.
- (2)
 - (a) Net Electric Power Output at 8700 KW
 - (b) Net plant heat rate at 9700 Btu/Net kWh
 - (c) Air Emissions:

- 1 Opacity: 31.0 percent
- 2 TSP: 0.1 lb/MMBtu
- 3 SO₂: 0.5 lb/MMBtu
- 4 NO_x: 6.0 gm/hp-hr
- 5 CO: 2.0 gm/hp-hr
- 6 HC: 1.0 gm/hp-hr

(d) Water:

- 1 Oil and Grease: 5 mg/l (daily maximum)
- 2 TSS: 30 mg/l (daily average), 100 mg/l (daily maximum)
- 3 Copper: 0.015 mg/l
- 4 Iron: 0.3 mg/l
- 5 pH: 6.5 to 8.5

(e) Noise emission: 55 dBA at L10 and 60 dBA at LMAX at the property line. Reference Monroe County Code.

16. As to Deviation Number 16, Colt and CES agree Section 15606.02 as contained in CES Bid Specification Number 35-88 shall stand as an agreed contract provision.

17. As to Deviation Number 17, Colt and CES agree that Deviation Number 17 be replaced and the following accepted as a contract provision.

DIVISION 15, SECTION 15650 - COOLANT LOOP HEAT EXCHANGERS

Delete Section 15650.04, Paragraph a. and replace with the following Paragraph a.:

"a. Type: Plate and Frame"

Delete Section 15650.04, Paragraph d., Subparagraphs (1) and (2) and replace with the following:

"(1) Plate: Titanium

18. As to Deviation Number 18, Colt and CES agree that

SECTION 301 - SPECIAL INSTRUCTIONS TO BIDDERS

301.07 BID DATA TO BE SUPPLIED BY VENDOR

In addition to other data and descriptive material furnished with the Bidder's Proposal, the Bidder shall fill in all spaces of the following Bid Data Section:

1. Unit Rating and Guaranteed Performance Data:

- (a) Gross output at the generator terminals: 9605 kW.
- (b) Net electric power output, including all auxiliary loads: 9497 kW.
- (c) List auxiliary equipment load:

<u>Quantity</u>	<u>Equipment Name</u>	<u>Load (kW)</u>
1	Service Water Pump	63.0
1	Jacket Water Pump	29.0
1	Intercooler Water Pump	12.5
1	Rocker Lube Pump	1.6
1	Injection Nozzle Cooling Pump	1.6
	Total	107.7

- (d) Gross Heat Rate (LHV): 8090 Btu/kWh.
- (e) Gross Heat Rate (HHV): 8605 Btu/kWh.
- (f) Net Heat Rate (LHV): 8180 Btu/net kWh.
- (g) Net Heat Rate, including all auxiliary loads (HHV): 8700 Btu/net kWh.
- (h) Net Heat Rate (HHV) curve at various part load outputs at standard conditions.
- (i) Minimum Gross output at the generator terminals: 1920 kW.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

- Total Process Input Rate (lbs/hr): _____
- Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary) Total for two 10MW diesels

See attached Fairbanks Morse guarantees.

Name of Contaminant	Emission ¹		Allowed Emission Rate per Rule 17-2	Allowable Emission lbs/hr	Potential ⁴ Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
NO _x	470	2100	NA	NA	470	2100	
CO	120	520	NA	NA	120	520	
HC	60	260	NA	NA	60	260	
SO ₂	100	440	NA	NA	100	440	
TSP	20	90	20% opacity	NA	20	90	

¹See Section V, Item 2.

²Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

³Calculated from operating rate and applicable standard.

⁴Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
No.2 Fuel Oil	1400 gal	1400 gal	200
			total for two diesels

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: 0.5 Percent Ash: 0.0

Density: 7.2 lbs/gal Typical Percent Nitrogen: 0.1

Heat ~~capacity~~ ^{content}: (HHV) 19,500 BTU/lb 140,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

See attachment labeled "Table 13" for emission of air toxics.

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

None

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 100 ft. Stack Diameter: 4 ft.
 Gas Flow Rate: 73,000 ACFM 32,000 DSCFM Gas Exit Temperature: 600 °F.
 Water Vapor Content: 6 % Velocity: 100 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume (ft) ³	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: Cyclone Wet Scrubber Afterburner
 Other (specify) _____

Brief description of operating characteristics of control devices: _____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

- 9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
- 10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

Yes No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

Yes No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
NO _x	8.0 gm/hp-hr

D. Describe the existing control and treatment technology (if any).

- | | |
|---------------------------|--------------------------|
| 1. Control Device/System: | 2. Operating Principles: |
| 3. Efficiency:* | 4. Capital Costs: |

*Explain method of determining

- 5. Useful Life:
- 7. Energy:
- 9. Emissions:

- 6. Operating Costs:
- 8. Maintenance Cost:

Contaminant	Rate or Concentration

10. Stack Parameters

- a. Height: . ft.
- b. Diameter: ft.
- c. Flow Rate: ACFM
- d. Temperature: °F.
- e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). See attachments labeled "BACT Analysis" and "Table 2".

1.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:¹
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:²
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:
- j. Applicability to manufacturing processes:
- k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:¹
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:²
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device: Timing retardation with NO_x emission of 8 gm/hp-hr

2. Efficiency:¹ 40 Percent

3. Capital Cost:

4. Useful Life: 20 Year

5. Operating Cost:

6. Energy:²

7. Maintenance Cost:

8. Manufacturer: Fairbanks Morse

9. Other locations where employed on similar processes:

a. (1) Company: Sebring Municipal Utility

(2) Mailing Address:

(3) City:

(4) State:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

NO_x

10 gm/hp-hr

(8) Process Rate:¹

b. (1) Company: PW Ventures

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

NO_x

12 gm/hp-hr

(8) Process Rate:¹

10. Reason for selection and description of systems:

¹Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ () SO₂* _____ Wind spd/dir

Period of Monitoring _____ / _____ / _____ to _____ / _____ / _____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

- a. Was instrumentation EPA referenced or its equivalent? Yes No
- b. Was instrumentation calibrated in accordance with Department procedures?
 Yes No Unknown

B. Meteorological Data Used for Air Quality Modeling

- 1. 5 Year(s) of data from 1 / 1 / 81 to 12 / 31 / 85
month day year month day year
- 2. Surface data obtained from (location) Miami
- 3. Upper air (mixing height) data obtained from (location) Miami
- 4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used

- 1. PTPLU no Modified? If yes, attach description.
- 2. ISCST no Modified? If yes, attach description.
- 3. _____ Modified? If yes, attach description.
- 4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	<u>2.5</u> grams/sec Total for two 10-MW diesel
SO ₂	<u>12.6</u> grama/sec

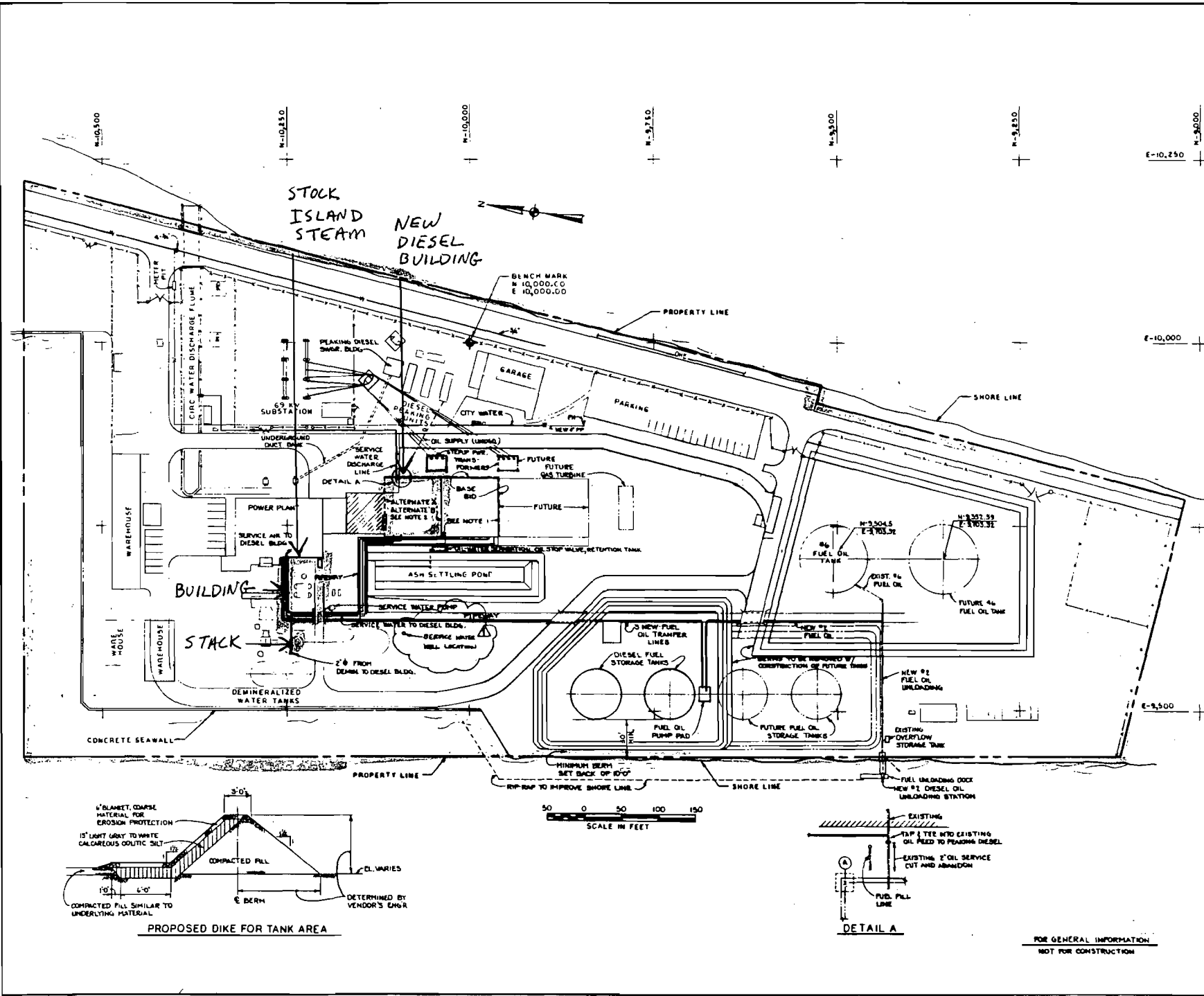
E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.



- NOTES**
1. --- EXTENT OF AREA AVAILABLE FOR DIESEL PLANT BUILDING AND DIESEL DAY TANKS ON BASE BND.
 2. EXTENT OF AREA AVAILABLE FOR DIESEL PLANT BUILDING AND DIESEL DAY TANK FOR ALTERNATE AND ALTERNATE D.
 3. FOR INFORMATION ONLY, CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES.
 4. FURNISH AND INSTALL UNDERGROUND DUCT BANKS BETWEEN DIESEL PLANT AND PEAKING DIESEL 15 KV SWITCHGEAR BUILDING AND ANY OTHER LOCATIONS AS REQUIRED.

NO.	DATE	BY	DESCRIPTION
1	9/17/00	PK	ADD PEAKING DIESEL WELL LOCATION
2	10/10/00	PK	ADD PEAKING DIESEL WELL LOCATION

REVISIONS

NO.	DATE	BY	DESCRIPTION
1	9/17/00	PK	ADD PEAKING DIESEL WELL LOCATION
2	10/10/00	PK	ADD PEAKING DIESEL WELL LOCATION

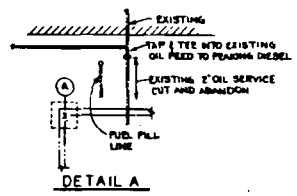
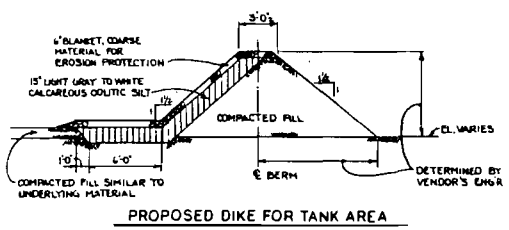


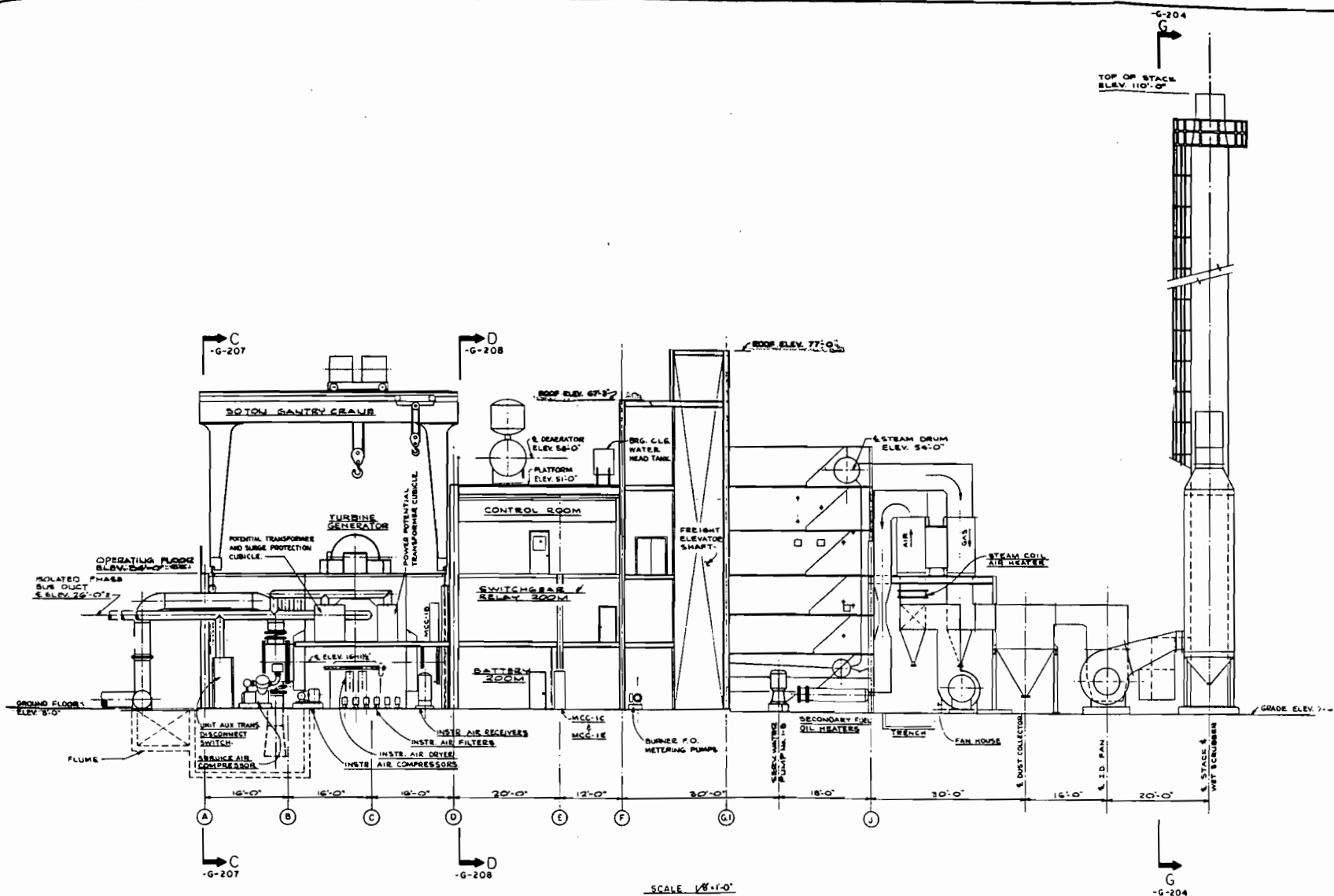
R. W. BECK AND ASSOCIATES
ENGINEERS AND ARCHITECTS

UTILITY BOARD OF THE CITY OF KEY WEST
KEY WEST, FLORIDA
**STOCK ISLAND DIESEL
GENERATING PLANT**
PROPOSED SITE PLAN AND
UNDERGROUND UTILITIES

DATE: 10/10/00
DRAWN BY: PK
CHECKED BY: PK
SCALE: AS SHOWN
PROJECT NO.: 2875-C-104.1

FOR GENERAL INFORMATION
NOT FOR CONSTRUCTION





NOT FOR CONSTRUCTION
FOR GENERAL INFORMATION ONLY

R. W. BECK and ASSOCIATES

ANALYTICAL AND CONSTRUCTION ENGINEERS

Seattle, Washington Orlando, Florida Denver, Colorado

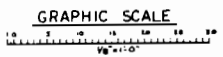
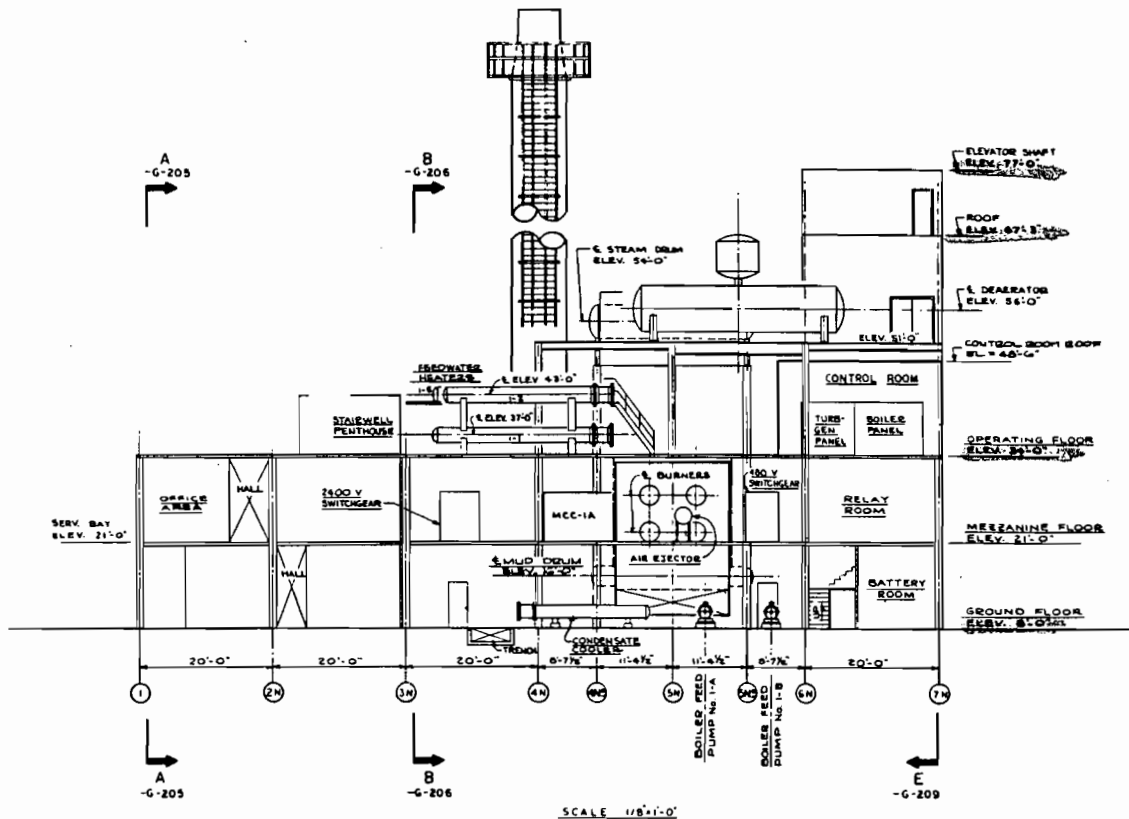
UTILITY BOARD OF THE CITY OF KEY WEST
KEY WEST, FLORIDA

STOCK ISLAND STEAM POWER PLANT
UNIT NO. 1

GENERAL ARRANGEMENT
SECTIONAL ELEVATION E-E

NO.	DATE	BY	CHKD.	DESCRIPTION
1	10/24/64	REK		ISSUED FOR GENERAL & MECHANICAL CONSTRUCTION BID.
2	10/24/64	REK		ISSUED FOR G.C. CONTRACT
REV.	DATE	BY	CHKD.	DESCRIPTION

1155-G-209.1



NOT FOR CONSTRUCTION
FOR GENERAL INFORMATION ONLY

R. W. BECK and ASSOCIATES
ANALYTICAL AND CONSTRUCTION ENGINEERS
Seattle, Washington Omaha, Nebraska Denver, Colorado

UTILITY BOARD OF THE CITY OF KEY WEST
KEY WEST, FLORIDA

**STOCK ISLAND STEAM POWER PLANT
UNIT No. 1**

**GENERAL ARRANGEMENT
SECTIONAL ELEVATION O-D**

NO.	DATE	DESCRIPTION
1	10/20/54	ISSUED FOR GENERAL & MECHANICAL CONSTRUCTION BID
2	11/10/54	ISSUED FOR G.C. CONTRACT
3	12/15/54	
4	1/15/55	
5	2/15/55	
6	3/15/55	
7	4/15/55	
8	5/15/55	
9	6/15/55	
10	7/15/55	
11	8/15/55	
12	9/15/55	
13	10/15/55	
14	11/15/55	
15	12/15/55	

1155-G-208.1

ISCST (DATED 88207)
AN AIR QUALITY DISPERSION MODEL IN
SECTION 1. GUIDELINE MODELS
IN UNAMAP (VERSION 6) JUNE 88.
SOURCE: UNAMAP FILE ON EPA'S UNIVAC AT RTP, NC.

IBM-PC VERSION (1.62)
(C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.
SERIAL NUMBER 5503 SOLD TO R. W. BECK & ASSOC.
RUN BEGAN ON 08-17-88 AT 15:45:40

DER
Key West EW
Downwash Scenario
1984
Stock Island Only

CALCULATE (CONCENTRATION=1,DEPOSITION=2)	ISW(1) = 1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)	ISW(2) = 2
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)	ISW(3) = 1
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)	ISW(4) = 0
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)	ISW(5) = 0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)	ISW(6) = 1
COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)	
WITH THE FOLLOWING TIME PERIODS:	
HOURLY (YES=1,NO=0)	ISW(7) = 1
2-HOUR (YES=1,NO=0)	ISW(8) = 0
3-HOUR (YES=1,NO=0)	ISW(9) = 1
4-HOUR (YES=1,NO=0)	ISW(10) = 0
6-HOUR (YES=1,NO=0)	ISW(11) = 0
8-HOUR (YES=1,NO=0)	ISW(12) = 0
12-HOUR (YES=1,NO=0)	ISW(13) = 0
24-HOUR (YES=1,NO=0)	ISW(14) = 1
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)	ISW(15) = 0
PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE	
SPECIFIED BY ISW(7) THROUGH ISW(14):	
DAILY TABLES (YES=1,NO=0)	ISW(16) = 0
HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)	ISW(17) = 1
MAXIMUM 50 TABLES (YES=1,NO=0)	ISW(18) = 1
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)	ISW(19) = 1
RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)	ISW(20) = 0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(21) = 1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(22) = 1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)	ISW(23) = 0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)	ISW(24) = 1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)	ISW(25) = 2
PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)	ISW(26) = 1
CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)	ISW(27) = 1
REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)	ISW(28) = 2
TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)	ISW(29) = 1
DEBUG OPTION CHOSEN (YES=1,NO=2)	ISW(30) = 2
ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)	ISW(31) = 0
NUMBER OF INPUT SOURCES	NSOURC = 1
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)	NGROUP = 1
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)	IPERD = 0
NUMBER OF X (RANGE) GRID VALUES	NXPNTS = 5
NUMBER OF Y (THETA) GRID VALUES	NYPNTS = 2
NUMBER OF DISCRETE RECEPTORS	NXWYPT = 0
SOURCE EMISSION RATE UNITS CONVERSION FACTOR	TK = .10000E+07
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED	ZR = 7.00 METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA	IMET = 9
DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION	DECAY = .000000E+00
SURFACE STATION NO.	ISS = 12839
YEAR OF SURFACE DATA	ISY = 84
UPPER AIR STATION NO.	IUS = 12844
YEAR OF UPPER AIR DATA	IUY = 84
ALLOCATED DATA STORAGE	LIMIT = 43500 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN	MIMIT = 1067 WORDS

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY					
	1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** RANGES OF POLAR GRID SYSTEM ***
(METERS)

100.0, 200.0, 300.0, 400.0, 500.0,

*** RADIAL ANGLES OF POLAR GRID SYSTEM ***

(DEGREES)

90.0, 180.0,


```
CALM HOURS (=1) FOR DAY 197 * 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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CALM HOURS (=1) FOR DAY 355 * 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
CALM HOURS (=1) FOR DAY 356 * 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 357 * 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 365 * 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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ISCST (DATED 88207)

AN AIR QUALITY DISPERSION MODEL IN

SECTION 1. GUIDELINE MODELS

IN UNAMAP (VERSION 6) JUNE 88.

SOURCE: UNAMAP FILE ON EPA'S UNIVAC AT RTP, NC.

IBM-PC VERSION (1.62)

(C) COPYRIGHT 1988, TRINITY CONSULTANTS, INC.

SERIAL NUMBER 5503 SOLD TO R. W. BECK & ASSOC. 171

RUN BEGAN ON 09-13-88 AT 07:28:56

CALCULATE (CONCENTRATION=1,DEPOSITION=2)	ISW(1) = 1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)	ISW(2) = 2
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)	ISW(3) = 1
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)	ISW(4) = 0
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)	ISW(5) = 0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)	ISW(6) = 1
COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)	
WITH THE FOLLOWING TIME PERIODS:	
HOURLY (YES=1,NO=0)	ISW(7) = 1
2-HOUR (YES=1,NO=0)	ISW(8) = 0
3-HOUR (YES=1,NO=0)	ISW(9) = 1
4-HOUR (YES=1,NO=0)	ISW(10) = 0
6-HOUR (YES=1,NO=0)	ISW(11) = 0
8-HOUR (YES=1,NO=0)	ISW(12) = 0
12-HOUR (YES=1,NO=0)	ISW(13) = 0
24-HOUR (YES=1,NO=0)	ISW(14) = 1
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)	ISW(15) = 0
PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE	
SPECIFIED BY ISW(7) THROUGH ISW(14):	
DAILY TABLES (YES=1,NO=0)	ISW(16) = 0
HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)	ISW(17) = 1
MAXIMUM 50 TABLES (YES=1,NO=0)	ISW(18) = 1
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)	ISW(19) = 1
RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)	ISW(20) = 0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(21) = 1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(22) = 1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)	ISW(23) = 0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)	ISW(24) = 1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)	ISW(25) = 2
PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)	ISW(26) = 1
CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)	ISW(27) = 1
REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)	ISW(28) = 1
TYPE OF POLLUTANT TO BE MODELLED (1=S02,2=OTHER)	ISW(29) = 1
DEBUG OPTION CHOSEN (YES=1,NO=2)	ISW(30) = 2
ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)	ISW(31) = 0
NUMBER OF INPUT SOURCES	NSOURC = 2
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)	NGROUP = 2
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)	IPERD = 0
NUMBER OF X (RANGE) GRID VALUES	NXPNTS = 9
NUMBER OF Y (THETA) GRID VALUES	NYPNTS = 36
NUMBER OF DISCRETE RECEPTORS	NXWYPT = 0
SOURCE EMISSION RATE UNITS CONVERSION FACTOR	TK = .10000E+07
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED	ZR = 7.00 METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA	IMET = 9
DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION	DECAY = .000000E+00
SURFACE STATION NO.	ISS = 12839
YEAR OF SURFACE DATA	ISY = 81
UPPER AIR STATION NO.	IUS = 12844
YEAR OF UPPER AIR DATA	IUY = 81
ALLOCATED DATA STORAGE	LIMIT = 43500 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN	MIMIT = 12193 WORDS

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
 (DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY					
	1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** RANGES OF POLAR GRID SYSTEM ***
 (METERS)

100.0, 150.0, 200.0, 250.0, 300.0, 350.0, 400.0, 450.0, 500.0,

*** RADIAL ANGLES OF POLAR GRID SYSTEM ***
 (DEGREES)

10.0, 20.0, 30.0, 40.0, 50.0, 60.0, 70.0, 80.0, 90.0, 100.0,
 110.0, 120.0, 130.0, 140.0, 150.0, 160.0, 170.0, 180.0, 190.0, 200.0,
 210.0, 220.0, 230.0, 240.0, 250.0, 260.0, 270.0, 280.0, 290.0, 300.0,
 310.0, 320.0, 330.0, 340.0, 350.0, 360.0,

*** SOURCE DATA ***

EMISSION RATE				TEMP.		EXIT VEL.					BLDG.	BLDG.	BLDG.
TYPE=0,1				TYPE=0		TYPE=0							
T W	(GRAMS/SEC)			(DEG.K);		(M/SEC);					BLDG.	BLDG.	BLDG.
Y A NUMBER	TYPE=2			BASE		VERT.DIM	HORZ.DIM	DIAMETER	HEIGHT	LENGTH	WIDTH		
SOURCE P K PART.	(GRAMS/SEC)	X	Y	ELEV.	HEIGHT	TYPE=1	TYPE=1,2	TYPE=0	TYPE=0	TYPE=0	TYPE=0		
NUMBER E E CATS.	*PER METER**2	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)	(METERS)
1	0 0 0	.12600E+02	.0	.0	.0	30.48	589.00	30.00	1.20	-21.34	29.71	29.71	
2	0 0 0	.15059E+03	.0	.0	.0	31.70	460.00	44.81	1.52	-21.34	29.71	29.71	

CALM HOURS (=1) FOR DAY 302 * 0 0 0 0 1 0
CALM HOURS (=1) FOR DAY 322 * 0 1 0
* CALM HOURS (=1) FOR DAY 323 * 0 1
CALM HOURS (=1) FOR DAY 328 * 0 0 1 1 1 1 0
CALM HOURS (=1) FOR DAY 332 * 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 341 * 0 1 1
* CALM HOURS (=1) FOR DAY 342 * 0 0 1 1 0
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* CALM HOURS (=1) FOR DAY 352 * 0 0 1 0 1 0
CALM HOURS (=1) FOR DAY 359 * 0 1
CALM HOURS (=1) FOR DAY 362 * 1 0 0 1 0

[REDACTED]



Barnett Bank
3406 N. Roosevelt Blvd.

63-775
670

2490 No 109153

KEY WEST, FLORIDA "SOUTHERNMOST CITY IN THE CONTINENTAL UNITED STATES" July 13 19 88

PAY TO THE ORDER OF State of Florida, Department of Environmental Regulation** \$ 2,000.00

PAY EXACT 2,000 DOLLARS

DOLLARS



Remitter: City Electric/bc

CASHIER'S CHECK

Bette G. Carroll



Subject: PSD Application for
Two 10-MW Diesel Generators
at Key West, Florida

1031

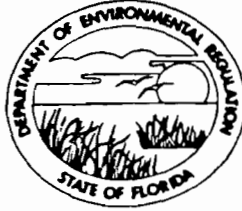
Dear Mr. Fancy:

The Utility Board of the City of Key West, Florida ("CES") is planning to add two 10-MW diesel generators to their Stock Island plant. Our environmental engineer, R. W. Beck and Associates, has prepared the enclosed application for a construction permit and New Source Review. Original representative and engineer signature pages 1 and 2 from DER 17-1.202(1) are attached to the letter along with a \$2000 check payable to DER for the processing fee. Four comb-bound copies of the application (including test, tables, figures and forms) and one comb-bound copy of the modeling printouts and experience information have been forwarded separately.

Mr. Michael D. Henderson of R. W. Beck and Associates had a pre-application meeting with your staff on June 30, 1988 to review the contents of the application on a preliminary basis and to identify additional issues requiring analysis to complete the application. Those items have been addressed in the application. It is understood that a fast-track process is available whereby any additional information required by DER could be requested via telephone. It is also understood that Mr. Barry Andrews is primarily responsible for BACT determination and will be leaving for a month's vacation on July 20, 1988. We have decided to not give our selected contract, Fairbanks Morse, notice to proceed until an indication of BACT is provided by DER. Should selective catalytic reduction ("SCR") be determined as BACT for emission of NOx, additional negotiations will be required with the contractor and CES may have to re-evaluate the decision to supply power with No. 2 oil-fired diesel generators.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA DISTRICT
2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896
(813)332-2667



BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY
PHILIP R. EDWARDS
DISTRICT MANAGER

PERMITTEE: Robert R. Padron, Gen. Mgr.
Utility Board of the City
of Key West
City Electric System
P. O. Box 6100
Key West, FL 33041-6100

I.D.No: 52/44/0002/06
Permit/Certification
Number: A044-147179
Date of Issue: 04-04-88
Expiration Date: 04-04-93
County: Monroe

*Tied to .02 mi
or 90 feet*

Latitude: 24° 33' 40" N
Longitude: 81° 47' 51" W
Section/Town/Range: 31/67S/25E
Project: Utility Board of the
City of Key West
City Electric System
Gas Turbine
Trumbo Road - Key West

*Stock Island is
24° 33' 49" N
81° 44' 03" E or 4 mi away*

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

Operate a gas turbine power plant with a rated output of 23.45 MW at ISO conditions fired with No. 2 distillate fuel oil having a maximum heat input of (321.1) MMBTU/HR. Emissions from this source are controlled by a water-injection system.

Plant is located on Trumbo Road, Key West, Florida.

DER FORM 17-1.205(5)
Effective November 30, 1982

Page 1 of 6

PERMITTEE: Utility Board of the
City of Key West

I.D. Number: 52/44/0002/06
Permit/Certification No. AO44-147179
Date of Issue: 04-04-88
Expiration Date: 04-04-93

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor 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 does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefor caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.
6. The permittee shall at all times 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.

PERMITTEE: Utility Board of the
City of Key West

I.D. Number: 52/44/0002/06
Permit/Certification No. A044-147179
Date of Issue: 04-04-88
Expiration Date: 04-04-93

GENERAL CONDITIONS:

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

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

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

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

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

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

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

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

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

PERMITTEE: Utility Board of the
City of Key West

I.D. Number: 52/44/0002/06
Permit/Certification No. A044-147179
Date of Issue: 04-04-88
Expiration Date: 04-04-93

GENERAL CONDITIONS:

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- () Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- () Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)
- () Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon Request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

b. The permittee shall retain 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), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

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

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

PERMITTEE: Utility Board of the
City of Key West

I.D. Number: 52/44/0002/06
Permit/Certification No. AO44-147179
Date of Issue: 04-04-88
Expiration Date: 04-04-93

SPECIFIC CONDITIONS:

1. The circular 24-hour strip chart to monitor the actual ratio of the water flow (GPM)/fuel oil flow (GPM) and the electrical output in MW shall be properly maintained and calibrated so as to be functional at all times.
2. Nitrogen oxides (NO_x) emissions shall not exceed 75 ppm by volume at 15 percent oxygen on a dry basis in accordance with the requirements of U. S. EPA "Standards of performance for stationary gas turbines", Part 60, Subpart GG.
3. Nitrogen oxides test is required to show continuing compliance with the standards of the Department. The test results must provide reasonable assurance that the unit is capable of compliance at the permitted maximum operating rate. Test shall be conducted in accordance with EPA Method 20 published in 40 CFR-60, Appendix A. Such test shall be conducted prior to the renewal of this permit. Results shall be submitted to the Department within 45 days after testing. The Department shall be notified at least 15 days prior to testing to allow witnessing. Annual tests may be required if the Department inspections show a need for such tests.
4. Compliance with Sulfur Dioxide emissions will be assumed if the fuel oil analysis report indicates a sulfur content of 0.5% by weight or less.
5. Visible emissions shall be less than 20% opacity.
6. Visible emission tests are required to show continuing compliance with the standards of the Department. The test results must provide reasonable assurance that the unit is capable of compliance at the permitted maximum operating rate. Test shall be conducted in accordance with EPA Method Nine as published in 40 CFR-60, Appendix A, or State approved equivalent method. Such tests shall be conducted once per year commencing April 1989. Results shall be submitted to the Department within 45 days after testing. The Department shall be notified at least 15 days prior to testing to allow witnessing.
7. Submit a fuel oil analysis report indicating sulfur content and heat value on a monthly basis or each new shipment received.
8. Operating period for this gas turbine shall not exceed 2,885.5 hours per year.

PERMITTEE: Utility Board of the
City of Key West

I.D. Number: 52/44/0002/06
Permit/Certification No. AO44-147179
Date of Issue: 04-04-88
Expiration Date: 04-04-93

SPECIFIC CONDITIONS:

9. An annual operation report (DER Form 17-1.202(6) attached) shall be submitted by March 1st each year. The attached form shall be reproduced by the permittee and used for future annual submittals.
10. Stack sampling facilities provided by the owner shall be in accordance with the requirements of Chapter 17-2.700(4), Florida Administrative Code.
11. All fugitive dust generated at this site shall be adequately controlled.
12. This facility shall be operated in such a fashion so as to preclude objectionable odors.
13. Notification and reporting requirements of this permit shall also be sent to the Department of Environmental Regulation, South Florida District Branch Office, 11400 Overseas Highway, Suites 219-224, Marathon, Florida 33050.

Issued this 4th day of April, 1988.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION



Philip R. Edwards
District Manager

PRE/00/1s
____ Pages Attached

DER Form 17-1.201(5)
Effective November 30, 1982

Page 6 of 6

4

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

April 4, 1988

RECEIVE

APR 14 1988

Robert R. Padron, General Manager
Utility Board of the City of Key West
City Electric System
Post Office Box 6100
Key West, Florida 33041-6100

APR 15 1988

MANAGER'S OFF

RE: Monroe County - AP
Utility Board of the City of Key West
City Electric System, Gas Turbine
Trumbo Road - Key West

Dear Mr. Padron:

Enclosed is Permit Number AO44-147179 to operate the subject gas turbine issued pursuant to Section(s) 403.087, Florida Statutes.

Persons whose substantial interests are affected by this action have a right, pursuant to Section 120.57, Florida Statutes (FS) to petition for an administrative determination (hearing) on it. The petition must conform to the requirements of Chapters 17-103 and 28-5.201, FAC, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57, FS. This action is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with this paragraph or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, FAC. Upon timely filing of a petition or a request for an extension of time this action will not be effective until further Order of the Department.

When the Order (Action) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, FS, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice

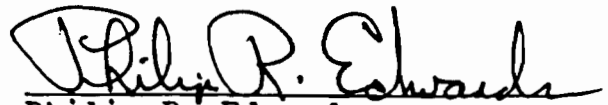
9-14-80

cc
L.T. Curry
Robert Padron

of Appeal must be filed within thirty (30) days from the date the Final Order is filed with the Clerk of the Department.

Executed in Ft. Myers, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION



Philip R. Edwards
District Manager
South Florida District Office
2269 Bay Street
Fort Myers, FL 33901-2896

PRE/00/1s
Copies furnished to:

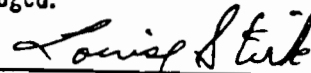
DER-Marathon Office

CERTIFICATE OF SERVICE

This is to certify that this PERMIT and all copies were mailed before the close of business on *April 12, 1988*, to the listed persons.

CLERK STAMP

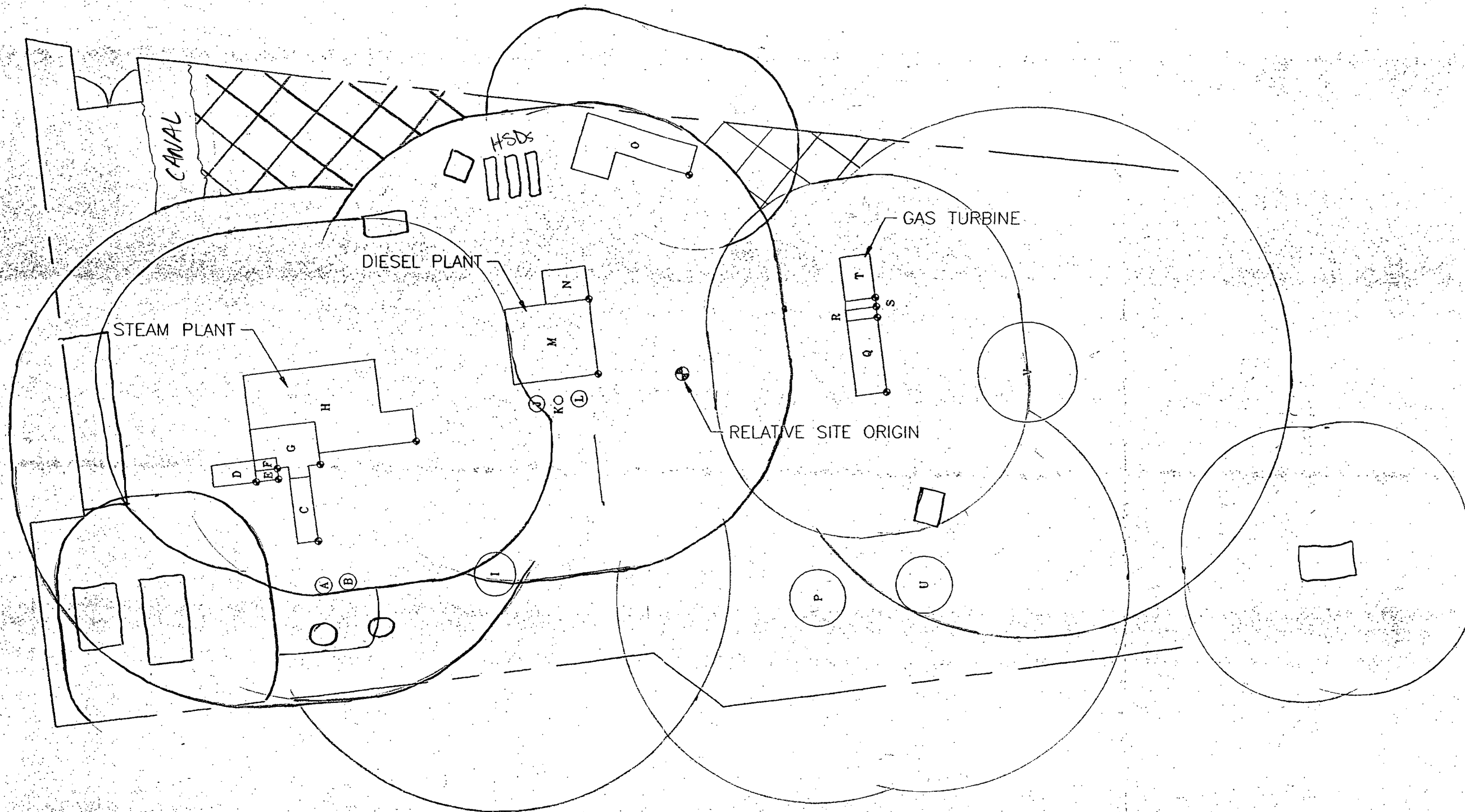
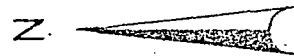
FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to S 120.52
Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.



CLERK

4-12-88

DATE



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REVISIONS	DATE	BY	CKD.	APP.	APP.

DRAWN _____
 CHECKED _____
 APPROVED _____
 APPROVED _____
 DATE _____

R.W. BECK
 AND ASSOCIATES

STOCK ISLAND
 GENERATING FACILITY

Figure 2-2
 FACILITY STRUCTURES

SCALE	REV.
NO.	
3068-SK-2	

● **SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. Show to whom delivered, date, and addressee's address. 2. Restricted Delivery
↑(Extra charge)↑ ↑(Extra charge)↑

<p>3. Article Addressed to: Mr. Robert R. Padron Key West City Electric System 1006 James Street Key West, FL 33041</p>	<p>4. Article Number P 702 177 475</p> <p>Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail</p> <p>Always obtain signature of addressee or agent and DATE DELIVERED.</p>
<p>5. Signature - Addressee X</p>	<p>8. Addressee's Address (<u>ONLY IF</u> requested and fee paid)</p>
<p>6. Signature - Agent X <i>Wanda Castillo</i></p>	
<p>7. Date of Delivery <i>8-15-88</i></p>	

PS Form 3811, Mar. 1987

★ U.S.G.P.O. 1987-178-268

DOMESTIC RETURN RECEIPT

P 702 177 475
RECEIPT FOR CERTIFIED MAIL
 NO INSURANCE COVERAGE PROVIDED
 NOT FOR INTERNATIONAL MAIL
 (See Reverse)

Sent to Mr. Robert R. Padron, Key West	
Street and No. City Elec. 1006 James St.	
P.O., State and ZIP Code Key West, FL 33041	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 8-12-88 Permit: AC 44-152197, -98 PSD-FL-135	

PS Form 3800, June 1985

Fed Exp. # 905 3633 444

8-23-88
Denver, CO

file copy

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615
Telephone (303) 295-6900 ■ Fax (303) 297-2811

FC-5801-CA1-CA

August 23, 1988

Mr. Clair Fancy
Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RECEIVED

AUG 24 1988

DER-BAQM

Subject: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

The purpose of this letter is to respond to your request for additional information in order to complete the subject application. The items are addressed below in the order of your letter of August 11, 1988. We appreciate the assistance of your staff in bringing these matters to our attention in an expeditious matter and providing feedback during preparation of our response.

1. Plot Plan and Downwash Modeling

Enclosed herewith is a marked-up version of the plot plan included in the application. The Stock Island site is approximately 450 m in the N-S direction, tapers from 250 m in the E-W direction at the inland end to 100 m at the seaward end. The existing steam unit stack is approximately 50 m and 150 m from the W and E property lines, respectively. The site of the proposed diesel generators is approximately 50 m southeast of the steam unit building and 100 m and 150 m from the SE and NW property lines, respectively.

Also pertinent to the downwash modeling is an input revision which has been made to the height of the Stock Island steam building. Enclosed herewith are elevation views of the building. We had previously considered the top of the elevator shaft (elevation 77 feet) relative to ground level (elevation 8 feet) in determining a building height of 70 feet for model input.

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 □ 1125 Seventeenth Street □ Denver, Colorado 80202-2615
Telephone (303) 295-6900 □ Fax (303) 297-2811

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FC-5801-CA1-CA

SEP 20 1988

September 19, 1988

DER - BAQM

Mr. Clair Fancy
Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

The purpose of this letter is to respond to your staff's informal request for downwash analysis of the Stock Island steam unit and the proposed diesel generators, with consideration of direction-dependent building dimensions. Prior information submitted on August 23, 1988 used a single set of building dimensions and should be disregarded. In order to perform this analysis, direction dependent projected widths have been calculated for the combination of the two buildings, as indicated in the modeling input listing. The ISCST model utilizes the Schulman-Scire downwash procedure when the regulation default option is specified and the physical stack height is less than the building height plus one-half the lesser of building height or width. At Stock Island the direction dependent projected building widths are all less than the building height. Consequently, a conservative building height of 70 feet (approximate distance between top of elevator shaft and ground level as indicated in elevation views of the Stock Island steam building enclosed with August 23, 1988 submittal) was utilized to permit use of the Schulman-Scire procedure.

Complete analyses with five years of meteorological data were made of downwash at the steam unit and diesel generators in 36 wind directions and 9 downwind distances. These results are submitted in enclosed Table 13 (complete ISCST outputs for the years 1981, 1982, 1983, 1984 and 1985 for the diesel generators are also enclosed) and incorporated into enclosed Tables 9 and 10. For comparison to AAQS, the downwash impact of the Stock Island steam

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Date: 9-19-88		RECIPIENT'S COPY			
1 From (Your Name) Please Print Mr. Halderon		Your Phone Number (Very Important) (303) 295-6900		2 To (Recipient's Name) Please Print Mr. Clair Fancy	
Company HICK & ASSOCIATES		Department/Floor No.		Recipient's Phone Number (Very Important)	
Street Address 1225 17TH ST STE 1900		City DENVER CO		State Florida	
State CO		ZIP Required 80202		City Tallahassee	
State FL		ZIP Required 32399-2400		Department/Floor No. Florida Department of Environ. Regs.	
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City TALLAHASSEE		State FL		ZIP Required 32399-2400	
3 YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.) FC-501-CA1-CA			4 IF HOLD FOR PICK-UP, Print FEDEX Address Here Street Address City State ZIP Required		
PAYMENT <input checked="" type="checkbox"/> Bill Sender <input type="checkbox"/> Bill Recipient's FedEx Acct. No. <input type="checkbox"/> Bill 3rd Party FedEx Acct. No. <input type="checkbox"/> Bill Credit Card <input type="checkbox"/> Cash					
4 SERVICES		DELIVERY AND SPECIAL HANDLING		PACKAGES WEIGHT TOUR DECLARED VALUE OVER SIZE	
1 <input type="checkbox"/> PRIORITY 1 Overnight Delivery		6 <input type="checkbox"/> OVERNIGHT LETTER*		Emp. No. Date	
2 <input checked="" type="checkbox"/> COURIER-PAK OVERNIGHT ENVELOPE*		7 <input type="checkbox"/>		<input type="checkbox"/> Cash Received	
3 <input type="checkbox"/> OVERNIGHT BOX		8 <input type="checkbox"/>		<input type="checkbox"/> Return Shipment	
4 <input type="checkbox"/> OVERNIGHT TUBE		9 <input type="checkbox"/>		<input type="checkbox"/> Third Party <input type="checkbox"/> Chg. To Del. <input type="checkbox"/> Chg. To Hold	
5 <input type="checkbox"/> STANDARD AIR Delivery not later than second business day		10 <input type="checkbox"/>		Street Address	
*Declared Value Limit \$100.		11 <input type="checkbox"/>		City State Zip	
		12 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)		Received By: X	
		1 <input type="checkbox"/> HOLD FOR PICK-UP (Fill in Box 4)		Date/Time Received FedEx Employee Number	
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		3 <input type="checkbox"/> DELIVER SATURDAY (Extra charge)		Release Signature:	
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		5 <input type="checkbox"/> CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable)		© 1988 F.E.C.	
		6 <input type="checkbox"/> DRY ICE Lbs.			
		7 <input type="checkbox"/> OTHER SPECIAL SERVICE			
		8 <input type="checkbox"/>			
		9 <input type="checkbox"/> SATURDAY PICK-UP (Extra charge)			
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		11 <input type="checkbox"/>			
		12 <input type="checkbox"/>			
		Received At 1 <input type="checkbox"/> Regular Stop 2 <input type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Box 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station		FEDEX Corp. Employee No.	
		Total Total Total		Date/Time for FEDEX Use	



IN REPLY REFER TO:
N16 (SER-ODN)

PM
10-12-88
Atlanta, GA

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OCT 14 1988

United States Department of the Interior

NATIONAL PARK SERVICE
SOUTHEAST REGIONAL OFFICE

75 Spring Street, S.W.
Atlanta, Georgia 30303

DER-BAQM

OCT 11 1988

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

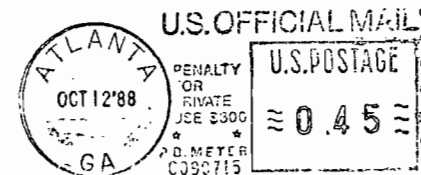
We appreciate the opportunity to review and comment on the Prevention of Significant Deterioration (PSD) permit application submitted by the Utility Board of the City of Key West, Florida, to add two 10-MW, Fairbanks Morse (model unspecified) diesel generators to their Stock Island plant. Concurrent with the startup of the two 10-MW diesel generators at the Stock Island site will be the retirement of three existing 16.5-MW steam units located approximately 6.5 km west of the Stock Island site at the Key West Plant. We understand that as a result of the retirement of these three steam units, the proposed project should result in a net decrease in area emissions.

The Stock Island site is located 1 mile east of the city of Key West and approximately 100 km southwest of Everglades National Park, a class I air quality area, and approximately 5 km south of Great White Heron National Wildlife Refuge, a class II air quality area. Under a cooperative agreement with the U.S. Fish and Wildlife Service, the National Park Service provides technical review of PSD permit applications that affect areas administered by the Fish and Wildlife Service.

Based on the National Park Service's review of the information provided, the distance of the facility from Everglades National Park, South Florida climatology, and the projected net decreases in area emissions, the proposed project should not adversely impact the air quality or air quality related values of Everglades National Park. However, based on the lack of ambient air quality monitoring and research data available we cannot determine whether or not emissions from the Key West City Electric System facility will impact the air quality related values (especially slash pine) of the Great White Heron National Wildlife Refuge. We do have several comments regarding (1) the best available technology analysis for sulfur dioxide and nitrogen oxides, (2) the air quality analysis, and (3) the air quality related values analysis (see enclosure).

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
SOUTHEAST REGION
75 SPRING STREET, S.W.
ATLANTA, GEORGIA 30303

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

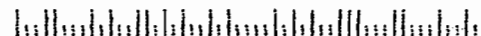


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OCT 14 1988

DER-BAQM

Mr. Claire Fancy, Central Air Permitting
Bureau of Air Quality Management
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400



*Airbill # 071 774 9651
12-14-88 Key West, FL*

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UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272
TELECOPIER: (305) 294-3685

December 14, 1988

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DEC 15 1988

DER - BAQM

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SUBJECT: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

As indicated in our letter of November 21, 1988, we have investigated the potential use of the Steuler International Corporation ("Steuler") "CER-NOx" Selective Catalytic Reduction ("SCR") system to be installed on the diesel engine generating units proposed to be constructed by the Utility Board of the City of Key West, Florida (the "Utility Board"). The results of this investigation which are outlined below, indicate (i) that the experience with the Steuler SCR system relative to diesel fueled generation is very limited and this system should be considered in the demonstration category relative to technical risk, not having been proven commercially; (ii) the addition of the Steuler SCR system will, in effect, void the Utility Board's existing performance guarantees and warranty on the diesel engine generator set, since Fairbanks Morse will not take any responsibility for the impact of the SCR equipment on the plant operation, performance and reliability; and (iii) the additional cost of this SCR system is excessively burdensome on the Utility Board's customers, which already have high electric rates as compared to customers of other electric utilities in the State, since, even if successful, it would result in a minimal benefit to the environment, based on the expected usage of this equipment, at a very high cost to the community for such benefit.



QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL NUMBER

6717749651

73387

6717749651

Date	12/14/88
------	----------

From (Your Name) Please Print Robert R. Padron, Manager	Your Phone Number (Very Important)
Company UTILITY BOARD OF KEY WEST	Department/Floor No.
Street Address 1001 JAMES STREET	
City KEY WEST	State FL
ZIP Required For Correct Invoicing 33040	

To (Recipient's Name) Please Print Mr. Clair Fancy, Central Air Permitting Bureau of Air Quality	Recipient's Phone Number (Very Important)
Company Florida Department of Environmental Regulations Twin Towers Office Building	Department/Floor No.
Exact Street Address (Use of P.O. Boxes or P.O. Zip Codes Will Delay Delivery And Result in Extra Charge.) 2600 Blair Stone Road	
City Tallahassee	State Florida
ZIP Street Address Zip Required 32309	

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3 OVERNIGHT BOX A 12 1/2" x 17 1/2" x 3"

4 OVERNIGHT TUBE B 38" x 6" x 6"

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*Declared Value Limit \$100.

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PRIORITY 1 - Delivery is scheduled early next business morning in most locations. It may take two or more business days if the destination is outside our primary service areas.
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2 DELIVER WEEKDAY

3 DELIVER SATURDAY (Extra charge)

4 DANGEROUS GOODS (P-1 and Standard Air Packages only. Extra charge)

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6 DRY ICE _____ Lbs.

7 OTHER SPECIAL SERVICE _____

8

9 SATURDAY PICK-UP (Extra charge)

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PACKAGES	WEIGHT	YOUR DECLARED VALUE	OVER SIZE
	1.05		
	1.05		
	1.05		
Total	Total	Total	

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 2 On-Call Stop
 3 Drop Box
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30714

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Return Shipment
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Street Address _____

City _____ State _____ Zip _____

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Date/Time Received _____ FedEx Employee Number _____

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Total Charges

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Telephone (303) 295-6900 □ Fax (303) 297-2811

FC-5801-CA1-AB

January 17, 1989

RECEIVED

Mr. Clair Fancy
Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

JAN 18 1989

DER-BAQM

Subject: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198, and PSD-FL-135

Dear Mr. Fancy:

We write this letter to follow up a meeting held with your staff on January 11, 1989. At that time, several issues were discussed regarding use of an SCR system for NO_x control on the proposed diesel generators. In a letter dated December 14, 1988, City Electric System ("CES") provided information on Steuler experience and equipment costs, and Fairbanks-Morse' engine performance guarantees. The conclusions in that letter were stated as follows:

- 1) The Steuler SCR technology has not been commercially proven since there is little operating experience in the oil-only diesel engines. The technology should be considered in the development and demonstration category.
- 2) Fairbanks-Morse has stated that they will cancel their engine performance guarantees and warranty if installation of the SCR equipment changes the operating conditions of the engine.
- 3) The increased costs imposed on CES' customers is excessively burdensome since their electric costs are already high relative to other utilities' customers in the state. The environmental impact of the equipment will be minimal, even if the installation were successful, because of the low planned capacity factor for the generators.

Our recent meeting provided the opportunity to informally present the information in the December letter and to discuss other concerns with the staff. The staff has requested we provide additional information relative to alternates considered for NO_x and SO₂ control, and information regarding Key

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2438106112		2438106112		2438106112	
Date: 1/17/89		RECIPIENT'S COPY			
From (Your Name) Please Print: Mike Henderson		Your Phone Number (Very Important): (303) 295-6900		To (Recipient's Name) Please Print: Mr. Clair Fancy	
Company: BECK & ASSOCIATES		Department/Floor No.:		Company: Florida Department of Environmental Bureau of Air Quality Management	
Street Address: 125 17TH ST STE 1400		City: DENVER CO		Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): Twin Towers Office Building 2600 Blair Stone Road	
State: CO		ZIP Required: 80202		City: Tallahassee, FL	
State: CO		ZIP Required: 80202		State: FL	
ZIP Required: 80202		ZIP Required: 32306-2400		ZIP Required: 32306-2400	
YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.): FC-5801-CA1-CA			IF HOLD FOR PICK-UP, Print FEDEX Address Here		
PAYMENT <input checked="" type="checkbox"/> Bill Sender <input type="checkbox"/> Bill Recipient's FedEx Acct No. <input type="checkbox"/> Bill 3rd Party FedEx Acct No. <input type="checkbox"/> Bill Credit Card			Street Address:		
<input type="checkbox"/> Cash			City:		
			State:		
			ZIP Required:		
SERVICES		DELIVERY AND SPECIAL HANDLING		PACKAGES	
1 <input type="checkbox"/> PRIORITY 1 Overnight Delivery		1 <input type="checkbox"/> HOLD FOR PICK-UP (Fill in Box 1)		WEIGHT IN POUNDS ONLY	
6 <input checked="" type="checkbox"/> OVERNIGHT LETTER*		2 <input checked="" type="checkbox"/> DELIVER WEEKDAY		YOUR DECLARED VALUE	
2 <input type="checkbox"/> COURIER-PAK OVERNIGHT ENVELOPE*		3 <input type="checkbox"/> DELIVER SATURDAY (Extra charge)		OVER SIZE	
7 <input type="checkbox"/>		4 <input type="checkbox"/> DANGEROUS GOODS (Extra charge)		Emp. No.:	
3 <input type="checkbox"/> OVERNIGHT BOX		5 <input type="checkbox"/> CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable)		Date:	
8 <input type="checkbox"/>		6 <input type="checkbox"/> DRY ICE Lbs.		Federal Express Usa	
4 <input type="checkbox"/> OVERNIGHT TUBE		7 <input type="checkbox"/> OTHER SPECIAL SERVICE		<input type="checkbox"/> Cash Received	
9 <input type="checkbox"/>		8 <input type="checkbox"/>		<input type="checkbox"/> Return Shipment	
5 <input type="checkbox"/> STANDARD AIR Delivery not later than second business day		9 <input type="checkbox"/> SATURDAY PICK-UP (Extra charge)		<input type="checkbox"/> Third Party <input type="checkbox"/> Chg. To Del. <input type="checkbox"/> Chg. To Hold	
10 <input type="checkbox"/>		10 <input type="checkbox"/>		Street Address:	
*Declared Value Limit \$100.		11 <input type="checkbox"/>		City:	
		12 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)		State:	
				Zip:	
				Received By: X	
				Date/Time Received: FedEx Employee Number	
				Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom.	
				FEDEX Corp. Employee No. 5	
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R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615
Telephone (303) 295-6900 ■ Fax (303) 297-2811

FF-5801-CA1-AA

February 8, 1989

Mr. Barry Andrews, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RECEIVED

FEB 10 1989

DER - BAQM

Dear Barry:

This letter is to follow up on telephone conversations over the last week with Mr. Clair Fancy, Bill Thomas and yourself. Previously you proposed that a BACT determination could be recommended on the basis that equal costs per ton of NO_x removal would allow use of additional timing retardation (6 gm/hp-hr) and limited operation (less than 8760 equivalent full load hours per year for the two engines) rather than use of the Steuler SCR equipment on the exhaust. The reasoning as we understand from the conversation is that since the SCR system is technologically risky and would be difficult for CES to finance at this time, CES should be required to reduce emission by a combination of limited hours and timing retardation on its engines such that the cost per ton of NO_x removal would be similar to the cost with the SCR system. CES and its Consulting Engineer requested time to review this concept and the methodology upon which it was based and provide comments.

We believe the concerns raised in our December 14, 1988 and January 17, 1989 letters support the position that "on a case by case basis, taking into account energy, environmental and economic impacts, and other costs" the best available control technology for NO_x emissions is the proposed 8 gm/hp-hr as requested in our application. The only currently available method for CES to reduce emissions from the diesel engines and still receive performance guarantees from the diesel manufacturer would be additional timing retardation to 6 gm/hp-hr, although this method represents a substantial economic penalty to CES's customers. Based on the projected economics of these units, it is unlikely that each of these units would be operated more than 2500-3000 hours per year each except in emergency cases. In the interest of minimizing emissions, CES could agree with the general concept that the use of timing retardation on its engines at some agreed level of operation represents the best available control technology for NO_x removal for CES's diesel engines since (i) the SCR system is not a reasonable or technically demonstrated alternative, and (ii) the financing of the SCR system would be difficult for CES as explained later in this letter.

BEST AVAILABLE COPY

		AIRBILL <small>USE THIS AIRBILL FOR DOMESTIC SHIPMENTS WITHIN THE CONTINENTAL U.S.A., ALASKA AND HAWAII. USE THE INTERNATIONAL AIR WAYBILL FOR SHIPMENTS TO PUERTO RICO. QUESTIONS? CALL 800-238-5355 TOLL FREE.</small>		PACKAGE TRACKING NUMBER 2425646296															
2425646296		Date 2-9-89		RECIPIENT'S COPY															
From (Your Name) Please Print Mike Henderson		Your Phone Number (Very Important) (303) 295-6900		To (Recipient's Name) Please Print Mr. B. Thomas Recipient's Phone Number (Very Important) Mr. Barry Andrews, Central Air Permitt															
Company R. H. BECK & ASSOCIATES		Department/Floor No.		Company Bureau of Air Quality Department/Floor No.															
Street Address 1125 17TH ST STE 1900		City State ZIP Required DENVER CO 80202		Exact Street Address (No Deliveries to P.O. Boxes or P.O. Zip Codes.) Twin Towers Office Building 2600 Blair Stone Road															
City State ZIP Required DENVER CO 80202		City State ZIP Required Tallahassee, FL 32399-2400		YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.) FF-5801-CA1-AA															
PAYMENT <input checked="" type="checkbox"/> Bill Sender <input type="checkbox"/> Bill Recipient's FedEx Acct. No. <input type="checkbox"/> Bill 3rd Party FedEx Acct. No. <input type="checkbox"/> Bill Credit Card <input type="checkbox"/> Cash		IF HOLD FOR PICK-UP, Print FEDEX Address Here Street Address City State ZIP Required		Emp. No. Date <input type="checkbox"/> Cash Received <input type="checkbox"/> Return Shipment <input type="checkbox"/> Third Party <input type="checkbox"/> Chg. To Del. <input type="checkbox"/> Chg. To Hold Street Address City State Zip Received By: X Date/Time Received FedEx Employee Number															
SERVICES 1 <input checked="" type="checkbox"/> PRIORITY 1 Overnight Delivery 2 <input type="checkbox"/> COURIER-PAK OVERNIGHT ENVELOPE* 3 <input type="checkbox"/> OVERNIGHT BOX 4 <input type="checkbox"/> OVERNIGHT TUBE 5 <input type="checkbox"/> STANDARD AIR Delivery, not later than second business day *Declared Value Limit \$100.		DELIVERY AND SPECIAL HANDLING 1 <input type="checkbox"/> HOLD FOR PICK-UP (Fill in Box H) 2 <input checked="" type="checkbox"/> DELIVER WEEKDAY 3 <input type="checkbox"/> DELIVER SATURDAY (Extra charge) 4 <input type="checkbox"/> DANGEROUS GOODS (Extra charge) 5 <input type="checkbox"/> CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable) 6 <input type="checkbox"/> DRY ICE Lbs. 7 <input type="checkbox"/> OTHER SPECIAL SERVICE 8 9 <input type="checkbox"/> SATURDAY PICK-UP (Extra charge) 10 11 12 <input type="checkbox"/> HOLIDAY DELIVERY (if offered) (Extra charge)		<table border="1"> <thead> <tr> <th>PACKAGES</th> <th>WEIGHT IN POUNDS ONLY</th> <th>YOUR DECLARED VALUE</th> <th>OVER SIZE</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>Total</td> <td>Total</td> <td></td> </tr> </tbody> </table> Received At: 1 <input checked="" type="checkbox"/> Regular Stop 2 <input type="checkbox"/> On-Call Stop 3 <input type="checkbox"/> Drop Box 4 <input type="checkbox"/> B.S.C. 5 <input type="checkbox"/> Station FEDEX Corp. Employee No. 526105 Date/Time for FEDEX Use 1/1/89		PACKAGES	WEIGHT IN POUNDS ONLY	YOUR DECLARED VALUE	OVER SIZE					Total	Total	Total		Federal Express Use Base Charges Declared Value Charge Other 1 Other 2 Total Charges PART #111800 REVISION DATE 10/88 PRINTED IN U.S.A. FXEM 009 PROD. 11/88 © 1988 F.E.C.	
PACKAGES	WEIGHT IN POUNDS ONLY	YOUR DECLARED VALUE	OVER SIZE																
Total	Total	Total																	



Florida Department of Environmental Regulation

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

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

March 21, 1989

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

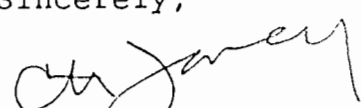
Mr. Robert R. Padron
Key West City Electric System
1006 James Street
Key West, Florida 33041

Dear Mr. Padron:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Key West City Electric System to construct two 10 MW diesel generators at the existing Stock Island Plant, in Monroe County, Florida.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,


C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/ks

Attachments

cc: D. Knowles
W. Aronson, EPA
C. Shaver, NPS
D. Swann, P.E./M. Henderson, R.W. Beck

INTENT PUBLISHED 3-29-89

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MAR 24 1989
DER
SOUTH FLORIDA DISTRICT

Department of Environmental Regulation
Routing and Transmittal Slip

To: (Name, Office, Location)

1. Cleve Holladay
2. Air Resources Management
3. Bureau of Air Regulation
4. Tallahassee

Remarks:

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Division of Air
Resources Management

From David Knowles South District	Date 11/10/93
	Phone SC 748-6975



PM
4-19-89
Atlanta, GA

file copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

4APT-APB-cdw
APR 19 1989

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APR 21 1989

Mr. Clair Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

DER-BAQM

Re: Key West Diesel Engine Generating Station (PSD-FL-135)

Dear Mr. Fancy:

We have reviewed your March 21, 1989, letter containing the preliminary determination, public notice, and draft permit for the proposed construction of two 10MW diesel generators for the Key West City Electric System (Key West) at the Stock Island Plant, Monroe County, Florida. We offer the following comments which were discussed on April 10, 1989, during a telephone conversation between Mr. Pradeep Raval of your staff and Ms. Karrie-Jo Shell of my staff.

Best Available Control Technology (BACT) for Nitrogen Oxides (NO_x)

Using a diesel engine with an uncontrolled emission rate of 8 gm/hp-hr as the basis for the evaluation, four options considered in the "top-down" BACT approach were:

<u>Control Option</u>	<u>Emission Limit (gm/hp-hr)</u>
1. Diesel Engine with SCR	0.8
2. Combined Cycle Engine	1.0
3. Gas Turbine	1.3
4. Diesel Engine with Timing Retardation	6.0

Selective Catalytic Reduction (SCR) was rejected as BACT because of its large capital cost. In order to cover the \$2.3 million capital cost, the applicant claims they will need additional bonding coverage, which in turn would raise electrical rates in the Key West area. The increase in rates would allegedly result in financial burdens for the citizens of Key West, who recently experienced rate increases for water.

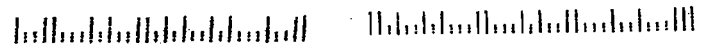
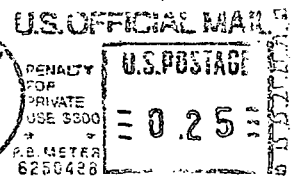
The use of a gas-fired turbine or a combined cycle engine was rejected because these units are typically sized larger than stationary diesel engines (only one unit of 20MW would be needed instead of the desired two 10MW units), which means one large unit would have a lower reliability than two smaller units. The fact that these units are typically sized larger than stationary diesel engines does not mean gas turbines or

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

AIR-4

Mr. Clair Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399



Please address our concerns prior to issuance of the final determination and permit so that any outstanding issues can be resolved. If you have any questions, please feel free to contact me or Karrie-Jo Shell of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

cc: Robert R. Padron
General Manager
Utility Board - City of Key West
P.O. Drawer 6100
Key West, Florida 33041-6100

copied: P. Raval
B. Andrews
S. Chu
D. Knowles, SF Dist.
R. Helbling, SF Branch
C. Shaver, NPS
eHF/BT

PM
4-26-89
Key West, FL

file copy

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

RECEIVED

APR 28 1989

April 25, 1989

DER - BAQM

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

SUBJECT: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

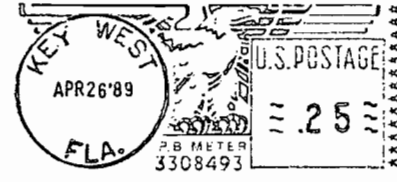
We have reviewed DER's March 21, 1989 Intent to Issue, Technical Evaluation and Preliminary Determination, draft Permit, and BACT Determination for the subject PSD application and offer the following comments. Our primary concern is that the numerical limits on operating hours, fuel consumption and NOx emission should be expressed on a per-plant, rather than per-unit basis, in order to allow CES operating flexibility. Otherwise, our comments are of an editorial nature.

We have no comment on the Intent to Issue or BACT Determination.

We have three comments on Tables I, II and III of the Technical Evaluation and Preliminary Determination. In Table I, footnote "(3)" should appear next to "173" under SO2 Emission. In Table II, the "9" under Actual Emission should be deleted and the following four values moved vertically upward. In Table III, the values "9.2, 0.2 and 5.8" should be inserted under Diesel Impact in vertically downward order.

We request that consideration be given to addressing numerical limits on a per-plant, rather than per-unit basis in the draft Permit in order to allow CES operating flexibility. Specific Condition 1 could be changed to "3740 hours" for the plant. Specific Condition 4 could be changed to "2.6 million gallons", "3740 hours" and "290 tons per year" for the plant.

UTILITY BOARD  OF THE CITY OF
KEY WEST, FLORIDA
33041-6100



Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

JUN 19 1989

4APT/APB-aes

Mr. C. H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

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JUN 22 1989

DER-BAQM

Re: Key West Electric System (PSD-FL-135)

We have reviewed your June 6, 1989, letter containing the final determination and permit for the proposed construction of two diesel generators to be located at the Stock Island facility in Monroe County, Florida. We concur with Florida's evaluation of this project.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

cc: Mr. Robert R. Padron
Key West Electric System
1006 James Street
Key West, Florida 33041

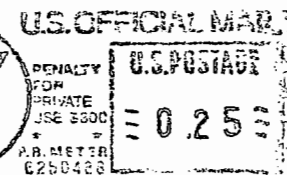
copied : P. Raval
B. Andrews
S. Chu
D. Knowles
CHF/BT

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

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PENALTY FOR PRIVATE USE, \$300

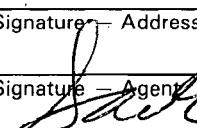
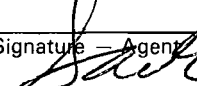
AIR-4


Mr. C. H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
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2600 Blair Stone Road
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3. Article Addressed to: Mr. Robert R. Padron, Gen. Mgr. Utility Board - City of Key West City Electric System P. O. Drawer 6100 Key West, FL 33041-6100	4. Article Number P 407 853 159 Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise
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PS Form 3811, Apr. 1989

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P.O. Drawer 6100	
P.O., State and ZIP Code Key West, FL 33041-6100	
Postage	\$
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UTILITY BOARD OF THE CITY OF KEY WEST

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TELECOPIER: (305) 294-3685

December 27, 1990
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DEC 31 1990
DER-BAQM

Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Extension of time to expiration date for construction Permit
No. AC 44-152197, PSD-FL-135

Dear Mr. Fancy,

Our contractor for the above referenced permit is behind in his construction schedule. The contractor claims late deliveries of equipment and essential parts as the reason for an 8 week delay in the completion of his contract.

The expiration date of our construction permit is April 01, 1991. We would appreciate an extension of 60 days to the scheduled date of expiration on this permit to allow our contractor time to complete the job.

If I maybe of further assistance in this matter, or additional information is required please call me.

Sincerely,

UTILITY BOARD-CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"
Robert R. Padron, Manager

Robert W. Wallace
Results Supervisor

RWW/me

cc:
R.R. Padron
L. T. Curry, Jr.
M. Anderson
T. Donovan, R.W. Beck and Associates
B. Pattinson, R. W. Beck and Associates
D. M. Knowles, FDER, Ft. Myers
R. J. Helbling, FDER, Marathon Office

File

B. Andrews
J. Harper, EPA

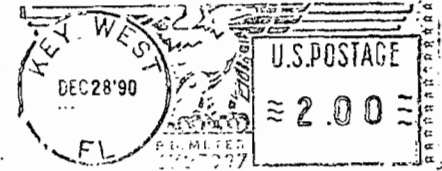
UTILITY BOARD



OF THE CITY OF

KEY WEST, FLORIDA

33041-6100



Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

*Fold at line over top of envelope to the right
of the return address.*

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P 506 006 0??

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Consult postmaster for fee.

3. Article Addressed to:
 Robert R. Padron, G.M.
 Utility Board - City of Key West
 1006 James St
 P.O. Drawer 6100
 Key West, FL 33044-6100

4a. Article Number
 P 832 539 829

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<input type="checkbox"/> Express Mail	<input type="checkbox"/> Return Receipt for Merchandise

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5. Signature (Addressee)

6. Signature (Agent)
[Signature] 8/1/91

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Street & No.	Utility Board - City of Key West
P.O., State & ZIP Code	Key West, FL
Postage	\$
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Return Receipt Showing to Whom & Date Delivered	
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PS Form 3800, June 1990

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MARTIN S. FRIEDMAN, P.A.
JOHN R. JENKINS
ROBERT M. C. ROSE, P.A.
WILLIAM E. SUNDSTROM, P.A.
DIANE D. TREMOR
JOHN L. WHARTON

Division of Air
Resources Management

MAILING ADDRESS
POST OFFICE BOX 1567
TALLAHASSEE, FLORIDA 32302-1567

TELECOPIER (904) 656-4029

October 30, 1991

JOHN R. WODRASKA
SPECIAL CONSULTANT
(NOT A MEMBER OF THE FLORIDA BAR)

Mr. Clair H. Fancy
Deputy Chief
Bureau of Air Quality Management
Department of Environmental
Regulation
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Re: Utility Board of the City of Key West
Extension of Permit Expiration Date
AC 44-152197 and PSD-FL-135

Dear Mr. Fancy:

Pursuant to our telephone conversation, this letter is to confirm the request of the Utility Board of the City of Key West for a further extension of the expiration date of the referenced construction permit for the diesel generator project at the Stock Island Power Plant. The requested extension is from December 31, 1991, to May 1, 1992.

The reason for this current request is our initial dissatisfaction with the results of the long-term performance testing conducted on behalf of the contractor. We do not believe it would be appropriate to apply for an operating permit until we are provided greater assurance that the diesel units will perform in full compliance with all applicable laws and regulations, and in accordance with the terms of our contract.

Testing to ensure that the diesel units meet all performance guarantees pursuant to the terms of our contract was conducted in August. While the results from the beginning portion (the first 100 hours) of the required 360-hour performance testing indicated compliance with our DER construction permit conditions, the results near the end of the 360-hour test period indicated increasing opacity or visual emissions from one of the units. We have discussed this situation with the contractor and it was agreed that additional testing will be performed during the first full week of

P 617 884 130



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P.O., State & ZIP Code <i>Key West, FL</i>	
Postage	\$
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Postmark or Date <i>12-16-91</i> <i>AC 44-152197</i> <i>PSD-FI-135</i>	

Key West

PS Form 3800, June 1990

P 062 921 890



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Special Delivery Fee	
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Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	\$
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AC 44-152197	
PSD-FI-135	
AO 44-207419	

PS Form 3800, June 1991

PS Form 3811, July 1983 447-945

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3. Article Addressed to:
Robert R. Padron
Key West Electric Sys.
1006 James St.
Key West, FL 33041

4. Type of Service:	Article Number
<input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Express Mail	<input type="checkbox"/> Insured <input type="checkbox"/> COD PD62 921 890

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6. Signature - Agent	X <i>[Signature]</i>
7. Date of Delivery	
8. Addressee's Address (ONLY if requested and fee paid)	

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Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

October 28, 1992

Mr. R. Williams
Key West Electric System
1006 James Street
Key West, Florida 33041

Dear Mr. Williams:

The application processing fee for a plant modification that will increase air emissions by 5 or more tons per year, but less than 25 tons per year, of any single pollutant is \$1,000.00 per F.A.C. Rule 17-4.050(4).

Sincerely,

Willard Hanks

Willard Hanks
Air Permit Review Engineer

MESSAGE CONFIRMATION

OCT-28-1992 WED 11:28

TERM ID: DIV OF AIR RES MGNT P-9999

TEL NO: 904-922-6879

NO.	DATE	ST. TIME	TOTAL TIME	ID	DEPT CODE	OK	NG
861	10-28	11:27	00:00:43	3052942392		01	00

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

RECEIVED

UTILITY BOARD OF THE CITY OF
KEY WEST (CITY ELECTRIC SYSTEM),

Petitioner,

vs.

OGC CASE NO. 92-1471

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION,

Respondent.

JAN 08 1993
DIVISION OF AIR
RESOURCES MANAGEMENT

ORDER GRANTING REQUEST FOR EXTENSION
OF TIME TO FILE PETITION FOR HEARING

This cause has come before the Florida Department of Environmental Regulation (Department) on receipt of a request made by Petitioner UTILITY BOARD OF THE CITY OF KEY WEST (CITY ELECTRIC SYSTEM), under Florida Administrative Code rule 17-103.070, to grant an extension of time to file a petition for an administrative hearing on Application No.A044-207419. See Exhibit 1 attached.

Counsel for Petitioner has discussed this request with counsel for Respondent State of Florida Department of Environmental Regulation, which has no objection to it. Therefore,

IT IS ORDERED:

The request for an extension of time to file a petition for administrative proceeding is granted. Petitioner shall have until February 4, 1993, to file a petition in this matter. Filing shall

Department of Environmental Regulation
Routing and Transmittal Slip

To: (Name, Office, Location)

1. Clair Fancy FLH - Air Rm 306A
2. Quality
- 3.
- 4.

Remarks:

RECEIVED

JAN 08 1993

Division of Air
Resources Management

From

Date

Phone

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4. Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. Show to whom delivered, date, and addressee's address. Restricted Delivery
 †(Extra charge)† †(Extra charge)†

3. Article Addressed to: Mr. Michael D. Henderson R. W. Beck and Assoc. 1125 Seventeenth St. Denver, CO 30202-2615	4. Article Number P 274-007-457 Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail Always obtain signature of addressee or agent and DATE DELIVERED.
5. Signature - Addressee <input checked="" type="checkbox"/> <i>Michael D. Henderson</i>	8. Addressee's Address (ONLY if requested and fee paid)
6. Signature - Agent <input checked="" type="checkbox"/>	
7. Date of Delivery SEP 23 1988	

PS Form 3811, Mar. 1987

* U.S.G.P.O. 1987-178-268

DOMESTIC RETURN RECEIPT

P 274 007 457

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
 NOT FOR INTERNATIONAL MAIL

(See Reverse)

PS Form 3800, June 1985 * U.S.G.P.O. 1985-480-794

Sent to	
Mr. Michael D. Henderson, R.W.	
Street and No.	Beck
1125 17th St.	
P.O., State and ZIP Code	
Denver, CO 80202-2615	
Postage	S
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	S
Postmark or Date	
Mailed: 9-21-88	
Permit: AC 44-152197, -98	
PSD-FL-135	

Ord Exp # 82 35015445
9-22-88
Denver, Co

file copy

R.W. BECK
AND ASSOCIATES

Denver National Bank Building, Suite 1900 ■ 1125 Seventeenth Street ■ Denver, Colorado 80202-2615
Telephone (303) 295-6900 ■ Fax (303) 297-2811

FC-5801-CA1-CA

September 22, 1988

Mr. Clair Fancy
Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RECEIVED
SEP 23 1988
DER-BAQM

Subject: PSD Application for Two 10-MW Diesel Generators
at Key West, Florida
Permit Nos. AC44-152197, AC44-152198 and PSD-FL-135

Dear Mr. Fancy:

The purpose of this letter is to correct the September 19, 1988 presentation of downwash impact calculations for the Stock Island Steam unit and the proposed diesel generators. The ISCST model outputs attached to the September 19, 1988 letter include separate impacts from the steam unit and the diesel generators, and have been utilized for the correction. Table 13, 9 and 10 as revised on September 19, 1988 consider the impacts separately. Corrections are hereby made (and Tables 13 and 9 revised accordingly) which consider the combined impacts of the sources on a short-term basis for the five years of analysis and for comparison to AAQS. For comparison to PSD increments in Table 10, no revision is necessary since only the downwash impact of the diesel generators (per Table 13 revised September 19, 1988) was assumed.

As the values in both Tables 9 and 10 indicate, compliance with AAQS and PSD Class II increments is achieved.

It is further noted that on July 1, 1987 EPA set the significant emission limit for PM-10 at 15 TPY, above which BACT analysis is required. The particulate matter emissions for the proposed diesel generators are conservatively expected to be 100% PM-10 and to exceed 15 TPY. However, as indicated in the July 14, 1988 application there are no known particulate collection installations on diesel engines and consequently no BACT analysis has been done.

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PACKAGE TRACKING NUMBER

8235015145

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Date 1-22-88

1 From (Your Name) Please Print
Mike Manderson

Your Phone Number (Very Important)

2 To (Recipient's Name) Please Print
Mr. Clair Fancy

Recipient's Phone Number (Very Important)

Company
W W BECK & ASSOCIATES

Department/Floor No.

Company
Bureau Of Air Quality Management

Department/Floor No.

Street Address
1125 17TH ST STE 1900

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.)
Twin Towers Office Bld. 2600 Blair Stone B.

City State ZIP Required
DENVER CO 80202

City State ZIP Required
Tallahassee, FL 32399-2400

3 YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.)
1-800-238-3355

IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address

PAYMENT Bill Sender Bill Recipient's FedEx Acct. No. Bill 3rd Party FedEx Acct. No. Bill Credit Card
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City State ZIP Required

4 SERVICES

1 PRIORITY 1 Overnight Delivery 6 OVERNIGHT LETTER*

2 COURIER-PAK OVERNIGHT ENVELOPE* 7

3 OVERNIGHT BOX 8

4 OVERNIGHT TUBE 9

5 STANDARD AIR Delivery not later than second business day 10

* Declared Value Limit \$100.

DELIVERY AND SPECIAL HANDLING

1 HOLD FOR PICK-UP (Fill in Box H)

2 DELIVER WEEKDAY

3 DELIVER SATURDAY (Extra charge)

4 DANGEROUS GOODS (Extra charge)

5 CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable)

6 DRY ICE Lbs.

7 OTHER SPECIAL SERVICE

8

9 SATURDAY PICK-UP (Extra charge)

10

11

12 HOLIDAY DELIVERY (if offered) (Extra charge)

PACKAGES	WEIGHT	YOUR DECLARED VALUE	OVER SIZE
1	1.93		
2	1.93		
3	1.93		
Total	Total	Total	

Received At
 Regular Stop
 On-Call Stop
 Drop Box B.S.C. Station

FEDEX Corp. Employee No.

Date/Time for FEDEX Use

Emp. No. Date

Cash Received
 Return Shipment
 Third Party Chg. To Del. Chg. To Hold

Street Address

City State Zip

Received By: **X**

Date/Time Received FedEx Employee Number

Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom.

Release Signature:

Federal Express Use

Base Charges

Declared Value Charge

Other 1

Other 2

Total Charges

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PM
9-29-84
Atlanta, GA

file copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

SEP 29 1988

4APT/APB-aes

RECEIVED

OCT 4 1988

DER-BAQM

Mr. Clair H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

Re: Key West Diesel Engine Generating Station

Dear Mr. Fancy:

We have reviewed the permit application, ~~preliminary determination and draft permit~~ for the construction of the Key West Diesel Generating Station. The permit was reviewed under the Region IV Overview of State Programs Policy. We offer the following comments:

RR 10-4-88

Emission Limits

As you know, EPA now requires that PM₁₀ emissions be addressed in air permits (ref: Federal Register (52 FR 24634)); therefore, an emission limit for PM₁₀ should be included in the discussion of the projected pollutant emissions for this facility.

Compliance Testing

To be more sufficient, the permit must include test methods to be used in compliance testing for each pollutant. When designating each test method, include which version of the 40 CFR Parts 60 and 61 to be used. Also, for pollutants not subject to testing provisions contained in 40 CFR Parts 60 or 61, include a testing protocol, specifying each pollutant's sample volume, sample time and the number of test runs for each test method specified.

Air Quality Analysis

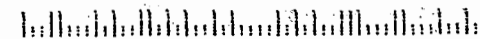
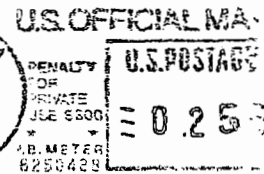
The summary of the downwash modeling did not explain why a downwash analysis for the diesel generator was done for the Prevention of Significant Deterioration (PSD) increment analysis but was not done for the Ambient Air Quality Analysis. Also, it was not explained why the Key West gas turbine was eliminated from the downwash analysis.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300
AIR-4

RECEIVED
OCT 4 1988
DER-BAQM

Mr. Clair H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399



UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100

KEY WEST, FLORIDA 33041-6100

May 6, 1993



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

RECEIVED

MAY 17 1993

Division of Air Resources Management

Mr. Clair Fancy
Department of Environmental Regulations
Twin Towers Office Building
2600 Blainstone Road
Tallahassee, FL 32399-2400

Dear Mr. Fancy:

During the PSD application (PSD-FL-135) process for the Medium Speed Diesel Units (AC-44-152197) at the Stock Island Power Plant in 1988, R.W. Beck and Associates identified the peaking diesels at Stock Island (AO-44-175804). However, "R.W. Beck" failed to include them in the impact modeling since they were not considered a major source. It was felt that if they were modeled their impact would be insignificant.

Subsequent to preparation of the PSD application in connection with the relocation of the combustion turbine from the Key West Power Plant to the Stock Island Power Plant additional modeling was performed.

One part of the analysis, the downwash analysis, included modeling the effects of building wakes on stack emission impacts. Inclusion of the high speed diesels in the downwash analysis revealed the three hour and twenty-four hour impacts unacceptable. The significant impact of the emissions from the high speed diesels appears to be related to two major factors; the low stack configuration and the relative location of the high speed diesels to the medium speed diesel building and the No. 6 oil tank.

R. W. Beck's modeling indicates that an acceptable impact could be achieved by limiting operating hours on all Stock Island high speed diesels to the hours of 9:00 a.m. to 5:00 p.m. C.E.S. will implement this schedule and is currently exploring the costs associated with relocating the high speed diesels.

If I can be of further assistance, please do not hesitate to call.

Sincerely, *Bringing Power To The People for 50 Years*

UTILITY BOARD - CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"
Robert R. Padron, General Manager

Carl R. Jansen, Jr.
Production Manager

CRJ/dh

cc:
R. Padron, General Manager
J. Greenshields, Environmental Supervisor
File (2)

UTILITY BOARD MEMBERS:

William T. Cates, Chairman • Marty Arnold, Vice-Chairman
Otha P. Cox, Member • Leonard H. Knowles, Member • John H. Robinson, Jr., Member

UTILITY BOARD



OF THE CITY OF

KEY WEST, FLORIDA

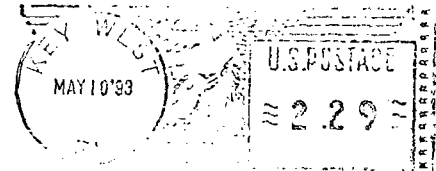
33041-6100

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CERTIFIED

P 004 192 392

MAIL



RETURN RECEIPT REQUESTED



CITY ELECTRIC SYSTEM

Bringing Power To The People for 50 Years

MR CLAIR FANCY
DEPARTMENT OF ENVIRONMENTAL REGULATIONS
TWIN TOWERS OFFICE BUILDING
2600 BLAIRSTONE RD
TALLAHASSEE FL 32399-2400

RETURN RECEIPT REQUESTED

5/24

John B

Have Cleve prepare response with copy to David Knowles

Clev

Patly, Please check the status of the AC 44-152197. Has it been done here? If so, give to Cleve Prector
② Cleve, Brief JB and GPL 5/25
ON THIS

UTILITY BOARD OF THE CITY OF KEY WEST

POST OFFICE DRAWER 6100

KEY WEST, FLORIDA 33041-6100
CERTIFIED MAIL
RETURN RECEIPT REQUESTED



TELEPHONE: (305) 294-5272

TELECOPIER: (305) 294-3685

RECEIVED
January 14, 1991

JAN 17 1991

DER - BAQM

Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Subject: Source Testing of New Diesel Plant, Construction Permit No. AC 44-1522197

Dear Mr. Fancy;

The present rate of progress at our construction site indicates we will begin source testing of the new diesels on January 30, 1991. Current scheduling indicates first start of the new units on the 24th through the 29th.

We hope that this schedule will meet with your office's approval.

If I maybe of further assistance in this matter, or additional information is required please call me.

Sincerely,

UTILITY BOARD-CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"
Robert R. Padron, Manager

Robert W. Wallace
Results Supervisor

RWW/me

cc:

R.R. Padron
L. T. Curry, Jr.
M. Anderson
T. Donovan, R. W. Beck & Associates
B. Pattinson, R. W. Beck & Associates
D. M. Knowles, FDER, Ft. Myers
R. J. Helbling, FDER, Marathon Office

File

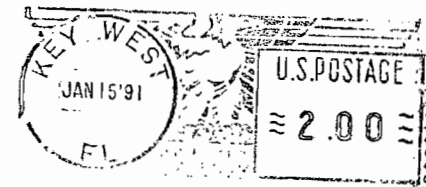
UTILITY BOARD



OF THE CITY OF

KEY WEST, FLORIDA

33041-6100



RETURN RECEIPT
REQUESTED

Mr. Clair H. Fancy
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

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of the return address.*

CERTIFIED

P 506 006 083

MAIL



886

January 8, 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Robert R. Padron, General Manager
Utility Board - City of Key West
City Electric System
1006 James Street
P. O. Drawer 6100
Key West, Florida 33041-6100

Re: Permit Expiration Date Extension
Two Diesel Generators
AC 44-152197 and PSD-FL-135

Dear Mr. Padron:

The Department is in agreement with your request, dated October 30, 1991, for an extension of the expiration date of the above permit. The following shall be changed and added to the permit:

Expiration Date:

From: December 31, 1991

To: August 31, 1992

Attachment to be Added:

- Diane D. Tremor's letter received October 30, 1991.

This letter must be attached to the above mentioned permit and shall become a part of that permit.

Sincerely,

STEVE SMALLWOOD, P.E.

Director
Division of Air Resources
Management

SS/MB/plm

c: D. Knowles, SD
Diane Tremor, _____

886

TO: Steve Smallwood
FROM: Clair Fancy
DATE: January 8, 1992
SUBJ: Expiration Date Extension for AC 44-152197 and PSD-FL-135
Utility Board - City of Key West

Attached is a letter that will extend the expiration date of the above mentioned permit.

I recommend your approval.

CF/MB/plm